Pre-service Teachers' Motivational Orientations and the Impact of Self-Regulated Learning on their Academic Achievement: A Mixed Method Study.

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Abstract

This convergent parallel mixed methods study investigated pre-service teachers' motivation and self-regulation learning and its impact on their academic achievement during their professional training in colleges of education. In addition, the contributory factors of beliefs and values that lay behind some pre-service teachers' motivational orientations were examined through episodic narratives. The multi-stage sampling technique was used in selecting 500 teacher trainees from 40 residential colleges of education in Ghana and data sources included surveys, archival and interview data. The results from the study indicated that taken as a set, the motivation component of pre-service teachers' self-regulation learning construct mediated the relationship between prior performances (entry aggregates) and academic achievement (GPA). The learning strategies component intervened significantly in the influence of prior performance on academic achievement. In the final model, prior performance showed a moderately large indirect effect on academic achievement through ten out of the fifteen variables of the self-regulation learning construct. The research findings indicated that desirable attributes such as critical thinking, metacognitive strategy use, and students' value for task on the courses on the teacher training programme were non-existing and did not predict pre-service teachers' academic performance in college. The pre-service teachers' narratives suggested that family members and friends, instead of candidates themselves, played a significant role in their choice of colleges of education for training and accordingly the teaching profession; motivation was principally external and teaching was mainly perceived as a means of imparting knowledge to young ones. However, participants held some positive values such as recognizing diversity among children, collaborating with parents to achieve optimal learning for children and holding high the ethical principles of the teaching profession. This study provides an ecological and empirical foundation for the specification and explanation of the theoretical connections between pre-service teachers' prior attainment, motivational orientations and self-regulation learning strategy use and their academic achievement in professional training context.

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THESIS SUBMITTED

BY

ERIC ANANE

TO THE SCHOOL OF EDUCATION
IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

DURHAM UNIVERSITY

OCTOBER 2014

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Acknowledgements

I would like to express my sincere gratitude to my sponsors: Institute of Education, University of Cape Coast and the Caedmon/Ceolfrid Trust for funding this study by paying for my tuition and cost of living in the UK. I also thank the John (Jack) Simpson Greenwell Memorial Fund for sponsoring my trip to Ghana for data collection. But for these sponsorships, I would not have been able to accomplish this project.

I would like to thank my supervisors, Dr. Caroline Walker-Gleaves and Dr. Richard Remedios, for their honest, thorough, and especially, usefully critical and prompt feedback on my ideas, analyses and writing. I am most grateful.

I would like to extend my heartfelt gratitude to Professors D. D. Kuupole, James Adu Opare, Peter Tymms, Frederick Ocansey, Naana Jane Opoku-Agyemang and Chris Hutchison; Hon. Richard Anane Adabor, Ms. Hannah Nyarkoh, Ms. Mabel Mensah, Mr. Nicholas Koku Kutor, Mr. Yaw Anwhere, Ms. Cecilia Boakye, Mr. Kwabena Owusu, Mr. Kofi Nti, Rev. Sis. Elizabeth Amoako, Captain Rita Anane Owusu, Mr. Richard Ofori and Mr. Samuel Gyan for their immeasurable contributions to my life and my academic development. I am highly indebted and most grateful.

I know I could not have achieved this feet without the love and support of some amazing friends: Mrs. Audria Dankwa, Ms. Veronica Abaidoo, Ms. Mabel Serwah Agyemeng, Mrs. Eleanor Araba Antwi, Ms. Ruth Anang, Ms. Martha Anang, Miss Christabelle Nyarko, Mrs. Lydia Agyekum, Dr. ZhiMin Xiao, Dr. Philip Arthur, Mr. Tim King Lung Chung, Mr. Joseph Mensah, Bishop Nana Hayford Afadzie, and Miss Linda Ameyaw, a part of me. I do appreciate you being there for me at different and critical moments in my life - thank you for your immense support and sacrifices.

All this has been possible because of such wonderful people of the Institute of Education, Ghana, students, principals and tutors of colleges of education, who contributed in various ways for the successful completion of this project. You all will forever be on my mind and I wish you all well and stay blessed!

Dedication

In loving memory of Barbara Anane – Hope you are happy, for this has been your dream!

And Professor James Adu Opare

CHAPTER 1: INTRODUCTION

1.1 Background to the Study

The first decade of the twenty-first century has been characterized by serious public debate about issues of education such as improving the quality of teaching and learning in schools and students' performances and teacher training (i.e., enhancing the effectiveness of teachers and modifying teacher training curricula). These issues are often accompanied by suggestions for the need to rethink education (Yogev & Michaeli, 2011; Cochran-Smith & Fries, 2005; Darling-Hammond & Bransford, 2005; Shulman & Shulman, 2004); to reflect on ways of helping children to acquire the vital competencies (i.e., the mixture of knowledge, skills and attitudes suitable for a specific context) needed to progress in today's societies and labour markets (World Bank, 2013; European Commission, 2012; Musset, 2010; Day, 2004). For example, The European Union in 2006 adopted a European Reference Framework of Key Competences for Lifelong Learning, to identify the key competences necessary for personal fulfilment, active citizenship, social cohesion and employability in a knowledge society. Its major innovation is to move from a static conception of curricular content to a dynamic combination of knowledge, skills and attitudes appropriate to the many and varied real-life contexts on which people need to use them (European Commission, 2012; UNESCO, 2012; Zimmerman & Schunk, 2009). There seems to be a budding level of policy interest in self-regulation and its impact on learning and attainment. From the early years, through to the school system and in out-of school activities, those who work with children are expected to assist them develop self-regulation skills and strategies, with the aim of enabling them to enjoy their childhood, fulfil their potential, achieve well and become employable adults (Duckworth, Akerman, MacGregor, Salter & Vorhaus, 2009).

In the light of this, there is the growing demand to reform curricula and programmes worldwide (European Commission, 2012; UNESCO, 2011; OECD, 2005; Eurydice, 2004) to include key competences such as learning how to learn and acquisition of lifelong learning behaviours because of the myriad of challenges children face in this era. These key skills are deemed essential in that, global competition for skills (European Commission, 2012), technological advances (Schussler, Poole, Whitlock, & Evertson,

2007; Eurydice, 2004), the impact of the internet and new media on learning (Avalos, 2011; Zimmerman & Schunk, 2009; Day, 2004), employment and private lives, the growing diversity of our societies–all are forces which are revolutionising our education systems and making students more complex and diverse than ever before (European Commission, 2012; UNESCO, 2011; Darling-Hammond & Bransford, 2005). The dynamics for the acquisition of knowledge are rapidly changing – due to the complex nature of human needs, advancement in technology, economic austerity measures and the need for people to work more and children spending more time in school, and accountability pressures on teachers to produce results in the form of examination scores. There is a growing sense that children should be helped to acquire skills and competencies which will enable them to become managers of their own learning and for survival and adapting to changes in acquiring knowledge for healthy life and employment.

To face the current challenges in tackling the multifaceted nature of problems with children in terms of the demands on them to acquire skills to fit into the 21st century world, increase productivity and encourage growth, education systems are seen as having a critical role in building the right 21st century skills and competences (such as critical thinking, creativity, initiative, problem solving, risk assessment, decision making and constructive management of feelings (World Bank, 2013; European Commission, 2012; UNESCO, 2011). There is the growing need therefore, to change the contents of, and approaches to teaching and learning to meet the diverse needs of children. This is reminiscent of Zimmerman and Schunk's (2009) assertion that:

> We live in societies where changes in human contexts are occurring at the fastest rate in history. Individuals as well as communities must change quickly in the face of rapid technological advance….To avoid obsolescence and unemployment, workers at all levels of society must become effective life-long learners (p. vii).

It is important therefore to present students with valuable and engaging topics through curriculum that seek to pay attention to attitudes, values and habits towards learning. In seeking for answers as to how to build children's core competencies teachers are seen as the most dominant organizational variables that affect outcomes in the school. Therefore, to support the development of their learners' key competences, teachers need to develop their own key dispositions as well as pedagogic practices that support the development of key abilities as any decision or activity that weakens the interaction between teacher and pupil tends to negatively affect the process of learning (Assie-Lumumba, 2012; Flores & Day, 2006; Darling-Hammond & Bransford, 2005; Higgings & Leat, 1997). The demands on teachers are becoming more and more complex (OECD, 2010, 2005) and this represents significant challenges to the profession: multicultural classrooms (Eurydice, 2004), integration of students with special needs (Rouse, 2010; Florian & Rouse, 2009; Moran, 2009), use of information and communication technologies (European Commission, 2012; UNESCO, 2011; Schussler, et al., 2007; Day, 2004) demands for more accountability and evaluation (Council of the European Union [CEU], 2010; Darling-Hammond & Bransford, 2005; Claxton & Carr, 2004), interactions with the community and the parents.

There is a growing call to train teachers differently although there is no unanimity about the nature of knowledge acquired and transmitted by the teacher. The issue of whether teaching is objective or affected by the context can be analysed from the perspectives of different schools of thought. However, one characteristic of this movement to reform schools is an international trend towards the development of measurable teaching competencies as a means of assessing teaching standards. To Day (2004), this has powerful consequences for teacher professionalism. The, contends for example, that at the nucleus of competency-based assessments are the ways in which rather separate views of teaching—teaching as a technology and teaching as a moral practice—are applied to judge teachers' effectiveness and worth. Being competent in both is part of a professional's practice but if the view of teachers as skilled technicians in the classroom whose only purpose is to implement the set curriculum prevails (Akyeampong, 2003), then the complex art and science of teaching may be reduced to possession of a repertoire of baseline technical skills. In this sense, the teacher is not just to be seen as a repository

of the knowledge to be transmitted, as this knowledge in the context of teaching and learning is constantly evolving (Pring, 2007) but also as an individual whose role it is to foster and precipitate transformation – thus serve as an active agent of change (Darling-Hammond & Bransford, 2005; Day, 2004).

In keeping with global trends and the demand for a more diversified curriculum in teacher training, coupled with the perennial show of poor performance among Ghanaian basic schools students both nationally and internally, much of which is often attributed to the teacher, Ghana has initiated a reform programme to train her teachers with the aim of developing professional teachers who are well-equipped with knowledge, skills and the disposition to learn and affect their students to meet the needs of the quality education in the 21st century. The reforms are to help pre-service teachers acquire the necessary skills to provide more authentic instructional contexts and activities that would help their students to learn how to learn and become independent lifelong learners so that they can face political, social and economic uncertainties better than traditional knowledge-based curricula would empower them. Teachers are to extend their craft to prepare more diverse students for the challenges of the workplace and life beyond school (Ministry of Education [MoE], 2011). Indicative of Dewey's opinion, outlined in *The Child and the Curriculum,* that the teachers mediate between the needs of the child and the demands of the curriculum (Dewey, 1902 cited in Darling-Hammond & Bransford, 2005), it is imperative that teachers are prepared to create learning environments that can be 'variously affording, inviting or potentiating and in potentiating learning environments teachers explain, orchestrate, commentate on, model and reify learning responses' (Claxton & Carr, 2004, p. 87).

For teachers to be able to help their students imbibe learning dispositions such as tendencies towards persisting, questioning, collaborating in their learning, it is believed that they need to have demonstrated such characteristics as effective learners - thus, it is expected of pre-service teachers to be active agents in their learning during and after training; need to be reflective in nature, think critically about all the available information to them in other to make a sound judgments about their own learning (i.e., they should be multiperspective thinkers), innovative, caring, committed and uphold ethical values

needed in their profession (Walker-Gleaves, 2009; Flores & Day, 2006; Darling-Hammond & Bransford, 2005; Hattie, 2003). Darling-Hammond and Bransford (2005, p. 10) suggest that there are three general important areas of knowledge, skills, and dispositions that any teacher should acquire. These are:

1. Knowledge of learners and how they learn and develop within social contexts;
2. Conceptions of curriculum content and goals (i.e., an understanding of the subject matter and skills to be taught in the light of the social purposes of education);
3. An understanding of teaching in the light of the content and learners to be taught, as informed by assessment and supported by classroom environments.

As Darling-Hammond and Bransford (2005) point out, two important conditions for practice frame the interactions between teachers, learners and curriculum content. These are: first, the fact that teaching is a profession with certain moral as well as technical expectations and second, the fact that education must serve the purposes of democracy. This is so, because, on daily bases, teachers are faced with multifaceted situations, and make decisions that rely on many different kinds of knowledge and judgment that can involve high-stakes results for students' future (Bransford, Darling-Hammond & LePage, 2005). Bransford and colleagues point further that for teachers to make good decisions, they must be aware of the myriad of ways in which student learning could be explained in the framework of development, learning differences, language and cultural effects, and individual dispositions, wellbeing, and attitudes to learning.

Current research proving how significant teaching is to children's learning and probabilities of life has strengthened the importance of developing a strong profession of teaching (see for example Hattie, 2003). As indicated by Darling-Hammond and Bransford (2005), even though conventional wisdom was based for many years on a conclusion widely attributed to the Coleman Report in 1966 – that is, schools make little difference beyond the influences of socioeconomic background – newer evidence based on different data and analytic methods suggest that schools do make a noticeable impact to what children learn and that teachers are an important part of what matters (Tsui, 2009; Dembélé & Lefoka, 2007; Darling-Hammond & Bransford, 2005; Hattie, 2003; Rice,

2003). From this point of view, it is important for teachers to understand their roles and responsibilities as professionals in schools that must prepare all students for equitable participation in a democratic society.

Effective learners have to gain understanding of the individual and social processes necessary to become operative learners. This is not just acquisition of particular strategies, but the monitoring and reviewing of learning to see whether strategies are effective (Watkins, 2002). This has been described variously as learning how to learn and/or meta-learning (James & McCormick, 2009; Zimmerman & Schunk, 2009; Kramarski & Michalsky, 2009). Effective learning includes this extra crucial ingredient which actively involves the student in metacognitive processes of planning, monitoring and reflecting on his or her own learning by providing tools for analysis of events and situations that enable him/her to understand and handle the complexities of life in the classroom (Zimmerman & Schunk, 2009; James & McCormick, 2009; Hammerness, Darling-Hammond, Bransford, Berliner, Cochran-Smith, McDonald & Zeicher, 2005). Chen (2002) contends that our ability to understand and support learning, attention flexibility, decision-making, problem-solving and task persistence is pivoted on ones capacity to self-regulate. Self-regulation therefore, comes to view as an important characteristic of teacher learners since they need to acquire strategies that are most likely to prepare them to be able to learn from their own practice, as well as the insights of other teachers and researchers whilst in college and on the field (Olsen, 2008; Flores & Day, 2006; Hammerness, et al., 2005).

According to Zimmerman and Schunk (2009), people are fascinated with understanding and regulating themselves - characteristics that many philosophers and psychologist believe most distinguishes humans as a species. They stress further that, recently, the search for self-understanding and self-regulation has turned to learning and academic achievement processes. This is because literature on academic self-regulation has shown that successful learners exercise behavioural control to not only choose or plan valuable academic tasks, but also to maintain motivation and intention in the light of distracting alternatives (Zimmerman, 2009). They engage in self-regulation of learning by using learning strategies to secure task completion (Bembenutty, 2007).

Self-regulation of learning is a self-directive process through which learners transform their mental abilities into task related academic skills and to get proactively involved in their personal, behavioural, motivational, and cognitive learning endeavours in order to accomplish important and valuable academic goals (Zimmerman, 2001, 2009). Self-regulation of cognition and behaviour is an important aspect of student learning and academic performance in the classroom context (Fenollar, Román, & Cuestas, 2007). It seeks to explain how people improve their performance using systematic procedures of learning. As an organizing concept, self-regulation of learning describes how learners control their thoughts, feelings and actions in order to achieve academically (Zimmerman, 2009). Concomitantly, self-regulation can be seen as an activity that learners consciously engage in to draw up learning intentions and achievement goals, plan the next steps for learning; manage examination anxiety and other forms of stress which can be debilitating to academic performance in order to reach their optimal achievement (Pekrun, Elliot, & Maier, 2009; Zimmerman, 2009; Fenollar et al., 2007).

It follows therefore, that, in order to be successful as professional teachers, and be seen as important part of what matters in making a noticeable impact to what children learn (OECD, 2010, 2005; Tsui, 2009; Dembélé & Lefoka, 2007; Darling-Hammond & Bransford, 2005; Rice, 2003), pre-service teachers as learners, must have essential attributes and dispositions that are readily needed for effective teaching since what the teacher knows, do, and care about that is the most influential in the teaching and learning equation. Learning teachers must be seen to be caring (Walker-Gleaves, 2009), be reflective, which involves the participant being a critique of practice, the values which are implicit in that practice, the personal, social, institutional and broad policy contexts in which practice takes place, and the implications of these for improvement of that practice (Bolton, 2014).

Teachers need to engage in reflective practice “based upon a particular notion of professionalism in which teachers have a responsibility for the education of students which goes beyond the instrumental, encompassing responsibilities to educate for citizenship and to imbue in their students a positive disposition towards lifelong learning” (Day, 2007, p. 4). It is the knowledge, beliefs and values of the teacher that are brought to

bear in creating an effective learning environment for pupils and that makes the teacher a critical influence in education (Reynolds, 2009) and that as Cardona (2009) notes that concentration on initial teacher education "… would seem to provide the best means to create a new generation of teachers who will ensure the successful implementation of inclusive policies and practices" (p. 35). But in the view of Sharma, Forlin, Loreman and Earle (2006), few international studies have been carried out to examine pre-service teachers' beliefs and readiness for teaching learners with diverse backgrounds and abilities.

Many studies conclude that teachers are crucial to the success of inclusive education. For example in an OECD report 'Teachers Matter', it was recognised that the demands on schools and teachers are becoming more complex as society now expects schools to deal effectively with different languages and student backgrounds, to be sensitive to culture and gender issues, to promote tolerance and social cohesion, to respond effectively to disadvantaged students and students with learning or behavioural problems, to use new technologies, and to keep pace with rapidly developing fields of knowledge and approaches to student assessment (p. 7), yet candidates are still leaving initial teacher education without the skills, knowledge, or attitudes needed to work with all of their future students (Jones & Fuller, 2003 cited in European Agency for Development in Special Needs Education [EADSNE], 2010). Some have 'a heart for diversity instruction' but lack the knowledge and skills of how to go beyond scratching the surface with students (Edwards & Kuhlman, 2007).

Consequently, teacher educators and researchers believe that teachers' capacity to support learners who are self-regulated through learning is tied to teachers' own self-regulation (Kramarski & Michalsky, 2009). If teachers are incapable of self-regulating their own learning and illogical about their own beliefs and practices, it will be difficult for them to develop these capabilities among their students (Kramarski & Michalsky, 2009; Perry, Phillips & Hutchinson, 2006; Crebert, Bates, Bell, Patrick & Cragnolini, 2004; Zohar, 2004; Gibbs, 2003; Knight, 2002; Randi & Corno, 2000) since they must acquire a deep understanding of cognitive and motivational principles of teaching, learning (Paris & Winograd, 2003) and assessment in order to help their students to

acquire the needed skills of learning (Robson, Leat, Wall, & Lofthouse, 2012). The ways in which teachers achieve, maintain and develop their identity, their sense of self, which includes motives (Pinnegar, Mangelson, Reed & Groves, 2011; Beauchamp & Thomas, 2009) in and through a career, are of vital significance in understanding the actions and commitments of teachers in their work, which could influence the way they are trained.

Literature on teacher quality ratifies the logical conclusion that poor quality of students' learning has a strong positive association with poor quality of teachers' teaching, in that 'teachers often give what they have'. In most cases, and especially in Ghana, effective student learning and academic performance is mired by weaknesses in teachers' pedagogical content knowledge and disposition for professional practice (Englehart, Batchelder, Jennings, Wilkerson, Steve Lang, & Quinn, 2012; Acheampong, Pryor, & Ampiah, 2006), notwithstanding the fact that research findings on the effect of content knowledge on teacher effectiveness is mixed and that on the impact of teacher dispositions is almost non-existing. Teacher education has been recognized as both part of the problem and remediation. Improved access to basic education through the introduction of capitation grants and the school feeding programmes means increase in pupil enrolment, which has brought about a huge demand for more teachers and the priority has been to find ways of increasing the numbers appointed by recruiting more trainees onto established courses, by creating new route into teaching or by a combination of both strategies with the hope of increasing access as well as improving quality of teaching and learning in order to train citizens who are well balanced intellectually, emotionally, spiritually and physically (UNESCO, 2011).

With this at hindsight, and based on the recommendations made by the Presidential Committee on the Review of Education Reform in Ghana that the objective of teacher education should be the training and development of the right type of teachers who are competent, committed and dedicated (Republic of Ghana, 2002), policies were initiated in making Colleges of Education (CoE) tertiary with the aim of training teachers who are capable of applying, extending and synthesizing various forms of knowledge; developing attitudes, values and dispositions that create a conducive environment for quality teaching and learning in schools; facilitating learning and motivating individual learners to fully

realize their potential and adequately preparing the learner to participate fully in the national development (Republic of Ghana, 2002).

Research suggests that advanced (i.e. university) students' motivations and learning conceptions are different (e.g., Fenollar et al., 2007; Valle, Cabanach, Nunez, Gonzalez-Pienda, Rodrguez & Pineiro, 2003) and as such the onus now rest on the pre-service teacher to be more proactive in learning and take charge of his or her own performance instead of expecting college academics to solely give them knowledge and skills (Lewin & Stuart, 2003). They need to possess the ability to engage in reflection and conscious deliberation of tasks relating to teaching and learning in college and the impact that would have on their academic achievement.

Again, Lewin and Stuart (2003) believe that any effective system of teacher education thrives on the recognition and building on the characteristics and motivation that pre-service teachers bring to the initial training programme. They assert that drawing on trainees' entry behaviour is necessary, because, these entry behaviours can serve as the starting points in drawing up curricula that address trainees' needs and competences. In the same vein, Duckworth et al. (2009) assert that learners draw on previous experience to build a repertoire of beliefs and strategies that enhance learning, however, available research conducted in Ghana by Lewin and Stuart (2003) revealed that "most trainee teachers achieved relatively low results at the end of their secondary school career, leaving them underqualified for higher education; teacher training colleges, it seems, take the next tranche down from the universities" (p. 45). In that same study, the great majority of the students indicated that they would rather have gone to university instead of teacher training college. This clearly gives an indication as to the level of motivation and self-preparedness which teacher trainees enter Colleges of Education (CoE).

These notwithstanding, the field of teacher education has recently received a call to shift from teacher preparation programmes which centred around teachers' knowledge of their content area, classroom management skills and/or ability to pass external examinations, to an examination of their beliefs, motivation, and self-regulatory factors associated with teaching and learning (Dembo, 2001; Randi, 2004). Lewin and Stuart (2003) suggest that

student teachers' ideals need to be nurtured and rewarded if they are to act as lifelong motivators. Dembo (2001) also proposed that learning to teach content area is not enough; rather, future teachers also need to learn how to learn and how to self-regulate their learning process. Further, he asserted that the curricula for pre-service teacher preparation programmes should introduce self-regulated learning (SRL) strategies into the theory and research of human learning. If pre-service teachers are expected to display intrinsic interest in academic tasks associated with their teaching programmes since they have willingly chosen that path as their future career; if it is expected that intrinsic interest will be associated with pre-service teachers' motivational beliefs and self-regulation of learning, then there is the need to know more about how teacher trainees go about their learning and the strategies they employ to get their academic task completed.

A theory of teacher learning that addresses cognitive and metacognitive as well as motivational orientations is necessary because tools, practices, subject areas, and the characteristics of learners are no longer static over the course of a teaching professional's career. Teachers must learn continuously in order to handle this complex, rapidly changing learning environment. Teachers in the 21st century, in order to become and remain effective, need to create new solutions and procedures as new tools become available, and contexts and needs change. Harley, Barasa, Bertram and Mattson (2000) state: 'in this sense, teacher roles are an integral component in the regulatory framework that integrates education and training through the concept of lifelong learning and practices of outcomes-based assessment' (p. 290). Even though Assessment is one of the most powerful influences on teaching and learning, in pre-service teacher training, it appears too much emphasis has been placed on subject knowledge, and less on skills and attitudes, and to neglect altogether the increasingly important cross-curricular competences such as learning to learn (Leat, Thomas, & Reid, 2012) and other dispositional attitudes such as self-regulation. These assertions are probably based on the fact that teachers might teach based on what motivates them intrinsically and how they were taught in schools and colleges.

Social cognitive theory (Bandura, 1997) has provided a theoretical basis for the development of a model of self-regulated learning in which personal, contextual and

behavioural factors interact in such a way as to give students an opportunity to control their learning. Within this framework, Zimmerman and Schunk (2009) describe self-regulated learning as an active, constructive process whereby learners set goals for their learning, plan actions and monitor, regulate and control their cognition, motivation and behaviour. These actions are guided and constrained both by their goals and the contextual settings and can mediate the relationships between individuals and the context and their overall achievement (Zimmerman, 2009).

With the variety of definitions of self-regulation existing, based on one's theoretical inclination in the literature, Zimmerman (2009, p. 5) posits that, "a common conceptualization of these students has emerged as metacognitively, motivationally, and behaviorally active participants in their own learning". These three components appear to be vital to classroom performance (Pintrich & De Groot, 1990). First, self-regulated learning includes students' metacognitive strategies for planning (conating), monitoring and reexamining their own thoughts or modifying their cognition (Zimmerman & Schunk, 2009; Huitt & Cain, 2005). Second, the way students manage and control their effort on classroom academic task (self-efficacy for learning and control of beliefs) has been projected as another important component.

For instance, it has been said that, capable students who persist at a difficult task or maintain their cognitive engagement in the task and keep to study schedules in the midst of distractive obstacles and noxious experiences perform better (Zimmerman, 2009; Bandura, 1997; Pintrich & De Groot, 1990). A third important aspect of self-regulated learning that some researchers have chronicled in their conceptualization is the actual cognitive strategies that students employ to study; remember and understand the materials (Moos & Ringdal, 2012; Zimmerman, 2008; Pintrich & De Groot, 1990). Various forms of cognitive strategies such as critical thinking, rehearsal, elaboration and organizational strategies have been found to help students to fine-tune and continuously adjust their cognitive engagement in learning and results in higher levels of achievement (Bembenutty, 2007; Pintrich, Smith, Garcia, & McKeachie, 1993). Regrettably, research has proved that a significant minority of learners across a wide range of ages are not optimally self-regulated (e.g., Azevedo & Cromley, 2004; Kramarski, 2008). They lack

the knowledge and skills they need to efficiently succeed in their learning. It has been suggested that although SRL is not spontaneously acquired, it may be shaped and developed through participation in environments that provide learners with opportunities to be in control of their own learning (e.g., Kramarski & Michalsky, 2009; Zimmerman, 2009).

Alluding to the point made earlier by Lewin and Stuart, that, majority of the pre-service teachers recruited into CoE are 'academic underdogs', and moving on to, in most instances, an entirely new curricula, the idea of teachers' self-regulation learning tendencies such as self-efficacy cannot be ignored as an important component in teacher preparation programmes. This is worth noting, owing to the fact that self-regulated learners analyse tasks in terms of their current knowledge and beliefs. According to Tschannen-Moran and Woolfolk (2001), teachers' sense of efficacy is "an idea that neither researchers nor practitioners can afford to ignore" (p. 803). Pre-service teachers need to be self-efficacious in order to draw up learning intentions and set achievement goals; plan the next steps for learning; manage examination anxiety and other forms of stress which can be debilitating to performance.

Furthermore, a growing body of research (e.g., Chen, 2002) suggests that the capacity to self-regulate is central to our ability to understand and support learning, attention flexibility, decision-making, problem-solving and task persistence. In relation to the afore mention suggestion, there are numerous theoretical perspectives in SRL which draw inspiration from different areas of scholarship and empirical studies which have highlighted the complex relationship between self-regulation and academic achievement, especially at the primary and secondary levels of education. For example, Duckworth et al. (2009) emphasize that there is a positive overall relationship between self-regulation and academic achievement. It is, therefore, vital for trainees to acquire the ability to engage in active, persistent analysis of his or her beliefs and knowledge and the consequences that follow from those beliefs and knowledge.

Research suggests that the expectancy and value components of learning will be positively related to the self-regulated learning components, whereas research on test

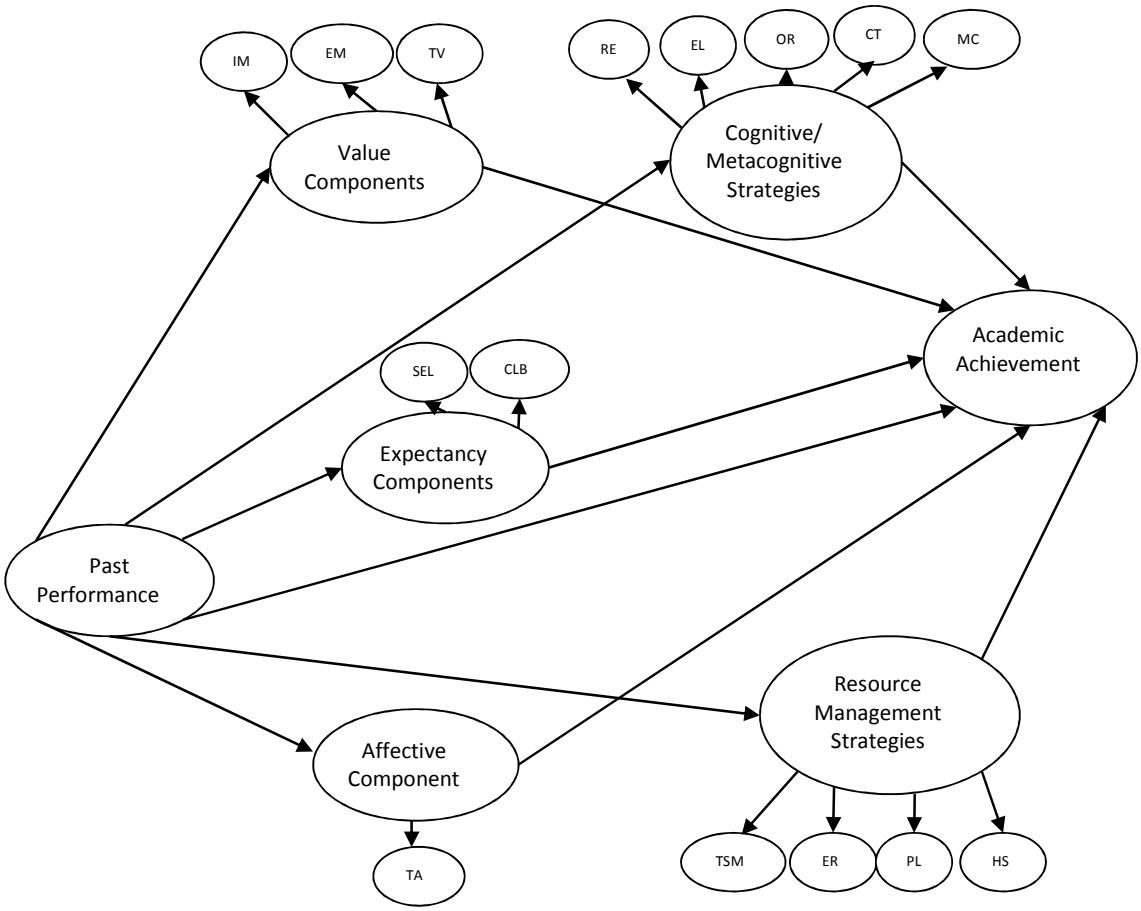
anxiety does not suggest such simple relations (Bembenutty, 2008; Pintrich, 2004; Pintrich & De Groot, 1990). In fact, literature on learning dispositions highlights the issue of transfer in relation to self-regulated learning (Avalos, 2011). As would be teachers, who need to act effectively in using their discretionary judgement which is seen as central to their professionalism, there is the need for the development of motivations, dispositions and transferable skills that will help the pre-service teachers to access and effectively engage with learning opportunities throughout their lives and possibly help their students enhance such structures in their learning (James & McCormick, 2009). These notwithstanding, it does appear not much has been done in terms of research into the entry behaviours, motivational beliefs and dispositions, and self-regulated learning strategies of pre-service teachers.

To this end, this researcher examined how pre-service teachers adapt to dynamic context (Zimmerman & Schunk, 2009) to improve their academic performance and the relationships between the motivational orientations and self-regulated learning strategies of teacher trainees in colleges of education in Ghana. As a secondary purpose, the study also determined whether significant differences exist between genders and programme majors with regards to pre-service teachers' motivational levels and their self-regulated learning strategies use and to explore the contributory factors of values and beliefs that undergird some pre-service teachers' motivational orientations.

1.2 The Nature of this Thesis

The main aim of this study is to gain an in-depth understanding of the relation between the main components of self-regulated learning as defined in this work and how trainee teachers of colleges of education self-regulate their learning, and the impact such self-regulated characteristics have on their academic performance. Five components (i.e., value, expectancy, affective, cognitive/metacognitive and resource management) constitute the working definition of self-regulation learning in this study. Theories of self-regulation and self-regulate learning; social cognitive and volitional aspects of self-regulation; operant theory of learning, and research on self-regulation and academic performance were examined. As a caveat from literature review, I propose using the model shown in Figure 1 as a main summary of the concepts included in the study. The

model is rooted in Zimmerman, Pintrich, Winne and Hadwin's models of self-regulation learning, and Vallerand's hierarchical model of intrinsic and extrinsic motivation.



IM = intrinsic motivation, CLB = control of learning beliefs, TA = test anxiety, TV = task value, SEL = self-efficacy for learning, EM = extrinsic motivation, ORG = organization, PL = peer learning, TSM = time and study environment management, RE = rehearsal, HS = help seeking, MCS = metacognitive regulation, CT = critical thinking, ER = effort regulation.

Figure 1: *A model of past performance, self-regulation learning and academic achievement*

In order to contribute empirical data to inform policy and address the gaps in literature, the motivational and learning strategies of pre-service teachers were the main concerns of this study. Identification of the motivational and learning strategies adopted by the pre-service teachers in relation to their gender and programme majors would provide a concrete profile of the motivated strategies for learning of the prospective teachers. This information would be useful and meaningful to course and curriculum designers and

developers as well as academic staff of relevant departments in colleges of education to give appropriate assistance and guidance to student teachers in their motivated strategies for learning process when necessary.

In line with the study's main purposes, the following objectives guided the research:

1. To examine the relationships between the motivational orientations, gender, programme-majors and self-regulated learning strategies of pre-service teachers in colleges of education.
2. To determine how prior attainment, motivation and self-regulated learning components may operate independently or jointly to influence pre-service teachers' academic performance.
3. To explore the contributory factors of beliefs and values that lay behind some pre-service teachers' motivational orientations.

The study looked at four research questions and one hypothesis:

Research Questions

1. What are the most prevailing motivational and self-regulation learning strategies among pre-service teachers in the colleges of education in Ghana?
2. How are the motivational components related to the components of self-regulated learning strategies?
3. What self-regulated learning strategies are related to gender, students' programme-majors and academic performance?
4. How do dispositional beliefs and values manifest among pre-service teachers?

Research Hypothesis

H_0: There is no mediating effect of self-regulation learning on the relationship between prior academic performance and academic achievement of pre-service teachers in colleges of education.

Research Design and Method

Five hundred (500) first and second year students were selected using systematic random sampling procedure from 10 colleges of education in Ghana. The study employed a

mixed method approach, thus both quantitative and qualitative data were collected based on the assumption that teacher trainees' performance might be attributed to their level of self-regulated learning strategies and development of dispositions in colleges. The study sought to find out the correlation between pre-service teachers' active involvement in their learning processes and their academic performance through the use of a questionnaire made up of two parts and an extant data in the form of students' Grade Point Averages (GPA) and series of episodic interviews conducted to illuminate and unravel pre-service teachers' beliefs and values (disposition). Part one of the questionnaire sought information on students' bio data such as sex, age, programme of study, students' identification number for the purpose of extracting GPAs, and part two of the questionnaire was made up of questions of the modified Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich, Garcia and Mckeachie (1993) which is seen to have demonstrated good psychometric properties which could be adapted to tap the motivated strategies for learning attributes of adult learners such as teacher trainees. The study also explored how dispositional beliefs and values manifest among pre-service teachers through the use of unstructured (episodic) interviews.

The diagrammatic representation as shown in Figure 2 indicates how the research questions and hypothesis were addressed in terms of the study's three major purposes. Figure 3 is a diagrammatic representation of the whole study, showing the relationship between Research Purposes, the Research Questions, Research Hypothesis, the Conceptual and theoretical Frameworks and Data Collection.

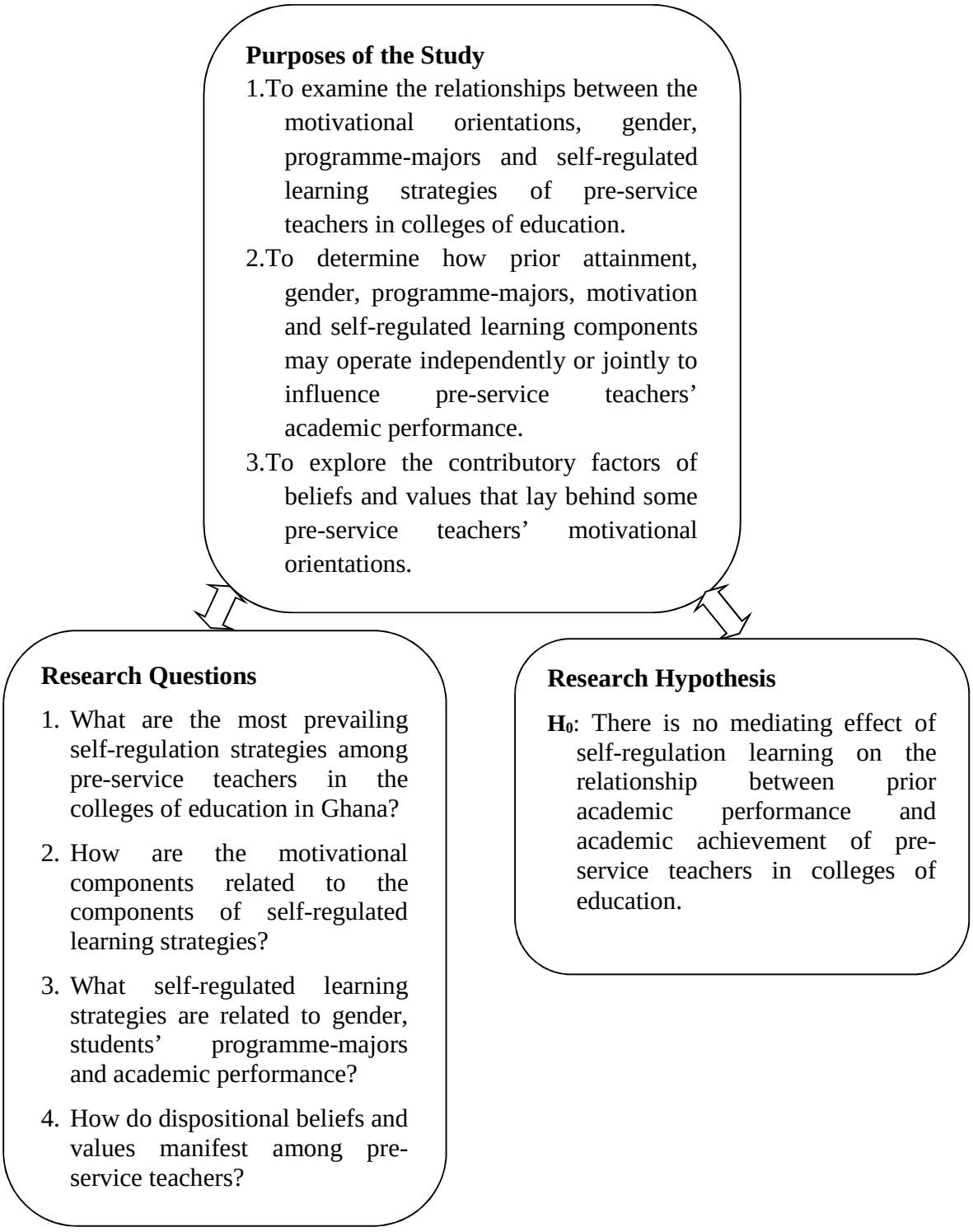


Figure 2: *Representation of how the research questions and hypothesis address the study's three major purposes*

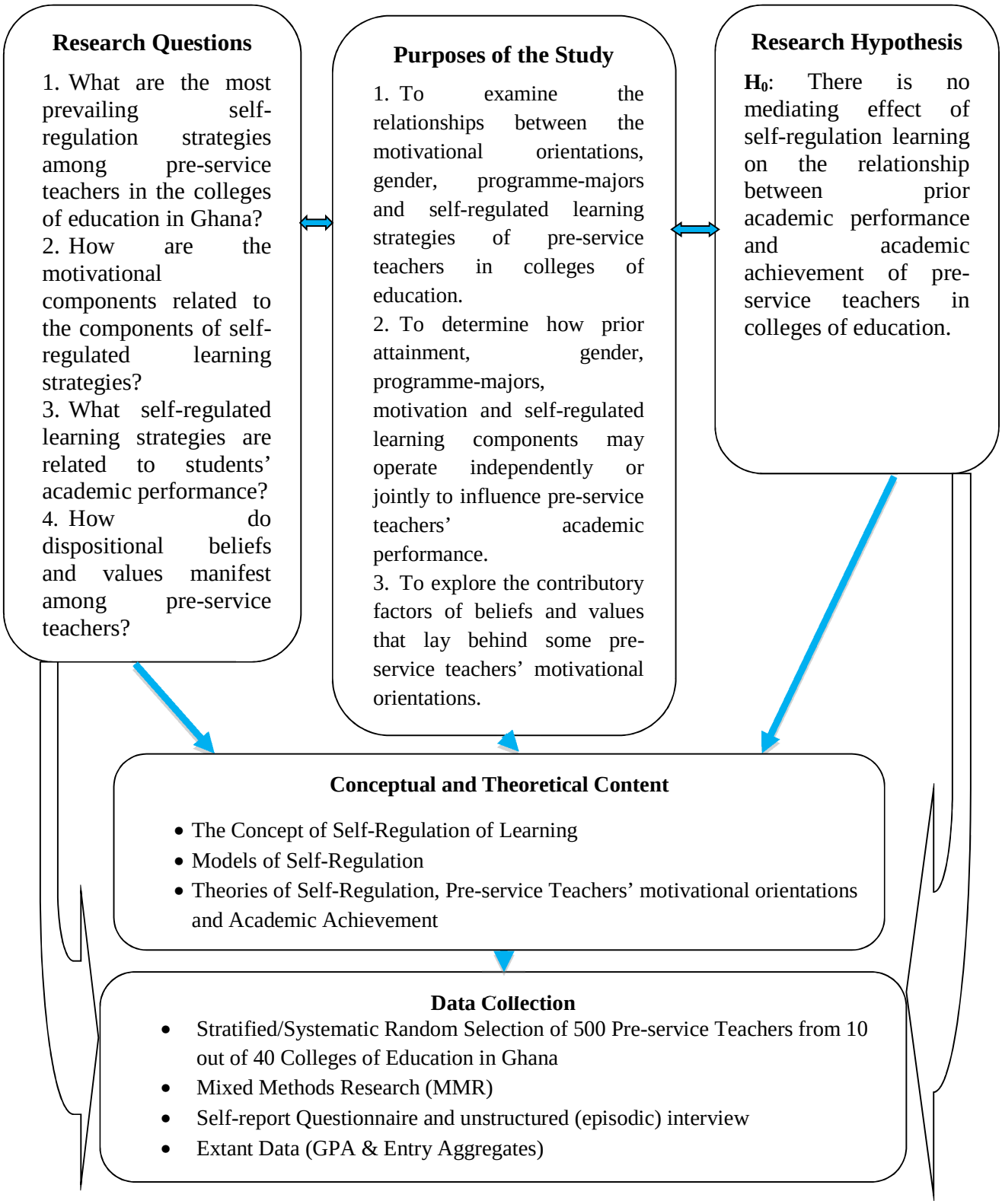


Figure 3: *Representation of the Whole Study*

1.3 Contribution of this Thesis

Self-regulation of learning is a term used to represent the process by which students get involved proactively in their personal, behavioural, motivational and cognitive learning actions in order to achieve significant and valuable academic objectives (Zimmerman, 2009; Bembenutty, 2007; Pintrich, 2004). However, using this oxymoron (SRL) to describe a composite concept in classroom learning is not without problems and how it is defined and then interpreted has teaching and learning implications. For example, some theorists and researchers postulate self-regulation as a mental ability or an academic performance skill, but Zimmerman (2009) sees it as not and rather refers to it as "the self-directed *process* through which learners transform their mental abilities into task-related academic skills" (p. 1).

Zimmerman points out that "this perspective shifts the focus of educational analyses from students' learning ability and environments as 'fixed' entities to their personally initiated processes and responses designed to improve their ability and their environments for learning" (p. 4). Therefore, models of self-regulated learning attempt to integrate these different motivational and cognitive components into a comprehensive model of students' classroom academic performance (Duckworth et al., 2009; Pintrich, 2004). However, most of these models adopt the position that self-regulated learning is quite a general process that operates in the same fashion across different fields of study or situations. Hence, very little empirical study has looked at how the different components of self-regulated learning interact, and the differences that may exist as a result of context (Zimmerman & Schunk, 2009; Pintrich, 2004; Wolters & Pintrich, 1998).

According to Zimmerman (2009), self-regulated learning perspective on students' learning and achievement has profound implications for the way teachers interact with students. Lewin and Stuart (2003) as a caveat from their studies in Ghana and other African countries proposed a new curriculum model:

> …that sees teaching as interactive problem-solving, requiring a thoughtful and reflective approach to one's own practice. Thus learning to teach means acquiring not only knowledge and skills, but

> also a situated understanding of pupils and how they are learning, along with repertoires of skills and strategies for dealing with unique and ever-changing circumstances (p. 203).

To this end, teacher educators have called for a paradigm shift towards a training programme that recognises the value of teachers' personal, experiential and craft knowledge as well as the public propositional knowledge offered in college (Avalos, 2011; Darling-Hammond, 2010; Bembenutty, 2007; Randi, 2004; Dembo, 2001; Lewin & Stuart, 2003). For example, Dembo (2001) suggested that learning to teach content area is not enough and that they should learn how to self-regulate in their learning process. Akyeampong cited in Lewin and Stuart (2003) asserts that programmes for teacher training should focus on the development of professional reasoning ability instead of, even though contentious, the acquisition of pre-defined behaviour. This presupposes that, we are in the era where the teacher must be a critical thinker and one who takes initiatives to be active in his or her own acquisition of subject and professional knowledge during and after initial teacher training. Pre-service teachers are projected to exhibit intrinsic interest in academic tasks associated with their teaching programmes since they have willingly chosen that path as their future career, according to Bembenutty (2007), howbeit, not much evidence could be seen from literature to support this claim.

Notwithstanding, many of the theories on and researches in initial teacher preparation seem to have concentrated on the development and analyses of curricula to the neglect of the processes pre-service teachers go through in learning the contents of these curriculum materials. Self-regulated learning, which is the main thrust of this study, has been found to be positively correlated to achievement, with highly self-regulated students being more motivated to use planning, organizational, and self-monitoring strategies than low self-regulated students (Boekaerts & Corno, 2005; Pintrich & De Groot, 1990).

Again, literature reviewed on the topic suggests that most SRL research in education is not guided by a clear conceptual model that describes the roles and functions of top-down and bottom-up SRL in the classroom acquisition of subject-matter knowledge and pedagogical skills (Boekaerts & Corno, 2005). These considerable evidence gaps mean

we know little about how the benefits of self-regulation develop over time or about sub-group variation. Those limited studies to date which do examine the connections with basic background characteristics show that the potential benefits of, and innate capacity for, self-regulation do not vary thoroughly with socio-economic background, ethnicity or gender (Duckworth et al., 2009). Again, very little empirical research has examined how the various components of self-regulated learning may vary as a function of contextual differences and the multiple dimensions of teacher quality (Rice, 2003) particularly at the teacher training level.

The basic tenets of the conceptual model presented in this study, therefore are specified in terms of several propositions (direct and indirect relations, moderators and mediators, as well as boundary conditions). Specificity and reciprocity in relations among different types of variables in and outside classrooms, particular mediators, and associated outcomes were formulated and tested. To address some of the shortcomings of past and present research, this study addresses the gap in the literature on SRL by examining whether pre-service teachers self-regulate their learning during training and the effect such regulation has on their academic performance. The study also looked at how the various components of self-regulated learning among teacher trainees may vary as a function of contextual difference. I am of the view that knowing more on prior knowledge of teachers combined with how teachers learn and self-regulate, can inform the planning and implementation of teacher education curriculum. The study, therefore, adds valuable information to current debate on SRL assessment and teacher preparation and development in terms of their use of self-regulation, disposition and agency and to crystalize the belief that trainee teachers' ability to self-regulate with respect to learning is important if they are to be able to facilitate the development of relevant SRL skills in others. Finally, data collected for this study is of importance to teacher educators, researchers and to initial teacher education policy makers and implementers who may have to restructure and focus curricula and training sessions to include self-regulation disposition to strengthen changing pedagogies.

1.4 Definition of the Terms

In this thesis, initial teacher education (ITE) refers to the three-year in-school training given to would be teachers. There are many references to the main participants in the study – the student teachers themselves, and also to the learners whom they will be teaching – their students. In most sections of the thesis, the literature for example, for the sake of simplicity and in order to prevent ambiguity, 'teachers' is used as a generic term to include professionals working in educational institutions whose main duty is to educate and teach. This therefore includes those teachers working in pre-tertiary education. Likewise, the term 'teaching' is used generically to denote activity within schools. Pre-service teachers and teacher trainees are used to denote learners in the various colleges of education in Ghana - thus those still undergoing initial teacher training. Newly qualified teachers (NQTs) is used to designate teachers who are in their first year of teaching after training. The term 'students' is used to describe those learners, both the teacher trainees and those within pre-tertiary education, whilst the word 'pupils' will denote those within the basic school context that pre-service teachers will be teaching.

1.5 Organization of the Research

This thesis is organized into seven chapters. The first chapter presents the background and the context of the issue under investigation as well as an overview of the main supposition of the study; purposes, research questions, hypothesis, methodological details and the contribution of the thesis. Chapter 2 contains the major conceptual and theoretical framework in relation to related literature in the field. The literature review is presented in two parts. Part one examines perspectives of initial teacher education and structure and challenges facing colleges of education. Part two discusses the concept of self-regulation learning in three threads, namely: conceptual, theoretical and empirical issues in relation to students' learning and pre-service education. Chapter 3 presents a description of the mixed methods research undertaken, defining the methodological approach, examining qualitative-quantitative dichotomy, and the philosophical positioning of mixed methods research. Chapter 3 also discusses the procedures and methods of collecting and analysing the data. Chapter 4 contains the results from the analyses of quantitative data and detailed narratives of participants with accompanying textual and other relevant

findings on contributory factors of beliefs and values that lay behind pre-service teachers' motivational orientations. Chapter 5 presents a discussion of the findings in line with the three main purposes of the study as well as implications and significance of the study to teacher education in general and teacher educators for improved teacher education curriculum, instruction and assessment. Chapter 6 draws conclusions on the findings from the study and suggests improvements for future phases of the study, and areas for further work in the field of teacher education.

CHAPTER 2: REVIEW OF THE LITERATURE

Part I

2.1 Perspectives of Initial Teacher Education

Issues of teacher quality, competency and professionalism are dominant in teacher education discourse. Governments, employers, policy makers, higher education providers and researchers continually and fervently seek explanations about how to train, retain and improve students learning. In UK, USA, Australia and internationally, efforts are being made to answer critical questions like "why do some teachers leave the profession and others stay?" "What could be done to improve quality and effectiveness?" "To what extent does initial teacher education influence teacher effectiveness?" According to UN Global Education First ([GEF], 2012) report, it is estimated that 2 million teachers are needed globally in order to meet the universal primary education (UPE) by 2015 and 1.9 million more teachers need to be recruited and trained to teach in schools across Sub-Saharan Africa (SSA) by 2015. These projections go in support of the view that no education system is better than its teachers - the principal resource in the system (Wayne & Youngs, 2003). An appreciation of the crucial role of teachers has also been steadily increasing in the international post-2015 education agenda. As GEF (2013) asserts, "we need a strong cohort of both female and male teachers who are paid well and respected in their communities" (p. 16). In view of these, education quality has received a great deal of attention in recent years, and as a matter of achieving the goal 6 of education for all (EFA). To this end, UNESCO in 2011 advocated that policies that efficiently address teacher training and retention should be made the central focus of national and international education policies.

Within the education sphere there has been increasing recognition that gains in access have not matched with gains in teacher training and quality of education (UNESCO, 2012). In Addis Ababa in 2010 at the Ninth Meeting of the High-Level Group on Education for All (23-25 February), it was said that, globally, 18 million new primary teachers will be needed in the next seven years just to achieve universal primary education. The report cited in MacBeath (2012) concluded:

> National governments must strike a balance between the short-term need to get teachers into classrooms and the longer-term goal of building up a high quality professional teaching force. Addressing the teacher gap requires country driven long-term strategies and firm commitments. Policies must encompass attention to professional development opportunities, adequate employment and teaching conditions and greater participation of teachers in decision-making via social dialogue (p. 10).

It is obvious from literature that teachers and teacher quality matter and indeed, the quality of teacher education has become a vital issue in recent years. Issues concerning teachers' competencies, effectiveness, resilience and other dispositional abilities feature prominently in teacher education literature. Developing the professional aspects of initial teacher education is high on the teacher training plans of many countries and especially in developing countries (e.g., SSA) where teacher education programmes and teacher education institutes are being reviewed. Teacher quality and effectiveness has been seen as the most essential school-related factor impacting on student achievement (UNESCO, 2012; Ronfeldt, 2012; Harris & Sass, 2011; Darling-Hammond, 2010; Rice, 2003; Wayne & Youngs, 2003).

Researchers and policy makers agree that providing all students with a quality education depends very significantly upon a country's capacity to provide schools with highly effective teachers. The demands placed on teachers today in terms of in-depth subject knowledge, advanced pedagogical skills, reflective practice and ability to adapt teaching to the needs of each individual child as well as to the needs of the group of learners as a whole, require that teachers are educated at a highly advanced level and equipped with the ability to integrate knowledge and handle the degree of complexity which characterizes the teaching profession (Harris & Sass, 2011; Yogev & Michaeli, 2011; Darling-Hammond, 2010; Hiebert, Morris, Berk, & Jansen, 2007; Rice, 2003). There is therefore a growing interest in how best to define the competences and qualifications that are required to be admitted as a qualified member of the teaching profession.

However, despite recent reforms in a number of countries, initial teacher education has been viewed as both the problem and the solution in achieving teacher effectiveness in schools. At present, there are diverse views about the quality of teacher education and the impact such training has on teacher effectiveness and student achievement gains and what to do about it (Hoban, 2004; Wayne & Youngs, 2003) and analysts have arrived at markedly different interpretations, perhaps because of the difficulty in defining what improved quality really means. Coupled with these different views about teacher education is the considerable disagreement surrounding what specific teacher attributes indicate quality and effectiveness and how to better devote resources to provide quality teachers for all schools to train students. The question is how strong do we need our teachers to be? What qualities do we judge as being critical in asserting their quality? What factors constitute quality or effectiveness? And what measures are used in ascertaining the strength of a teacher in terms of delivery of his professional duties in the school?

In the view of Musset (2010), initial teacher training programmes are in several respects not preparing teachers adequately for the complexity of the teaching career today. For example, some teachers brand teacher education as ‘irrelevant’ and some pre-service teachers call their teacher education experiences ‘inadequate’ and the approach to teacher training as mechanistic (Moon, 2007; Hoban, 2004). Researchers (e.g., Hanushek, 1997; Goldhaber & Brewer, 2000) have concluded in their analyses that initial teacher qualification has no significant effect on teachers’ ability to improve students’ academic achievement, whereas researchers (Darling-Hammond, 2006; Darling-Hammond & Bransford, 2005; Rice, 2003; Scannell, 2002) praise the use of initial teacher training institutions in preparing teachers. In opposition to those who propose the elimination of initial teacher training, a thorough review of literature has shown that most of the researches do not seek to capture interactions among the multiple dimensions of teacher quality and effectiveness, and as result, there are major gaps in the research that need to be explored. This research aims to contribute a better understanding of some of these inter-relationships.

These contributions have been made with the backdrop of flawed measures and inexplicit assessment of what constitute a teacher's education in many researches. Assessments vary according to the interpretation and use of the results that ensue from such researches. As some use measures of gain in achievement scores, others focus on the use of subjective assessments, and all of these seem to produce different and conflicting accounts of the actual effect of teacher education on teacher effectiveness, throwing the debate of the effect of pre-service teacher training education and teacher effectiveness into a quandary. Differences in the measurement tools, in fact, have exacerbated the problem further in deciding on the effectiveness of teacher training in colleges. Many of the measures are not clear as to what variables define the concepts they do assess and the inferences they make. For example, for those studies that focused on teachers' certification, only the qualification grade such as pass or fail; professional or non-professional was used in modelling the effect on students' achievement gains. It therefore makes sense to turn to the existing evidence on "which teacher attributes are related to teacher effectiveness in order to guide policy decisions about hiring, compensation, and distribution with respect to teachers" (Rice, 2003, p. 4).

In a study conducted by Brian and Lefgren (2008) on school principals' subjective assessment of teachers in comparison to traditional determinants of teacher compensation-education and experience - and another potential compensation mechanism - value-added measures of teacher effectiveness based on student achievement gains, it was evident that subjective principals' assessments of teachers predicted future student achievement significantly better than teacher experience and education. In the study, the subjective assessment measure was made up of variables such as dedication and work ethic, organization, role model for students and positive relationships with colleagues. The irony in the literature of the effect of teachers' education on teacher effectiveness is that as critics of the system seems to suggest, pre-service teacher education has no significant effect on students' achievement gains although it appears some content on pedagogy and content knowledge influence teacher effectiveness in subjects like mathematics (Wayne & Youngs, 2003; Goldhaber & Brewer, 2000). Furthermore, there seem to be no reliable research that reveals any systematic advantage to students of having teachers without initial teacher training and that investing in teachers can make a

difference in student achievement (The National Council of Accreditation of Teacher Educations [NCATE], 2002; Rice, 2003). However, this situation seems to be true in educational environments where employing non-professional teachers appear to be the cheaper alternative to training professionals to teach and manage schools.

In summarizing what we know about pre-service field experience, Wilson and Floden (2003) state that:

> The sample sizes in all of these studies are limited, the results thin and inconclusive. Since little research is grounded in information about student achievement or documented increases in teacher knowledge and skill, it is difficult to make claims about the qualities of good field experience…. We lack reliable and valid measures of impact as well as insights into what specific features of field experiences are more or less effective (pp. 20-21).

Recognizing that teacher education can play an important role in improving teacher quality, a growing number of studies are focusing on the effects of teacher preparation policies and practices (Cochran-Smith & Zeichner, 2005) and recent empirical studies on the effects of teacher quality and effectiveness seem to have demonstrated student achievement gains (Ronfeldt, 2012; Rockoff, 2004). Yet, we still lack a strong research base that identifies specific dimensions of teacher education related to the preparation and retention of high quality teachers (Ronfeldt, 2012; Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009; Wilson, Floden, & Ferrini-Mundy, 2001). As evident in MacBeath's (2012) report to Education International, school effectiveness studies seem to have offered an unprecedented opportunity to compare schools with a toolbox of criteria. The seven, 11 or 12 indicators emerging from studies, most prolifically in the US, the UK, the Netherlands, Australia and New Zealand helped in school improvement and effectiveness; appropriated a less common-sense construction of 'improvement' and applying effectiveness measures to determine 'residual value-added' or achievement above expectation.

To try to improve low-performing schools by encouraging them to adopt the characteristics detected in effective schools is problematic, argues Sandoval-Hernandez (2008) because:

> Schools differ so much in relevant aspects, such as the causes underlying their specific performance, capacity for change, contextual characteristics, etc. These differences are stressed when considering the practice of importing school effectiveness models from one country to another. That is to say that, one-size-fits all solution cannot be used to improve school performance; instead school improvement efforts should carefully consider the power of site or place (p. 32).

2.2 Significance of Pre-service Teacher Training in Ghana

As in many other places, the question of competencies as a basis for teacher education in Ghana has been prompted by questions about teacher quality in light of new student demands, the changed nature of the knowledge and skills needed by teachers, and the balance between accountability and professional autonomy (Day, 2007). Learning to teach is a multi-faceted and developmental process. Pre-training experiences, teaching context and teacher education programmes would have a certain impact, either constraining or expansive, on a student teacher's conceptions of teaching. Nevertheless, teacher education programmes are expected to have an expansive impact on the student teachers' conceptions of teaching as well as to help them overcome constraining impacts from other sources of influence practice. To Cheng, Cheng and Tang (2010), the quality of teacher education programmes can be improved only if the teacher educators help student teachers identify the gap between teaching and theory, and continually facilitate them in connecting their learnt theory and practice

Pre-service education and training of teachers is central to the achievement of Jomtien, 1990; Dakar, 2000 Education For All (EFA) and Millennium Development Goals for universalizing access to primary schooling; expanding early childhood care and education; promoting learning and life skills for young adults and achieving high rates of

enrolment and improving the quality of education for all (World Bank, 2013; UNESCO, 2012, Lewin, 2005). In those countries (i.e. Sub-Saharan Africa) furthest from achieving these goals, meeting the demand for new teachers is a major constraint on increased access, provision of quality education, retention and completion (Cobbold, 2010; Lewin, 2005, Lewin & Stuart, 2003). Some educationists argue that meaningful targets for the EFA goals on education quality can realistically be set only at the national level as each country has its own evolving standard of education performance and its relevance to specific development contexts (UNESCO, 2012).

Therefore, in order to meet the EFA and the MDG goals, many developing countries, especially in sub-Sahara Africa, have resorted to different ways of increasing the numbers in teachers to meet the growing numbers of enrolment in schools. According to Moon (2007), commitment to improving quality primary education in Sub-Sahara Africa has focused basically on infrastructure (i.e. classrooms, learning materials and school uniforms) without due cognizance of the fact that teachers' ability to developing new learning strategies to take care of learners and supporting meaningful learning and achieving successful outcomes is necessary in the current discourse of teacher education.

To facilitate the development and implementations of the improved teaching and learning agenda, teachers need to be trained to learn to teach more effectively–not only to "think like a teacher", but also 'to put what they know into action' (Hammerness et al., 2005, p. 359). They need to understand and know how to do a variety of things, many of them spontaneous and concurrent. Teachers typically work with diverse students at a time and have to balance several academic and social goals requiring trade-offs from time to time and day to day in order to have positive effect on students. Even though some aspects of teaching can be made somewhat routine, changing student needs and unexpected classroom processes will still influence the work of teachers in their day-to-day engagement with their students. Thus, many other decisions in teaching cannot be routinized because they are contingent upon student responses, which are often unpredictable, and on particular objectives sought at a given moment. Therefore, helping prospective teachers learn to be reflective about this multifaceted activity, and develop adaptive expertise (Leat et al., 2012; Hammerness et al., 2005; Barnett & Koslowski,

2002) is necessary to ready teachers about to enter the teaching profession (Englehart et al., 2012; Avalos, 2011; Dottin, 2009; Hammerness et al., 2005).

Student teachers need to be helped to study in more independent and proactive ways, so they experience themselves new ways of learning and teaching; they need to learn to reflect in ways that enable them to improve the quality and effectiveness of their learning and later, their teaching. They should be provided with, opportunities for growth and development of personal attributes and skills that can help trainees become confident and competent in their diverse professional roles (Avalos, 2011; Dembélé & Lefoka, 2007; Akyeampong et al., 2006; Hammerness et al., 2005). Evidence suggests that, the initial training they receive in addition to their own biographies and personal experiences influences teachers' identities and development. For example, in O'Sullivan's case study of unqualified and under-qualified practicing teachers in Namibia (cited in Avalos, 2011), the participating teachers had been exposed for the most part of their pre initial teacher training education to structured instruction and rote learning.

The study further found teachers had no prior experience of techniques such as brainstorming, of volunteering ideas, and of sharing of views that affected their professional thinking processes since they were not familiar with strategies that might be used in the classroom. To the extent that these approaches are contextually unfamiliar, they raise much broader questions about the relationships between children and adults, role models and aspirants, and professionals and those for whom they provide services. Such issues need to be opened up and debated so that culturally appropriate ways are found to develop curricula and pedagogy consistent with the demands of 'Education for All' (Lewin, 2005, p. 27). It is therefore necessary that teacher educators may need to develop or lay a foundation for lifelong learning and/or rediscover socially, culturally and contextually appropriate visions of what an effective teacher is (Schwille & Dembele, 2007; Hammerness et al., 2005; Bandura, 1991).

Initial teacher training explains quite a substantial amount of the variation in the ways teachers learn and teach. Thus, teacher preparation programmes have a unique opportunity to have a significant impact on teacher quality in the area of content

knowledge, pedagogic skills and values. As posited by Dottin (2006), any explanation rendered for specific actions among teachers should arise out of knowledge based on teaching, learning and associated purposes. Such learning outcomes identified by the unit should be supported as a practical "way of life for teachers through theoretical knowledge, contemporary research or through wisdom of practice as delineated in the current knowledge-based literature" (p. 42). This knowledge-based approach enables the teaching profession to justify the purpose of having its outcomes and also to have prospective teachers be taught certain things and certain ways so that they might come to possess the desirable outcomes and have a greater impact on student learning. All this is aimed at achieving candidates' proficiencies in content knowledge, skills and dispositions. Teachers need to be given sound professional training based on research and best practice on teaching and learning to be able to carry out their work efficiently.

In sum, researchers who have been analysing data accumulated since the 1970s have suggested that teaching is arguably the strongest school-level determinant of student achievement and that teacher preparation helps candidates develop the knowledge and skills needed in the classrooms; well prepared teachers are more likely to remain in teaching and well prepared teachers produce higher student achievement (see for example, Avalos, 2010; Diez, 2007; Darling-Hammond, 2006; Gauthier & Dembele, 2004; Gauthier, Bissonnette, Richard & Djibo, 2003; Hattie, 2003; Hopkins, 2001; Scheerens, 2000). There is a growing interest in and concern about teacher quality and effectiveness worldwide, as well as interest in and criticism raised against teacher education systems that can be ascribed to such suggestions (Schwille & Dembele, 2007).

While it is clear from literature that further identity development will take place in actual practice later on, a teacher education programme seems to be the ideal starting point for instilling not only an awareness of the need to develop an identity, but also a strong sense of the significance of on-going shifts that will occur in that identity. In order to anticipate the reshaping of professional identity that will come, teacher educators must continue to consider the situation of teachers in the early years of practice, where the influence of their surrounding context – the nature of the educational institution, teacher colleagues, school administrators, their own students and the wider school community – is strongly

felt (Avalos, 2011; Jurasaite-Harbison & Rex, 2010; James & McCormick, 2009; Flores & Day, 2006). We must then try to incorporate what we know about the contexts and communities and their influence on the shaping of teacher identities into our teacher education programmes to prepare new teachers for the challenges of developing strong professional identities in positive ways (Beauchamp & Thomas, 2009). It is possible to identify quality and effectiveness in teaching according to various criteria. However, "there is still much debate on what it takes to produce excellence among teachers at large" (Schwille & Dembele, 2007, p. 25) as we "live in a time of serious jurisdictional challenges and ideological chasms" (Grossman, 2008, p. 21).

2.3 Objectives of Initial Teacher Education in Ghana

Teacher education plays a crucial role in empowering a group of people to assist the greater majority of individuals to adapt to the rapidly changing social, economic and cultural environment to ensure the development of human capital required for the economic and social growth of societies. Research has shown that, apart from students, teacher effect accounts for approximately 30% of the variance in students' academic achievement (Diez, 2007; Hattie, 2003). It is said that if they (teachers) acquire the professional competence and attitudes that enable them to optimally perform their multiple tasks in the classroom, in the school and in the community, teachers become the single most important contributing factor in ensuring quality educational provision (Dave & Rajput, 2000). Providing competent and professional teachers who can deal with issues to enhance the teaching and learning processes is necessary if the major objective of the school system, as designed by the Education Reform Programme of 1987 "to make education more relevant to the socio-economic realities of the country, so that every Ghanaian child will be able to live a productive and meaningful" (UNESCO, 2010, p. 2) is to materialize.

A critical aspect of this professional competence is reflected in what Hattie (2003) asserted as:

> a search driven by the goal of ascertaining the attributes of excellence– because if we can discover the location of these goal posts, if we can

> understand the height of the bar of the goal posts, we then have the basis for developing appropriate professional development, the basis for teacher education programmes to highlight that which truly makes the difference, the basis for extolling that our profession truly does have recognizable excellence which can be identified in defensible ways, and the basis for a renewed focus on the success of our teachers to make the difference (p. 1).

The underlying principle of teacher education is to provide teachers with better knowledge and skills, together with better incentives to use their knowledge and skills for the benefit of children, through the creation of an accessible, integrated teacher education and training system which provides a structure for continuous professional development throughout their teaching careers (UNESCO, 2010). In their report, the Presidential Committee on the Review of Education Reform in Ghana stated the objective of teacher education in Ghana as the training and development of the right type of teacher who is competent, committed and dedicated. Such a teacher should be capable of:

1. Applying, extending and synthesizing various forms of knowledge;
2. Developing attitudes, values and dispositions that create a conducive environment for quality teaching and learning in schools;
3. Facilitating learning and motivating individual learners to fully realize their potential;
4. Adequately preparing the learner to participate fully in the national development effort (Republic of Ghana, 2002).

With this background, it is clear why the need to train quality teachers has become predominant in the discourse of teacher education. As has been noted by Hattie (2003), “we should be asking where the major source of variance in students’ achievement lie, and concentrate on enhancing these sources of variance to truly make the difference” (p. 1). Following this, the Ministry of Education (MoE) states through the national teacher education policy (NTEP) that, the objectives of teacher education are to provide the teachers with a sound basis in the content of the courses they teach; sound professional skills that will enable them to guide and interest the children in the acquisition of learning

and basic vocational skills and foster qualities of leadership. Leadership should create favourable conditions in which children learn how to learn with pleasure and ease. It should also enable them to integrate themselves within the community (UNESCO, 2010). The central objective is to produce highly knowledgeable, competent, committed and dedicated teachers capable of potentiating, facilitating and encouraging learning in students (MoE, 2011).

Among other things, on successful completion of their initial teacher education, it is expected that newly trained teachers possess the requisite knowledge and skills to plan for and manage learning programs for students. They demonstrate knowledge and understanding of the implications for learning of students' physical, cultural, social, linguistic and intellectual characteristics. They understand principles of inclusion and strategies for differentiating teaching to meet the specific learning needs of students across the full range of abilities. Newly trained teachers have an understanding of their subject(s), curriculum content and teaching strategies. They are able to design lessons that meet the requirements of curriculum, assessment and reporting. They demonstrate the capacity to interpret student assessment data to evaluate students' learning (Robson et al., 2012) and modify teaching practice. They know how to select and apply timely and appropriate types of feedback to improve students' learning. From the literature thus far, there is general consensus that initial teacher education is to provide prospective teachers with the knowledge and skills needed to carry out their work as teachers successfully (Darling-Hammond & Bransford, 2005).

2.4 Historical Antecedents and Structure of Initial Teacher Education in Ghana

As was the case in many colonies during the early colonial period, the main objective of education was to train highly qualified citizenry to help with evangelism and to help train people who can adapt to the demands of life (Quist, 2003). This account gives a clear narrative of how education in Ghana was implemented in the colonial days. Initially it was the Danish, Dutch and English merchants who set up schools in their Forts (Christiansburg Castle Accra-Danish, Elmina Castle-Portuguese then Dutch and Cape Coast Castle-British) to educate their mulatto children by native women. Obviously

linked to the implementation of formal education in Ghana were the Christian Missionaries, who realised that the enrolment numbers were growing and in order to spread the word of God, they needed well-educated local assistants. In the initial stages of educational development, teaching in Ghana as in other parts of West Africa, was tailored on the monitorial systems, which were popular in Britain and Canada at the beginning of the nineteenth century. In this system, the limited numbers of professional teachers were short-circuited. Thus, one master or trained teacher was in charge of a school and a number of "monitors" were selected from among the students in the top of the school to help him/her. The monitors' work was to be in charge of the "mechanical" teaching work and rote learning of the various classes. Comparable school management and pedagogic procedures were adopted in Ghana (Little, 2010; Quist, 2003).

Even though the 'monitorial' system was popular, it had to be abandoned in England in that it was thought of as encouraging much mechanical learning and the monitors, who were at the same time students were immature for teaching which demanded not only the teaching of the three Rs (i.e. reading, writing and arithmetic), but also the exercise of moral disposition on pupils. With the increased access and a change in curriculum content at all levels of education and the need to improve quality of teaching and learning, there was the need to train teachers who could place emphasis on political emancipation, questioning educational ends and means (Darling-Hammond & Bransford, 2005), contents, and have the tendency to focus upon political and social issues, stressing on empowerment and personal responsibility. In effect, the new system of education demanded teachers to be experts who can reflect on their day-to-day activities in and out of the classroom rather than just being supervisors and imparters of knowledge.

Thus, there was the need to train professional teachers. Therefore, the problem of inadequate teachers had to be taken head-on by training qualified teachers, who have the commitments to help every child succeed to teach in schools. In the same vein, Ghana had to also make efforts to train professionally qualified teachers. According to Akyeampong et al. (2011), the Basel Mission started initial teacher training in the later part of 1840 at Akropong-Akuapem. In 1848, the mission established a theological seminary to train African teachers and catechists to as it were, further their aims of

evangelism (Cobbold, 2010). The Basel Mission also established two other seminaries at Osu, Accra in 1850 and at Abetifi in 1898, which was later merged with the seminary at Akropong-Akuapem (Akyeampong et al., 2011). Even though historians are not fixed on the date of establishment, it is known that the Roman Catholic Mission did set up another teachers' college at Bla in the Trans-Volta Region of the then Gold Coast in the later part of the nineteenth century. Hence, at the close of the 1890s, there were three teacher-training colleges in Ghana (Cobbold, 2010).

In 1909, the Government in an effort to supplement the efforts of the Missions opened a teacher training college in Accra that became the teacher-training centre not only for publicly trained teachers, but also for the teachers of all other missions who had no teacher training institutions. This started as a form of partnership between the government and the missions (and more recently private individuals) in the delivery of teacher education that has existed to date (Cobbold, 2010). From 1919 there was a marked change in government policy. Governor Guggisberg established 16 guiding principles for the development of education. These stressed equal opportunities for boys and girls, co-education in certain stages, the importance of a vernacular education as the base for English education, the provision of trade schools to equip young men with craft skills and high quality teachers. The principles did not include free and compulsory basic education and educational expansion was cautious and limited by the supply of trained teachers (Little, 2010).

Nonetheless, as has been observed, the path to teacher education delivery in Ghana has been a "wavy one" (Cobbold 2010, p. 65). In other words, teacher education in Ghana has had a chequered history, "often based on ad hoc programmes to meet emergency situations and needs of the education system" (Akyeampong, 2000:24) and driven by "the fortunes sometimes of political history, the interest and fervour of the missionary factor or the availability of funds to implement policies which were deemed appropriate" (Pecku, 1998 cited in Cobbold, 2006). In fact, as Little (2010) points out, most commentators on the history of educational policy in Ghana converge on the notion that each successive policy script owes much to the policy themes set out in earlier texts. Recurring policy themes include the provision of free education and the need for a

practical, vocationally oriented education (Osei, 2006). The call for free primary education goes back to at least 1951, and that for practical, vocationally oriented education to as early as 1847, during the British colonial period. Recurring policy concerns include access, quality and costs, with varying emphases at different points in time (Little, 2010).

According to Cobbold (2010), through such uneven terrain:

> Ghana has built up a teaching body comprising teachers who have been trained in courses of varied duration and nature and hold different categories of professional qualifications…. The courses and the qualifications they lead to are the products of a series of reforms and counter reforms embarked on in attempts to solve the problem of shortage of trained teachers necessitated by educational expansion as well as socio-economic and political factors (p. 65).

Teacher training colleges, which are principal institutions for training basic school teachers in Ghana have been categorized as college(s) of education (CoE) and are regarded as part of the tertiary sub-sector (Ministry of Education [MoE], 2011). The MoE's education strategic plan (ESP) 2010-2020 has set the target for the proportion of qualified primary and junior high teachers at 95% by 2015 and the pattern of the development of CoE has been in line with achieving this objective. At present, it is estimated that less than 60% of the teaching force in basic schools are qualified. For example, of the 101,321 basic school teachers in public schools in 2009/10 academic year, 58.2% were trained and 41.8%, untrained. The MoE therefore seeks to increase the number of CoE to at least 50 by 2015 from 38 as of now to make up for the deficit in trained teachers needed.

Over the years, the CoE have produced teachers with varying qualifications through various programmes such as:

1. The regular 4-Year Post-Middle Teacher Training Course for teaching in Primary and Middle Schools

2. modular 4-Year Post-Middle Teacher Training Course also for teaching in Primary and Middle Schools,
3. Year Post-Secondary Teacher Training Course for teaching in Middle and Junior Secondary Schools

The regular 4-year post-middle teacher-training programme was originally started as a 2-year programme. The 1937/41 Education Review Report recommended a 2-year training programme for Middle School leavers leading to Teachers Certificate 'B'. Successful candidates were posted to teach in the Primary schools. These Certificate 'B' teachers were given further two years training to qualify for Certificate 'A' after two years of teaching on completion of the initial teacher training. At the launching of the Accelerated Development Plan for Education (1951), the following certifications for Primary school teachers were in existence:

a) Teacher Certificate 'B' after 2-year Post-Middle Training Course.
b) Teacher Certificate 'A' (Post 'B') after obtaining Certificate 'B'.
c) Teacher Certificate 'A' after 4-year Post-Middle Training course (McWilliam & Kwamena-Poh, 1975).

In 1952, the 4-year Teacher Certificate 'A' course was suspended because of the Accelerated Development Plan for Education which led to over-rapid expansion of Primary Schools requiring large members of teachers. In its place, a crash programme to produce large numbers of Certificate ‘B’ teachers was substituted (McWilliam & Kwamena-Poh, 1975). In 1953 an Emergency Teacher Training programme that lasted 6 weeks was introduced at Saltpond in the Central Region of Ghana to give some orientation to pupil teachers. Ten more of such training programmes were opened at various centres throughout the country. With the introduction of fee-free and compulsory Primary Education following the Education Act of 1961, the C. P. P. Government under Kwame Nkrumah phased out the 2-year Certificate ‘B’ course and the Emergency Training Programme, and re-introduced the 4-year Certificate 'A' course for holders of the Middle School Certificate.

This was intended to improve upon teacher education. After 1961 there was a serious shortage of trained teachers to teach in the Training Colleges. The problem was so serious that it was thought that teachers who were not sufficiently qualified to teach in Secondary Schools could nonetheless teach in Training Colleges (Ahiabele-Addo, 1980; McWilliam & Kwamena-Poh, 1975). As at the early 1980s, there has been the exodus of trained teachers to Nigeria to look for greener pastures that, about 50% of Primary School Teachers were untrained, many of who had also been teaching for a reasonable amount of time. The national consensus was that a way should be found to train such personnel. The modular system was therefore introduced in 1982 to enable serving Pupil Teachers undergo in-service Training, organized in modules for two years. It is to be noted that the term ‘modular’ is only a descriptive term for the syllabus organized in units of lessons called modules. The advantage of this system is that serving Pupil Teachers earned their regular salary and attended the modular courses at the same time. They completed their course by spending the last two years of the course in regular residential 4-Year-Post-Middle Training Colleges for the award of the 4-Year-Post-Middle Certificate 'A'. This qualified the teachers to teach in Primary and Middle Schools (Djangmah, 1986).

Following this, a 3-Year-Post Secondary Teacher Training Course that has involved over a long period of time was introduced. In the 1940's a Post-Secondary Certificate ‘A’ programme was introduced to offer a 2-Year Post Secondary initial Teacher Training Courses. The products were assigned to teach in Middle Schools. In later years some of them found their way into the Junior Secondary Schools. At the beginning of 1964/65, 2-year further training courses for already certificated teachers in English, Science, Geography, History and Mathematics were offered in nine Training Colleges in order to meet the specialist staffing needs of Middle Schools. In 1973 two-year specialist courses in selected Training Colleges were mounted to offer subjects such as Science and Mathematics. Such teachers were posted to teach in the lower forms of Secondary Schools, Middle Schools and Post-Middle Training Colleges and to satisfy the demand to prepare teachers for the Junior Secondary Schools, the specialist programmes mentioned above were phased out in 1976 to make way for a 3-year Post Secondary quasi-specialist programme also grouped around the following subject areas:

1. Science, Mathematics, Agriculture or Home Science;
2. Social Studies, English, Ghana Languages or Religious Education;
3. Training Technology and
4. Home Science and Catering, Hairdressing, Beauty Culture, Dressmaking, Art and Crafts.

In 1979 a 3-Year Post Secondary Training course for teaching in Middle and Junior Secondary Schools replaced the quasi-specialist programme because not all the products could find placement in the then existing Junior Secondary Schools (Djangmah, 1986).

Currently, there are 41 (residential) colleges of education – 38 are publicly funded and three privately run, and of the number, at least one publicly funded college located in each of the ten administrative regions in Ghana. The location of the colleges in all the regions is to meet a constitutional mandate that stipulates that, the state shall provide educational facilities at all levels in all the regions of Ghana, and shall, to the greatest extent as possible, make those facilities available to all citizens. The establishments of private intuitions are also in accordance with Article 25(2) of the 1992 constitution that states that, "every person shall have the right, at his own expense, and to establish and maintain a private school or schools at all levels". Teachers in all the CoE are prepared to teach all subjects in the curriculum as well as techniques for multi-grade teaching. Alongside this, 18 colleges are designated to train teachers who specialize in teaching science, mathematics and/or technical skills subjects in junior high schools. Seven (female only colleges) of the 38 public CoE offer specialized courses in early childhood teaching.

The pre-service training course for primary and junior high teachers is of three years duration, of which the first two years are spent at the college, and the third year, trainees attached to a community school for practical training. Thus, colleges run a six-semester Diploma in Basic Education (DBE) programmes, dubbed, IN-IN-OUT, which involves trainees studying at least eight content related subjects and eight methodology subjects in first and second years on the programme, and spending their last year on the programme in nearby community-schools for practicum. Students spend the last term of the third year

in college to write two professional papers and present their project works to complete the three-year programme.

2.5 Initial Teacher Education Programme and Curriculum in Ghana

A review of training programmes over the years indicates that training college courses and curricula have been ad hoc and are usually implemented based the growing demand for teachers to teaching increasing numbers of students in schools. A look at the curricula for teacher training seemed premised on the idea that if students are given enough knowledge and skills at college these can be applied without any problems, like 'recipes' in any classrooms (Lewin, 2005). A look at the current teacher training programmes in Ghana suggests a mechanistic approach to teaching as it was in the nineteenth century.

Currently, all trainees, irrespective of their areas of specialism, study core subjects relevant to the basic school curriculum. These core courses are: Principles & Practice of Education, English Language Studies, Mathematics (Numbers & Basic Algebra), Ghanaian Language & Culture Teaching 1, Science 1, General Introduction to Religious and Moral Education, Agriculture, Vocational Skills (Art Related), Environmental & Social Studies 1 for first year semester one. Child and Adolescent Development & Learning, English Language 1 (With Elements of Literature), Mathematics (Geometry & Trigonometry), Science 2, Environmental and Social Studies 2, HIV/AIDS Education are studied in the first year semester two. Principles & Methods of Teaching in Basic Schools, English Language (Methodology), Mathematics (Statistics & Probability), Environmental & Social Studies, Introduction to Information & Communication Technology, Methods of Teaching Issues in HIV/AIDS, Methods of Teaching Science, Methods of Teaching Primary School Mathematics for second year semester one. In second year semester two, students study - Educating the Individual with Special Needs, Assessment & Research Methods in Education, English Language Studies 2, Mathematics (Methods of Teaching JHS Mathematics), Introduction to Information & Communication Technology (ICT), Science 3, Mathematics (Further Algebra), Environmental & Social Studies 3. In addition to these core subjects, candidates whose specialty is in science, mathematics and/or technical subjects study – Algebra,

Trigonometry, Calculus, Biology(both theory and practical), Physics theory and practical, and chemistry (both theory and practical). Students also select from a range of subjects such as French language, technical and vocational skills.

A critical look of the range of subjects in offer at the CoE suggests a strong focus of content-based curriculum with students taking eight or more academic courses in a semester. This seems to reflect many of the criticisms levelled at the functioning of colleges of education. Some claim that teacher-training institutions overemphasize theories and inadequately address the practical realities of contemporary classrooms (Grossman & Loeb, 2008; Lewin, 2002). Others (Akyeampong et al., 2011; Zeichner, 2010) argue that college curricula sometimes lack intellectual substance and focus instead on pedagogical practices, and that the old paradigm of university-based teacher education, in which academic knowledge is viewed as the authoritative source of knowledge about teaching, needs to change to one in which there is a non-hierarchical interaction between academic, practitioner, and community expertise. On the other hand, the alignment of students' entry to programme specifications seems to be in line with teacher educators who have levelled criticism against the trend toward open entry to teaching. The evidence provided by researchers on the quality of prolonged teacher training programmes indicates that programme graduates are better prepared for their professional work, drop out less, and contribute more as teachers (Boyd et al., 2009; Darling-Hammond, 2010).

2.6 Challenges Facing Colleges of Education

Teaching is a complex profession that is influenced by various components of teacher competencies and quality that requires a more integrated and dynamic approach in designing its training programmes. The quality of teacher education has been put under the microscope in recent years and debate is raging on the quality of teacher education programmes, as well as the problems encountered by teaching and teacher education in many countries. Stakeholders need to acknowledge these problems as an important starting point both for reviewing the emerging agenda for change and for considering alternative prospects (Sykes, Bird, & Kennedy, 2010). Larry Cuban in his history and

recent update of efforts to reform teaching in 2009, reviewed six reasons why liberal reforms (which Cuban characterized as "student-centred" in contrast to traditional "teacher-centred" instruction) have not had firmer grip on schools, especially in America.

Even though historical records from several reform eras over the past century indicated each explanation Cuban had for the six explanations he offered for why reforms have had seemingly no effect, each had merit, despite the fact that none could account for all of the evidence (Sykes et al., 2010, p. 464; Cuban, 2009). Cuban in concluding his analysis, proposed a superficial model that depicted the "situational constraints" on teachers growing out of wide range of "cultural patterns, the historical development of the teaching occupation, the organization and culture of schools, and others" (Sykes et al., 2010, p. 464). In their analysis which parallels that of Cuban, Sykes et al. (2010) contend that, the field of teaching and teacher education is faced with dilemmas and in order to complement the more communal established assessment of teacher education, there is the need for occupational analysis as well. According to Lampert (2010), teaching involves managing several issues in different domains in the classroom. In her view, teaching is a relational work that demands "intellectual and social collaboration" (2010, p. 22) and that teachers should learn how to advertently direct their agencies to maintaining productive relationships with their students (Mansfield, Beltman, Price, & McConney, 2012; Darling-Hammond & Bransford, 2005; Rice, 2003). However, there are even challenges with, and differences in the use of the word *practice* in the field of teacher education

Based on Sykes et al. (2010), Lampert (2010), and Cuban's (2009) assertions, I recognize that school teaching has faced daunting spectra of constraints in responding to reform efforts, and progress in teacher education must be mostly troubled as it addresses the nature of teaching in the schools (Cuban's puzzle); pre-service training and professional development; its own institutionalization in universities, and the relations between school and university. As posited by Sykes et al., "each of these three aspects gives rise to tensions and dilemmas, and their combination sums to a wicked brew of problems, which systems analysts would characterize more properly as a 'mess'" (p. 464). In most literature on teaching and teacher education, the problems are spread through text and

bringing them together would be useful in stabling the full situation of the challenges facing teacher education.

2.6.1 The Conceptualization of Occupational Competence and Practice in Teaching and Teacher Education

According to Sykes et al. (2010), the idea of occupational competence often follows the sociological tradition as developed by Lortie, Dreeben, Abbott and Ellström which views the teaching profession holistically from the point of character, development and effectiveness of the teacher. As explored particularly in the work of Robert Dreeben (1970, 2005), cited in Sykes et al. (2010), the focus is on the concept of occupational competence, which

> pertains to a collective entity. What lies behind it are the knowledge and skills available to practitioners, that is, the state of the art and its adequacy to meet the demands of the work. Here, "state of the art" refer(s) to a repertoire of accepted practices appropriate to address most of the problems arising in the daily round of work (Dreeben, 2005, p. 52).

This approach looks at how occupations evolve in tandem to technological advancements and knowledge growth, social opportunities, programmatic efforts, and constraints of various kinds. Whereas some occupations, notably medicine and engineering, have relied on science for their development, others such as the clergy or the law have utilized other forms of knowledge to comprise codified approaches to problems of practice (Sykes et al., 2010). Dreeben suggests that occupational competence entails managing three central tasks of diagnosis, inference, and treatment, intending that these terms derived from medicine may be suitably adapted to characterize work in other occupations (cited in Sykes et al., 2010), but because of the different contextual components involved in school teaching (i.e., managing the emergent social features of a school classroom and working with many clients at the same time), teacher competence could be perceived to be more complex than the analogy presented.

However, the nature of the work and how occupational development supports the accomplishment of the central tasks and supports in the management of "hard cases" that

rely on professional judgment and discretion should be the focus (Sykes et al., 2010, p. 465). Thus, 'being competent' involves possessing the range of acceptable skills necessary to carry out one's duty on daily basis. To this end, Lizzio and Wilson (2004) see competence as the capacity to enact specific combinations of knowledge, skills and attitudes in appropriate job contexts. This viewpoint obviously captures the role of training or preparation in the development of occupational competence.

Lizzio and Wilson (2004) define competence as consisting of integrated pieces of knowledge, skills, attitudes and dispositions which are assumed to be requirements for effectively functioning on a particular job. Similarly, Dreeben (2005) articulated in his work that, the idea of occupational competence is a collective entity, and undergirding it are the knowledge, skills and experiences or the potential capacity (Akyeampong et al., 2011; Schwille & Dembele, 2007; Morais, Neves, & Afonso, 2005; Lizzio & Wilson, 2004) of an individual (or a group) to effectively handle certain situations or complete a task. An important function of occupational competence is that it embodies individuals' perceptual motor skills (e.g. dexterity); affective components (e.g., motivations, values and beliefs, attitudes and goals); cognitive components in the form of exhibiting different forms of knowledge and intellectual skills; personality characteristics such as conscientiousness, self-efficacy and self-confidence, and social skills (e.g., collaborative/co-operative and communicative skills)(Avalos, 2011; Dreeben, 2005; Lizzio & Wilson, 2004).

Occupational competence is necessary in teacher training and teaching. Even though writers in teacher education literature acknowledge the importance of occupational competence, there appears to be some major problems that make attempts to conceptualising occupational capacity difficult. The teaching occupation is considered as too large and continues to increase in size. For example, UNESCO (2013) estimates the number of primary school teachers at 28 million, teaching about 691 million children enrolled in primary schools. A look at this number at the primary school level alone tells the story of the scale of the teaching force. In addition, teaching is highly hierarchical with many different grades, subject areas and specialisms. In the view of Sykes and colleagues, these organizational characteristics of the occupation bring about challenges

for training programmes that must produce large numbers of newly qualified teachers (NQTs) yearly "while filling a wide range of specialty niches in the labour marketplace"(2010:465). In the light of this, Boyd et al. (2009) believe that the teacher education arena is likely to exhibit different approaches in providing potential solutions to teacher training across the range of teaching duties in schools. Under these situations, training which is dedicated to "developing occupational competence is likely to be compromised, as too many programmes coupled with too many specialties produces fragmentation overall" (Sykes et al., 2010, p. 465). Thus, programmes might need to attend to all the subject areas in the basic school curriculum, all the special education categories and early childhood education. Working out programmes that attend to such a variation in teaching assignments is overwhelming, even for large public universities.

Even though teaching is seen as a unitary entity, yet, it produces variable results. The ways that the impact of teaching has on students' learning is measured is problematic, and literature has grappled with methods of measuring this that both attend to the diversity of outcomes as well as according with the validity of such variable measures (see for example, Desimone, 2009). The extent rather than the presence of variability in results is what marks teaching, where any sort of common procedures or methods applied to a highly diverse student body is likely to yield variable results. In this sense, I describe not an absurdity but a fundamental condition of teaching that generates difficulties for any efforts to prepare practitioners (Sykes et al., 2010). Rowan, Correnti and Miller (2007) provide a large body of evidence in their analyses of models that decompose the variance in elementary student achievement among students, classrooms, and schools in support of the variation between students' achievements. According to Sykes and colleagues, teaching is culturally scripted. Thus, there are many conventional features of teaching as practiced in the schools such as teacher-centred discourse, textbook-based lessons, coverage as the main curricular principle, and standardised tests; as well, features of how schools organise instruction, including age-graded, self-contained classrooms, trailing, and so on. In stricter sense, this could be seen as ensuring consistency in the practice of teaching as a profession which could be regarded as an indicator of occupational competency (Sykes et al., 2010), but in the view of Glazer (2008), this

consistency in teaching has not arisen as a result of shared knowledge based on evidence, and accepted as efficacious.

Instead, consistency derives from the nature of teaching as a cultural activity that follows scripts deeply inscribed by tradition, supported by public perception and approval, and handed down through the apprenticeship of observation (i.e., the learning that takes place by virtue of being a student for more than eleven years in a traditional classroom settings) that provides a powerful basis for continuity with past practice (Avalos, 2011; Sykes et al., 2010; Hammerness et al., 2005; Lortie, 2002). So on one hand, teaching seems culturally routinized, whereas on the other, teaching's results appear quite variable, not least at the classroom level, such that two teachers in the same grade level in the same school can produce quite different results in student achievement. In the view of Sykes and his colleagues, a common explanation associates such inconsistency with what Hammerness et al. (2005) termed as "the problem of complexity" (p. 359), that is having to work with many different students at a time and the student variability from classroom to classroom; another explanation places the problem in the traditional norms of individualism in teaching that weakens efforts to establish any common basis for practice (Sykes et al., 2010). And still another explanation finds the problem in content coverage in the school curriculum, with teachers devoting quite different amounts of time to coverage of curricular topics (Schmidt & Maier, 2009).

A growing problem of the variability in results stems from what Lortie (1975) calls the 'subjective warrant' which involves preconceptions about teachers and teaching as a profession and the requirements in fulfilling the duties involved. Like almost no other profession, people believe that they have a warrant to teach based on their individual experience. This could be due to the fact that teachers see and reflect themselves to others as transmitters of knowledge – thus, the 'looking-glass self' (see for example, Henriques, 2003; Scheff, 2003; Cooley, 1902). Perhaps, the fundamental impulse from "such portrayals is that teaching is a natural talent or gift that is more related to emotional disposition and attribution fit than to serious and prolonged reflection and critical examination of one's practices" (Walker-Gleaves, 2009, p. 36). It is in fact the presence

of reflection and adaptive expertise that attempt to make teaching results more uniform and more consistent (Hammerness et al., 2005; Day, 2004).

Do initial teacher training (ITE) courses count? According to Dembélé and Lefoka (2007), policies and plans often assume that initial teacher education programmes make a difference to teachers' pedagogic knowledge and skills which in turn will be reflected in enhanced student learning outcomes. The idea of ITE builds on Dewey's (1938) concept of educative experiences, which are experiences that promote rather than retard future growth and lead to richer subsequent experiences. According to Dewey, the educator is responsible for organising the physical and social conditions so that learners have growth-producing practices.

> Every experience is a moving force. Its value can be judged only on the ground of what it moves toward and into…It is the business of the educator to see in what direction an experience is heading…so as to judge and direct it. (p. 39).

There is also the growing point of view that, ITE programmes could help bridge the gap between pre-service teachers' beliefs and values and the different perspectives of professional development college programmes present (Musset, 2010; Bartholomew & Sandholtz, 2009; Gravani, 2008). Pre-service teachers' attitudes and beliefs about teaching and learning and the pedagogical knowledge garnered from classes and fieldwork play an important role in shaping their patterns of instructional behaviour (Plourde, 2002, as cited in Yılmaz & Çavaş, 2008). Supporters of formal teacher training often claim that "hundreds of studies" support the value of pre-service education courses. ITE reinforces teacher trainees' initial effectiveness and the likelihood of their professional perseverance (Clotfelter, Ladd, & Vigdor, 2007). In their study, Henke, Chen and Geis (2000) found that novice teachers who did not undertake practical experience during their training dropped out at more than twice the rate of those trained in prolonged programmes (Yogev & Michaeli, 2011). Recent reviews of the literature, however, have largely disputed that claim (Allen, 2003).

These reviews have found that all but a handful of these studies suffered from significant methodological shortcomings, ignored basic scientific protocol such as the “peer review” process, and, in most cases, did not use student achievement to judge a teacher’s effectiveness (See for example, Wayne & Youngs, 2003; Monk, 1994; Ferguson & Womack, 1993). According to NCTQ (n.d.), some of the research has concluded the following: One massive study by Bradford Chaney looked at the standardized test performance of 24,000 eighth graders in USA to determine if students did better in mathematics and science if their teachers had a degree in education. The study found that an education degree had no impact on student scores. Another study by Goldhaber and Brewer (2000), found that students actually did worse on science achievement tests if their teachers had a degree in education and yet another study indicates why it is important to rely on the findings of more than one study and to not assume that what is true for one group of teachers is equally true for another. Richard Monk found that students did better on a math test if their teachers had taken courses in math education as opposed to pure mathematics. On the other hand, Monk (1994) found the reverse was true in science; teachers who took pure physical science courses as opposed to science education courses were more effective.

Hammerness et al. (2005) assert that there has been a number of large-scale pieces of research that have found associations between the quantity of training teachers have gotten from their subject matter and methods related to their content-specific areas. Even though they pointed out that many of the studies examined were not able to analyse the nature of the quantity of the training, current studies have scrutinised the substance of training as well as the amount. For example, in a study conducted by Wenglinsky (2002), it was found that, more effective math and science teachers had more subject matter training and professional preparation in how to work with diverse student populations (a combined measure of training in cultural diversity, teaching limited English proficient students, and teaching students with special needs), how to develop higher-order thinking skills, and how to use activity based methods (Hammerness et al., 2005).

But in their view, Akyeampong et al. (2011) suggest that not enough is known about how teachers working in different educational environments and contexts adopt and adapt the

knowledge and skills they have acquired through formal training to address the particular learning needs of young students in their actual schools. This is so, because, in SSA, there seem to be few scientific studies on the content and processes of knowledge, skill and professional character acquisition by teacher trainees and effective teaching by NQTs. In a study in some six selected African countries supported by William and Flora Hewlett Foundation, it was found out that NQTs were fixed in their procedures of teaching and gave a sense which indicated that they wanted to get the procedures in their teaching right. Akyeampong et al. (2011) noted that teachers in the study lacked reflection on the relevance of the procedures and its impact on the learners. The effect of this fixation on procedures, they suggested, was that, the NQTs appeared insensitive to the pupils' context and the need for adaptation when the method and procedure did not work, thus, portraying that they demonstrate low reflection in practice. But on this point, I argue that the NQTs are probably practising how and what they were taught at college and that ITE seemed to have had a some effect on their practice in this regard, even though the teacher education programme seem to have failed to open them up to the student-centred, problem-solving, decision making, critical and reflective thinking, which the syllabus recommended (Institute of Education, 2005).

There is therefore a mixed position as to the effect of ITE courses as to whether they can make a difference or not in the classroom effectiveness of NQTs. It is hard to understand how pre-service training can appear to add so little value to a teacher's effectiveness. The prevailing views are that teaching skills must be learned on the job and that education courses lack rigour and true content. However, economist Dan Goldhaber offers an interesting insight, theorising that the apparent lack of an impact from education coursework might be related to the low academic calibre, on average, of the people that take such coursework. Because academic calibre is the most pronounced measurable attribute of an effective teacher, education coursework's true value may be masked by the fact that education schools attract on average less academically talented individuals. It does that appear majority of the claims are rhetoric backed by little or no research evidence.

A more useful model, I surmise, is one that sees teaching as interactive problem-solving, requiring a thoughtful and reflective approach to one's own practice (Avalos, 2011; Dottin, 2009; Darling-Hammond, 2006). Thus learning to teach means acquiring not only knowledge and skills, but also a situated understanding of pupils and how they learn, along with repertoires of skills and strategies for dealing with unique and ever changing circumstances. Teachers should be trained as researchers and collaborators who can learn from their own practice and others. The main foci programmes of the initial teacher training therefore should be the development of professional habit of mind and reasoning ability, rather than just the acquisition of pre-defined behaviours (Dottin, 2009; Akyeampong, 2003). Such a model requires an epistemological shift towards a view of knowledge that recognises the value of teachers' personal, experiential and craft knowledge as well as the public propositional knowledge offered in college (Avalos, 2011; Akyeampong et al., 2011).

In considering the situation in Ghana, these expositions merge with another as well, connected to what Cohen and Moffitt (2009) refer to as an "educational infrastructure," which they report is present in some countries. The term refers to a set of elements that make up a coherent and whole basis for practice. These include common curricula that are aligned to examinations, which in turn provide diagnostic feedback to practitioners; training that is grounded in the curriculum; and recruitment and selection of teachers who have been successful in the curriculum. An infrastructure, in turn, supplies a crucial resource to teachers—"a common language with which to identify, investigate, discuss, and solve problems of teaching and learning, and thus the elements of common professional knowledge and skill" (p. 5). Without a common vocabulary grounded in elements of infrastructure, they argue, it is problematic to build knowledge relevant to practice. Although this idea of common curricula pertains in the training of pre-service teachers in Ghana, there seem to be a weak link between what is learnt in colleges of education and what is taught in basic schools.

In effect, pre-service teachers' educations are grounded in no "mutual curriculum" that they would use with students. Thus, there appears to be a misalignment of college and school curricula such that what pre-service teachers learn in colleges is different from

what they actually teach and this was evident in a study carried out by Akyeampong et al. (2011) in six countries in Sub-Sahara Africa. They reported that in all the six countries which took part in the study, even though there had been reforms in the basic schools, "in none of the countries studied did the introduction of the new curricula include concomitant change in the colleges; this meant that even if it fulfilled its aims, it was preparing trainees for a situation that the schools were seeking to move away from" (p. 18). In their estimation, the problem is further compounded by the fact that even though the training curriculum sought to prepare trainees on active learning procedures, the method being used in their training was the lecture type.

Similarly, the main means of assessment for teacher certificates and diplomas was examinations, which did not align well with the constructivist approaches advocated by the new curricula. For this reason among others, pre-service teachers' training could be seen as "pitifully weak preparation for classroom practice" (Cohen & Moffitt, 2009, p. 4). In recognising this need, the MoE and GES decided to request a consultant to assist with the revision of staffing norms and related guidelines. It was to recommended that pre-service training courses (full-time and distance) be reviewed and if necessary revised to produce teachers who are able to teach the curriculum in a pupil-centred way. The GES was to convey the relevant issues to the attention of the appropriate body by the end of March 2012, with a request that the necessary changes be made in time for implementation in colleges of education from the start of the 2013/14 academic year. But as of now, no new changes have been made either in the structure or programmes of teacher training colleges.

This lack of alignment between what pre-service teachers learn and what they teach while in the classroom poses some problems germane to occupational competence. According Sykes and colleagues, the probability of teachers producing variable results is high in teaching different students. In furtherance to their earlier point, they assert that, the "teacher curriculum cannot be reliably anchored in the student curriculum on any widespread basis" (p. 466). This is particularly worrying knowing that, "when educational improvement focuses on learning and teaching specific academic content, and when a curriculum for improving teaching overlaps with curriculum and assessment

for students, teaching practice and student performance are likely to improve" (Cohen & Hill, 2001, p. 250). In fact, these analyses seem to point to professional development; there is an association between them and initial teacher training as well. In a highly decentralised system, there is almost no overlap between the specific curriculum of the schools and of teacher preparation. There is no common system of work around which to adapt a system of training for that work. Under these conditions, training cannot serve to develop occupational competence in any comprehensive way.

Currently, frantic efforts are being made by policy makers, governments, teacher education providers and academics and researchers seeking explanations as to what the possible causes are in terms of the high attrition rate among teachers, especially, those in their early careers (Office for Learning and Teaching[OLT], 2012; Beltman, Mansfield & Price, 2011; Cobbold 2010). Teacher attrition is seen as problem, as an acute shortage of teachers may lead to non-achievement of the EFA as well as the universal primary education (UPE) goals. According to OLT report, 2012, one of the contributory factors that accounts for teacher attrition is teachers' lack of resilience. Teacher resilience has been variously defined to include those who have the capacity to "rebound from disappointments" and "sustain their commitment to the profession, and with this, their effectiveness" (Day & Gu, 2009, p. 449). In the same vein, Sammons, Day, Kington, Gu, Stobart and Smees (2007) view resilience as the "capacity to continue to 'bounce back', to recover strengths or spirit quickly and efficiently in face of adversity"; "a dynamic construct subject to influence by environmental, work-specific and personal contexts" (p. 694). Teachers who are resilient are seen as having control over their work as well as their personal and environmental issues. They reflect on their work and adapt to situations and overcome setbacks with enhanced competency - do not simply survive, but they maintain job satisfaction and commitment to the profession – they thrive (Beltman et al., 2011; Bobek, 2002).

Literature has it that, teachers' resilience may contribute to their adaptive capabilities and as well as their persistence on the job in the face of adverse conditions. Teachers with high sense of resilience are thought to be intrinsically motivated, efficacious, problem solvers, optimistic and persevere in the face of adverse situations (Beltman et al., 2011;

Day & Gu, 2010; Castro, Kelly, & Shih, 2010; Cohen & Moffitt, 2009; Sinclair, 2008; Tschannen-Moran & Woolfolk Hoy, 2007; Yost, 2006). They also show inclination to take risks (Tschannen-Moran & Woolfolk Hoy, 2007; Sumsion, 2004) and flexibility in adapting to situations both in and out of classroom (Le Cornu, 2009; Darling-Hammond & Bransford, 2005; Rice, 2003), active coping skills (Chan, 2008) and teaching skills (Mansfield et al., 2012; Kaldi, 2009; Bobek, 2002,). However, in their review of literature, Fantilli and McDougal (2009) identified some personal challenges such as teachers finding it difficult in seeking assistance when in trouble or when the need arises and working collaboratively with colleagues as some of the potential threats to teacher resilience.

Some of the other common threats are the indecisiveness between beliefs and practice among teachers (Flores, 2006), health related problems and wellbeing (Day & Gu, 2010, 2009; Day, 2008), reduced self-efficacy, poor recruitment services, lack of infrastructure and essential learning resources coupled with heavy workload and large class sizes (Akyeampong et al., 2011; Kitching, Morgan & O'Leary, 2009; Castro, Kelly & Shih, 2010; Day, 2008; Flores, 2006; Darling-Hammond & Bransford, 2005), unsupportive parents and colleagues (Price, Mansfield, & McConney, 2012; Sumsion, 2004). These notwithstanding, prospective teachers could be helped to develop confidence that they can learn and be successful in college; will attain qualified teacher status; feel efficacious and have a sense of agency in their role as teacher and feel supported in the challenging task of becoming a teacher. Essentially, resilience is not an innate psychological quality but a form of self-regulatory process and a capacity which is socially built and identifies that learning to teach is multifaceted, involving (Price et al., 2012), and the intricate nature of the teaching profession makes it unpredictable (Hammerness et al., 2005). I am therefore of the view that building pre-service teachers self-regulation and thus building their reflexivity, resilience and adaptive skills will help better prepare individuals to be able to deal with the myriad of challenges and the complexities of the teaching job.

Another problem in teaching, it appears, is teacher educators knowing what to teach prospective teachers in programmes in colleges of education. Over the years, it seems attention has been focused on the format, length, or the location of teacher education to

the detriment of the substance of such programmes, thus what prospective teachers need to learn and how they may best be able to learn it (Darling-Hammond & Bransford, 2005, p. 2). According to Sykes et al. (2010), the teaching profession seems to be uncertain about the technical knowledge it requires for its teachers to link teaching to learning. In the same vein, Darling-Hammond & Bransford (2005) assert that, a look at most programmes for initial teacher training reveals wide variation in both qualities, and quality across the many contemporary routes into teaching, and "do not divide neatly across categories often used to describe them" (p. 4).

Even though in developing occupational competence, some body of shared knowledge and skills however rationalised, is required, cross-professional perspectives on the issue of technical knowledge suggest that such a body of knowledge need not be grounded in science (Sykes et al., 2010). These perspectives appear to reflect the myriad of problems in developing knowledge in and for teaching (see for example, Darling-Hammond & Bransford, 2005, pp. 1-39; Dreeben, 2005, p. 69; Lortie, 2002, pp. 134-161). Prominent among these problems is the fact that teachers themselves appear neither to be aware of nor to use knowledge gathered by other professionals and researchers. This lack of knowledge seems to work against the availability of a number of handbooks of research on teaching and teacher education, considering the fact that some technical knowledge is accumulating (for example, around early literacy practices). Instead, a baffling plethora of advice about teaching are proffered, which makes sorting, appraising, and bringing different suggestions into practice very difficult. In the view of Sykes and colleagues (2010), there are a number of questions teacher educators may need to ask such as what is the nature of occupational competence in teaching that has not been established on any firm ground? And in the view of Darling-Hammond and Bransford (2005), what kinds of knowledge, skills and commitment do effective teachers need that might be available for the training of teachers? It is difficult to establish common grounds when it comes to teacher competence since there seems to be no consensus as to what works for teachers in achieving high performance for students, probably because the variations in settings and in the pupils they teach.

More so, competence is sometimes characterized as an ability to perform a task effectively and other times seen as encompassing a broader perspective of intellectual, attitudinal and performance dimensions. There is therefore often lack of clarity about the different forms of competence described by different programmes as well as different countries (Akyeampong et al., 2011; Darling-Hammond & Bransford, 2005). Some competences seem to be person-related and others task-related. While some programmes restrict themselves to defining a short list of general professional competences, others basically embrace a number of discrete behaviours; many fail to distinguish between these varied forms of capacities or specify the ways in which they are supposed to be related. But difficult as it may appear to answering questions surrounding teacher competence because of the complexities and the fluidities in defining teacher competences, Sykes et al. (2010) suggest that "what seems most likely is a parallel profusion of guidance, some of it based on research, some on untested popular ideas from many sources, with no evident means for distinguishing what really might be warranted" (p. 466).

A further complication here is that, as teaching qualifications may need to show equivalence to those of universities in the educational system this may lead colleges to emphasise subject content knowledge to ensure some comparability and engagement at tertiary level (Akyeampong et al., 2011). Thus, when colleges are aligned with universities as in the case of Ghana, courses are designed as though they are 'miniature' university degrees fashioned around what is done in the universities without recourse to the needs of colleges and the peculiarities of the knowledge needed by trainees to function well in a complex and heterogeneous classrooms. Once teacher education fuses itself to the university, thereby separating itself from the field of practice, the problems begin (e.g., Labaree, 2008), notwithstanding the fact that many other specialised schools are affiliated with the modern university without suffering, the calumnies heaped on teacher education (Sykes et al., 2010). In the view of Harry Judge (cited in Sykes et al., 2010) teacher education could be seen as "a deeply institutionalised error" (p. 466). What this means is that the individual parts of teacher preparation—subject matter preparation are lodged in the disciplines, educational coursework in the schools of education, and

practice teaching in the schools could not be made to hold together (Akyeampong et al., 2011; Sykes et al., 2010; Boyd et al., 2009).

Moreover, the challenge that ITE faces is how to build opportunities for learning subject matter that would enable teachers not only to know but also to put what they know into action and to learn to use what they know in the varied contexts of practice (Akyeampong et al., 2011; Hammerness et al., 2005). Sometimes attempts to develop pedagogic content knowledge in prospective teachers lack this conceptualisation – Ghana is a case in point where emphasis is placed on acquiring procedural methods as scaffolds for learning to teach (Akyeampong, 2003). In effect, what prospective teachers should know and be able to do is reduced simply to a set of knowledge ideas, teaching sequences and prescriptive instructional aids. A number of literature review thus far suggest that there is lack of common professional guidance even though there seem to be some commonalities in programmes in teacher education institutions (Akyeampong et al., 2011; Sykes et al., 2010; Darling-Hammond & Bransford, 2005; Wayne & Youngs, 2003). Programmes offered in colleges of education differ in conceptions.

In some instance, teachers' education seemed to be grounded in no curriculum that trainees would use with students and hence is generic. For this reason among others, it could be described as piteously weak preparation for classroom practice. The differences in programmes have led to the supply of a large, internally differentiated occupation to local labour markets in continual flux, which certainly strains the training function. On the whole, teaching at once conforms to cultural scripts that produce uniformity on many dimensions while achieving highly variable results due in part to the absence of common instructional guidance encoded in elements of infrastructure (Sykes et al., 2010), there is therefore the general notion that the quality of training is often itself inadequate.

These notwithstanding, research on teaching, particularly in the US has demonstrated the importance of also having knowledge about learners and learning, the curriculum and teaching, and using multiple skills rather than relying on set of uniform teaching behaviours for all teaching circumstances (Darling-Hammond & Bransford, 2005). In addition, effective teachers should possess a strong sense of the context-dependent nature

of teaching knowledge so that what they teach reflects differences in how students understand the subject (Darling-Hammond & Bransford, 2005). Reviews of literature seem to suggest that evaluation of competence in teaching requires the demonstration of:

1. Success in stimulating and challenging students and promoting their intellectual and scholarly development
2. Creative educational leadership and strong communication skills
3. Success in developing students' mastery of a subject and of the latest developments in the field through significant contribution to the technological enrichment of teaching in a given area, for example, through the development of effective new technology or the use of new media to fullest advantage
4. Success in encouraging students' sense of inquiry and understanding of a subject through discovery-based learning
5. Active engagement with students' learning progress and accessibility to students
6. Promotion of academic integrity and adherence to grading standards of the division and, as appropriate, the ethical standards of profession
7. Creation of opportunities which involve students in the learning process

In the presence of competence, motivation, and confidence of pre-service teachers can improve the teaching practices (Lim-Teo, Low, Wong & Chong, 2008). To this end, Heinich, Molenda, Russell and Sandino (2002) developed a framework on effective teaching processes summarised in six steps as: (i) analyse learners (ii) state objectives (iii) select methods and teaching materials (iv) utilise teaching materials (v) require learner participation (vi) evaluate and revise the whole steps in the process (p. 23). This framework is ideal for pre-service teacher training because it will equip trainees with the knowledge and skills in their preparations for classroom teaching. Pre-service teachers' performances in the pedagogical, subject matter and technological knowledge in the teaching practice are needed to reflect the efficacy of pre-service training programmes (Feiman-Nemser, 2001). To this end, there is widespread recognition that countries need to have clear and concise statements of what teachers are expected to know and be able to do, and these teacher profiles need to be embedded throughout the school and teacher education systems. The profile of teacher competencies needs to derive from the

objectives for student learning, and provide profession-wide standards and a shared understanding of what counts as accomplished teaching (OECD, 2005). Therefore, some teacher education programmes need to undergo a complete overhaul based on research so that what teachers are able to do in the school system is influenced positively.

2.6.2 Initial Teacher Education Policy

2.6.2.1 Why is Teacher Education Policy Important?

Teacher education is important because of its impact upon teacher quality. To teach is a complex and demanding intellectual work, one that cannot be accomplished without the adequate preparation. Teacher education not only ensures that teachers are – and remain competent, but it also guarantees that they stay motivated through time (Eurydice, 2004). Research shows that the most effective way to raise educational quality is to modify initial teacher education and recruitment, and to develop the means to train teachers that are already in-service; indeed, teacher education has a significant impact on teachers' behaviours and teaching skills, and on the student outcomes (Musset, 2010). In the public school arena, the policies enacted by state governments help to select individuals who will have admission to this honoured profession. These policies have an enormous influence on the quality of the nation's teaching force, making it crucial that they are based on the best knowledge and evidence available (National Council on Teacher Quality [NCTQ], n.d.).

There are many different challenges that have to be dealt with in different countries, and the design of the teacher education has to respond to the specific needs of each system. The situation can be very different from country to country. Some countries experience teacher surplus and others have to cope with teacher shortage. The shortage of teacher may be general (all type of schools, all types of teachers), or focused on certain subjects (mathematics, languages, science, etc.); locations (rural areas, impoverished communities) or special kind of schools (special needs). Teacher attrition is also a problem (Cobbold, 2010). As pointed out by Musset (2010), "there is no magical—"policy mix" that can be applied in each and every situation" (p. 3). This is why it is important for policy makers to have at their disposal a repertoire of good

practices such as the one offered by OECD and those offered by academics and organizations which deal with issues relating to teaching and teacher education. The apprehension of these good practices in their specific context, and the understanding of their interaction with the other inputs of the educational system, can lead to a reflection on how to combine these practices between themselves, the goal being the design of a policy that fits the specific needs of a particular country and educational system.

According to UNESCO report on education for all beyond 2015, there has been a spate of publications from influential bodies to support this trend. They include, the Global Partnership for Education Strategic Plan 'Learning for All' 2012, DFID's 2010 'Learn for All' education strategy, World Bank's '2020 Learning for All' education strategy, USAID's 'Opportunity Through Learning' and 'All Children Reading' Grand Challenge, the Brookings' Institute's 'A Global Compact on Learning' initiative. Private foundations have also re-crafted their portfolios in this direction with Hewlett's Quality Education in Developing Countries (QEDC) and MasterCard's Youth Learning emphasis. The research survey publications by Uwezo in Kenya, Tanzania and Uganda and Pratham's ASER in India, which reveal the acute lack of learning within classrooms, have been particularly influential to trigger this trend.

Unfortunately though, in most cases, the overwhelming emphasis has been on measuring 'learning outcomes' rather than making concrete investments to improve 'learning'. The Bank, for example, has developed a new tool—System Approach for Better for Education Results (SABER) which provides detailed, internationally comparable, learning-focused assessments of the quality of each country's education policies including student learning assessments. The logic is that countries are unlikely to make sustained progress toward learning for all unless they measure student learning and target it for improvement. The motto seems to be that delivering on results requires measuring the right results. But there is a danger that this overemphasis on outcomes can divert energies and resources from investments in quality inputs which are crucial to deliver quality learning outcomes. These policies have forced many initial teacher education programmes to conform to cultural scripts to produce teachers who would only drill students to pass examinations.

These features of the teaching occupation, Lortie (2002) notes, produce a tilt toward continuity with and conservation of past practices that enjoy broad cultural legitimacy even as they fail to serve the emergent reform ideals of excellence and equity. The project to produce technical knowledge in teaching that would reliably link means to ends has not enjoyed any breakthrough successes. Under these conditions, a persistent challenge of teacher education has been the lack of firm anchors in a system of practice and in some body of codified knowledge. Its problems begin not with teacher preparation itself but in the enterprise it seeks to serve and develop (Sykes et al., 2010). In this context, teaching and learning is filtered through a medical model, in which students are made analogous to patients to be cured, and, as such, the knowledge from research that provides the most effective means for the cure, serves as the dominant paradigm for professional practice. Biesta (2007) contends that when professional action is viewed as effective intervention, then professional action: ‘‘…is based [simply] on the idea that professionals do something–they administer a treatment, they intervene in a particular situation–in order to bring about certain effects’’ (p. 7).

In Ghana, the process of initial teacher training commences when pre-service teachers are selected into various colleges of education to undertake programmes leading to a specialization in science, mathematics and technical skills or a specialization in the teaching of general subjects. Candidates are eligible for certification as long they complete a state-approved teacher preparation programmes. Over the years, polices on teacher training have been erratic and inconsistent with each changing government having to change what has been previously done in terms of policy framework and resource allocation towards improving initial teacher training. For example, in studies conducted by Akyeampong et al. (2011), Lewin and Stuart (2003), they observed that many countries across Sub-Saharan Africa do not have coherent polices on primary teacher education or where they existed, they were fragmented and incomplete. Lewin and Stuart (2003) noted that despite the notable need of policy on teacher education to the achievement of nationally and internationally agreed objectives of universalise primary schooling, improved quality, and enhanced equity (Darling-Hammond, 2010) in access and retention (Cobbold, 2010), “the development of coherent, medium term, financially sustainable teacher education policy, tailored to meet the demand for new teachers, has

been widely neglected" (p. ix). States influenced the nature of teacher preparation by prescribing coursework in subject matter and/or education and by establishing student teaching requirements. But state policies rarely promoted specific approaches to instructional practice. In Ghana, College reforms including the recent 'In-In-Out' programme which replaced the three-year fully residential training in 2004 are often not influenced by research evidence. Even though evidence suggests that pre-service education and training is very necessary for teacher professional development and improvements, teacher quality cannot be achieved maintaining the status quo in the way teacher policies are developed and implemented.

Again, Ghana is saddled with the problem of having to recruit many more teachers in order to achieve EFA goals and the increase in students' enrolment. For example, between 1999 and 2005 the number of children in school rose by 36% and the trend continues (UNESCO, 2008). While this rapid increase deserves celebrating as it seeks to achieve the Free Compulsory Universal Basic Education (FCUBE) and EFA goals, these encouraging numbers hide a challenge since such a rise in school attendance requires a large and fast increase in numbers of teachers. In many African countries, the task of training so many teachers quickly enough to respond to immediate needs is proving particularly daunting (Akyeampong et al., 2011). It is feared that governments' quest to achieve the MDGs on education and the EFA goals will not be achieved—and the broader project to improve teaching and schooling—will be hijacked or waylaid (Darling-Hammond, 2010) and that we will continue sliding down the slippery slope we have been on as a nation since the 1987 educational reform.

Since the reforms, we have advanced little in achievement, especially in international comparisons, with no real reduction in the achievement gap. There is an intense discussion on the quality of teachers the existing programmes produce basically from the sort of achievement results basic school pupils obtain in national examinations such as NEA, BECE and international examinations such as TIMMS and PIRLS. However, the focus of meeting the challenges of pupils' enrolment has required governments to direct attention on the provision of infrastructure to the detriment of how teacher education can support the training of competent teachers to meet the real needs of students in the

classroom (Akyeampong et al., 2011; Moon, 2007) leading to expanded inequality in access to school resources and learning opportunities. Meanwhile, many other nations have been pulling ahead, making intensive and sustained investments in teaching—the major policy strategy our Ghana has been unwilling to try.

The most recent national pupil to teacher ratios (Akyeampong et al., 2011, UNESCO, 2011) suggests that current procedures are inadequate to the task of achieving an equitable distribution of teachers across regions, districts and schools. Although guidelines for staffing schools exist, they are not sufficiently clear to ensure uniform interpretation. In Ghana, recruitment seems to have followed suggestions by donor agencies such as the World Bank's policies, which "encouraged the recruitment of 'para-teachers' on cheaper, short-term contracts in favour of more trained, qualified and permanent recruitment of the teacher cadre to fill the enormous teacher vacancies in developing countries" (UNESCO, 2012, p. 17). These traditional practices in regard to the recruitment of student teachers and the deployment of teachers seem to have exacerbated the situation. Many analysts worry that the emphasis on quantity in the previous EFA and MDG framework has diluted efforts at ensuring quality. Hence, most recently "the global agenda is shifting towards a focus on learning outcomes and the way we measure such outcomes" (UNESCO, 2012, p. 17).

2.6.2.2 Current Teacher Education Policy in Ghana

Over the years, much focus has been on the attributes of excellent teachers in an attempt to restore more faith in the public school system–which has taken a major condemnation in line with students' achievement. For example, it is established that, till date, less than half of the children under the age of five worldwide, and only 17 per cent in sub-Saharan Africa, receive any pre-primary education. More than 70 million adolescents (See UNESCO, 2012) too lie outside the formal education system. In the case of developing countries, especially those in SSA, the quality of education "is often so abysmal that even children who complete primary education often lack basic literacy and numeracy skills"(UNESCO, 2012, p. 8). This notwithstanding, the universally regarded centrality of the teacher as an agent of the transmission of knowledge and the critical social institution

of education has affected the way teaching and learning is conducted in schools as teaching has often centred on the teacher rather than the pupils they teach.

It is often believed that teachers possess the competence to transmit the knowledge and values articulated in curriculum contents, however, teachers seem to have an inadequacy in the encouragement and nurturing of creative and critical thinking among their students (Akyeampong et al., 2011). The typical redress has been to devise so-called 'idiot-proof' solutions where "the proofing has been to restrain the idiots to tight scripts–tighter curricula specification, prescribed textbooks, bounded structures of classrooms, scripts of the teaching act, and all this underpinned by a structure of accountability" (Hattie, 2003, p. 1). The national testing movements such as school-based-assessment (SBA) systems have been introduced to ensure teachers teach the right stuff, concentrate on the right set of processes (those to pass pencil and paper tests), and then use the best set of teaching activities to maximize this narrow form of achievement. Therefore, teacher education should be of the utmost concern to policy makers, education providers and all stakeholders in education.

Ghana's national teacher education policy (NTEP) has as its scope and purpose to develop professional teachers who are well-equipped with knowledge, skills, the right attitudes and values to meet the needs of quality education in the 21st century. It seeks to bring clarity and coherence to the complex but critical matrix of teacher education and activities from pre-service throughout the professional career of the teacher and to equip teachers to properly undertake their essential and demanding tasks and to enable them to enhance their professional development and competence continually (MoE, 2011). The policy determines the needs of teacher education training system in Ghana by drawing on the nation's constitutional obligations, the Ghanaian experience as well as local and international research. The policy seeks to provide an overall strategy for successful recruitment, retention and professional development of teachers to meet the social, economic and political needs of Ghana, premised on the need to have quality teacher education, with an overacting aim of producing "highly knowledgeable, competent, committed and dedicated teachers capable of facilitating and inducing learning in students" (MoE, 2011, p. v). In furtherance of the notion that quality teachers are pivotal

to every education reform process, the principles underlying the NTEP are influenced by the philosophy of teacher education in Ghana which stipulates that Ghana needs to prepare for its schools, teachers who are:

1. Morally, emotionally and intellectually balanced
2. Organizers of knowledge and facilitators of learning
3. Attentive to the cultural milieu and social backgrounds of learners
4. Abreast of current issues that will enable them to become effective agents of social change
5. Capable of contributing to the building of a knowledge-based and just and democratic society
6. Innovative, creative and research-oriented
7. Reflective practitioners
8. Aware of the pertinence of life-long learning to effective professional practice and deliberately pursue it
9. Capable of operating at specific levels of the educational system
10. Conversant with and effectively use information and communication technology as a tools for teaching
11. Capable of playing leading roles in the development of their communities. (MoE, 2011; pp. 2-3).

These principles are to be executed in the current context of teachers being the largest single occupational entity and profession forming about 66% of the public sector workforces. It has been said over and over again that their role in ensuring quality learning is quintessential and that they have strategic significance of for intellectual, moral and cultural training for young children. However, teachers are by and large poorly paid. From a high position, the teaching profession has experienced a downward movement on the ladder of occupational prestige throughout the African continent. In the immediate post-independence era of the 1960s, at the height of human capital theory and when education was declared ‘the priority of all priorities’ for national development, a few countries such as Côte d'Ivoire, adopted a policy acknowledging the critical role of the teacher from the basic to higher education levels.

Investment in the development of teacher training institutions, higher teacher salaries and benefits including housing and pensions, were among the policy items that constituted eloquent indicators of government consistency in actualizing its stated policy (Cobbold, 2010). However, this policy was dismantled under the structural adjustment programs (SAPs) that led to salary freezing or even decreases, the elimination of many aspects of benefits (including housing), employment freezes, which caused higher student/teacher ratios, an internal and cross-national brain drain in addition to the impact of HIV/AIDS decimation of teachers, all of which created devastating consequences for teacher morale and motivation. As of now, teachers' salaries are among the lowest, even in nominal terms, as there are fewer fringe benefits in teaching than in other professions equivalent levels of education and training (UNESCO, 2011). This has led to college admissions attracting mostly high school graduates with low academic performance or people who might not be so much interested in the teaching profession. Teacher education graduates who take up teaching appointments have little motivation for teaching and for lifelong learning and therefore do not stay in teaching for long (MoE, 2011; UNESCO, 2011; Cobbold, 2010).

In sum, literature suggests that concerns of teacher quality, competency and professionalism have taken the central stage in government policies, and have become dominant in teacher education discourse among employers, policy makers, higher education providers and researchers as they are constantly and passionately looking for approaches and explanations about how to train, retain and improve students learning. In the hope of achieving these, several programmes and frameworks have been proposed and used to train teachers, especially in Ghana. However, students' performance in examinations such as BECE and PISA does not seem to suggest an ending sight to mass failure among students in basic schools, and this has raised eyebrows on the effectiveness of initial teacher education and its impact on students who are learning how to teach.

An appreciation of the crucial role of teachers has also been steadily increasing in the international post-2015 education agenda. As GEF (2013) asserts, "we need a strong cohort of both female and male teachers who are paid well and respected in their communities" (p. 16). This assertion is probably based on a general belief that no

education system is better than its teachers - the principal resource in the system and therefore UNESCO in 2011 advocated that policies that efficiently address teacher training and retention should be made the central focus of national and international education policies.

Many have suggested governments resorting to different forms of training teachers other than the use of initial training colleges, while others are of the view that, ITE contributes significantly towards the development of teacher identity and professional dispositions that are essential for teacher retention, quality and effectiveness on the job. Therefore, programmes that seek to prepare teachers must do so adequately in meeting the complexities and demands of the teaching career today. Initial teacher training should foster self-regulatory behaviours in pre-service teachers with the hope that they would sustain their dynamism on the job. This is critical in that teachers work in complex and unpredictable conditions that call for complex and diverse reflective and reflexive practices (Bolton, 2014).

There is therefore the need to train teachers who can self-regulate in their acquisition of content and pedagogical knowledge with the belief that this will be mirrored in the quality of their work; bring greater unity and wholeness of experience from training and on the job to themselves, and greater empathy between them and their students (Bolton, 2014; Darling-Hammond, 2010; Walker-Gleaves, 2009). Classrooms and schools to a large extent need teachers who can persevere and show resilience in the face of adversities and that pre-service teachers should possess self-regulatory dispositions to motivate them for life-long learning and actively take part in the transformation of their profession. The next section, which forms the second part of the literature review, discusses self-regulation and its importance in pre-service teachers' education.

Part II

2.7 Self-Regulation Learning: Conceptual, Theoretical and Empirical Issues

Educators and educational leaders over the years have emphasised the need for individuals to take personal responsibility and control for their own acquisition of knowledge and skills. Dating back to the 19th century, Benjamin Franklin in his autobiographic writings elucidated about the techniques he used to improve his learning, erudition and self-control (Benjamin Franklin Writings, 1868/1987, cited in Zimmerman, 1990, 2009). This goes to stress the significance of personal initiatives in the acquisition of knowledge where the ultimate goal of the education system is to shift to the individual, the responsibility of pursuing his or her own education.

In recent times, researchers have begun to identify and study some of the key processes by which students direct their acquisition of academic knowledge. Methodological as well as technological advancements have provided educational researchers and theorists the opportunity to study extensively not only what children learn, but also how they learn. Empirical studies have found that pro-activeness in learning such as setting appropriate goals, self-motivation and persistence in achieving task completion are all essential for performance outcomes. Thus, students' self-regulation of learning involve the use of a variety of learning strategies (e.g., organising, self-evaluation, elaboration) to achieve specific learning targets (Zimmerman, 2009; Kitsantas et al., 2008). A self-regulated learning perspective on students' learning and achievement is not only distinctive, but it has profound implications for the way teachers should interact with students and the manner in which schools should be organised. As Zimmerman (2009) points out, this perspective shifts the focus of educational analyses from students' ability and environments being fixed frames to their personally initiated processes and responses orchestrated to improve their ability and their environments for optimal learning. I therefore discussed the necessity of learners actively giving meaning to what they learn and how teachers could aid in helping learners optimise their academic learning.

2.7.1 Definition and Importance of Self-Regulation of Learning

A growing body of literature supports the idea that optimal academic performance is strongly open to the level of self-regulation the learner is capable of exercising. Self-regulation is a broad concept covering a number of interdependent aspects. It includes both affective capacities–moods, feelings and emotions–and cognitive capacities–beliefs, perceptions and knowledge. Learning and attainment are best understood when we acknowledge the interactions between affective and cognitive processes. Self-regulation also includes metacognitive skills (Pintrich, 2004)–that is, understanding one's own cognitive skills, including memory, attention and problem solving and which enables learners to make the best use of their knowledge and skills. It is believed that self-regulated learners approach educational tasks with confidence, diligence and resourcefulness and are aware when they know a fact or possess a skill and when they do not. Unlike other passive learners, self-regulated students proactively seek out information when needed, persist at difficult tasks and take necessary actions to master the information they seek (Zimmerman, 2009; Pintrich, 2004); they have the ability to concentrate in the midst of obstructions such as noisy classmates (Duckworth et al., 2009; Zimmerman, 2009); they appear to be more keenly aware of the relations that exist between specific behaviours and how to succeed academically and are more likely to employ such behaviours systematically and appropriately (Zimmerman & Schunk, 2009).

Self-regulation abilities are variously defined by different agencies, and are usually included within broader terms, such as 'social and emotional' or 'personal, learning and thinking' skills. Self-regulation is a dynamic and cyclical process (Duckworth et al., 2009; Zimmerman, 2009; Pintrich, 2004) and a concept which suggests activities and thinking processes that learners can engage in and which are open to change, rather than fixed characteristics that individuals either possess or lack. For example, self-regulation focuses on how learners self-generate thoughts, feelings and actions and actively manage such feelings and motivations to learn (Zimmerman, 2009, p. 5). And self-regulation improves with practice that learners rely on earlier experiences to build a range of beliefs and strategies that improve learning (Lai, 2011).

Although definitions of self-regulation learning involve specificities with regards to the theoretical position of a researcher, a common conceptualisation of the student with such attributes has emerged, according to Zimmerman (2009) as "the degree that they are meta-cognitively, motivationally, and behaviourally active participants in their own learning process" (p. 5). He asserts that self-regulation is not a mental ability or an academic performance skills but rather a "self-directive process through which learners transform their mental abilities into task-related academic skills" (p. 1). In the area of metacognitive processes, self-regulated learners plan, set goals, systematise, self-monitor, and self-appraise at different stages during the knowledge acquisition process (Scott & Levy, 2013; Lai, 2011; Zimmerman, 2009; Kitsantas, Winsler, & Huie, 2008; Bembenutty, 2007). These metacognitive processes facilitate self-regulated learners to be knowledgeable, self-conscious, and conclusive in their approach to learning (Zimmerman, 2009; Pintrich, 2004).

Research findings in relation to motivational processes indicate that, learners who self-regulate report of high self-efficacy (Zimmerman, 2009; Zimmerman & Schunk, 2009; Kitsantas et al., 2008), self-attributions, and intrinsic task interest (Zimmerman, 2009; Vansteenkiste, Lens & Deci, 2006; Vallerand, 2000), even though, outsiders may think that these learners are self-starters who display extraordinary effort and persistence during learning. In terms of their behavioural processes, learners who are involved in self-regulation have the following hallmarks: a) they select, structure, and create environments that optimise learning; b) they seek help and advice, information, and places where they are most likely to learn; c) they self-instruct during acquisition and self-reinforce during performance enactments (Sitzmann & Ely, 2012; Zimmerman, 2009, p. 5).

Barry Zimmerman views learning from this perspective of self-regulation as an activity that students perform for themselves in a purposeful manner, rather than as a concealed incident that occurs to them reactively as a product of teaching involvements. Self-regulated learning thus refers to the control of affective, cognitive, and behavioural processes throughout a learning experience in order to reach a desired level of achievement (Sitzmann & Ely, 2012; Leat et al., 2012; Zimmerman, 2009; Bembenutty,

2007). Thus, learners display personal initiative, perseverance and adaptive skills in pursuing their important and useful academic goals. When learners are self-regulating they make use of processes that activate and sustain their thoughts, behaviours, and affect in order to attain goals (Zimmerman & Schunk, 2009; Chen, 2002). In other words, self-regulation learning refers to taking charge of one's own learning by coordinating the thinking skills through self-observation, self-judgement and self-reaction. These processes enable individuals to guide their goal-directed activities over time. It reflects motivational-oriented behaviour, which includes multiple processes operating in concert (Sitzmann & Ely, 2012). Self-regulated learners are flexible. They do not do these tasks just once. Rather, they go through their learning processes recursively, looking back to make adjustments as and when it is necessary (Zimmerman, 2009). Self-regulation learning is a self-initiated act that includes students' self-monitoring strategies; management and control of efforts on academic task; cognitive strategy use and motivation. Strategy used involves processes which are directed at acquisition of information or skills that comprise agency, learning dispositions, persistence and instrumentality perceptions by learners (Avalos, 2011; Duckworth et al., 2009; Zimmerman & Schunk, 2009).

What is evident from this review is that most definitions of self-regulation learning require the purposive use of specific application of processes, strategies or reactions by students to consciously enhance their academic achievement. Zimmerman (2009) notes that different scholars based on their orientations present definitions to suite their philosophies. For example, researchers from cognitive backgrounds, such as constructivists, prefer definitions implied in terms of covert processes and that our understanding of situations and learning materials, as well as that knowledge can be created from one's own perspective (see Maxwell & Mittapalli, 2010; Paris, Byrnes & Paris, 2009; Windschitl, 2002), whereas behaviourists favour definitions couched in terms of observable (overt) responses. Others, such as phenomenologists believe that learning style is dynamic and dependent on feedback from self-evaluation. This definition centres on the use of feedback loop, which implies the use of a cyclical process by students to monitor the effectiveness of their learning strategies and act according to the

response in a varied ways during learning (McCombs, 2009; Zimmerman, 2009; Carver & Scheier, 1981).

They depict the feedback loop in relation to covert or cognitive processes such as self-esteem (i.e., judgments of self-worth), self-concepts, outcome expectations and self-actualisation (van Dinther, Dochy, & Segers, 2011; McCombs, 2009; Zimmerman & Cleary, 2006) and locus of control (i.e., an individual's beliefs about the main fundamental causes of actions in his or her life, and about whether the outcomes of his or her actions are reliant on what he or she does, or on events outside his or her personal control) (van Dinther et al., 2011, p. 96). On the other hand, researchers who are in support of operant (overt) behaviours prefer metaphors such as self-monitoring, self-instruction, self-reinforcement, self-evaluation and self-correction actions (van Dinther et al., 2011; Duckworth et al., 2009; McCombs, 2009; Zimmerman, 2009, p. 6). However, social cognitive theorists such as Albert Bandura, have cautioned against seeing the control loop as only seeking to reduce differences between one's goals and overt outcomes (i.e., negative feedback), but we should also be aware that learners report positive feedback effects by raising their goals due to observed outcomes (Zimmerman, 2009). Notwithstanding the differences in theoretical positions on what is monitored and how outcomes are interpreted, nearly all researchers admit the dependence of self-regulation on continuing feedback of learning effectiveness.

Another feature of self-regulation of learning from literature is that student learning and motivation are treated as interdependent processes that cannot be fully understood apart from each other. Self-regulation is a multi-trait concept made up of different forms of motivation and cognitive strategies which are employed to task completion. It allows us to consider the interrelationships between key concepts such as self-efficacy and motivation within a single framework, rather than exploring these areas in isolation (Duckworth et al., 2009; Eccles, 2005). It reflects motivational-oriented behaviour and includes multiple processes that operate in tandem. Self-regulation learners use different strategies to achieve a particular goal. They employ varied capabilities and proactively pursue opportunities to learn and get tasks completed, which makes them only not reactive their learning outcomes (Zimmerman, 2009). They show autonomy in initiating

activities which are planned to promote self-assessment (i.e., self-observation, self-judgements and self-reaction) (Avalos, 2011), and adopt self-improvement strategies such as practice sessions, specialised training and challenging activities (Zimmerman, 2009) in achieving their learning goals.

Thus far, literature review indicates that the processes examined in relation to self-regulation learning have moderate to strong relationships with each other, suggesting that the processes are interrelated. That is, self-regulated learners' heightened motivation is evident in their persistent tendency to set higher goals for themselves when they achieve earlier goals through self-motivation (see Bandura, 1989). Thus, self-regulated learning involves more than a capability to execute a learning response by oneself (i.e., self-control) and to change learning responses to novel situations or negative feedback, but it involves conscious efforts to find out ways of learning as well as gaining from learning (Zimmerman & Schunk, 2009). Therefore, it is not enough for individuals to have confidence in their ability to accomplish the task successfully—they must also perceive a need or value gained by continuing to apply full effort and attention to the task. Without such motivation, high self-efficacy may have functioned as a signal that success was guaranteed and continued commitment of full attention and effort was unnecessary (Sitzmann & Ely, 2012). To wit, will and skill are integrated parts of self-regulation (McCombs, 2009).

Furthermore, self-regulation theory can be used to explain why both children and adults are willing to exert considerable mental effort to learn. For adults, the ability to self-regulate may be their most essential asset (Porath & Bateman, 2006). Self-regulation learning is an indication of how and why students decide to use a particular strategy or response. According to Zimmerman (2009), self-regulated learning involves defined strategies or responses which are volatile, and that students' efforts to initiate and regulate them proactively require preparation time, attention and effort. For example, Operant theorists contend that all self-regulated learning responses are ultimately determined by contingent external rewards and reinforcers such as social approval, enhanced status, or material gains. On the other hand, phenomenological theorists (e.g., McCombs, 2009.) view students as motivated by a comprehensive sense of self-esteem or

self-actualization. However, between the two ends of the divide, other theorists (e.g., Bandura, 1989.) favour motives such as self-efficacy, achievement success, and cognitive balance (Zimmerman, 2009, p. 6).

This notwithstanding, a question of importance is 'do students self-regulate under all conditions?' The answer is no according to the review of literature. Zimmerman (2009) intimates that even though phenomenologists believe that students are basically motivated by their sense of self, in consonance with operant theorists, unless the results of their efforts are adequately attractive and rewarding, students will not be motivated to self-regulate. Consequently, task value has a major influence on the decision to use a particular strategy or not. Students may decide not to self-regulate their learning when the opportunity arises – an outcome that requires a comprehensive accounting of their academic motivational process. Positions on why students fail to self-regulate vary. Many theoretical positions are of the view that very young children (Zimmerman, 2009) are not able to self-regulate during learning in any approved manner.

However, current studies (see Galinsky, 2010; Blair, 2002) have found that some children develop basic skills for self-regulation in the first five years of life. Albeit, Vygotskian theorists and cognitive constructivists believe that majority of children form capacities to self-regulate during basic school years, they differ in relation to when children's inability to self-regulate start and what cause such incapacity (see McCaslin & Hickey, 2009; Paris, et al., 2009; Zimmerman, 2009). Again, cognitive constructivists hold the view that children are egocentric and are limited in metacognitive function which explains their inability to self-regulate. Meanwhile, Vygotskians emphasise and attribute children's inability to use language covertly as a function of their inability to self-regulate in learning situations. It is generally believed that children may not use self-regulation learning processes when they get to a point where they may have developed SRL processes because of doubts or amotivation such as:

1. Students may not believe that a known self-regulation process will work, is needed, or is preferable in a particular learning context;

2. They may not believe that they can successfully execute an otherwise effect self-regulation response;
3. They may not be sufficiently desirous of a particular learning goal or outcome to be motivated to self-regulate. (Zimmerman, 2009, p. 7).

Therefore, students should be taught directly and/or enabling environments created for them to learn self-regulatory behaviours indirectly from teachers and school systems.

In sum, self-regulation learners show self-sufficiency, they show autonomy in seeking knowledge, take initiative in learning and sustain attention in action. They show limitless boundaries in their quest for knowledge. Thus, theorists involve in SRL consent that students who self-regulate their learning are engaged actively and constructively in a process of meaning generation and that they adapt their thoughts, feelings, and actions as needed to consciously affect their learning and motivation. Consequently, educators should be aware that that learning situations should be potentiating enough to model and reify learning responses with the aim of harnessing self-regulatory behaviours in students.

2.7.2 Assumptions Underlying Self-Regulated Learning

Students' motivation and learning is pretty varied across individual learners and in learning situations which has led to the existence of many different assumptions and standpoints. A significant distinction in the field has been the contrast between two general perspectives, one called the student approaches to learning (SAL) and the other often referred to as the information processing (IP) approach (e.g., Winne, 2009; Pintrich, 2004; Biggs, 2001). SAL models are usually characterized as being based on bottom-up (inductive) models derived from in-depth qualitative interviews with students about their own actual motivation, learning, and studying in real school, college and university contexts (Pintrich, 2004). Of course, many researchers note that, SAL models also use quantitative methods, particularly self-report surveys and questionnaires to assess college student motivation and learning (Pintrich, 2004).

The IP approach is often described as being derived in a top-down (deductive) manner from psychological constructs and theories in cognitive and educational psychology and then applied to college student learning using quantitative methods (Pintrich, 2004). Even

though various current representations of learning in among students are traditionally derivatives of information processing perspective, “a more accurate characterisation of this perspective now would be to use the term ‘self-regulated learning’ (SRL) perspective” (Pintrich, 2004, p. 386). Currently, SRL perspective has assimilated the IP perspective, because most researchers in SRL see it as too narrow and not reflective of current theory and research in students’ learning (Pintrich, 2004). Therefore, current assumptions about students’ learning often centre on SRL models and perspectives.

According to Boekaerts and Corno (2005), understanding students’ capabilities to direct their own learning in school and beyond has been a central topic of discussion among practising educators, policy-makers, and educational researchers alike. Researchers (e.g., Moos & Ringdal, 2012; Zimmerman & Schunk, 2009; Boekaerts & Corno, 2005; Pintrich, 2004; Paris & Paris, 2001; Pintrich et al., 1993) in particular argue that the capacity to self-regulate is central to our assumptions about learning, decision making, problem solving, and resource management in education. Underlying this assertion is the fundamental enquiry question as to “what is implied by the ‘capability to self-regulate’?” Some researchers conceptualise self-regulation as a general disposition that students bring into the classroom, whereas others conceive of self-regulation as a property of the person-in-situation and attend to domain-specific self-regulatory skills that develop through experience within and across situations. But Boekaerts and colleague see these two perspectives as not at variance and I agree to this position in view of the composite nature of SRL.

Generally, there are four basic assumptions with regards to students learning that most SRL models which are pertinent to this study share (see Moos & Ringdal, 2012; Pintrich, 2004). First, review of the literature on SRL suggests that, one shared supposition is that students actively construct their own goals and meaning abstracted from both the learning context and their prior knowledge, that is to say that students engage in a constructive process of learning (Moos & Ringdal, 2012). Pintrich (2004) referred to this as the active, constructive assumption that follows from a general cognitive perspective. That is, under a SRL perspective, learners are viewed as active participants in the learning process. Learners are assumed to construct their own meanings, goals, and strategies from the

information available in the “external” environment as well as information in their own minds (the “internal” environment).

Second is the assumption that there is some form of goal, criterion, or standard against which appraisals are made in order to evaluate whether the learning process should continue as is or if some type reform is necessary. This is often referred to as the goal, criterion, or standard assumption (Pintrich, 2004). The general example for learning believes that individuals can set standards or goals to try to achieve in their learning, monitor their progress toward these goals, and then modify their behaviour (Moos & Ringdal, 2012) and control their cognition, motivation, and behaviour in so as to achieve their goals (Zimmerman & Schunk, 2009; Boekaerts & Corno, 2005; Pintrich, 2004). Thus, SRL models allow for the possibility of multiple goals within and across students and diversity in the linkages between goals (motivational orientations) and strategies.

Third, it is assumed that students can potentially monitor and regulate their cognition, behaviour, motivation, and learning processes that are dependent on a number of factors such as individual differences and developmental constraints. This, according to Pintrich (2004) is called the potential for control assumption. This SRL perspective assumes that, learners can potentially monitor, control, and regulate certain aspects of their own cognition, motivation, and behaviour as well as some features of their environments. This assumption does not mean that individuals will or can monitor and control their cognition, motivation, or behaviour at all times or in all contexts, rather just that some monitoring, control, and regulation is possible. A SRL perspective clearly recognises that there are biological, developmental, contextual, and individual difference constraints that can impede or interfere with individual efforts at regulation (Moos & Ringdal, 2012; Zimmerman, 2009; Boekaerts & Corno, 2005; Pintrich, 2004).

Last, SRL theorists and researchers believe that self-regulatory behaviour mediates the association between a student’s performance, contextual factors, and individual characteristics. This fourth general assumption of a SRL perspective, asserts that, self-regulatory actions are mediators between personal and contextual characteristics and actual achievement or performance. That is, it is not just persons’ cultural, demographic,

or personality characteristics that affect attainment and learning directly, nor just the situational features of the classroom environment that form achievement, but the individuals' self-regulation of their cognition, motivation, and behaviour that mediate the relations between the person, context, and eventual achievement (Zimmerman & Schunk, 2009).

In all, these assumptions of active construction; goal and standard setting; the potential for control of cognition, behaviour and learning environments and self-regulatory activities as moderators and mediators of context and performance undergirds theories and models of SRL. That is, learners regulate their own learning by observing what they are able to do, then comparing this what they have observed to a standard of some kind and making judgments about the quality of this performance, and finally making plans regarding what to do next. The core issue is whether a learner demonstrates personal initiative, persistence, intuitiveness and adaptive skill.

To Zimmerman and Schunk (2007), these proactive qualities of learners arise as a result of valuable motivational feelings and beliefs as well as metacognitive strategies which are relevant in the pursuit of academic excellence in schools. Self-regulation theory can be used to illuminate why both children and adults are ready to employ significant amounts of mental effort to learn, solve a problem, or understand other complex rules and relations in the world and for adults, the ability to proactively enact their actions may be their most crucial strength. Self-regulation, thus, enables students to function effectively in their personal lives as well as to acquire the skills and knowledge necessary to succeed in schools and the workplace by carefully examining the components of SRL. We can develop more effective strategies for helping students develop this important skill and to assist students to be effective in their learning, teachers should help students become aware of alternative ways of approaching learning situations. When faced with a learning task, self-regulated learners typically do the following:

1. They begin by analysing the task and interpreting task requirements in terms of their current knowledge and beliefs.

2. They set task-specific goals, which they use as a basis for selecting, adapting, and possibly inventing strategies that will help them accomplish their objectives.
3. After implementing strategies, they monitor their progress toward goals, thereby generating internal feedback about the success of their efforts.
4. They adjust their strategies and efforts based on their perception of ongoing progress.
5. They use motivational strategies to keep themselves on task when they become discouraged or encounter difficulties.

2.7.3 Theories and Models of Self-Regulation Learning

2.7.3.1 Theoretical Perspectives of Self-Regulation Learning

Self-regulation theory originates from the psychological tradition of theory and research on self-control (Schunk, 2005). Learning theories under consideration in this research address how people learn, and they tend to fall into one of several paradigms: including behaviourism, cognitivism and constructivism. These theories are synthesised in tandem with the perspectives of contemporary theorists of SRL. I consider this approach suitable for this study in that, psychological theories that have been used to explain, for example, behaviour in achievement contexts have shifted in the last few decades, from observable behaviour to psychological variables such as values, beliefs, efficacy and goals that can be inferred (latent) but cannot be directly observed from behaviour (Stipek, 2002).

Theories of self-regulation place their focus on how students actively modify and withstand certain learning practices in private as well as social setting, in informal as well as formal instructional contexts (Zimmerman 2009). This is a departure from previous models of learning which had the aim of stimulating educational reforms, but rather, "these theorists believe that learning is not something that happens *to* students; it is something that happens *by* students" (Zimmerman 2009, p. 33). Theorists of SRL have the assumption that students should be active participants in their own learning in other to achieve optimal results. They should engage in their learning proactively both at the cognitive and behavioural levels. I therefore discuss the three paradigms behaviourism, cognitivism and constructivism under the relevant SRL theories, that include social

cognitive, phenomenological, and Vygotskian theories, Phenomenological and Vygotskian theories are described briefly and social cognitive theory discussed in detail because of its relevance to the current study.

In contrast to SCT, phenomenological theorists emphasise global self-system structures as the source of personal agency (Zimmerman, 2009; McCombs, 2009). They view students as motivated by a global sense of self-esteem (Brown, 2014; McCombs, 2009) or self-actualization (Moore & Sermat, 2012; Zimmerman, 2009). Phenomenologists believe that the development of students' natural tendencies for self-regulation depends on the development of what McCombs calls "self-system knowledge structures" (p. 69) and self-monitoring (Zimmerman & Schunk, 2009), processes of self-awareness, self-reflection and self-evaluation (Schunk, 2009). Yet, like other theories of SRL, phenomenologists assume that students' motivation and persistence on their courses of action are a function of monitoring their performance. The phenomenological perspective helps us understand the "who" parts of self as well as how best to improve not only students' growth of positive self-concepts, how they perceive their self-worth and competence, but also their beliefs about their locus of responsibility, degree of self-determination, and sense of agency in creating positive possibilities for self-development and self-regulation. That is, when students are mindful of the fact that they are in control of their own learning, they are likely to become efficacious, feel competent and internalise learning goals (Zimmerman, 2009). This means that learners must be responsible for seeing to it that they actually go through all the stages of learning. It is important that learners feel they are in control of their learning, and be motivated intrinsically rather than extrinsically. McCombs (2009), states however that a structural cause for the development of these beliefs appears insufficient. She advocates a continued exploration and theorising about the self-system to help us understand the role of I and me aspects of self in the development of metacognitive processes for the regulation of thought, feelings and actions (p. 83).

The Vygotskian perspectives on learning could be viewed as a combination of both constructivism and cognitivism. Formalisation of the theory of constructivism is generally accredited to a number of people, including Vygotsky and Piaget, and has

increasingly been applied to learning and teaching. Constructivism is a theory about knowledge and learning and it describes both what "knowing" is and how one "comes to know" (Fosnot, 2005). Constructivism sees learning as a process in which the learner actively constructs or builds new ideas or concepts from their current and past experiences (Schunk, 2009; Roberts, 2006); it connects new knowledge to prior knowledge and incorporates the new experience into an already existing framework with little or no alteration in the existing structures. In some respects, constructivist theories are similar to cognitive belief in that learners take the information from the environment and combine it with their present knowledge so as to make meaning of whatever is being learnt. On the other hand, cognitivism is about how we gain knowledge and use that knowledge to guide decisions. This theory stresses the need for the acquisition of knowledge and the practising of skills, the formation of mental structures (memory networks) and the processing of this information to enhance learning (Schunk, 2008). Psychologist Jean Piaget's assertion is that a learner's interaction with their peers, and the learning environment supporting the activities of the learner, are important in increasing cognitive development (Piaget, 2000).

In the process of learning, actions and active participation, not just responding to environmental spurs, results in thinking (McCombs, 2009; McCaslin & Hickey, 2009; Schunk, 2008; Downing, Ho, Shin, Vrijmoed, & Wong, 2007). Vygotsky (1978) adds to this with the view that culture–including the family environment – is a prime determinant of an individual's development. For example, Downing and colleagues' work on the influence of social and cultural variables on the development of metacognition in first year university students found significant differences between students living in their home environment and those who moved away from their family and, in some cases, cultures (Downing et al., 2007). They assert that living away from home probably provided a new learning environment which promoted the development of meta-cognition and afforded students more opportunity to become effective problem-solvers and lifelong learners (Downing et al., 2007).

Vygotskian view of learning can therefore be classified as a form of social constructivism with the assumption that that even though knowledge is personal, yet it is built through a

mutual social system (McCaslin & Hickey, 2009; Roberts, 2006). The individual learner constructs meaning, contingent on the wider society's definition of what knowledge is. Even though the society may not always provide support to students, it is often perceived by Vygotskians that relationship replaces individual conceptions or tasks or goals and that, students only serve as coordinators in knowledge creation in a multiple social worlds (McCaslin & Hickey, 2009, p. 242). Vygotskian perspectives of learning therefore have at the heart of their framework the idea of co-regulation (McCaslin & Hickey, 2009; Zimmermann & Schunk, 2009). Thus, the process of teaching and learning should be seen as a reciprocally formed understanding of contextually situated tasks and learners self-regulate through social and interpersonal interactions that gives the functional value of human knowledge. In the teacher education context, it is believed that pre-service teachers are likely to use teaching processes that are employed by their tutors and students of pre-service teachers may learn from them as the use self-regulation strategies.

2.7.3.2 Social Cognitive View of Self-Regulation Learning

Social cognitive theory (SCT) follows Albert Bandura's triadic representation (i.e., the reciprocal interactions between behaviours, environmental and personal variables) of learning in reaction to his unhappiness with the principles of behaviourism and psychoanalysis. He contends that in these two theories, the role of cognition in motivation and the role of the contextual influence on learning are principally overlooked (Bandura, 1977, as cited in Redmond, 2010). According to Bandura (1999), individuals function as contributors to their own motivation, behaviour and development within a network of reciprocally interacting influences (p. 169) and that individuals could be described as agents of change, who purposefully influence their functioning and life situations. In SCT, human behaviour is perceived to be influenced to a large extent by continual exercise of self-influence (Bandura, 1991).

Social cognitive theorists believe that human learning occurs inactively (i.e., people learning by doing and through selectivity – actions that bring rewards are retained and those that lead to failures are rejected). Even though the process of enactive behaviour is similar to that of B. F. Skinner's concept of shaping, social cognitive theorists contend that "behavioural consequences serve as sources of information and motivation rather

than as response strengtheners" (Schunk, 2009, p.128). Under this theory, learning is also deemed to occur vicariously – thus, in the absence of overt behaviour and by observing others such as teachers, parents or by reading or watching news on TV and other media. Social cognitive theorists therefore hold the view that exemplifications of required behaviour through persistence and effort regulation with clear information can heighten students' perceptions of their own performance abilities (Schunk, 2009).

Generally, social cognitive theory is viewed as a representation of the fact that individuals proactively seek and interpret information in as much as they react to environmental influences (Nevid, 2009; Schunk, 2009). Albeit, the influencing factors are considered to have varied strength and often do not occur simultaneously. Social cognitive theory conceptualises SRL as having three sub components which are interrelated (Redmond, 2010; Schunk, 2009; Bandura, 1991) and each have effect on students' motivational orientation and goal attainment (Redmond, 2010; Zimmerman & Schunk, 2009). These sub processes are: Self-observation, Self-evaluation and self-reaction (Redmond, 2010; Zimmerman & Schunk, 2009; Zimmerman, 2008; Bandura, 1997).

Self-observation involves tracking one's self during task performance which can serve as a source of information and motivation for behaviour change. It helps learners to set smart goals and be able to assess their progress toward the set goals. It is believed that individuals are not capable of affecting their own motives and actions unless they pay attention to their own performances. In the light of this, social cognitive theorists (e.g., see Bandura, 1991) believe that, for students to be successful in regulating themselves, they need to be devoted to their courses of action. Self-observation is purposeful and directed towards a goal and that students make use of prior knowledge and belief systems to judge their actions in order to decide which aspects of their activities should be given most attention rather than just doing a mechanistic audit of their performances (Schunk, 2009). Students can self-diagnose and use self-talk and self-monitoring strategies to keep their progress of learning in check (for example, they can ask questions like "In what ways can I improve my learning?"). According to Albert Bandura, individuals need not restrict self-monitoring activities to only the factors that interact naturally in their day-to-

day experiences or to past events, but could be done by varying their activities and consciously observe the effects. He thinks that "self-knowledge provides direction for self-regulatory control" (Bandura, 1991, p. 251) and that by changing their usual forms of thought patterns and observing the associated effects, individuals can comprehend how their thought processes affect their emotional states, level of motivation and ultimately, performance (Redmond, 2010; Zimmerman & Schunk, 2009; Bandura, 1997).

These notwithstanding, self-observation has been found to vary among learners in terms of its directive and motivational effects. It has been found to have sometimes a positive, negative or no effect with the behaviour under consideration. Self-observation when done systematically serves as a good source of information as it can reveal a lot about students on their progress and how well or worse they are using their time and resources. This means that teachers must give guidance to students as to how they can methodically observe their actions and activities to achieve the best results. For optimal effect, self-observation should be done often (regularity) and in closeness with task performance (proximity), that is, one is likely to achieve self-directed change when actions are brought to bear on current behaviour than delayed effects. Self-observation near in time tends to give on-going information and, thus, the best opportunity to bring self-influence to bear on the strategies one is using and on one's behaviour while it is in progress.

Focusing on the more distant effects of courses of action cannot remediate the effect of the past and may provide little guidance for the future. Intermittent self-monitoring, because it is only partially informative, also brings about less effective self-monitoring than does steady attention to one's own performance (Zimmerman & Schunk, 2009). However, it is often seen as not sufficient as students' sustained motivation is a function of "outcome and efficacy expectations" (Schunk, 2009, p.131). Thus, if there would be any change in students' behaviour or study habits, they should be convinced that they have what it takes to successfully carry out the action, and that any alteration will lead to the projected result. It is imperative that making clear the objectives of teacher training programmes and courses and the values there-in, is essential to gain pre-service teachers enthusiasm in studying those courses during their training and transfer into professional practice after college.

Self-evaluation is when students make time to think and reflect on their current performance with desired goal (Redmond, 2010; Zimmerman & Schunk, 2009). Self-evaluation is defined as learners judging the worth of their work, based on evidence and clear standards, with the aim of doing better or improving their work. Self-judgment is influenced by the standards which are often developed from information conveyed by how significant others have responded to their behaviour; through direct teaching of mutually drawn up standards and through modelling. Nonetheless, an individual's use of a standard depends largely on the importance of the goals set and that, goals must be specific and of value to the learner. Therefore, goals such as, "more room for improvement" are vague and will not motivate. Schunk and Zimmerman (2009) contend that specific goals which specify the amount of effort required for success can boost self-efficacy because progress is easy to gauge. If one has little regard for his goal he will not evaluate performance (Redmond, 2010). Teachers should therefore engage pupils in how to set meaningful goals and guide them to achieving such goals in a measured and purposeful way as a means of helping pupils to develop self-regulatory behaviours.

Thus, people will spend little effort or do not care much about how they do in activities that they have little or no value for them (Sitzmann & Ely, 2012; Pintrich & Zusho, 2007; Schunk & Ertmer, 2000). However, the form of value a student attaches to a task is very essential (see Kitsantas et al., 2008, p. 6). Social cognitive theorists accentuate that people gain satisfaction when they attain goals that they value, and individuals' performances are usually compared to one of two self-judgement standards: normative and absolute. Normative standards are relative to others while absolute standards are fixed points on a scale (e.g., 3.6-4.0 = First Class). Students also become encouraged and are willing to work more when success is attributed to themselves rather than by others such as teachers (Schunk, 2009). Training programmes should seek to train adaptive individuals who can initiate actions in solving learning related problems and to boost their efficacy for effective practice.

Students often respond to observations they have made based on the evaluation of their achievements and this is referred to as self-reaction. The response may be in the form of change in behaviour or a modification in the standards that have been set so as to keep to

valuable goals. This presupposes that students' attitudes towards actions are moderated by standards. Bandura (1991) asserts that individuals can create incentives (tangible outcomes or self-judgment reactions) for their own actions and react expectantly to values and goals in order to attain self-regulatory control. He reiterates that people pursue courses of action that are rewarding and put up behaviours devoid of self-censure (p. 256). Responses to one's performance can be motivating (Zimmerman, 2008). This motivating factor is pivotal in the effect that self-incentives have on behaviour (Redmond, 2010; Schunk, 2009; Pintrich, 2004). Students who self-regulate increase their intrinsic motivation in a performance situation so as to accomplish task completion (Zimmerman & Schunk, 2009; Stoeger & Ziegler, 2008; Hattie & Timperley, 2007). For example, as a reaction to their success after certain positive tasks or activities, students may reward themselves of a delayed activity such as having a chat or watching a special programme on the television (Schunk, 2009; Bembenutty, 2007; Pintrich, 2004). If the progress made is measured acceptable, then one will have a feeling of self-efficacy with regard to continuing on a task, and will be motivated towards the achievement of their goal. A negative self-evaluation might also be motivating in that one may desire to work harder provided that he considers the goal to be valuable. If a person has achieved a goal, he/she is likely to re-evaluate and raise the standard (goal); whereas, if a person has not achieved the goal, he/she is likely to re-evaluate and lower the standard (goal) to an achievable goal Redmond, 2010). Eventually, what differentiates proactive students from their reactive counterparts is their effective use of self-incentives in persisting on task performance (Zimmerman, 2009).

Another mechanism that is of significant mentioning in SCT is self-efficacy. Social cognitive approaches to self-regulated learning (e.g., Schunk, 2009; Zimmerman, 2008; Pintrich, 2004; Bandura, 1991) have focused on perceptions of self-efficacy as the ultimate source of students' thoughts, affects, actions and motivation. To Bandura, self-efficacy mechanism plays a central role in the exercise of personal agency (p. 257). Self-efficacy is defined as the belief in one's ability to bring about valued outcomes of engagement and learning (Duckworth et al., 2009; Pintrich, 2004; Bandura, 1991) including unmotivated or amotivated learning situations (Vallerand, 2000) -thus, people

with a high sense of self-efficacy are more likely to maintain more enthusiasm towards learning (Moos & Ringdal, 2012; Pintrich, 2004; Ryan & Deci, 2000), and in the case of teachers, teaching (Avalos, 2011; Bembenutty, 2007; Darling-Hammond & Bransford, 2005). In SCT, self-efficacy differs from other self-system processes by focusing on personal ratings of performance success in task domains (Pintrich, 2004). Self-efficacy is seen as performing a central role in the examination of changes in behaviour in the midst of fearful and avoidant situations.

Researchers have demonstrated the positive effects of self-efficacy beliefs on effort, persistence, goal setting, and performance (Pajares, 2009). Thus, how one perceives his or her strength in terms of outstanding capabilities in the needed area of performance affect both initiation and persistence of coping behaviour. individuals beliefs in their efficacy influence the choices they make, their aspirations, how much effort they mobilise in a given endeavour, how long they persevere in the face of difficulties and setbacks, whether their thought patterns are self-hindering or self-aiding, the amount of stress they go through in coping with strenuous environmental demands (Bandura, 1991, p. 257). Therefore, self-efficacy is seemingly a purposive process of achieving a motive or goal (Carver & Scheier, 2011). In the classroom learning situation, students who are efficacious tend to have confidence in their abilities and self-regulatory strategies to succeed in their academic work (Zimmerman & Kitsantas, 2014; Usher & Pajares, 2008).

In the view of social cognitive theorists, self-regulation influences outcome expectation, which refers to individuals' beliefs that their course of action will result in attainment of desirable outcomes and self-regulatory mechanisms of self-monitoring, self-evaluation and self-reaction mediate the effects of most external factors that influence behaviour and offer the base for purposeful actions. self-regulation is considered as specific to contexts or situations – thus, self-regulation is neither a fixed trait nor a general characteristic as Schunk terms it "a particular level of development" (Schunk, 2009, p. 25) but rather driven by the context and the needs and goals of the individual. This means that learners are not expected to engage in self-regulatory processes equally in all domains, but regulating self is a matter of degree, notwithstanding the fact that the use of some strategies or processes (for example, planning and goal setting) could be attributed to

general situations. Social cognitive theorists, therefore, believe that learners must understand how to adapt processes to specific subject areas and contexts and must feel efficacious about doing so (Carver & Scheier, 2011; Pajares, 2009; Zimmerman, 2009; Pintrich, 2004; Bandura, 1991). Thus, students attend to instruction, process information, rehearse and associate new learning to prior knowledge with the hope that one is able to learn and establish productive social relationships and work environments (Schunk, 2009).

2.7.4 Models of Self-Regulation Learning

Self-regulation is seen as a composite concept; hence the models under consideration in this research would be focused on the phase models. The theoretical model most appropriate for grounding this research combines a student's motivational orientation with strategy use framework. The self-regulation model of learning encompasses a key set of capabilities that students use to acquire academic skill, such as setting goals, selecting, planning and using strategies, and self-monitoring one's effectiveness in learning context (Zimmerman, 2008), so that his/her learning is shaped by a framework of motivation and strategy use in a context. Research into SRL has suggested a number of theoretical models in an attempt to identify the various variables that form the SRL as a composite construct. Self-regulated learning (SRL) theories try to model how each of these cognitive, motivational, behavioural and contextual factors influences the learning process (Winne, 2009; Zimmerman, 2000, 2009; Pintrich, 2000, 2004; Winne & Hadwin, 1998).

Even though the four assumptions serve as the basis for most SRL theories, review of literature indicates that some approaches have shown major dominance when it comes to studies involving students' academic performance. I considered also the context of the study, that is, teacher education setting with the aim of assessing pre-service teachers' self-regulation, reflexivity, dispositions and academic achievement and the assertion that we need to consider training models that are intended to train teachers as "involved intellectuals" whose professional identity is based on strong intellectual self-image, resilience, awareness of social engagement, and commitment to public activity

(Mansfield et al., 2012; Yogev & Michaeli, 2011, p. 314; Day & Gu, 2009; Tschannen-Moran & Woolfolk Hoy, 2007; Darling-Hammond & Bransford, 2005). Among the models that have relevance for this study are Zimmerman's (1989) social cognitive view of academic self-regulation, Winne and Hadwin's (1998) four-phase model of self-regulation of learning, Biggs' (1978) model of metalearning and Pintrich's (2000) general framework for self-regulated learning.

2.7.4.1 Zimmerman's Cyclical Model of Self-Regulated Learning

The theoretical model of self-regulation by Zimmerman examined in this research is rooted in Bandura's social cognitive theory as described earlier in the chapter. Consequently, the model takes into consideration how an individual's perceptions, environment, and behaviour interact to influence the learning process. Zimmerman contends that self-regulated learning is somewhat distinct from other theoretical models of learning because it describes learning activities from the student's perspective and draws heavily from an individual's self-image as a learner. Hence, his cyclical model of self-regulated learning provides a useful way of exploring issues such as how self-efficacy shapes learning strategy use, and how learners' self-evaluations influence their subsequent motivation and goal-setting. Zimmerman's cyclical model involves three sequential phases, namely, the forethought (pre-action) phase, performance control (action) phase and the self-reflection (post-action) phase. These phases are represented in Figure 4.

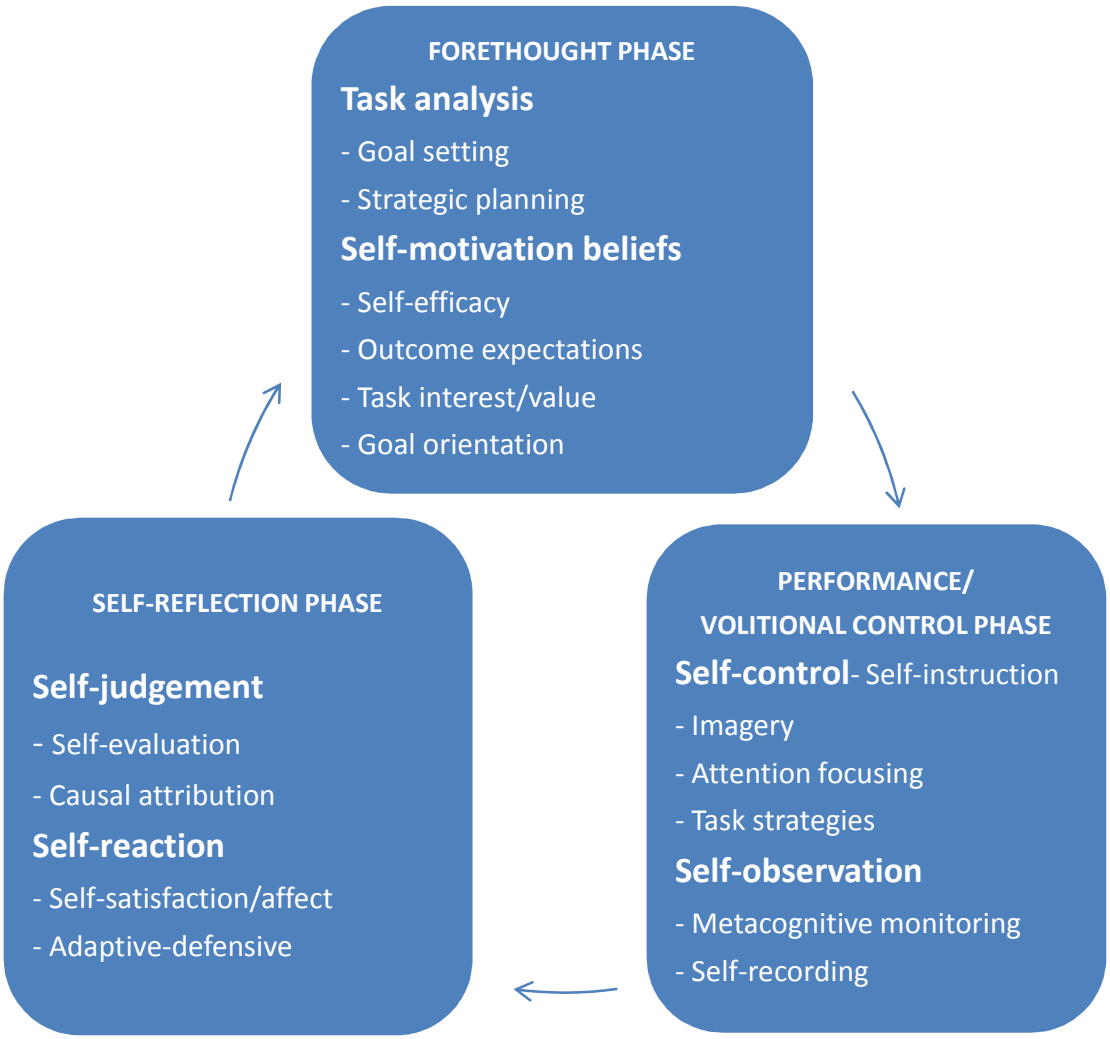


Figure 4: *A cyclical model of self-regulated learning (by Zimmerman, 1989)*

Forethought is seen as stage setting for learning- students engage in task analysis and assess their motivational beliefs and self-competence. Students who self-regulate set achievable goals and are specific with the outcomes they are expecting (Moos & Ringdal, 2012; Zimmerman, 2008; Pintrich, 2004). They strategically plan and select strategies that would optimise their success in a particular learning activity (Duckworth et al., 2009; Stoeger & Ziegler, 2007; Boekaerts, Pintrich & Zeidner, 2000). Under this phase, students tend to ask themselves a series of questions so as to shape their thought processes and their actions. For example, students ask themselves questions such as "Where is the suitable place to complete this task?", and "How can I complete this

assignment on schedule?" The second phase of the model is what he calls the performance and volitional phase. The phase entails the processes (i.e., self-control and self-observation) that students use in achieving their goals during task performance or learning. Questions that self-regulated students may ask themselves in the second phase are "Am I following my plan correctly?", "Am I being distracted?", and "What strategies can I use to help me keep working?"(Moos & Ringdal, 2012, p. 3).

Finally, self-regulated learners self-reflect on their actions and learning and evaluate them to see if they have been able to achieve the stated goals and the expected outcomes (Moos & Ringdal, 2012; Zimmerman, 2000, 2008, 2009; Pintrich, 2004). Students do self-reflection by asking questions such as "Have I been able to achieve all of my goals?", "Which strategies worked in view of the activity and the situation (environmental context)?" "Which conditions helped me be successful and what conditions distracted them?" These questions are asked so as to guide the student to maintain and improve on strategies and to be motivated as well. In a nutshell, this SCT model of SRL emphasis the interconnectedness of personal, social and environmental factors as potential resource for learning and a lack of it is likely to weaken a student's self-regulation.

2.7.4.2 Winne and Hadwin's Model of Self-Regulated Learning

Winne and Hadwin's (1998) views on SRL are based on information processing theory (IPT). They assert that students' self-regulation learning occurs in three essential phases with one optional phase. Thus in all, there are four phases (see Figure 5) (Moos & Ringdal, 2012; Winne, 2009):

1. Task definition;
2. Goals setting and planning how to achieve them;
3. Tactics and strategies enactment and
4. Metacognitive adaptation.

According to Winne (2009), in each of the phases, information processes shape the products that come out of it as conditions, products, standards or evaluations (p. 163). Conditions are the resources accessible to a learner while working on a task and the constraints, be it the task itself or one that emanates from the environment, which may affect standards and the processing of the information a learner encounters (Moos &

Ringdal, 2012; Winne, 2009; Zimmerman, 2008; Greene & Azevedo, 2007; Pintrich, 2004). Winne (2009) posits that of all the resources (i.e., both cognitive and contextual), prior knowledge (which includes values, beliefs, dispositions, and styles; motivation; field knowledge; knowledge of the current task; and knowledge of study tactics and strategies) is the most significant in information processing during task performance. He further asserts that the courses of action that are involved in students' information processing during learning are believed to include searching, monitoring, assembling, rehearsing, and translating ([SMART] or operations), which aids in the creation of a new information called product (Winne, 2009; p. 163). Under Winne and Hadwin's model of SRL, operations, be it routinized or acquired are cognitive and the products that result out of them can be tangible or intangible. For example, during a task performance, a learner can think of the strategies and resources he/she would need for a successful completion of the task and then start work on the task, such as writing introductory paragraphs. The learner then judges or evaluates through monitoring, these products against a quality (standard), several of which form the goal of the learner.

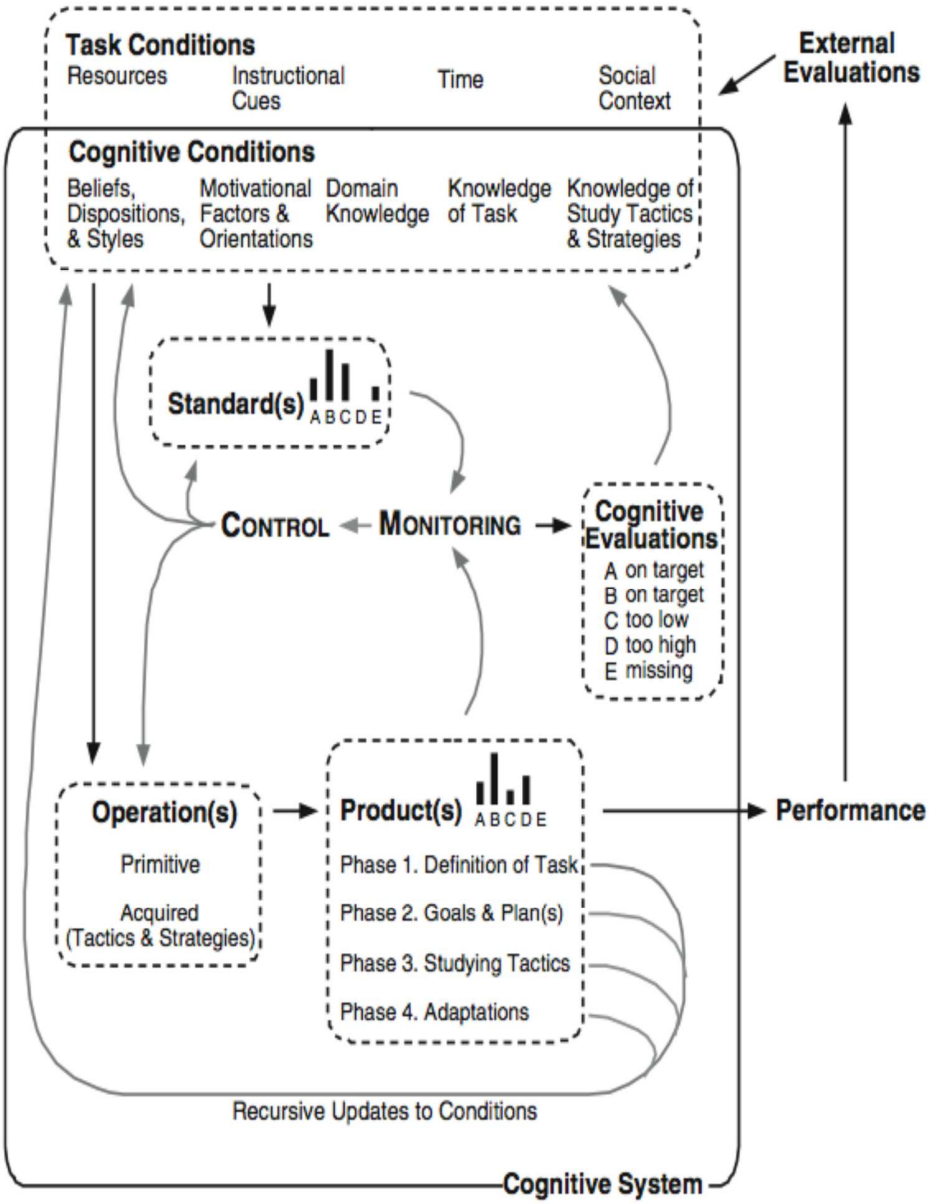


Figure 5: *A four-stage model of SRL (by Winne and Hadwin, 1998).*

In effect, all these processes: conditions, operations, products, evaluations and standards come together to form what Winne and Hadwin term as COPES - a *script* that students work with in task completion (Winne, 2009). In the operationalization of COPES during the four stages as outlined in the model, the student creates a situated need and forms perceptions based on the attributes of the task given. This task definition and formation of

perceptions about the task, as well as the estimation of available resources in the first phase is usually influenced by two key conditions - task and cognitive conditions (see Winne, 2009). For example, learners ask questions such as “What do I know about this task?” and “What are the available resources to help me solve this problem?” And once information about task and cognitive conditions is activated in the working memory, the learner integrates it to build an idiosyncratic definition of the task at hand (Winne, 2009, p. 165). The student then forms a goal(s) and gathers the needed strategies to meeting the goals in the second phase. In the third phase, the student begins to perform the strategies identified in Phase 2 in working on the task at hand. Phase 4, which according to Winne is voluntary, involves the student reforming goals and transforming tactics in the course of tackling the task. Throughout the phases, the student then constantly monitors task performance metacognitively in relation to the set goals to determine if phase standards have been met or if there is the need to do further work (Moos & Ringdal, 2012; Winne, 2009). Hence, the model is a “recursive, weakly sequenced system” (Winne & Hadwin, 1998, p. 281) in which the monitoring of products and standards within one phase can lead to adjustments of products from previous phases. The addition of monitoring and control in the cognitive construction allows these processes to impact each phase of SRL (Greene & Azevedo, 2007). The characteristic features of a self-regulated learner in relation to this model are summed by Winne (1995) as:

> When they begin to study, self-regulated learners set goals for extending knowledge and sustaining motivation. They are aware of what they know, what they believe, and what the differences between these kinds of information imply for approaching tasks. They have a grasp of their motivation, are aware of their affect, and plan how to manage the interplay between these as they engage with the task. They also deliberate about small-grain tactics and overall strategies, selecting some instead of others based on predictions about how each is able to support progress toward chosen goals (p. 173).

2.7.4.3 Biggs' (1978) Model of Metalearning

Biggs' metalearning is a form of metacognition, which he explains as the "awareness of students of their own learning processes and their increasing control over them" (Biggs, 1987, p. 1). He states that the concept of meta-learning leads to a model of student learning in which associations among personal factors, the situational context, approaches to learning, and quality of outcome are mediated by the students' metacognitive (meta-learning) capability. Biggs' model involves three stages of presage, process and product. According to the model, the presage variables are of two components: personal factors and situational factors that exist before the student gets into the learning environment (Biggs, 2001).

In the learning situation, it is believed that personal factors such as prior knowledge, values, beliefs, attitudes and other abilities influence both the approaches that students employ and their performance on the task (Moos & Ringdal, 2012; Avalos, 2011; Pintrich, 2004). It is also believed that contextual variables such as time spent on a task, the difficulty level of a task, the arrangement of courses for students (for example, whether the unit in a course is grouped as optional of compulsory), the processes of teaching (pedagogy) and assessment all have direct effects on the students motives, beliefs, efficacy and strategies in approaching the task as well as performance. The second stage of the model involves the perception of the student of the learning environment. Students' perceptions are modelled through process variables referred to as "learning process complex" made up of students' motives and strategies for learning (Biggs, 1987, p. 10).

Biggs suggests that students' perceptual meaning of the learning situation or the institution as a whole is exemplified by motives (such as to gain a qualification, to get a job, to gain higher grades to pursue higher education and so on), which in turn influence the choice of learning strategies for optimal performance (Zimmerman, 2009; Boekaerts & Corno, 2005; Pintrich, 2004; Biggs, 2001). Finally, the product factors include performance which can be in the form of examination results (e.g., grades or GPA) or self-reflection leading to a rise in self-efficacy or satisfaction. Biggs concludes that

"meta-learning" occurs when a student relates his/her cognitive abilities with available strategies based on task demands in order to perform. It follows therefore that, pre-service teachers' prior knowledge and the context of their learning are very essential in influencing their attitudes to learning the courses, their self-regulation and academic performance.

2.7.4.4 Pintrich's General Framework of Self-Regulated Learning

Pintrich presents SRL model which represents a general time-ordered sequence that he believes individuals would go through as they perform a task. However, he posits that the phases as proposed are not hierarchical or linear in structure such that earlier phases must always be completed before later phases (Pintrich, 2004, p. 389). This is probably so because, not all academic learning follows a linear structure – there are many occasions for students to learn academic materials in more covert or unintentional or tacit or implicit ways without self-regulating their learning in such an explicit or overt way as proposed by most SRL models (Zimmerman, 2009; Pintrich, 2004; Boekaerts, Pintrich & Zeidner, 2000). Pintrich (2004) believes that in a greater number of the models of self-regulated learning, monitoring, control, and reaction can occur concurrently and dynamically based on individuals' evolvements through the task, with the standards and plans being altered or updated as a result of the feedback from the monitoring, control, and reaction processes. In line with the general assumptions described earlier in the chapter, he proposes four phase model that, according to him most of the SRL models share (see Zimmerman, 2008; Winne, 2009). The four phases involve planning and goal setting, monitoring, control, and reflection (Moos & Ringdal, 2012; Zimmerman, 2008; Schunk, 2005; Pintrich, 2004) and they occur under four main areas (cognition, motivation/affect, behaviour and context, Pintrich, 2004, p. 390).

During the Phase 1 which includes forethought, planning, and activation, the learner engages in such activities as goal setting, planning, reflections on prior knowledge on the task at hand, as well as reflection on the context and the self in relation to the task (Pintrich, 2004, p. 389). According to Schunk (2005), even though activation of relevant content knowledge may occur without conscious awareness, yet self-regulated learners often activate knowledge in a planned way through prompting and self-questioning (e.g.,

"What do I know about this?"). Students' actions also involve metacognitive knowledge, which includes thoughts about the use of declarative knowledge, for example, available learning strategies such as rehearsal and note taking, procedural knowledge (e.g., how to apply these strategies and rules), and conditional knowledge (when and why to employ and use different strategies)(Schunk, 2009, p. 128, 2005).

Of course, these afore mentioned processes could also occur consciously or unconsciously, but the SR learners do them purposefully. Under this phase, students attempt to regulate different facets of motivation and affect (Schunk, 2005: Pintrich, 2004, Pintrich & Schunk, 2002), which includes volitional (action control) strategies (See Corno, 2009; Boekaerts & Corno, 2005) such as goal orientation – thus, reasons or purposes for doing tasks; for example, why they came to teacher college or why they want to earn high grades in the courses (Schunk, 2005); self-efficacy, that is students' evaluations of their capabilities to undertake the task; judgments on task difficulty and task value (i.e., the importance, utility and relevance of the task, Pintrich, 2004, p. 395), and learners' interest in the learning material, for example, the extent to which students like the course, topic or area being learnt (Moos & Ringdal, 2012;. Greene & Azevedo, 2007; Schunk, 2005: Pintrich, 2004).

In relation to behaviour, students plan to self-observe, control their time and effort to raise learning outcomes. Students' self-observation includes asking questions and deciding on methods they can use to assess their progress on courses of action. Effort control involves students' decision on why to expend their energies and attempts to control effort in order to do well in the course. Time management includes the preparation of schedules (time tables) for studying and allocating time for different activities, which is a common aspect of most learning and study skills courses (Davies, 2011; Schunk, Pintrich, & Meece, 2008; Zimmerman, 2008). In terms of contextual control, students regulate the tasks and contexts that they confront in the learning environment (e.g., classroom, home or community). Students attempt to control and organise the environment in ways that expedites goals and task completion (Vandevelde, Keer, & Rosseel, 2013; Zimmerman & Schunk, 2009; Corno, 2009; Pintrich, 2004). Pintrich (2004) asserted that, even though perceptions are cognitions, their focus is on the

context and not on the individual's self-perceptions. These might include perceptions about classroom features that may promote or hinder learning, types of tasks to be completed, assessment practices, and classroom climate factors (e.g., helpfulness and commitment of the teacher)(Schunk, 2005).

The Phase 2 of the model involves monitoring of cognition, motivation, behaviour and context. The learner engages in activities that lead to awareness of cognitive and metacognitive (feeling of knowing, Schunk, 2005) processes of task performance. Pintrich contends that students have to become aware of and monitor their progress toward their goals and their learning and understanding of the task, so as to make any adaptive changes in their learning (Bransford et al., 2005; Pintrich, 2004; 2000b; Higgins & Leat, 1997). Their understanding may be due to the fact that they may have studied it before (prior knowledge); albeit they may not able to remember due to a phenomenon Schunk termed as "tip-of-the-tongue", the material may appear familiar to them (Schunk, 2005). Motivational monitoring denotes being mindful of one's self-efficacy, values, attributions (perceived causes of outcomes), interests, and anxieties (Scott & Levy, 2013; Moos & Ringdal, 2012; Avalos, 2011; Schunk, 2009; Pintrich, 2004). In terms of behaviour, monitoring includes checking of effort against task, self-observation, time use and assessment of needed help (Zimmerman & Schunk, 2009; Pintrich, 2004). Students seek help, regulate why, when, and from whom to seek help – a characteristic of good students and good self-regulators (Pintrich, 2004). Monitoring context involves observing task and environmental conditions to determine whether they are changing and how it could be shaped.

Phase 3 of the model involves control. Actual selection and use of different cognitive strategies for memory, learning, reasoning, problem solving, and thinking is the core mandate of control and regulation of cognition (Pintrich, 2004). Researches (e.g., Zimmerman, 2008, 2000; Greene & Azevedo, 2007; Pintrich & Zusho, 2007; Pintrich et al., 1993; Pintrich & De Groot, 1990) have shown that students use different cognitive and learning strategies such as elaboration, rehearsal and organization to control their mental processes and learning (Corno, 2009; Pintrich, 2004). Control also involves the selection and adaptation of strategies for managing motivation and affect. Students

attempt to control self-efficacy through the use of positive self-talk activities - for example, “I know I can do well on this course” (see Pintrich, 2004; Bandura, 1997). Pintrich posits that SR students try to increase their extrinsic motivation for the task by promising themselves extrinsic rewards or positive results reliant on their academic achievement (Schunk, 2009, 2005; Zimmerman, 2008; Bembenutty, 2007; Pintrich, 2004).

Apart from dealing with essential motivational beliefs, students also use various coping strategies (See Corno, 2009) to control their emotions and affect in order to deal with negative affect such as fear and examination anxieties (for example, “Don’t worry about grades now,” Pintrich, 2004, p. 396). Research literature also shows that students may use other strategies such as invoking negative affects, for example, shame or guilt as a form of motivation to persist at a task (Zimmerman, 2008; Pintrich & Zusho, 2007), use ‘defensive pessimism’ to yoke negative affect and anxiety about poor performance as a motivator to increase effort in task performance, or ‘self-handicapping’ strategy which involves a decrease in effort (little or no studying), or procrastination so as to attribute probable poor performance to low effort and not low ability in order to protect self-worth (Steel, 2007; Pintrich, 2004). Contextual control includes strategies to make the learning situation more favourable by modifying or leaving the context. For example, if a student finds a classroom to be noisy, he or she may look for another place where he/she can concentrate on task performance. Pintrich (2004) asserts that:

> In the traditional classroom, the instructor controls most of the aspects of the tasks and context. Therefore, there may be little opportunity for students to engage in contextual control and regulation. However, in more student-centred classrooms, students are asked to do much more actual control and regulation of the academic tasks and classroom climate and structure. They often are asked to design their own projects and experiments, work together in collaborative or cooperative groups, design how their groups will collect data or perform the task, develop classroom norms for discourse and thinking, and even work together with the teacher to determine how they will be evaluated on the tasks. These types of

> classrooms obviously offer a great deal more autonomy and responsibility to the students and they provide multiple opportunities for contextual control and regulation (p. 399).

Phase 4 involves reflection and reaction to learners' cognitive, motivational, behavioural and contextual situations. According to Pintrich (2004), students' reactions and reflections phase of the model consist of cognitive evaluations, attributions and reflections on the task, context and one's own behaviour. SRL theorists believe that, any move to control, regulate, and change cognition should be linked to cognitive monitoring activities that provide information about the relative differences between a standard and current progress toward that standard (goal). Thus, the learner must evaluate his/her task performance to ascertain whether it is in line with the stated goals, make attributions of his/her success and failures, and reflect on the effectiveness of his/her motivational and cognitive strategies to make adjustments where necessary (Schunk, 2005). As explained by attribution theorists, the types of attributions that students make for their success and failure can lead to the experience of more complicated emotions like pride, anger, shame, and guilt (Zimmerman, 2008; Pintrich & Zusho, 2007; Pintrich, 2004; Weiner, 1986) and students' reflection on the reasons for their performance, both the quality of the attributions and the quality of the emotions experienced are necessary outcomes of the self-regulation process (Pintrich, 2004).

The SRL model as provided by Pintrich, thus provides a conceptual model for the current study of pre-service teachers' motivation and regulation based in a psychological analysis of academic and professional learning. However, the model is modified in terms of the concentration of some aspects of the motivation use. Within his framework, Pintrich (2000b, 2004) uses the achievement goal theory which conventionally differentiates between mastery and performance goals. In the present study, however, the focus is on the reasons underlying learners' behaviour ("the why of certain behaviour"), rather than on the type of goals learners might focus on ("the 'what' or the content of goal pursuit") (Deci & Ryan, 2000), as pre-service teachers can have various reasons for pursuing the courses on their programme (Urdan & Mestas, 2006). Therefore, I opt for conceptualising motivation for learning from the perspective of the Self-determination theory ([SDT],

Deci & Ryan, 2000), a contemporary theory of situated motivation that is built of the fundamental premise of learner autonomy. SDT has received an increase in attention in the literature over the last decade, and has been recognised as a well-validated and coherent theoretical framework for the conceptualisation and examination of motivation in several settings, including education (Vandevelde et al., 2013; Vansteenkiste, Lens, & Deci, 2006; Deci & Ryan, 2004; Reeve, 2002). SDT argues that all humans have an intrinsic need to be self-determining or autonomous, as well as competent and connected, in relation to their environment.

Additionally, SDT provides theoretical grounds for examining how social and environmental factors can facilitate high-quality forms of motivation and engagement in activities (Deci, Vallerand, Pelletier, & Ryan, 1991) and in doing so provides practical implications and guidelines for the educational context (see Reeve, 2006). These guidelines show important parallels with guidelines regarding the promotion of SRL. In contrast, regarding the achievement goal theory, researchers acknowledged that a precise and consensual definition of achievement goals remains elusive (Urdan & Mestas, 2006; Pintrich, 2000) and some researchers even claimed that a revision of the achievement goal theory is needed (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002). Moreover, Hulleman, Schrager, Bodmann and Harackiewicz (2010) state, as a result of their meta-analysis, that, there is a lack of both conceptual and operational consistency, which has resulted in an overall misalignment between theory and measurement of goals.

More particularly, SDT has expanded the traditional distinction between intrinsic and extrinsic motivation by differentiating extrinsic motivation into types of regulation that vary in their degree of relative autonomy (Vandevelde et al., 2013; Ryan & Deci, 2000a, 2000b). In doing so, SDT focuses on the quality of motivation rather than on the quantity of motivation (Ryan & Deci, 2000b). ‘Intrinsic motivation’ reflects behaviour that is undertaken for its own sake, enjoyment, and interest with a high degree of perceived internal control. In contrast, extrinsic motivation reflects an activity or behaviour undertaken for some instrumental value or external reason. The least autonomous form of extrinsic motivation is ‘external regulation’. In this case, behaviour is prompted by external contingencies, such as rewards, punishments, and deadlines, and the

contingencies or reasons for performing the behaviour have not been internalised at all. With regard to 'introjected regulation', a second type of extrinsic motivation, people engage in an activity to comply with internal pressure or to avoid feelings of guilt and shame. It reflects the start of an internalization of values, but control is still perceived as being external to the person as he or she seeks approval from others. A more autonomous form of extrinsic motivation is 'identified regulation'. In this case, the learner has identified with the personal importance of behaviour and has accepted its regulation as his or her own (Vansteenkiste et al., 2006; Deci & Ryan, 2000; Ryan & Deci, 2000a, 2000b). Research has shown that students who adopt more autonomous motivation (i.e., identified regulation and intrinsic motivation) display greater persistence, deeper learning, better performance, and better transfer (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004; Deci & Ryan, 2000).

Taken together, notwithstanding the fact that there are important differences between various theoretical definitions in terms of how students generate their thoughts and approaches to learning, self- regulated learners are generally characterized as active, efficiently managing their own learning through monitoring and strategy use (Boekaerts, Pintrich, & Zeidner, 2000; Biggs, 2001; Paris & Paris, 2001; Pintrich, 2004; Winne, 2009; Winne & Hadwin, 1998; Winne & Perry, 2000; Zimmerman, 2009), guided and constrained by the contextual features in the environment (Vandevelde et al., 2013; Pintrich, 2004). Taking into account of the variations in the conceptualisations and re conceptualisations of the SRL by major groups of theories and models in education, bearing in mind the composite nature that reflects its complex nature, it is overwhelmingly the case that the significant majority of studies concerning SRL theories appear to agree that it involves the use of metacognitive, motivational, and behavioural strategies.

SRL theorists believe that we can only understand students' learning and motivation fully when they are studied together since the two concepts are inter-reliant processes. On the whole, self-regulated learners are perceived to be able to plan and control the nature of, and amount of instruction; select, create and organise advantageous situations and environments for themselves at any given time. Teachers should be able model

classrooms that encourage self-reflection, self-observation and self-reaction, in order to nurture students' self-regulatory skills and capacities. Thus, academic self-regulation includes skills such as the following (Vandevelde et al., 2013; Zimmerman, 2009; McCombs, 2009; Schunk, 2005; Pintrich, 2004; Biggs, 2001):

1. Valuing learning and its anticipated outcomes
2. Setting performance goals
3. Planning and managing time
4. Holding positive beliefs about one's abilities
5. Attending to and concentrating on instruction
6. Effectively organising, rehearsing, and encoding information
7. Setting up a productive work environment
8. Using social resources effectively
9. Focusing on positive effects
10. Making useful attributions for success and failure

2.8 Positioning Self-Regulated Learning in Contextual Teaching: Purposes and Practices for Teacher Preparation

2.8.1 Why do we need self-regulation in teaching?

The call to move from a ''transmission model'' of teaching in which the teacher just prepares and transmits information to learners to an ''enculturation model'' in which the teacher builds a culture in the classroom in which critical thinking and dispositions that facilitate intelligent action are encouraged and orchestrated through student and student interaction which supports Dewey's notion that we never educate directly but by means of the environment, and are taught directly (see Dottin, 2009). Through interaction with the environment and significant others in that environment, one develops certain intellectual virtues such as enthusiasm for learning, fair mindedness and careful reflection (Coulter et al., 2007; Hansen, 2001), attitudes, values, beliefs about what is important and worthwhile (Diez, 2007). Teachers must therefore help their students become more autonomous, strategic, and motivated in their learning so that they can apply their efforts

and strategies in a variety of meaningful contexts both in school and in the wider society. Thus teachers need to foster students' self-regulation through classroom practices.

Additionally, teachers need to provide instruction across a more extended variety of contexts, integrate a wider set of perspectives, which requires the teacher not to accept the prevailing picture of reality but to question it and strive for its improvement, and apply a more extensive set of instructional strategies than has traditionally been the case. In each of these new contexts, with each of these unfamiliar standpoints, and with each of these new strategies, teachers need to be much more thoughtful and reflective about their teaching and about their students (UNESCO, 2012; Musset, 2010; Darling-Hammond & Bransford, 2005). Some specialists have concluded that teaching is a professional practice that requires both theoretical and practical judgment which is believed to be enhanced by reflective (metacognitive) practice (Dottin, 2009; Avalos, 2011; Coulter et al., 2007; Day, 2007; Diez, 2007; Darling-Hammond & Bransford, 2005; Hattie, 2003; Rice, 2003). These scholars are of the view that knowing what to do – that is professional action in teaching is not enough; that teachers must act, and to act requires practical judgment and reflective intelligence (Dottin, 2009), which involves doing the right thing at the right time for the right reasons with the right individuals and thus its importance for teaching (Coulter et al., 2007, p. 6).

According to Oser cited in Dottin (2009, p.84), professional action is linked to pedagogical responsibility which he contends is connected to agency; it is influenced by being able to decide freely on one's acts and having the requisite knowledge for appraising the possible effects on others. And as Rest cited in Day (2007), posits it that the people who develop are those who love to learn, who seek new challenges, who enjoy intellectually stimulating environments, who are reflective, who make plans and set goals, who take risks and are resilient (Mansfield et al., 2012), who see themselves in the large social contexts of history and institutions and broad cultural trends, who take responsibility for themselves and their environs and have the inclination to exercise sound professional judgement. In all these, teachers need to self-regulate in order to discharge their duties efficiently and to thrive on their job.

Research on teacher reflection has shown that developing a reflective stance can help teachers to systematically improve their practice. Hammerness et al. (2005), and others (e.g., National Research Council, 2000) have argued that reflection can help beginning teachers to overcome the limitations of tacit knowledge about teaching and learning that they have constructed through their previous experiences as students (i.e., the problem of "the apprenticeship of observation", Hammerness, et al., 2005, p. 367). According to these authors, reflection, or metacognition (Flavell, 1979), is critically important to the development of "adaptive expertise" (Dottin, 2009; Hammerness, et al., 2005, p. 360) in the context of the extremely complex professional activity of teaching (Hammerness et al., 2005; Shulman, 1987). Bransford, Derry, Berliner, Hammerness and Beckett (2005) define adaptive experts as teachers who reform their essential ideas about teaching and learning; beliefs and capabilities to improve effectiveness - thus, they demonstrate both competence and novelty in their teaching.

Another important idea which is dominant in teacher education discourse is the idea of co-construction (Avalos, 2011). Co-construction is linked to the concept of co-regulation, which represents a "shared responsibility" with the goal of self-regulation that is instrumental to socially meaningful activity that eventually improves culture (McCaslin & Hickey, 2009, p. 242). That is teachers are expected to collaborate with students, colleagues and other stakeholders education to improve learning and in turn build collaborative innovation. They work together with others – create networks and teams within communities of practice to adapt, create, assess, discuss, and revise instruction that fits their own classrooms and contexts, including such determinants as students' diversity, time, infrastructural and technological resources, accountability pressures, and parents (McCaslin & Hickey, 2009; Hammerness et al., 2005; Paris & Paris, 2001). Studies of teacher co-learning through mutual collaboration and feedback (see for example, Sato, & Kleinsasser, 2004; Randi & Corno, 2000) have found a link between co-construction and instructional improvement (Dottin, 2009; McCaslin & Hickey, 2009), capacity building for judgement (Diez, 2007; Dottin, 2009), efficacy (Mansfield et al., 2012; Avalos, 2011; Guo et al., 2011; Zimmerman & Schunk, 2009), and collaboration (Boyd et al., 2008). In my view, teachers who are self-regulated are likely to collaborate innovatively with others to provide opportunities to be motivated and

strategic as they develop their methods of instructing and assessing students which mimic the processes of collaborative innovation that they require their students to learn and construct.

Yet another area of importance is teacher efficacy. Teachers' sense of efficacy is a construct derived from Bandura's (1991) theory of self-efficacy alluded to earlier in my literature review, in which the generalised behaviour change of an individual is seen the light of two factors, efficacy expectation and outcome expectation (Schunk, 2009, 2005). It is believed that, people go through certain activities in order to achieve an outcome. In this regard, perceived self-efficacy is of essence to the amount of energy a teacher expends on selecting and sustaining interest on such a task, in that, it is related to the teacher's inherent beliefs of his or her capabilities to accomplish something, regardless of actual competencies (Mansfield et al., 2012; Avalos, 2011; Schimdt & DeShon, 2010; Hammerness, et al., 2005). Research on self-efficacy in relation to teaching has been the point of reference for many researchers (Day, 2007; Morrell & Carroll, 2003; Palmer, 2001; Tschannen-Moran & Woolfolk Hoy, 2007; Bembenutty, 2007). Self-efficacy, defined by Bandura (1986) as "people's judgment of their capabilities to organize and execute courses of action required to attain designated types of performances" (p. 391), has important influence on human behaviour and affect in goal setting, effort expenditure and the level of persistence in facing daily tasks. In accord with SCT, Henson (2001), states that:

> …people are capable of human agency, or intentional pursuit of courses of action, and that such agency operates in a process called triadic reciprocal causation. Reciprocal causation is a multi-directional model suggesting that our agency results in future behaviour as a function of three interrelated forces: environmental influences, our behaviour, and internal personal factors such as cognitive, affective, and biological processes (p. 3).

Teacher efficacy has been found to be one of the important variables consistently related to positive teaching behaviour and student outcomes (Henson, 2001; Day, 2007).

According to Tschannen-Moran and Woolfolk Hoy (2007), teachers make efficacy judgments by assessing teaching tasks and personal teaching competence in specific teaching contexts. They assert that an efficacious teacher makes "judgment of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated" (p. 783). Similarly, Flores and Day (2006) state that coping with the demands of teaching and its inherent tasks entails a continuing process of analysis of one's own beliefs and practices. To Day (2004), the first few years of teaching may be seen as a "two-way struggle in which teachers try to create their own social reality by attempting to make their work match their personal vision of how it should be, whilst at the same time being subjected to the powerful socializing forces of the school culture" (p. 59). Sutherland and colleagues (2009) point out that, although becoming a teacher implies some form of core stable identity that may gradually emerge over time, in practice, identity is neither static, not invariant, nor unitary, and is continuously reconstructed in the form of life stories negotiated through interactions with both individuals and the institutions in which individuals work (Walker-Gleaves, 2009). In this sense, the teacher's self-efficacy power is an essential tool in adjusting to community and classroom demands.

In line with this, the construct of teacher efficacy has been explored by a number of researchers in recent years. For example, Tschannen-Moran and Woolfolk Hoy (2007) proposed a model of efficacy that integrates several important components of social cognitive (Zimmerman, 2009; Bandura, 1997) and locus of control theories (van Dinther et al., 2011; McCombs, 2009). Within this model, the teacher's efficacy judgments are the result of the interaction between a personal judgment of the relative importance of factors that make teaching difficult and a personal assessment of his or her personal teaching competence or skill. Research on the efficacy of teachers suggests that behaviours such as persistence at a task, risk taking, and the use of innovations are related to degrees of efficacy (Beltman et al., 2011; Day & Gu, 2010; Zimmerman, 2008).

Highly efficacious teachers have been found to be more likely to use inquiry and student-centred teaching strategies, while teachers with a low sense of efficacy are more likely to use teacher-directed strategies, such as didactic lectures and reading from the textbook.

Pajares conducted a study in 2009 to ascertain the relationship between teacher efficacy and classroom pedagogy. He found that there was a strong relationship between teachers' educational beliefs and their planning, instructional decisions, and classroom practices and suggested that educational beliefs of pre-service teachers play a pivotal role in their acquisition and interpretation of knowledge and subsequent teaching behaviour. Indeed, it seems that beliefs are far more influential than knowledge in determining how individuals organize and define tasks and problems and are stronger predictors of behaviour (Pajares, 2009). In the light of these, self-efficacy could be seen as having both predictive and mediating functions in relation to teachers' task performance, notwithstanding the fact that, decisions made by teachers in their classrooms are likely to be influenced by multiple factors including the nature of the curriculum, personal capabilities and constraints such as time.

Literature, again suggests that, students generally learn more from teachers with high self-efficacy than those same students would learn from those teachers whose self-efficacy is low (Bruce, Esmonde, Ross, Dookie, & Beatty, 2010; Wolters & Daugherty, 2007; Perry, Phillips, & Hutchinson, 2006; Randi & Corno, 2000). Woolfolk Hoy and Hoy (2001) argue that teacher efficacy is one of the few constructs about teachers that are related to the behaviour of learning of students and that a teacher's belief system is important in teaching. Gibson and Dembo (cited in Guo et al., 2011) suggest that two types of beliefs seemed relevant - belief that student learning can be influenced by effective teaching (outcome expectancy beliefs) and confidence or belief in one's own teaching ability(self-efficacy belief). However, having one belief being high, for instance outcome expectancy, does not mean a strong belief with respect to the other measure. Riggs (cited in Bruce et al., 2010) reported that, elementary school teachers with low science teaching efficacy beliefs avoided science teaching even though their outcome expectancy beliefs regarding teaching generally were high.

These points converge in the view that teacher self-efficacy is a belief construct that has been used to explain motivational processes and achievement in varied academic settings such as: (1) teacher classroom behaviour (e.g., enthusiasm and value for diversity), (2) students' outcome, (3) teacher collaboration with others, and (4) career satisfaction and

retention. Teacher self-efficacy can therefore be seen as the extent to which the teacher believes he or she has the capacity to affect student performance, and use the appropriate strategies to enhance students' learning. Teachers who believe that they can be successful on a given task are more likely to be so because they adopt challenging goals, try harder to achieve them, persist despite setbacks and develop coping mechanisms for managing their emotional states.

In sum, it is believed that teachers accrue enormous benefits when they become knowledgeable in metacognition and involved in self-regulation. Through self-regulation, teachers become aware of their thought processes and analyse their own thinking habits. They reflect on their own practices, which can lead to improved students' performance (Zimmerman, 2008) and adapt where necessary so as to bring about improved teaching and learning. Teachers who self-regulate are resilient and efficacious and tend to be satisfied with their job which in effect may reduce teacher turn over or attrition. General teaching efficacy rests primarily with teachers' beliefs regarding the influence of the environment on the teaching process and how much these factors (e.g., home conditions and socioeconomic status) affect the overall academic success of students (Moos & Ringdal, 2012; Tschannen-Moran & Woolfolk Hoy, 2007; Hammerness et al., 2005; Schunk, 2005; Pintrich, 2004). Personal teaching efficacy on the other hand has been defined as a belief in one's ability to teach effectively and teaching outcome expectancy as the belief that effective teaching will have a positive effect on student learning (Avalos, 2011; Dottin, 2009; Darling-Hammond & Bransford, 2005). Research on efficacy of teachers suggests that behaviours such as persistence at a task, risk taking, and use of innovations are related to degrees of efficacy. Research has shown that teachers in high SRL contexts facilitate student-centred classrooms in which students are encouraged to formulate their own aims, to conceptualise their own problems, to design the ways in which such problems might be addressed, and to develop knowledge out of their own interests and needs (Moos & Ringdal, 2012; Perry et al., 2006; Randi & Corno, 2000). Teachers need to transform their classrooms to foster rises in self-regulated learning among their students.

2.8.2 Why Study Self-Regulation among Pre-service Teachers?

What is desirable in any teacher education programme, whether in the Western countries or internationally should be linked to the important question of what one is trying to foster in teacher education candidates (Dottin, 2009, p. 84). Consistent with historical precedent, educators are struggling to develop new and more sophisticated repertoires of practice to realise the vision of children constructing their own knowledge. Classroom practice is therefore, more than a function of the content of teacher education programmes – it is interplay of teachers' dispositions, beliefs, values and motivations, which to a very large extent shape their classroom behaviour and practices. What teachers do to teach people something can be described as complex and multifaceted - they explain the relations among learning content, provide examples, show how a theory may be applied in practice, motivate students, and plan, monitor and evaluate the learning processes of students. It seems that learning and instructional activities can be seen as images of each other and that they may be described in similar terms.

Thus, one can speak of learning functions; functions that have to be fulfilled for worthwhile learning processes to be realised. Teaching young children self-regulation first requires strong teacher self-regulation. Children learn to regulate thoughts, feelings, behaviour, and emotion by watching and responding to adults' self-regulation. Referring to motivation regulation, Galinsky (2010) notes that "adults foster children's motivation by being motivated themselves" (p. 11). Therefore, we need to know what teacher trainees do and do not do when it comes to their learning while in college because teachers need to have a control of the critical ideas and skills, commit to duty and, equally important, the capacity to reflect on, appraise, and continually learn from practice (Darling-Hammond & Bransford, 2005). We need to understand teachers' personal and professional histories and pre-service training, alongside issues of school culture in determining the kinds and relative stability and instability of professional identities which teachers develop in the early years of training and teaching and thus the kinds of teachers they become and their effectiveness (Flores & Day, 2006).

Understanding the role of self-regulation in a learning context among pre-service teachers is increasingly important as the nature of training evolves. This is because teachers need to understand their own thinking to become more effective in nurturing the thinking of their students. Over time, work has become progressively more complex and knowledge centric, requiring employees to adapt to changing job demands (Hammerness et al., 2005; Bell & Kozlowski, 2008). Furthermore, it is believed that pre-service teachers are often given some control over training courses and how they participate in and over the content, structure, and pace of material in the training environment (Kraiger & Jerden, 2007; Sitzmann, Kraiger, Stewart & Wisher, 2006). Unstructured learning and peer construction of training materials (e.g., the use of internet resources to enhance teaching and learning) are also becoming more prevalent, increasing the requirement for teachers to evaluate what they need to know and where they can obtain accurate information (Brown & Sitzmann, 2011). All of these changes are escalating the demands placed on employees of in the education system and pre-service teachers to self-regulate their learning. As Dottin concludes, building intellectual dispositions must be higher education's obligation which takes on more urgency for teacher education programmes in higher education institutions if teaching is seen through the lens of a clinical profession that requires discernment and judgment, problem solving skills, continuous learning and the utilization content knowledge to address problems.

If the capacity for judgment is enhanced in teacher education programmes then trajectories of action in preparation can be assumed to also be demonstrated later on the job. If a candidate demonstrates promptness, courtesy, commitment, collaboration, resilience in his or her preparation, it is likely that he or she will act similarly when on the field. These dispositions are necessary for teaching in the 21st century as the profession is becoming more and more complex. Similarly, a student consistently discourteous, not prompt, and have less value in pre-service work will more than likely have challenges on the job (Dottin, 2009; Professional Dispositions Assessment [PDA] Form, 2006). It could be argued that teaching has been reduced to a moral endeavour as a result of economic circumstances in many countries. However, literature has shown that teachers need to be committed to, and collaborate with other stakeholders in order to meet the complex needs of the pupils. In a field similar to teaching, nursing, a study on first- and last year nursing

students in Finland examined the effects of ethics teaching on the development of moral judgment and found that students who had had to deal with ethical dilemmas in their practical training had higher moral judgment in practice than students who did not (Dottin, 2009, p. 87; Auvinen, Suominen, Leino-Kilpi, & Helkama, 2004).

Thus far, the review of literature has shown that successful learners are those who engage in self-regulation of learning by using learning strategies to secure task completion. They exercise behavioural control to not only choose or plan valuable academic tasks, but also to maintain motivation and intention in the face of distracting alternatives (Zimmerman, 2008, Bembenutty, 2007; Schunk, 2005; Pintrich, 2004). The self-regulation literature has played a substantial role in shaping our understanding of the processes through which trainees systematically adapt their actions during training in order to achieve their learning goals. However, after more than 30 years of research among students, it is time researchers pause and examine the current state of self-regulated learning activities among pre-service teachers and identify gaps in our collective understanding of how teacher trainees regulate their learning of teaching-related knowledge and skills as this could impact on their acquisition of core professional competencies, abilities and dispositions (Englehart et al., 2012; Avalos, 2011; Barnett & Koslowski, 2002; Day & Gu, 2009; Dottin, 2009). Given the role of initial teacher training institutions as a social institution through which individuals and groups learn, and are taught to acquire their identity, agency and values (Avalos, 2011; Dottin, 2009; Flores & Day, 2006; Hammerness et al., 2005), it is essential that that we understand how pre-service teachers form their identities and become efficacious for teaching; believe that pre-service teachers who are self-motivated are likely to stay on the job and that could lead to a reduction in the rate of teacher attrition.

Literature on teacher learning has shown links between being a self-regulated learner, reflecting effectively on one's own practice, and being described as an "adaptive expert" (Darling-Hammond & Bransford, 2005; Hammerness, et al., 2005; Avalos, 2011). For instance, the metacognitive skills needed for effective reflection on teaching practice (habit of mind) are seen as critically important to developing adaptive expertise in the context of the highly complex classroom environment. Similarly, self-regulated learning

is often defined, at least in part, in terms of using metacognitive skill to adapt one's approach to complex learning situations or problems. Although there is rich literature on reflective practice in teacher education, less is known about measuring teachers' self-regulated learning or the relationship between self-regulated learning and teacher reflections. Similar to the way in which effective teachers can be described as adaptive experts; effective learners are often depicted as adaptive experts in the literature on SRL (Winne & Hadwin, 2008; Zimmerman & Schunk, 2009). Self-regulated learners are commonly described as metacognitively, motivationally, and behaviourally engaged in the learning process. Given that pre-service teachers self-regulated their learning when in training they could be viewed as experts at managing complex learning tasks because they are self-aware, goal-directed, strategic, and able to monitor and motivate their own learning, and therefore could become teachers who manage their pedagogical practices in similar fashion and may also be seen as adaptive experts at their craft.

What does the evidence say about pre-service teachers' efficacy and their academic performance? Pre-service basic school teachers arrive at their student teaching semester with established values, attitudes, and beliefs (Stoeger & Ziegler, 2008; Zimmerman, 2008; Schunk & Zimmerman, 2007). They carry with them a lifetime of experiences as learners which strongly influence the way they think about teaching and learning (Price et al., 2012; Tschannen-Moran & Woolfolk Hoy, 2007; Schunk & Zimmerman, 2007). Teaching frequently involves solving ill-structured problems which are characterized by a large amount of information, open constraints and the absence of a single correct solution (Price et al., 2012). Day (2008) and Mansfiled et al (2012) argue that the ill-structured nature of many of the challenges faced by teachers result in teachers' beliefs playing a major role in defining tasks and selecting strategies because, unlike other forms of knowledge, beliefs can be flexibly applied to new problems (Schunk, 2009). They suggest that, rather than reflective and systematic study in the course of teacher education, it seemed likely that some crucial experience or some particularly influential teacher produces a richly-detailed intermittent memory which later serves the student as an inspiration and a template for his or her own teaching practices.

Studies evaluating cross-cultural comparisons of teacher efficacy suggest that pre-service teachers in different cultures vary in the degree to which they believe themselves to be efficacious in their teaching (Lin, Gorrell, & Taylor, 2002; Lin & Gorrell, 2001; Yeung & Watkins, 2000). These studies suggested that the concept of teacher efficacy may be influenced by the unique features of cultures (Lin et al., 2002). For example, using a modified version of a teacher efficacy scale developed by Gibson and Dembo, Lin and Gorrell (2001) suggested the existence of a different factor structure compared with the original scale developed with a sample of Taiwanese pre-service teachers. They concluded that the concept of teacher efficacy may be culturally oriented and needs to be carefully examined when applied to teachers in different countries. Similarly, Lin et al (2002) examined the influence of culture and education on U.S. and Taiwan pre-service teachers' efficacy beliefs; they found that pre-service teachers in these two countries may have conceptually different expectations of teaching (e.g. parental support, social awareness, and individual efforts). They suggested that in both countries, pre-service teachers' efficacy beliefs may be influenced by the context of their academic programs, by their increasing competence and experience as teachers, and by cultural perspectives.

In this regard, it does appear that, an important component of teacher preparation programmes is the teachers' sense of efficacy. Tschannen-Moran and Woolfolk Hoy (2001) observed "teachers' sense of efficacy is an idea that neither researchers nor practitioners can afford to ignore" (p. 803). For example, in a study conducted by Bembenutty (2007), Pintrich and DeGroot (1990), self-efficacy was found to be positively related to student cognitive engagement and academic performance - Thus students who believed they were capable were more likely to report use of cognitive strategies, to be more self-regulating in terms of reporting more use of metacognitive strategies, and to persist more often at difficult or uninteresting tasks. However, in Pintrich and DeGroot's study, self-efficacy was not significantly related to performance when cognitive engagement variables were included in the regression analyses. Which suggested that self-efficacy plays a facilitative role in relation to cognitive engagement as posits by Schunk (2005), but that cognitive engagement variables are more directly tied to actual performance. This means that teaching students different cognitive and self-

regulatory strategies may be important for improving actual performance on classroom academic tasks, but that improving students' self-efficacy beliefs may lead to more use of these cognitive strategies (Dottin, 2009; Zimmerman, 2009; Duckworth et al., 2009; Burant et al., 2007; Schunk, 2005).

However, little is known about the relationship between pre-service teachers' self-efficacy and their academic performance. Studies on teacher training seem to have concentrated on curriculum and pre-service teachers' acquisition of pedagogical and content knowledge and on teaching and learning in schools, but as Day (2007) puts it "what marks teachers out as good as or better than good is more than their mastery of content knowledge and pedagogical skills. It is their passion for their teaching; their students and for their learning" (p. 1) and for that matter their confidence in their ability to learn whatever they are taught in college, which makes it necessary to investigate the extent to which pre-service teachers possess these self-efficacious attributes and their application in their learning while in college and the eventual transfer of the developed skills to practice.

Research shows that students who were more cognitively engaged in trying to learn by using coping strategies and transforming task materials through the use of elaboration, rehearsal and organisation performed better than students who did not use such strategies – thus, students who are high in their overall use of self-regulation strategies sought help more frequently from peers, teachers, and parents and learned more than students who do not seek help (Stoeger & Ziegler, 2008; Zimmerman, 2008; Pintrich et al., 1993). Increases in students' level of SRL in personally managed contexts, such as when at home or in the library, are linked to improvements in their overall academic achievement (Zimmerman, 2008; Azevedo & Cromley, 2004; Azevedo, Cromley, & Siebert, 2004). A self-regulation strategy measure also predicted students' academic grades and their teacher's ratings of their proactive efforts to learn in class (Zimmerman, 2008). Intrinsic value relates to strategy use and regulation, independent of initial (prior) performance levels or self-efficacy and test anxiety and cognitive variables were found to be better predictors of academic performance (Stoeger & Ziegler, 2008; Zimmerman, 2008; Pintrich & DeGroot, 1990).

In recent study, Greene and Azevedo (2007) found that SRL strategies were significant predictors of the quality of the students' mental model. A study by Schmitz and Wiese (2006) of a sample of civil engineering students at a German university revealed that students who received self-regulatory training displayed significant improvements in the following questionnaire measures: intrinsic studying motivation, self-efficacy, effort, attention, self-motivation, handling distractions, time management, planning and concentration, and procrastination. Students in the control group displayed increases in only self-motivation (i.e., setting self-rewards and arranging a supportive environment) during the study. As Zimmerman (2008) points out, even though this study did not comprise of methods of academic performance, it indicated that college students who were given training in SRL processes were effective in reaching their study goals.

In another research study, Stoeger and Ziegler (2008) used an experimental research design in studying how teachers can structure their regular classroom assignments to convey SRL processes. These researchers trained teachers of fourth-grade students to implement SRL processes during mathematical instruction according to a cyclical model (Zimmerman, 2008; Pintrich, 2004). The results showed that students in the training group reported significantly greater increases in time management skill and self-reflection on their learning than those in the control group. Students in the self-regulation training condition also displayed increases in several measures of motivation. Their willingness to exert effort (Perry, Vandekamp, Mercer, & Nordby, 2002), their task interest, their learning-goal orientation, and their perceptions of self-efficacy all increased after training, and their feelings of vulnerability (Schunk & Zimmerman, 2007) dropped significantly. Students in the self-regulation training group showed significantly greater gains in mathematics achievement than students in the control group. Interestingly, all students in the self-regulation training group passed an entrance examination for admittance to a higher level school, which was an increase of 50% compared to past cohort groups of students (Zimmerman, 2008, p. 175). These results therefore suggest that teachers can implement SRL processes in their classroom practice.

Generally, it is expected that, the more that sense of efficacy among pre-service teachers, the better they can sustain motivation and engage in self-regulation. Without confidence,

pre-service teachers are most likely to perform poorly in the courses that they study in their teacher training programme. But expectation alone is not likely to produce the needed outcome that the pre-service teacher is required to produce at the end of his or her three years of training. As Schunk and Ertmer (2000) argue, teaching a strategy does not serve as an assurance that students will continue to use it, especially if they believe that the strategy is not as significant for success as other personal and environmental factors. One barrier to the uptake of taught learning strategies may be a lack of self-efficacy: if students do not believe they are capable of learning, they will not feel that applying particular strategies will help them (Duckworth et al., 2009).

Teaching teachers facts and rigid decision making models is less effective than nurturing within teachers the capacity and skills to deal with the difficult problems of the real world. It is ironic that teachers are often taught with pedagogical methods that are contrary to the principles that they are being taught, such as direct instruction on problem-based learning or cooperative learning. Experts advocate that teachers should be given the same contexts, challenges, and choices that are beneficial for students (Corno, 2009). In the light of these, teacher preparation programmes need to be tailored around not only teachers' knowledge of their content area, ability to pass national tests, and classroom management skills, but to an examination of their beliefs, motivation, and self-regulatory factors associated with teaching and learning (Avalos, 2011; Zimmerman & Schunk, 2009; Duckworth et al., 2009; Dottin, 2009; Bembenutty, 2007; Randi, 2004; Dembo, 2001).

There is a positive overall relationship between self-regulation and academic achievement. This thus implies that students with more adaptive personal skills and learning resources are more likely to succeed academically (Moos & Ringdal, 2012; Zimmerman, 2008; Duncan et al., 2007; McClelland et al., 2000). This means that in the teacher training context, tutors should not only provide more instruction but also by providing immediate corrective feedback, lesson planning, ensuring an orderly classroom, providing clear learning objectives for progression from simple to more complex concepts, the use of practice and repetition thus strengthening learner motivation and ensuring learners are aware of the significance of the subject matter.

The emphasis should be on hands-on learning, with the teacher helping to make connections between the facts and fostering a new understanding in the student. It is the learner rather than the teacher who must be at the centre in the learning approach. While it undeniable the fact that self-regulation can improve academic achievement among students especially in elementary schools, little is known about how higher education students in general and teacher trainees in particular, self-regulate their learning. It is evident that research (e.g. Moos & Ringdal, 2012; Avalos, 2011; Bembenutty, 2007) supports the value of reflective practice that is appropriate to enhance learning and perspectives of the individual child. It therefore seems worth examining the extent to which pre-service teachers self-regulate their learning when in college.

In summary, self-regulation comes to view as an important characteristic of teacher learners since they need to acquire strategies that are most likely to prepare them to be able to learn from their own practice, as well as insights of other teachers and researchers whilst in college and on the field. Literature on academic self-regulation has shown that, successful learners exercise behavioural control to not only choose or plan valuable academic tasks, but also to maintain motivation and intention in the light of distracting alternatives. Empirical studies have found that pro-activeness in learning such as setting appropriate goals; self-motivation and persistence in achieving task completion are all essential, and they work in tandem for performance outcomes. Thus, students' self-regulation of learning involve the use of a variety of learning strategies (e.g., organising, self-evaluation, elaboration) to achieve specific learning targets. Consequently, teacher educators and researchers believe that teachers' capacity to support learners who are self-regulated through learning is tied to teachers' own self-regulation.

However, a thorough review of literature has shown that most of the researches on teacher quality do not seek to capture interactions among the multiple dimensions of teacher quality and effectiveness, and as result, there are major gaps in the research that need to be explored. In instances where teacher quality and characteristics are explored, many of the measures used are not clear as to what variables define the concepts they do assess and the inferences they make are usually not based on any clearly defined purpose. For example, for those studies that focused on teachers' certification, only the

qualification grade such as pass or fail; professional or non-professional variable was used in modelling the effect on students' achievement gains. It therefore makes sense to turn to approaches that would yield evidence on "which teacher attributes are related to teacher effectiveness in order to guide policy decisions about hiring, compensation, and distribution with respect to teachers" (Rice, 2003, p. 4). This study is therefore aimed at using mixed methods procedures to capture interactions among the multiple dimensions of pre-service teachers' self-regulation and how it impacts on their academic achievement in colleges of education.

CHAPTER 3: METHODOLOGY AND DESIGN

3.1 Overview

This study examined pre-service teachers' motivational orientations and cognitive strategy use in professional training environment and how that impact on their academic performance in residential colleges of education in Ghana. The 500 respondents were selected through a multistage sampling process.

This study had three main purposes:

1. To examine the relationships between the motivational orientations, gender, programme-majors and self-regulated learning strategies of pre-service teachers in Colleges of Education.
2. To determine how prior attainment, motivation and self-regulated learning components may operate independently or jointly to influence pre-service teachers' academic performance.
3. To explore the contributory factors of beliefs and values that lay behind some pre-service teachers' motivational orientations.

This study examined four research questions and one hypothesis:

1. What are the most prevailing motivational and self-regulation learning strategies among pre-service teachers in the colleges of education in Ghana?
2. How are the motivational components related to the components of self-regulated learning strategies?
3. What self-regulated learning strategies are related to gender, students' programme-majors and academic performance?
4. How do dispositional beliefs and values manifest among pre-service teachers?

H_0: There is no mediating effect of self-regulation learning on the relationship between prior academic performance and academic achievement of pre-service teachers in colleges of education.

In this section, I will address the reason(s) why mixed methods design was selected for this study; the nature of mixed methods research and how it fits in solving the research problems posed. The chapter also addressed issues concerning the researcher's beliefs and role, selection procedures, setting of the research and colleges in this study, ethical issues, data collection procedures, data quality procedures and management and analysis.

3.2 Research Design in Practice

In this era of teacher professional practice, teachers need to be analytical and reflective about their own beliefs and practices and that they must gain a deep understanding of cognitive/metacognitive and motivational values of learning and teaching in order to be successful. The disposition of self-regulation (i.e., awareness of thinking, strategy use and situated motivation) is therefore paramount in teacher development and training through initial teacher education. These characteristics of autonomous learning need to be constructed and experienced by student teachers, and for pre-service teachers to nurture the same development in their students, they need to discuss among themselves, their tutors and others for a better understanding. Teacher dispositions and for that matter teacher self-regulation has been variously been defines to include the values, attitudes, and beliefs about principles and procedures of learning, children, subject matter, and the skills of teaching that cause teachers actions to be judged as positive or negative (Englehart et al., 2012). In teaching, keeping with sound professional judgment seem to suggest having the necessary knowledge and skills, that is, the ability to act and be reflexive.

However, knowledge, insights and professional reflections are generative; as Dottin (2009) points out, "having the ability to act (the knowledge and skills) does not guarantee the inclination to do so" (p. 84). Others (see Englehart et al., 2012; Diez, 2007; Hammerness, et al., 2005) are of the view that even though pre-service teachers may know the appropriate actions and best practices of learning what is taught them during their professional training in colleges, they may fail to implement them because of lack of self-regulation. Therefore, there is the need to assess how pre-service teachers engage in academic and professional work as well as examine their motivational orientations, values and beliefs in a holistic manner. However, as a result of the broader nature of the

construct, it is difficult to define self-regulation in order to offer a working connection between professional reflection/judgement and dispositional beliefs of teacher trainees, which poses as a major threat to construct validity.

Also, it is clear from the literature that researchers and educators are just beginning to contend with the definitional, philosophical and assessment aspects of pre-service teachers' self-regulation (Dottin, 2009) and that little has been done in terms of research to clearly situate how pre-service teachers develop self-regulatory behaviours and how that has impacted on their academic performance. This is probably so, because teacher professional learning is perceived to be complex and multifaceted process (Avalos, 2011), that entails both the affect and cognitive engagement of teachers jointly or independently and the ability to willingly scrutinize the positions of individual or group convictions and beliefs so as to enact the appropriate alternatives either for enhancement or total transformation (Avalos, 2011; Darling-Hammond & Bransford, 2005; Ross et al., 2003). As composite construct, self-regulation is made up of six latent factors that come together to form the motivational component (i.e., task value, self-efficacy for learning, control of learning beliefs, the affect, intrinsic and extrinsic orientations), and nine latent constructs, which together form the cognitive strategy use component (i.e., metacognitive strategy use, critical thinking, rehearsal, peer learning, help seeking, elaboration, effort regulation, organization and time and study environment management). In this case, a major issue associated with methodology is in relation to coverage of the various parts of the construct and the choice of procedures so as to achieve trustworthiness of results from such studies and therefore, as Ross et al. (2003) point out, most of the present models of self-regulated learning are theoretical in nature.

Again a synthesis of the studies of SRL reviewed in this study indicates that learning involves an interaction between personal factors such as prior academic performance and motivations. There are interactions between contextual factors such as tasks demands and value, assessment systems, teaching and learning strategies and available resources. The review further revealed that learning involves the management of ends (such as achievement outcomes) and metacognition as well as the implementation of motivational and cognitive learning strategies suitable to the demands of the task at hand (Englehart et

al., 2012; Guo et al., 2011; Zimmerman, 2008; Ross et al., 2003), and so as Zimmerman (2008) suggests, there should be an innovative ways of researching SRL. Examining SRL as a means of lived experiences and beliefs that occur in a social and authentic contexts means research design should be able to capture the possible limitations in the assessment of the observed aspects of self-regulated learning through catalytic tasks (self-reports), and since self-reports alone for example would not be able to assess in totality students' self-regulated processes in personally managed contexts and as well as how pre-service teachers develop their SRL through social processes there is the need for narratives.

As Boekaerts cited in Ross et al., (2003) point out, only by studying students' cognitions, feelings and behaviour in context, will person-environment transaction units that form the basis for self-regulated learning be allowed to surface (p. 191) and that narrative accounts could serve to unveil the role of emotions in change. This contextually connected information is particularly valuable when "diagnosing and remediating self-regulatory dysfunctions" (Zimmerman, 2008, p. 181). For instance, a teacher trainee who reports knowing a strategy on an SRL ability questionnaire may not know how to adapt it to work in a particular academic context. At its heart, SRL involves a dynamic feedback loop (Butler & Winne cited in Zimmerman, 2008; Hattie & Timperley, 2007), and qualitative measures can capture subtle changes in motivation and functioning during each learning cycle (Zimmerman, 2008, p. 181). Notwithstanding, studies in relation to SRL and how teachers learn (see Bembennuty, 2007) often miss out on the social-contextual factors that are central to self-regulation learning in that, they mostly employ the use of mono-methods.

Researchers (Prestridge, 2010; Hou, Sung, & Chang 2009; Borko, Jacobs, Eiteljorg & Pittman, 2008) have used discourse and content analysis to study the use of classroom video for teaching and learning to assess the uses of technology in professional training and development. In another example, an article by Schussler et al. (2007) suggests that a model - hypertextual function be used in studying teachers' thinking, practice and development in the use of technology in teaching and learning. The complexities of the SRL construct are often modelled somewhat metaphorically, with little ecologically valid research into learning in pre-service teacher education context. There is the need to

emphasize reflection as an instrument of change in teacher education discourse and one way of achieving that is the use of narrative analysis in conjunction with survey methods to bring out how pre-service teachers develop their metacognitive abilities and motivational orientations. Yet, few studies have been conducted to ascertain how the various facets of the construct interact to influence academic achievement in professional training context. There is therefore the need to study SRL in teacher education context from different perspectives or SRL looked at with different lenses at the same time so as to providing valuable original evidence regarding the causal impact of SRL processes on academic performance among pre-service teachers, as well as raising new questions for future study.

The need for a general systematic approach for research on student motivation, and the utility of multidisciplinary perspectives in research on motivation and learning cannot be overemphasized. Studies have consistently shown that the use of single methods in examining a composite construct like SRL is not effective. I could assume that a well administered survey would be able to capture the complexities and richness of students' motivation and strategy use; however, some concealed responses could have been missed or misinterpreted had I chosen not to interact with some of the participants in person. For example, in this study, I used the survey instrument to gather data to answer questions that demanded quantitative data analyses about the connectedness of students' cognitive strategy use and motivation, which was straight forward. Nonetheless, I would not have been able to get insights into like factors that influenced students' choice of colleges of education for their higher education and for that matter, the teaching profession as a career. In considering the different levels of the investigation, the purpose of the study is to gain insights of "the intimate connectedness" between "wider contexts and conceptualization" and the "merely particular" (Webster, 2005, p. 453). This is oriented towards Englehart et al.'s (2012) study from which they concluded that, with their findings from a mixed methods approach, there is the potential for systematic objective measurement (quantitative data) of teacher inclinations and habits of mind combined with qualitative data analysis techniques (personal narratives) in studying self-regulation to inform and improve practice.

In this study I employ mixed method design which cuts across one single procedure or philosophy – thus, making use of different philosophical underpinnings for different research questions and hypotheses (see Creswell & Plano Clark, 2011; Onwuegbuzie & Leech, 2005). I employ MMR design that mixes top-down deductive and bottom-up inductive processes in investigating pre-service teachers motivation and self-regulation learning in Ghanaian colleges of education, using both confirmatory and exploratory research questions in a search for relationships between motivation and learning strategy use by way of correlational survey; the processes that underlie these relationships, and the context of these occurrences through narrative analysis (Flick, 2014; Squire, 2008). It involves as many diverse data collection and analysis procedures as I think of appropriate procedures that will result in thorough integrated findings and inferences about self-regulation and academic performance among pre-service teachers (Creswell & Plano Clark, 2011; Johnson et al., 2007). I do this with the hope that, these inductively and deductively based findings and inferences could produce another sequence of research as the SRL phenomenon under study is explored at deeper levels of understanding compared to hitherto, single method approaches to the study of SRL.

3.3 Nature of Mixed Methods Research

3.3.1 Defining Mixed Methods Research

Mixed method research (MMR) has variously been defined by different writers on the subject. Using a blend of qualitative and quantitative data is research studies dates back to the 20th century when researchers and methodologists in social and behavioral or human sciences (see for example, Glaser & Strauss, 1967; Campbell & Fiske, 1959; Hollingshead, 1949; Lynd & Lynd, 1929/1959) started using it. Even though they did not identify their approaches as mixed methods until many years later, they believed that qualitative and quantitative perspectives and approaches were important and useful as they addressed their research questions (Johnson et al., 2007, p. 113). The early researchers' ideas of using both qualitative and quantitative methods in a study were extended by Webb, Campbell, Schwartz and Sechrest (1966) when they defined multiple operationalism as representing the use of several procedures that "are hypothesized to

share in the theoretically relevant components but have different patterns of irrelevant components" (p. 3). As cited in Johnson et al. (2007), Webb et al. stated that:

> Once a proposition has been confirmed by two or more independent measurement processes, the uncertainty of its interpretation is greatly reduced. The most persuasive evidence comes through a triangulation of measurement processes. If a proposition can survive the onslaught of a series of imperfect measures, with all their irrelevant error, confidence should be placed in it. Of course, this confidence is increased by minimizing error in each instrument and by a reasonable belief in the different and divergent effects of the sources of error (p. 3).

Based on these ideas and standpoints, Greene, Caracelli and Graham (1989) assert that using MMR involves the mixing of methods with at least one quantitative and one qualitative method, albeit, their definition gloss over the essence of philosophical and theoretical components in research methodology. To fill this void, Johnson and Onwuegbuzie (2004) defined mixed methods research "as the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or languages into a single study" (p. 17). Johnson, Onwuegbuzie and Turner (2007) in a study which sampled the views of 36 authorities (i.e., 31 leading mixed methods research methodologists and 5 additional leaders, p. 118) in the field of MMR. Based on the responses of 19 of their sample, concluded that MMR "… combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purpose of breadth and depth of understanding and corroboration" (p. 123). Similarly, Creswell and Plano Clark (2007) stated that:

> Mixed methods research is a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis and the mixture of qualitative and quantitative approaches in many phases of the research process. As a method, it focuses on

> collecting, analysing, and mixing either quantitative and qualitative data in a single or series of studies. Its central premise is that the use of quantitative and qualitative approaches, in combination, provides a better understanding of research problems than either approach alone (p. 5).

Even though, these definitions and proponents of MMR have expanded their definitions to cover philosophies undergirding the use of MMR and position it as third methodological or research paradigm along with qualitative and quantitative research (Johnson et al., 2007; Johnson & Onwuegbuzie, 2004), MMR still reinforces restrictions in research by grounding itself on the quantitative and qualitative research paradigms that makes it a wobbling position to take when considering MMR as the third methodological or research movement (Teddlie & Tashakkori, 2010; Johnson et al., 2007; Johnson & Onwuegbuzie, 2004). According to Johnson and Onwuegbuzie (2004), this movement is proposed with the aim of moving past the paradigm wars between QUAL-QUAN purists, by offering what they termed as "logical and practical alternative" (p. 17) and thus to make it a standalone approach which is different from both quantitative and qualitative research and as well get its own terminologies. As Teddlie and Tashakkori (2010) put it this single paradigm stance (Teddlie & Tashakkori, 2003; Johnson & Onwuegbuzie, 2004) was primarily formulated to provide a philosophical foundation for MMR in the same manner that constructivism did for qualitative methods and post-positivism did for quantitative methods.

However, there seem to be an inherent contradiction when proponents suggest the goal of mixed methods research as not to replace either of qualitative or quantitative approaches but rather to draw from the strengths and minimise the weaknesses of both (Teddlie & Tashakkori, 2009) in single research studies and across studies and to legitimize the use of multiple methods in solving research problems and answering research, rather than limiting or constraining one's choices of methodology (Teddlie & Tashakkori, 2010; Creswell & Plano Clark, 2007; Johnson et al., 2007; Johnson & Onwuegbuzie, 2004). On terminology, for example, the dilemma continues as various terms are used - "trustworthiness" for "authenticity" (Lincoln & Guba, 1985), and "legitimation" instead of "validity" (Onwuegbuzie & Johnson, 2006; Johnson & Onwuegbuzie, 2004);

"inference transferability" instead of "inference" or "transferability" alone (Teddlie & Tashakkori, 2009, p. 311); "qualitising" for "quantitative data" "quantitising" instead of "quantitative data" (Teddlie & Tashakkori, 2010; Teddlie & Tashakkori, 2003) and sometimes "qualiquantology" (Stenner & Rogers, 2004) instead of "mixed methods," for the word "methods" cannot appropriately characterize what is really going on in the mixture – it is more than the mixing of methods. The vocabulary is likely to grow as MMR become more robust and many more practitioners systematically use it in various studies.

Again, the definitions as provided by scholars who practice MMR do not clearly delineate how the mixing of methods or paradigms could be done and that leaves room for much contentions on how well the method could be described as a standalone or a third paradigm. In most definitions, MMR seem to be premised on the fact that combining the two existing paradigms is better than using only one (Johnson & Onwuegbuzie, 2004). This is done without contemplating on the "whys" and the "hows" of the barriers between quantitative and qualitative methods are there, and of what advantage there may be in violating these assumptions. This has led to questioning questions about the validity of the assumptions that are adduced and carried out by mixed methods (Symonds & Gorard, 2010).

Symonds and colleague further assert that definitions of MMR further accentuate the usefulness and polarisation of research methods by the two traditional paradigms, which Stephen Gorard believes should be done away with entirely, because issues such as the process of selecting cases – sampling; sample size - the number of cases, and the relationship between researcher and subjects do not always accurately reflect what happens in actual practice (2010, p. 245). Symonds and Gorard (2010) made a suggestion for researchers to stop in trying to encourage a certain type of excellence through the creation of overarching groupings and researcher identities, and focus rather on the quality of our actual research techniques, the resulting data and on how that data is used (p. 131). By this position, Gorard (2007) suggested that mixed methods itself could refer to any research which purposefully incorporates various techniques to accomplish a final set of data, whilst 'multiple methods' can be used for studies that use more than one

method and report the results of these separately. This use of terms better describes actual research practices and moves us closer to identifying the "universal underlying logic to all research" that leaves "little or no place for paradigms" (p. 3).

Nevertheless, Teddlie and Tashakkori (2010) have addressed some of the pressing issues revolving round the definition of MMR and mixed methods by stating that the methodology of mixed research could be viewed as the broad inquiry logic that guides the selection of specific methods. In line with this point, Teddlie and Tashakkori (2010) and Creswell and Plano Clark (2011) have reckoned some attributes of MMR. They contend that MMR should be driven by research questions and features a more exotic mix of methods by crossing traditional methodological precincts in finding answers to research problems and advancing our knowledge on particular situations through research questions. In agreement with this position, Teddlie and Tashakkori (2010) suggest that, research questions should be explored through a synergistic process often referred to as *mutual illumination* (Simmonds, 2010 cited in Teddlie &Tashakkori, 2010, p. 16, italics in original). Once more, and based on Morgan's (2007, pp. 50-54) conceptualisation of paradigm as: worldviews - ways of perceiving and experiencing the world; epistemological positions, which he called the metaphysical paradigm, which in his analysis is composed of the tripartite linkage of ontology, epistemology, and methodology; model examples (i.e., exemplars indicative of how research is conducted in a field of study); "shared beliefs among a community of researchers" (Morgan, 2007, p. 53) about the nature of questions, the methods of study, and the interpretation of data. This has led to practitioners perceiving MMR as "community of scholars" (see Creswell & Plano Clark, 2011; Creswell, 2010; Teddlie & Tashakkori, 2010; Tashakkori & Creswell, 2008).

Howbeit, proponents talk of principles governing the conduct of MMR as eclectic (Johnson et al., 2007; Johnson & Onwuegbuzie, 2004), and welcoming all legitimate methodological tradition (Greene 2005, p. 207) and involve the use of both a "top-down" approach - in which research is driven by the conceptual or philosophical orientation of the researcher, and a "bottom-up" approach - in which research questions and methods related to those questions that direct the research process (Teddlie & Tashakkori, 2010, p.

19). In defining MMR, we need to position and discuss the basic structural and process elements of research to bring about independence (Symonds & Gorard, 2010), which is essential to help researchers attain power in their studies and to render their research findings more valid than otherwise. However, definitions themselves do not push people to use a methodology, let alone the fact that there is currently no "canonisation" of a mixed methods design (Kelle, 2006, cited in Creswell & Plano Clark, 2011, p. 280) due to the varied conceptual positions common to mixed methods practitioners (Teddlie & Tashakkori, 2010). Instead, the definition should function as a guiding framework against which researchers can better weigh alternative design options and justify their decisions under specific circumstances (p. 60).

What is more, mixed methodologists have made considerable growth in conceptualising how multidimensional research can be constructed effectively and the design that could be used to get the most out of studies that involve composite variables like self-regulation learning. According to Teddlie and Tashakkori (2010), mixed methods designs should have overarching question that potentially requires a structured quantitative approach *and* an emergent and holistic qualitative type of approach. The importance of such a question is that it may be broken into sub-questions, each needing a different (QUAL or QUAN) method to answer (p. 18, italic in original). I therefore, treat MMR as a research design in this study following Punch's (2009) definition of a research design as the blue print for a study that consists of four key constituents: "the strategy, the conceptual framework, the question of who or what will be studied, and the tools to be used for collecting and analysing empirical materials" (pp. 211-212).

However, there are many positions from which one can engage with MMR as both a research methodology and a design, ranging from concurrent mixed-method design, where inferences from each approach are drawn together at the end of the study (Teddlie & Tashakkori, 2010; Symonds & Gorard, 2010; Creswell, 2003), with dominant quantitative or qualitative analyses (Johnson & Onwuegbuzie, 2004) through to fully integrated sequential mixed-method design, where methods and inferences from both methods are combined consistently throughout the study (Teddlie & Tashakkori, 2010; Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2003). A characteristic of the

current study is the dominant quantitative (Johnson et al., 2007, p. 123) to the study of pre-service teachers' self-regulation and academic achievement. I made use of self-reports and extant data in studying the interactions of prior academic performance, self-regulation learning and academic achievement, still recognising the importance of the contributory factors of beliefs and values that lay behind pre-service teachers' motivational orientations.

3.3.2 A Look at the Quantitative-Qualitative Dichotomy

Generally, divisions between researchers exist in the form of the quantitative or qualitative argument. Literature has it that, since the 1960s, social science researchers have been betrothed in open debate of which some writers often refer to it as "paradigm war" (Schwandt, 2006; Johnson & Onwuegbuzie, 2004, p. 14) over which of these two methodologies is the most suitable representation of reality (Symonds & Gorard, 2010). According to Johnson and Onwuegbuzie (2004), these ardent debates have led to a creation of quantitative purists (e.g., Maxwell & Delaney, 2004; Shadish, Cook, & Campbell, 2002) and qualitative purists (e.g., Guba, 1990; Denzin & Lincoln, 2005) which is reminiscent of Western ways of knowing which is often based on philosophical dualisms (Johnson & Gray, 2010), that is, Plato's universal truths or approaches to viewing the world and Sophists' multiple or relative truths (Johnson et al., 2007, p. 113). For example, this dichotomy in reasoning is also expressive in research as deductive (reasoning from the more general to the more specific) versus inductive (reasoning from specific observations to broader generalizations and theories); empiricism (learning through experience) versus rationalism (learning through reasoning); absolutism (there are unchanging laws governing the world) versus relativism (true knowledge varies across person, time, and place). In research methodology, those who take the purists stance (see Greene, 2007; Rossman & Wilson, 1985) contend that paradigms (e.g., constructivism or interpretivism and positivism or postpositivism) play the leading role in determining how researches are conducted (Teddlie & Tashakkori, 2010). To this end, I describe briefly the concepts of quantitative and qualitative paradigms or world views.

Quantitative purists espouse assumptions that are usually attributed to the positivist philosophy. That is, they believe that objectivity must be the key driver of social science

inquiries. One fundamental root of this idea is that ‘measurement enables us to transcend our subjectivity’ (Bradley & Shaefer, 1998 cited in Symonds & Gorard, 2010, p. 123). Positivism rejects metaphysics and holds the idea that the objective of knowledge is basically to describe the phenomena that we experience. They contend that social observations should be considered as entities in much the same way that physical scientists treat physical phenomena and that we must stick to what we can observe and measure (Johnson & Onwuegbuzie, 2004). The quantitative purist views science as the way to get at truth and to comprehend the world adequately so that we may control and predict it. The world and the universe are seen as deterministic, and that they are controlled by laws of cause and effect that we could discern if we apply the irreplaceable approach of the scientific method (Teddlie & Tashakkori, 2010; Greene, 2007; Onwuegbuzie & Leech, 2005).

In terms of educational research, believers of this philosophical position assert that research should be conducted devoid of personal biases, remain emotionally separated from the objects of study, and test or empirically justify their stated hypotheses (Johnson & Onwuegbuzie, 2004). By this, some researchers laud the idea of employing quantitative methods to researching issues in education in order to quantify and bring to light the scale of complex issues such as learning and motivation, which small scale studies cannot show. In this connection, Letherby (2003) also argues that multivariate statistical analyses of large data sets can provide the most truly contextual analyses of people’s experience because they allow the incorporation of a large number of variables, allowing the concurrent testing of intricate and complex theoretical models. She thus counters the argument that quantitative methods may never offer the kind of richly surfaced sensation for the data that qualitative methods yield.

On the other hand, qualitative purists contend that constructivism and relativism are better than positivism. They believe that constructivism must play a leading role in how research is conducted (see Teddlie & Tashakkori, 2010; Guba & Lincoln, 2005). According to Denzin and Lincoln (2005), qualitative research developed largely from anthropological ethnographic studies with observation, interview and in-depth investigations as its methods (Symonds & Gorard, 2010; Creswell, 2009). These

techniques are held by some to be ‘more faithful to the social world than quantitative ones’ (Gergen & Gergen, 2000, p. 1027) in that they depict social reality and allow for data to arise more freely from natural context (Symonds & Gorard, 2010; McNeill & Chapman, 2005; Miller & Fox, 2004) and that qualitative techniques are necessarily hermeneutic (Johnson & Onwuegbuzie, 2004).

Quantitative purists (e.g., Rossman & Rallis, 2003; Lincoln & Guba, 2000; Schwandt, 2000; Smith, 1984) contend that there are a lot of multiple constructed realisms and that generalisations independent of time and context are neither necessary nor feasible because individuals seek out meaning and comprehend the world in which they live and work. They form personal meanings of their experiences - meanings focused on certain objects or things. These meanings are multifaceted that direct the researcher to search for the complexity of views rather than narrowing values of variables into a few sets of ideas (Creswell, 2009). Interpretivists therefore advocate that the main aim of research should as much as possible, focus on the participants' views of the situation being studied (Creswell, 2009). Rhetorically, those who believe in qualitative research approaches tend to dislike the passive style of writing about knowledge and reportage of research findings, preferring what Johnson and Onwuegbuzie (2004) called “detailed, rich, and thick (empathic) description, written directly and somewhat informally” (p. 14, emphasis in original).

This ontological dualism is so pervasive that, for purists, the assumptions associated with both paradigms are incompatible regarding how the world is viewed. For example, Snow cited in Xiao (2013), noted that, in natural and literary sciences, the distinction is so immense that they habitually hold biased perceptions of each other – thus, anti-positivists/-post-positivists usually regard those with science orientation as shallowly optimistic; whereas scientists view literary intellectuals or interpretivists as lacking foresight. “There seems then to be no place where the cultures meet” (p. 17). Yes, I do agree with Snow, and even this position has been articulated more strongly by some purists to which some writers often refer to as the “*incompatibility thesis”* (Howe, 1988, cited in Johnson & Onwuegbuzie, 2004, p. 14, italics in original).

Researchers who favour naturalistic inquiry (e.g., see Guba & Lincoln, 2005; Denzin & Lincoln, 1994) and those who prefer reductionist approach might assume that they have nothing to share, even if they have very similar motivations; are driven by the same assumptions, and are both associated with knowledge creation (Biesta, 2010, pp. 98-99). They posit that quantitative and qualitative research paradigms and methodologies cannot and must not be mixed (Onwuegbuzie & Leech, 2005; Johnson & Onwuegbuzie, 2004), but to Snow, the perceived inharmonious borders can be exactly where the two philosophies can connect to each other in attaining common goals. And this is what Johnson and Gray (2010) think is the central precept of MMR, for research community need both quantitative and qualitative "shared beliefs" (Morgan, 2007, p. 50) as important and useful tools (Johnson & Onwuegbuzie, 2004).

In social science research, these positions have been the bane on researchers; sometimes putting them in a quandary as to what position they should take for the acceptance of their research. This is probably so, because according to Green and Preston (2005), Johnson and Onwuegbuzie (2004), researchers have to pledge allegiance to one paradigm or another as affiliations are still often exhibited by university faculties, journals and funding bodies, thus 'institutionalising' the divide (Symonds & Gorard, 2010). In any case, researchers who ascribe to epistemological purity disregard the fact that research methodologies are merely tools that are designed to aid our understanding of the world (Onwuegbuzie & Leech, 2005). However, Morgan (2007) believes that, much attention has been focused on the differences between qualitative and quantitative research to the detriment of assessing what works between the two perspectives. Others (see for example, Biesta, 2010; Symonds & Gorard, 2010; Schwandt, 2007), have questioned the need for the creation of this ontological dualism. Specifically, Schwandt has taken a tougher point on the "paradigm wars," calling into question the need for the divisions or differentiation and the defining through opposition of qualitative and quantitative research. He asserts that "it is highly questionable whether such a distinction (between qualitative inquiry and quantitative inquiry) is any longer meaningful for helping us understand the purpose and means of human inquiry" (2000, p. 210). Schwandt makes the following assertions to which I associate to a large extent, that:

> All research is interpretive, and we face a multiplicity of methods that are suitable for different kinds of understandings. So the traditional means of coming to grips with one's identity as a researcher by aligning oneself with a particular set of methods (or being defined in one's department as a student of "qualitative" or "quantitative" methods) is no longer very useful. If we are to go forward, we need to get rid of that distinction (2000, p. 210).

Again, Biesta (2010) contended that the very notions of quantitative and qualitative research are challenging, in that, "research *in itself* is neither qualitative nor quantitative;" it is "*data*" that can be handled as qualitative or quantitative (p. 98, italics in original). But as Symonds and Gorard (2010) pointed out, data can be fluid and shift in form as initiated by the researcher, and is not constrained by paradigms or worldviews. Even though Gert Biesta's argument holds in contending the divisive positions taken by the qualitative-qualitative purists, we need not lose sight of the fact that the intellectual discourse about the two perspectives transcends "data", but includes among other things: philosophical assumptions, design typologies, analytical processes, and specific research methodologies (Biesta, 2010; Teddlie & Tashakkori, 2010; Creswell, 2009) for which when one accepts or rejects one component of either packages, the person is labelled bluntly in a general way as either a quantitative or qualitative researcher. In accord with Biesta's view, if what is in contention in most paradigmatic debates is not data alone, then adopting those labels without a second thought is essentially characterising approaches to research while glossing over their constructed nature and disregarding their distinctive social and historical perspectives (Greene & Hall, 2010, p. 125).

Some critics therefore have called for the abandoning of the QUAN and QUAL concepts in their entirety in research as in their view the two words do not add anything to a study. They believe that when the labels are removed, we can better scrutinise the inclination for mixes in research construction. According to Yin (2006), 'once freed from the quantitative-qualitative dichotomy, the relevance and reality of a broad variety of ''mixes'' emerges; the broad variety recognises the true diversity of the research methods used in education' (p. 42). In the same vein, some researchers are sceptical about the

divide and question, for example, if quantitative or qualitative interview exist (see for example, Gorard, 2010; Symonds & Gorard, 2010). They believe that paradigms are a sign of scientific naivety or a cultural cliché with varied meanings (see Morgan, 2007, pp. 50-54) that, it is now almost meaningless (Gorard, 2010, p. 244). To Gorard, in accord with Schwandt, both quantitative and qualitative methods "involve subjective judgements about less than perfect evidence, both involve consideration of quantity and of quality, of type and frequency" (2010, p. 248) and that positions taken by purists could be viewed as a contest to influence beliefs, including beliefs about the nature of the past (Morgan, 2007). Opponents of the Q-Words therefore suggest that researchers should rather focus on the "core" business of research practice – finding suitable approaches to solving perplexing problems. To this end, Symonds and Gorard (2010) recommended that research practitioners should rather focus on what they called the "ethological elements" (i.e., the structures that emerge from the full display of research design processes, p. 11) of the research and forget entirely about qualitative and quantitative paradigms.

These notwithstanding, others are of the opinion that, instead of discarding completely the qualitative and quantitative paradigms as suggested by Gorard and colleagues, we should focus on what is useful and important for research practice (see for example, Teddlie & Tashakkori, 2010; Creswell, 2009; Johnson et al., 2007; Johnson & Onwuegbuzie, 2004) and "frame the differences and challenges as opportunities for further learning and further conversation and further discourse" (Greene, cited in Leech, 2010, p. 262). I surmise paradigms should not be a philosophical thesis on the nature of knowledge, but as Creswell suggests, it can provide a practical grounding in some of the philosophical ideas behind research (2003, p. 3). Creswell (2009) therefore recommends that, a general framework be adopted to provide guidance about all facets of the study, from assessing the general philosophical ideas behind the inquiry to the detailed data collection and analysis procedures. He further asserts that using an extant framework also allows researchers to lodge their plans in ideas well-grounded in the literature and recognised by audiences philosophical assumptions about what constitutes knowledge claims; general procedures of research called strategies of inquiry and detailed procedures of data collection, analysis, and writing, referred to as methods. Philosophical ideas must be combined with broad approaches to research (strategies) and implemented

with specific procedures (methods). Thus, a framework is needed that combines the elements of philosophical ideas, strategies, and methods into the approaches of research (Symonds & Gorard, 2010; Leech, 2010).

Others, for example, Greene (2007) and Niglas (2007) have advocated alternative methods that could get us away from the binary logic of knowledge acquisition. Like Charles Sanders Peirce, they recommend that we perceive research process as a continuum with qualitative and quantitative methods at its ends, notwithstanding the fact that studies tend to be more quantitative or qualitative (Creswell, 2003). Johnson and Gray (2010, p. 70) think that, in so doing, we can move away from "false choices" and reflect synecticstically to help us bring together divergent perspectives in specific research designs in order to address research questions. To Dewey, human experiences serve as a way to get into the core of nature, which on the other hand responds to people and their activities. The reciprocal interaction between human and nature accordingly proposes that humans bear the consequences of their actions and learn from the outcomes so as to intelligently manipulate future actions.

Dewey asserts that an individual commands more control over his/her environment and becomes more accustomed to it. To wit, he/she learns from those tentative, realistic, experimental, and synchronised relations with nature. Teddlie and Tashakkori (2010), therefore suggest that researchers subscribe to the iterative, cyclical approach. To Ridenour and Newman (2008), the iterative process is an "interactive continuum" (p. 27) because quantitative and qualitative methods are no longer considered as dichotomous and researchers make use of all-inclusive approach in their studies where methods can be mixed and theories built and tested. This is seeing by some authors as an empowering thought as researchers are not essentially caught between quantitative (deduction) and qualitative (induction); instead, they posit "abduction", which is an innovative and iterative way of discerning about knowledge (Johnson & Gray, 2010, p. 71).

Considering these positions, some theorists (e.g., Teddlie & Tashakkori, 2010; Jonson et al., 2007; Jonson & Onwuegbuzie, 2004), have proposed mixed methods research - an approach to knowledge (theory and practice) that attempts to consider multiple

viewpoints, perspectives, positions, and standpoints (always including the standpoints of qualitative and quantitative research) with pragmatism or the 'philosophy of free choice' as the primary philosophy or the most appropriate epistemology. Mixed researchers also think of multiple realities and are referred to as "shamelessly eclectic" (Teddlie & Tashakkori, 2010, p. 16), and practitioners advocate that the future of the field (i.e., MMR) should feature increasingly interesting mixtures of methods. They favour more with qualitative researchers that human thoughts, feelings, values, emotions and dispositions are real. Like sociologists and anthropologists, they subscribe to the belief that languages (Johnson & Onwuegbuzie, 2004), institutions, and cultures (Teddlie & Tashakkori, 2009) abound and they together form human views and serve as lenses through which we form our understandings of the world.

In similar vein, they agree with quantitative researchers that there are objective realities (Johnson & Gray, 2010) that do influence both individual and societal lives (Creswell, 2009). Thus, several authors describe MMR as that integrates more advanced techniques from the qualitative and quantitative approaches, integrally mixed procedures (Teddlie & Tashakkori, 2009), and other methods purported to be exclusive to MMR (see Teddlie & Tashakkori, 2010). Thus, mixed researchers recognise subjective reality associated with individual's personal and experiential understanding of the world and objective reality, which relates to be concrete objects and cause and effect procedures. What is more, they admit inter-subjective reality such as social structures, institutions, and languages (Johnson & Gray, 2010, p. 72). As a result, they inter-connect the subjective, objective, and inter-subjective components of the world by learning from discrepancies and forming new syntheses. By that, they inter-connect the macro, meso, and micro (Xiao, 2013). Basically, admitting that there are not only different echelons, but also different of realities which then becomes an ontological principle for MMR (Johnson & Gray, 2010, p. 72).

3.3.3 Positioning MMR Philosophically

Thus far, literature on research methods have indicated that each method (i.e., qualitative and quantitative) is generally best at responding to one type of question or the other and all methods have inherent weaknesses (see Johnson & Onwuegbuzie, 2004) and that results produced from one method only are likely to be influenced by biases. In other words, we are more likely to widen the scope of a research problem if two or more methods with compensating biases are employed (Teddlie & Tashakkori, 2010; Johnson et al., 2007). Besides, it is believed that the convergence of results from different methods enhances the validity of research findings (Boekaerts & Corno, 2005). Aside this convergence argument for MMR, Zimmerman (2008) asserted that the complex nature of how students become self-regulated as learners calls for the use of MMR, and that contextually linked information is especially useful when diagnosing and remediating self-regulatory dysfunctions (p.181).

To this end, Creswell (2009) posited that an explicated understanding or more detailed accounts can be realised if the strengths of both quantitative and qualitative methods are exploited. Regarding research into SRL, when additional measures, such as interviews, are used in conjunction with trace measures, more valid conclusions can be drawn (Zimmerman, 2008, p. 171). For instance, in this study, Likert type questionnaires are used to assess the factual aspects of the SRL, whereas interviews are used to explore the motivational beliefs and values of pre-service teachers. Thus, the two approaches measure related, as well as different, aspects of the SRL phenomenon, with the hope that results from one method will exemplify, elaborate, illuminate, or support the ones from the other.

MMR advocates often place emphasis on the strengths normally associated with the integration of quantitative and qualitative methods (see for example, Morgan, 2007; Onwuegbuzie & Johnson, 2006; Onwuegbuzie & Leech, 2005; Johnson & Onwuegbuzie, 2004) and view them as independent, yet capable of being mixed through processes such as commensurability validity or legitimation, which is the examination of "the extent to which the meta-inferences made in a mixed methods study reflect a mixed worldview

based on the cognitive process of Gestalt switching and integration" (Onwuegbuzie & Johnson, 2006, p. 57). According to Bryman (2008), these rationalisations could be said to be what he referred to as "technical versions" (p. 206) of mixed methods. A version of MMR which places a greater emphasis on strengthens of the two traditional methods rather than on their weaknesses. However, Kelle and Erzberger (2004) maintain that the frontier of qualitative and quantitative research should not to be so impervious, emphasising that studies that combine quantitative and qualitative methods are often proposed at the theoretical methodological level. In their view, this is a fundamental shortcoming of these models, because "...they frequently attempt to formulate methodological rules for methodological integration without formulating a relation to any theoretical ideas about the nature of the subject area under investigation" (p. 176). Flick (2002) supports this argument, contending that, problems that arise as result of integrating quantitative and qualitative methods are yet to be adequately resolved. He views this approach of integration as problem laden, as it is constrained to the level of research design, or what Kelle and Erzberger (2004) call methodological rules for integration.

However, proponents of MMR think they have begun addressing this issue in what they have labelled the fundamental principle of mixed research (Johnson et al., 2007; Johnson & Onwuegbuzie, 2004; Johnson & Turner, 2003). They propose that when designing a mixed study, according to this "logic," the research should strategically fuse qualitative and quantitative methods, approaches, and concepts in a way that produces complementary strengths and avoid overlapping weaknesses. There should be an explicit and systematic consideration of qualitative and quantitative perspectives Johnson et al. (2007). In this way, careful consideration of the strengths and weaknesses of different approaches is required in relation to situational contingencies. Their intention is for the principle to be viewed very broadly. The principle is not limited to triangulation. To them, the "complementary strengths" component of the principle means data should be collected that will provide, if not all, most of the information that is potentially essential to the purpose(s) of the study. The complementary strengths component, for example, includes any or all of the major purposes identified by Greene et al. (1989) – thus, triangulation, expansion, complementarity, development, and initiation. Based on this,

Johnson and Gray (2010) have characterized what they consider the mixed methods position on this issue as ontological pluralism or multiple realism, which "fully acknowledges the 'realities' discussed in QUAL and in QUAN and . . . rejects singular reductionisms and dogmatisms" (p. 72).

In spite of the principles offered by Johnson and colleagues, other experts caution against unprofessional mixing of methodologies since it is possible to threaten the legitimacy and credibility of our claims, in that there are palpable grounds for some violations to occur in relation to the use of both quantitative and qualitative approaches (Morse, 2010). Morse argues that MMR is possible, but that the qualitative and quantitative components must be kept as separate as possible so that the strengths of each paradigmatic position can be realised, in that is not feasible to combine qualitative and quantitative methods in one study and comply with all the undergirding principles (see Morgan, 2007, p. 58). In agreement, Yin (2006) advises that studies should not just mix numbers with other data types, but should also be free to mix 'quantitative' methods without any qualitative method present and vice versa.

Nonetheless, some academics believe that mixing methods in a research study could be possible without having to infringe on the philosophical suppositions of either tradition. In fact, as pointed out earlier on in my writing, some have gone ahead without considering having paradigms whatsoever, but just follow what Gorard advocated, "mixed methods, in the sense of having a variety of tools in the toolbox and using them as appropriate, is the only sensible way to approach research . . . without the need to create a new paradigm" (2010, p. 247) or resort to other alternative approaches with different philosophical foundations (e.g., Biesta, 2010; Greene & Hall, 2010; Greene, 2007; Johnson & Onwuegbuzie, 2004; Maxwell & Loomis, 2003). Advocates of the compatibility thesis, contend that combining qualitative and quantitative methods is suitable in many research settings, rejecting the idea that that mixing qualitative and quantitative methods is inappropriate due to fundamental differences (incommensurability) between the paradigms; the view that "a wedding of methods is epistemologically incoherent" (Howe, cited in Teddlie & Tashakkori, 2010, p. 8).

Even though many academics who believe in MMR admit not to be solving the ontological, epistemological, axiological, aesthetic, and methodological beliefs and differences in toto, for many, MMR should be predicated on, and draw its idiosyncrasies from the pragmatic method and system of philosophy because of its ontological pluralism. For example, Morgan believes that the "pragmatic approach" as the new alternative paradigm, can both resolve the many problems caused by the metaphysical paradigm while also providing a new range of opportunities for scholars in the field of social science research methodology (2007, p. 60). To Morgan, the main drive of pragmatism is not the abstract pursuance of knowledge through "inquiry", instead, an attempt to advance knowledge in pursuance of desired ends (2007, p. 69).

Similarly, Johnson et al. (2007) posit that some form of pragmatism is viewed by most mixed methods writers as the most useful philosophical partner for MMR. In accord with Johnson and colleagues, I agree that pragmatism is a well-developed and attractive philosophy for integrating perspectives and approaches. Johnson et al. (2007) assert that pragmatism, through pragmatic epistemic values or standards provides epistemological justification and logic, thus the "use the combination of methods and ideas that helps one best frame, address, and provide tentative answers to one's research question(s) for mixing approaches and methods" (p. 125). Indeed, pragmatists ascribe to the philosophy that the research question should drive the method(s) used, believing that epistemological purity does not get research done. A pragmatic approach prompts us that our values and our politics are always a part of who we are and how we act and that we need to redirect our attention to investigating the factors that have the most impact on what we choose to study and how we choose to do so (Morgan, 2007).

A pragmatist would contend that what really matters is the research itself and not ontological positions and the debates about qualitative and quantitative methods and therefore would not accept the irreconcilability idea and would claim that research paradigms can stay separate, but they also can be mixed into another research paradigm and would be satisfied with making what Dewey called warranted assertions (Johnson et al., 2007). That is, assertions about the imports of human agencies can only be warranted in specific times and situations. But they can be important and useful in or transferred to

other circumstances and therefore take a pluralistic or eclectic position in research with the view that such a position could help researchers improve information communication and advance knowledge (Johnson & Onwuegbuzie, 2004; Maxcy, 2003).

However, there are many positions from which one can engage in MMR as both a philosophy and a research methodology. By accepting elements from multiple theoretical lenses, pragmatists may both test theories and build multiple perspectives, for they employ whatever that might work to address their research questions. It is practicality and consequence that they focus on. As Bryman puts it, it is "horses for courses," which means that courses determine the selection of horses that will run on them, or one adapts his/her methodological approach to his/her specific research problem (cited in Leech, 2010, p. 259). In view of this, pragmatic researchers are typically not restricted to a sole stance and can be both formal and informal in writing. They may collect both quantitative and qualitative data to deductively test and improve theory and inductively advance and form understandings. From the pragmatic view point, there are a wide range of theories that mixed methods researchers can consider.

For example, Rescher and Putnam cited in Johnson et al. (2007) offered what Rescher calls pragmatism of the right, where according to them "right" is not a political idea but refers to "holding a moderately strong form of realism and a weak form of pluralism" (p. 125). Rorty (see Brandom, 2000) and Maxcy (2003) offered what is called pragmatism of the left, where "left" suggests "antirealism and strong pluralism" (Johnson et al., 2007, p. 125). Then again, Johnson and colleagues argue for what they call "pragmatism of the middle" – thus when a researcher(s) operates between qualitative and quantitative approaches as an essentially useful and important viewpoint for mixed methods. This version is akin to "situationalist" (see Creswell & Plano Clark, 2011, p. 26; Onwuegbuzie & Leech, 2005, p. 376) view that both qualitative and quantitative methods are essential and could be mixed in a study by considering research questions and solves them with the appropriate methodology as I have done in this study.

3.4 Fitting Theory and Research Method in Practice

What the literature and my theoretical framework of SRL show is that SRL itself is a composite and complex synthesis of values, beliefs, and actions and cognitive strategy use. No matter what instruments are selected from the available array, investigators often realise that a combination of procedures is needed to measure SRL in any given learning context (Zimmerman, 2008) to provide greater breadth and precision than can only one instrument (Boekaerts & Corno, 2005). In the light of this, one needs to employ varied and useful approaches in examining and understanding how teacher trainees apply themselves to the use of SLR approaches during their professional training in residential colleges. I believe that combining methods of data collection and analyses allowed for the construction of more sensitive survey instrument as well as a better and broader understanding of the SRL among pre-service teachers. In the first part of the study, the main aim was to examine the breadth of interactions of students' prior academic knowledge and how they regulate their work-related knowledge and skills (i.e., the self-regulated learning components). I therefore made use of the quantitative procedures and collected quantitative data through a survey investigating psychological dimensions associated with motivational orientations and cognitive strategies. Accordingly, SRL theories guided the development of the conceptual framework of 15 fundamental constructs which then formed 5 latent variables to be explored in the study. The quantitative position adopted also influenced the selection of the students, the type of data to be collected and the analysis to be carried out.

Furthermore, the theoretical background for conceptualising teacher trainees' motivation and strategy use in colleges is an adaptation of the general SRL model or expectancy-value model of motivation which proposes that there are three motivational components (i.e., value, expectancy and affective) that may be interconnected (Sitzmann & Ely, 2012) to the two different cognitive and strategy use components (i.e., cognitive/metacognitive and resource management strategies). Due to this interconnectedness, post-positivists stance was taken to examine how these relations affect directly or indirectly, pre-service teachers' academic performance. With this at hindsight, I believe that, if I survey a larger number of students, I would be able to unearth trends, associations, construct explanatory

arguments (Johnson & Onwuegbuzie, 2004) and where applicable, predictions of students' behaviour outcomes.

Notwithstanding the strengths of the quantitative methods employed in this study, the constructs in SRL could not be explored fully as studying motivation through the use of self-reports always yield high scores without telling much beyond interrelations among constructs, hence the need to examine the contributory factors of identity, beliefs and values that lay behind pre-service teachers' motivational orientations qualitatively – narrative, a form of presenting pre-service teachers learning related life experiences (Flick, 2014). To look at the individualised accounts of experience as stories to exemplify what trainees do in building their dispositions, identity and agency, I employed narrative analysis to the interview data collected from 6 students who were selected based on the distribution of the students' cumulative grade point averages (CGPA) from two semesters. According to Flick (2014), Creswell (2009), interview or narrative procedures allow the researcher to get his/her participants involved in the study and to enter into the life courses of their participants so that we might enter into the life of the teacher trainee "more fully and be aware of its subtleties and complexities" (Walker-Gleaves, 2009, p. 56).

The qualitative methods included in this study involves individual interviews, thus, participants are described as individuals with diverse motives, experiences, and personal life stories, even though the study mainly focuses on groups of teacher trainees, to provide rich, narrative information to investigate the motivational factors that may promote or hinder the development of self-regulation learning among student teachers. To help me understand how their lived experiences framed or shaped their current dispositions and beliefs as student teachers in colleges of education. As Cole and Knowles (2001) and Goodson and Sikes (2008) argue, in narrative research, the context is critical to understanding the place of historical motivations and elucidations within the current habits of mind of a person's lived experience. The two approaches were concurrently used to bring out the best in examining self-regulation and academic achievement. The two types of data collected were concurrent but separate - that is, one is not contingent on the results of the other (Creswell & Plano Clark, 2011). Quantitative

(i.e., data from extant and survey sources) and qualitative (data from interviews) methods combinations are used to enable confirmation or corroboration of each other through triangulation; to develop analysis in order to provide richer data and combinations used to initiate new and innovative ways of thinking of SRL by attending to paradoxes (Squire et al., 2008) that arise from the two data sources. So that, the "limitations of one method can be offset by the strengths of the other method, and the combination of quantitative and qualitative data provide a more complete understanding of the research problem than either approach by itself" (Creswell & Plano Clark, 2011, p. 8).

Using mixed designs is to consider students as people with inclinations and thoughts and therefore the study required talks about issues between the researcher and students (Dellinger & Leech, 2007), rather than recording their behaviour through self-reports only. In choosing to mix both methods, I took into account the complexity of the questions and hypotheses posed in this thesis and allowed for more insightful and personalised contributions from the student teachers. I believe that this method has the advantage of creating a piece of research with valuable data from both approaches (Johnson et al., 2007; Erickan & Roth, 2006). Apart from its practicality and insightfulness, MMR design fits well with the purposes of this study. The study seeks to examine the complex interconnections among cognitive learning strategies, students' motivation and academic performance through the use of questionnaires and life histories of participants to improve the clarity and robustness of the SRL construct in teacher education and to present a parsimonious model for further research. For that matter, the convergent parallel design – which uses concurrent timing to implement the quantitative and qualitative components during the same phase of the research progression, prioritizes the methods equally, and independently keeps the aspects during analysis and then interprets the results together (see Creswell & Plano Clark, 2011, p. 77) is deemed to offer varied ways and interpretive rigour (Teddlie & Tashakkori, 2010) of looking at the SRL in teacher education context and in Ghana to contribute valuable data and evidence to professional academic practice.

3.5 The Researcher's Beliefs and Role

Researchers' beliefs are thought to have a profound influence on their field, analytical and interpretive practices. The identity of the researcher as she/he puts her/himself in various roles during the field work is very essential in ensuring the credibility (Unluer, 2012) and trustworthiness of the data collected for the study. Since I am a practicing teacher educator and a former basic school teacher, it is extremely difficult, if not impossible, to excerpt my own theoretical beliefs, biases and values, - that teaching and learning is pivoted on active co-construction of knowledge and knowing one's students' totally so as to guide them in learning how to learn. As Flick (2014, p. 158) points out, of utmost relevance is the "communicative competencies" of both the researcher and the respondents in data collection recognition. He therefore suggests that the researcher cannot assume a neutral role with the participants during data gathering. There is the need to adopt certain roles and positions, explicitly or implicitly as the sort of information you collect from the field hinges on the successful assumption of a proper role or position. In this study, I had some predetermined processes of data gathering, especially with the collection of quantitative information using the questionnaires. Still, there was some flexibility as to how I decided to approach data gathering, especially with the narrative interviews. I have tried to ensure that meaningful, well planned and ethical results were achieved for all the participants involved in this study.

Basically, within this study, identifying my role and identity was of particularly importance, since I have been working with the colleges involved on a number of issues as well as my previous professional interactions with most of the students. Before I began my studies in Durham University, I worked with the Institute of Education, University of Cape Coast, from 2007 to 2011 as a lecturer and assessment expert. I had been directly involved with some continuous professional development programmes for tutors aimed at improving teaching, learning and assessment in the teacher training institutions., and for students, especially in assessment practices and study skills improvement. I also worked with a team of researchers from my university and tutors from the colleges to conduct a study on the causes of poor academic performance among students, and introduced into

the training colleges, software designed to gather students' bio-data and continuous assessment marks for the institute of education.

Thus, I was familiar with the curricula of the colleges, research background and some of the issues under study as well as knowing some of the participants. From this point of view, I consider myself as a partial 'insider' in considering my role as a researcher in determining the problem, the purposes and research questions of the study, issues of the research design, the collection and analysis of data, ethical issues and reporting the data. Bonner and Tolhurst (2002) contend that being an insider offers the researcher a greater understanding of the culture being studied, enjoys a reputable intimacy with the subject(s) which encourages both the telling and the judging of truth, and it helps one to keep the natural flow of social interactions. In fact, I generally knew the politics of the institutions, both on formal hierarchy and how it "really works", that helped me to approach people in the best way possible. Insiders tend to have a great deal of knowledge, which takes an outsider a long time to gain (Smyth & Holian, 2008). Conversely, being labeled an insider-researcher comes it some associated challenges. For example, there are times when greater familiarity could obscure objectivity; introducing bias due to wrong assumptions of the research procedure because of the researcher's prior knowledge.

Bearing these in mind, I tried to conduct the research in a manner devoid of exploitative involvement in the study (Shacklock & Thorp, 2006). The problem is often imminent in qualitative data gathering than objectified and aggregated (quantitative data), and in my case the use of narrative interviews pose more challenges I had to look at. As Josselson (2007) points out, the crux of the ethical conundrum in narrative research derives from the fact that the narrative researcher is in a dual role: in an intimate relationship with the participant (normally initiated by the researcher) and in a professionally responsible role in the scholarly community as a researcher. In the same way, relational ethics require responsibility to the dignity, privacy, and well-being of those who are studied (Flick, 2014), and these often conflict with the scholarly obligation to accuracy, authenticity, and interpretation (Josselson, 2007).

As Smyth and Holian cited in Unluer (2012) advised:

> To conduct credible insider research, insider-researchers must constitute an explicit awareness of the possible effects of perceived bias on data collection and analysis, respect the ethical issues related to the anonymity of the organization and individual participants and consider and address the issues about the influencing researcher's insider role on coercion, compliance and access to privileged information, at each and every stage of the research (p. 2).

This I did by following formal procedures of seeking permission and administering informed consents, which have been described in detail at subsequent sections. I believe the use of mixed methods could also assuage some of the problems such as bias and misinterpretation of results through triangulation – thus by juxtaposing the results of various methods to identify the deferent aspects of the SRL phenomenon. As summed by Flick (2014):

> Triangulation means that researchers take different perspectives on an issue under study or – more generally speaking – in answering research questions. These perspectives can be substantiated by using several methods and/or in several theoretical approaches…For example, triangulation should produce knowledge on different levels, which means insights that go beyond the knowledge made possible by one approach and thus contribute to promoting *quality* in research (p. 184, italics not in original).

From how I gathered the data, I considered all the dimensions of the SRL construct, analyzed them, and presented the results in the findings. Thus, I am tried to write the thesis such that I just produced what I saw, heard, and thought of the pre-service teachers in their study (van Manen cited in Xiao, 2013), but from time to time I projected the information in the thesis with students' voices that represented their point of view rather than mine and highlighted their experiences "on their own terms and in their own words" (Stern, 2008, p. 99). In sum, my identity was considered critical in the research process

and therefore steps were taken to ensure that the data I collected was a true reflection of personal views of students and actual practices in the context of study. Results from the preliminary study informed which and how many schools were studied, what items appeared in the survey, and how samples were drawn in the main study, which are the topics of the sections that follow.

3.6 Selection Procedures

In the view of Morse (2010), one of the greatest threats to the soundness and usefulness of the interpretation of data is sampling - thus, the process of selecting participants from a population of interest in order to collect a representative, truthful and rich data about a group of people, settings, and psychosocial processes and phenomena based upon the research questions, so as to undertake a critical and in-depth analysis of the information collected and make attributions to a wider group of population. According to Collins (2010), the decisions made on sampling techniques have an impact on "the quality of the researchers' meta-inferences and the degree to which the findings can generalise or transfer to other individuals, groups, and contexts" (p. 354).

In relation to MMR, meta-inferences connote those interpretations from qualitative and quantitative results being "integrated into either a coherent whole or two distinct sets of coherent wholes" (Onwuegbuzie & Combs, 2010, p. 398). Because the study is abductive in nature, that is, since both deductive and inductive analyses of data are employed, sampling strategies for qualitative and quantitative components are different. This necessitated the application of both probability and non-probability sampling strategies in selecting the respondents for the different components of the study so as to enhance the study's credibility, dependability, confirmability and generalizability. In the same way as we select philosophical positions (paradigms) and methodologies, in the view of Collins (2010), sampling decisions mirrors the researcher's attitudes, beliefs and values as to "what constitutes credible data and what are the best mechanisms to collect data" (p. 355) and what is fitting to the study's objectives (Patton, 2002). Decisions and choices are made based on the researcher's mental models, thus, "the complex, multifaceted lens through which a social inquirer perceives and makes sense of the social world" (Greene, cited in Collins, 2010, p. 355).

In this case, the SRL concept is studied using both qualitative and quantitative data collection methods and as suggested by Morse (2003, p. 194) that methodological suppositions of each paradigm must be observed in MMR, therefore, I employed probability sampling to run the survey and non-probability (purposive) sampling techniques in selecting some respondents for an in-depth interviewing about pre-service teachers' motivational orientation and strategy use. As Rossman and Rallis (2003) and Collins (2010) put it, we describe how the setting, context and participants are selected in order to establish the sampling frame, and boundary, which refers to the individuals, cases, groups, or activities that are likely to offer the data source (i.e., either quantitative or qualitative), for a study (Collins, 2010, p. 356), and as well delineate the scope and limitations of the study (Walker-Gleaves, 2009). The sampling frame, in my case, year 1 and 2 pre-service teachers, the sample size of 500 (ten colleges of 250 students each from year 1 and year 2) were predetermined prior to fieldwork.

3.7 Setting of the Research and Colleges in this Study

The purposes of the study were to examine the relationships between the motivational orientations and self-regulated learning strategies of pre-service teachers; determine how prior attainment, gender, programme-majors, motivation and self-regulated learning components may operate independently or jointly to influence pre-service teachers' academic performance and to explore the contributory factors of beliefs and values that lay behind some pre-service teachers' motivational orientations in colleges of education. As such, the researcher selected colleges across all the regions in Ghana with the aim of getting a diverse representation of teacher trainees to providing information rich enough to facilitate the understating of the research problems. The researcher's professional background and nationality also influenced the choice of the geographical location for the study. There are 38 publicly funded colleges of which 18 offer mathematics/science or technical programme combinations and the rest, 20 offer general teaching programmes. Three privately funded colleges also offer general courses. Colleges are classified into five zones spread across the country. The geographical zones are Central/Western, Ashanti/Brong Ahafo, Volta, Northern and Eastern/Greater Accra regions. Teacher training colleges as post-secondary institutions are regarded as tertiary institutions

affiliated to the University of Cape Coast for the award of academic and professional certificates to students who complete the three-year programme (DBE).

The Ministry of Education (MoE) is responsible for the formulation of policies, as well as monitoring and evaluation, while policy implementation is the responsibility of the National Council for Tertiary Education (NCTE), Ghana Education Service (GES) and the Colleges of Education (CoE). At the core of teacher education policy in Ghana is to produce effective and competent teachers through the recruitment and training of good candidates, with good academic background as well as positive attitudes and dispositions in colleges of education. Even though candidates are selected with the demand-driven conception – that is producing teachers based on the needs of basic schools, it is believed that, if candidates are selected based on good prior academic performance, they would benefit from various training programmes and also would be able to perform worthily when posted to teach in basic schools after training (MoE, 2011). As their mission, the colleges of education are to train competent and effective school teachers who possess: a clear sense of responsibility for ensuring that learning takes place, and in this regard, the need to train an empathetic, enthusiastic, self-confident and self-motivated teacher; broad education background that will enable them function purposefully and efficiently as citizens; essential professional skills and techniques relevant in teaching to safeguard effective interaction with pupils in instruction and moral soundness and capability to serve as a role model and capabilities to use the contents of the curriculum to develop desirable personal qualities of children.

Administratively, the principal is mandated to handle the day-to-day administration of the teacher training college. The Principal is responsible to the Governing Board on matters of management and administration of the college. In terms of the implementation of policies, the Principal is responsible to the Director General of the Ghana Education Service. In most colleges, Principals have Vice-Principal(s) who assist in the area of administrative and academic and/or professional issues. Colleges adopt the committee system of organization, and the administration and management committee, with the Principal as the chair, Vice-Principal(s), and heads of departments and chairpersons of

other sub-committees as members, being the highest body in the college to consider policies and their implementations and see to the general functioning of the college.

Economically, government has been the principal financier of teacher education in Ghana, spending an estimated proportion of 25% of its entire budget on this sector with the Ministry of Finance and Economic Planning (MOFEP), the Ghana Education Fund (GETFund), the District Assemblies Common Fund (DACF), Internally Generated Funds (IGF) and Donor Contributions serving as the main sources of finance for education included the budgetary allocation. Within the late 1990s and early 2000s, the government increased funding for teacher education and also embarked on extensive policy deliberations and restructuring of teacher education to support the new educational reforms. Up until 2013, pre-service teachers were being paid allowances or stipends to serve as incentives to attract high calibre candidates to the teaching profession. However, beginning 2013/2014 academic year, students in colleges of education would no longer receive such allowances from the central government, but rather access students' loans and grants which they would pay back after training.

Entrance to post-secondary teacher training institutions in Ghana is mainly based on stated minimum requirements. As an entry requirement, candidates for colleges of education need aggregate 36 or lower in six subjects at the West African School Certificate Examinations (WASSCE). The six subjects should include credit passes in three compulsory subjects (i.e., Mathematics, English Language and Integrated Science) and any other three subjects from the person's specialism, usually referred to as electives. There is another window of entry into colleges of education which is applied as and when it becomes necessary often referred to as access courses. The access courses are organized for candidates who do not have the required entry grade in either English Language or mathematics or integrated science. When students who qualify based on the minimum entry grades are selected, they often go through face-to-face interviews in their colleges of choice to satisfy other non-academic prerequisites such as inclination for teaching, personality qualities, and aptitude for teaching. Whilst in college, teacher trainees go through two years of four semesters of academic work and spend the last one

year on the field for practical teaching. Colleges are residential and the main mode of teaching is the face-to-face type.

Because of the professional nature of their training, programmes are designed to provide a comprehensive coverage of professional knowledge, values and skills. Programmes also seek to offer the pre-service teachers a strong functional orientation in meeting the learning needs of basic school pupils by ensuring that adequate combination of both content and pedagogical knowledge are provided to cover the various facets of teacher competence. These, the colleges do so by providing courses serving about 34,200 students through curriculum components such as foundation courses (e.g., teaching as profession, Ghanaian Language and culture, integrated science, mathematics and English Language); education and professional studies (e.g., child and adolescent development and learning, assessment and research methods in basic schools, school management and administration, development of education in Ghana and on-campus teaching practice); practical activities (e.g., physical education, music and dance) and general studies (e.g., communication and study skills, introduction to information technology, HIV/AIDS education).

The mode of assessment is supposed to be performance-based with emphasis on continuous in-course assessment, however it appears assessments are characteristically high-stakes with more emphasis on the end-of-semester (60%) component than the continuous assessment (40%) component (Anane, 2011) and assessment of learning seem to have taken over the overall assessment of teachers trainees. As a requirement for progression from year to year, candidates would have to pass all semester courses or be referred in at most two. Students who are referred in three or more courses at any stage in the programme are withdrawn from college. Successful candidates at the end of the studies are awarded diploma in basic education (DBE) the institute of education, university of Cape Coast for and in behalf of the GES. As a cross-sectional study, students were selected from 100 and 200 academic levels in equal numbers to get snapshots of students' motivational orientations, beliefs and learning strategy use as they progress through courses in college. Also, the study assumes a holistic approach, which

means students' SRL are examined at academic level or programme of specialization and then those contexts are related to the general college level.

3.8 Process of Selecting Participants in this Study

The prospective contributors in this study comprised of all the 22800 first and second year students in all the 38 publicly funded colleges of education in Ghana. The sample frame was made up of 6542 students from the ten selected. Multistage sampling techniques were used in selecting participants for this study. I will now describe the processes and follow this with descriptions of the respondents that were ultimately selected. The sampling was carried out in stages using smaller and smaller sampling units at each stage. Multistage samples are used for feasibility (practicality) reasons. The objectives are to minimize the variance of a parameter estimate and to maximize the total number of subjects with a certain desired characteristic (i.e., pre-service teachers in this case), in line with the limitations of a fixed total budget in carrying out the study in all the 38 publically funded colleges of education in Ghana. Considering the spread of colleges across the country, it would not have been possible to use simple random sampling (SRS) method which would have led to selecting students in all the 38 colleges. This situation would have made data collection impractical in terms of time and cost (Flick, 2014). However, I could proceed in phases: I considered colleges as "blocks" in relation to zones and a list of colleges under each zone was then secured from the institute of education database. Equal-sized samples of two were allocated to each zone and SRS used in selecting the required number for the study. Students in these colleges were then categorized as first and second year students and the required number of samples drawn as per the pre-determined number for the study. In the next section, I describe how participants were selected from the colleges for the study.

3.8.1 Stratified and Systematic Random Sampling

In the case of the survey part of the study, I aimed for the representativeness of the sample for the pre-service teacher population, hence the need for formal (random sampling) criteria (see Flick, 2014, p. 168; Field, 2013, p. 44; Bryman, 2008). I therefore used both stratified and systematic random sampling procedures in the selection of the study's participants so as to keep unsystematic variation between participants to the

minimum (Field, 2013). For the purpose of this study, two colleges each were selected from the five zones through a simple random sampling technique. The zones are Central/Western with 6 colleges, Ashanti/Brong Ahafo, 10 colleges, Volta with 7 colleges, Northern, 7 colleges and Eastern/Greater Accra, 8 colleges. This gave a total of 10 colleges considered for the study. The students were then categorized into academic levels, thus level 100 vs level 200 for selection. In each of the colleges, a systematic simple random sampling was employed in selecting 25 first year students and 25 second year students making a total of 50 students from each college. Systematic sampling involves selecting items using a constant interval between selections, the first interval having a random start. Systematic sampling is deemed to provide simple and unbiased estimator of the population characteristics.

During the sampling, the examination register containing all the candidates for the end-of-semester examinations was used. In each case, students were selected based on the following formula $k = \frac{\mathrm{N}}{\mathrm{n}}$; where *k* is the sampling interval, *N*, the number of students on the register in each of the cohorts under study and *n* is the predetermined sample size (i.e., 25) to be selected from each group, that is year 1 and year 2 students in all the 10 selected colleges of education. The multiple random start systematic sampling was used – thus, in each group, the first five names on the register was selected, and a number picked at random to determine the starting point of the selection and very k^{th} term selected until all the 25 needed have been selected. In all, 500 students were recruited for the study. The sample size was arrived at through a robust computation of sample size power using the G*Power software v3.0.10. Considering the sensitivity of data in ex post factor studies, the number of latent variables, I think an effect size (i.e., the extent to which the SRL phenomenon is present in the pre-service teacher population, Cohen as cited in Preacher & Kelley, 2011) lying in the range of medium to large would be appropriate considering the fact that a "*large value* need not constitute an important value, and an important value need not be a *large value*" (Preacher & Kelley, 2011, p.107, italics not in original).

Rather, Preacher and colleague suggest that the interpretation of the effect sizes in mediation analysis should be based on a meaningful metric measure and the constructs

and context under study. Cohen defines the proportion of variance explained in one variable by another (i.e., r_{xy}^2) as values .01 representing small, .09 as medium and .25 as large effect sizes (Field, 2013; Preacher & Kelley, 2011). In view of this, an expected effect size of .09 was used for the computation of the required sample size and the protocol of power analysis from G*Power is as follows:

F tests - MANOVA: Special effects and interactions
Options: Pillai V, O'Brien-Shieh Algorithm
Analysis: A priori: Compute required sample size

Input: Effect size f²(V)	=	0.09
α err prob	=	0.05
Power (1-β err prob)	=	0.95
Number of groups	=	2
Number of predictors	=	16
Response variable(s)	=	1
Output: Noncentrality parameter λ	=	29.61
Critical F	=	1.67
Numerator df	=	16.0
Denominator df	=	327
Total sample size	**=**	**329**
Actual power	=	0.950059
Pillai V	=	0.082569

As shown in the output, I needed 326 respondents to achieve the expected power, however, I decided on 500 students so as to cater for the two groups as well as the ten colleges in the study to improve representativeness.

3.8.2 Purposive Sampling

In purposive sampling, subjects are selected based on the knowledge of the population and the rationale of the study. According to Patton (2002), in qualitative research, sampling should be intentional, non-random and purposeful. This is to allow for the inclusion of diverse cases and to capture the views of students at different performance

levels. Even though in a study like this, employing saturation, thus, in the view of Krueger & Casey, 2009) “the point when you have heard the range of ideas and aren’t getting new information” (p. 26) or as Collins (2010) frames it, “a researcher collects and analyses cases to the point that sampling additional cases does not provide any new information (i.e., informational redundancy) that can be incorporated into the thematic categories” (p. 360), should have been better. But in practical terms and in relation to the this study and the sample frame, the situation gets more complex than as posited by Collins, in that, getting to the point of saturation is pivoted on many factors such as the complex nature of the data to be collected, sample heterogeneity or diversity so as to include all or most opinions and views (Collins, 2010, p. 361) concerning the construct of SRL. In other cases, optimal variation usually demands more subjects than others in relation to sampling technique.

To wit, to determine the size of sample to be selected purposively through theoretical saturation is not a linear decision to be made. And as Guest, Bunce and Johnson (2006, p. 59) suggest, while the idea of saturation is helpful at the conceptual level, it offers little practical direction for estimating sample sizes for robust research prior to data collection. To this end, however, I tend to follow Professor Flicks’ suggestion that selection of participants “proceeds according to the *relevance* of cases, rather than their **representativeness**” (Flick, 2014, p. 175, emphases in original) or what Patton calls the use of criterion of convenience. Morse cited in Mason (2010) also suggests that "the scope of the study, the nature of the topic, the quality of the data, the study design and the use of what Morse calls "shadowed data" (p. 4) should be the guiding principle, while Lee, Woo and Mackenzie (2002) suggest that studies that use more than one method need fewer subjects.

Again, Ritchie, Lewis and Elam (2003) suggest that "the heterogeneity of the population; the number of selection criteria; the extent to which 'nesting' of criteria is needed; groups of special interest that require intensive study; multiple samples within one study; types of data collection methods use; and the budget and resources available" (p. 84). Guest et al. (2006) have concluded that, for studies with a high level of homogeneity among the population "a sample of six interviews may [be] sufficient to enable development of

meaningful themes and useful interpretations" (p.78). These conclusions were based on their analyses of their data from a study carried out in Africa concerning the reproductive health care of sixty women. During their analyses, they found out that they had developed majority, 34 of the 36 codes slated for their study from six interviews and achieved 97% of the codes after analyses of twelve interviews (Mason, 2010). In this study, the main focus was to give the participants a voice in telling what for them, may well account for their beliefs and values and what constitutes their motivation to be trained as teachers and to illuminate a concept – self-regulation – that is usually described in different ways by experts and novices alike in the field of education. I therefore considered SRL as a phenomenon that required participants themselves to clarify and reiterate their motivational orientation and beliefs in line with their experiences before and during training.

I employed Romney, Batchelder and Weller's idea of "cultural consensus" cited in Mason (2010, p. 2). That is, even though the consensus among the different groups in the performance levels vary on the SRL construct, they are considered to have a predetermined set of attributes or views across the spectrum of performance (Flick, p. 175). In accord with this and in order to avoid 'elite bias' (i.e., talking only to high status students), I ranked the GPAs of participants and selected two students each purposefully from the upper, middle and the lower groups for the purposes of interviewing. I kept to a small sample size, selected across performance levels based on literature, expert advice and my own expertise as a researcher in the study area (Flick, 2014; Jette, Grover & Keck, 2003), and to avoid the data becoming repetitive and, eventually, superfluous. In fact, Guest et al. (2006) posit that, the sample size becomes irrelevant as the quality of data is the measurement of its value. Therefore, I selected 6 students from within the sample size of 500 for interviewing based on critical case selection idea by Patton, and as I was looking for depth in exploring and exemplifying the contributory factors of beliefs and values that lay behind some pre-service teachers' motivational orientations, and also to assist with the integrity, trustworthiness and the credibility within the research (Flick, 2014, p. 177).

3.9 Ethical Issues

According to Northway (2002), all aspects of any research have ethical implications. To Flick (2014), issues of ethics are very essential in research and more especially in social sciences. He contends that researchers need to follow laid down codes of ethics in order to regulate and manage the relationships between the researcher and the research to prevent any harm that is likely to befall participants directly or indirectly. In the view of Schnell and Heinritz cited in Flick (2014, p. 49), ethics in research seek to address the question, "which ethically relevant influences the researcher's intentions could bear on the people with or about whom the researchers do their research?" In addition, it is concerned with considering the procedures that should be useful for guarding those who take part in the research, whenever it is deemed fit.

In the view of Josselson (2007), interpersonal ethics require concern for the dignity, privacy, and well-being of those who are studied, the process of data collection, analyses and reporting. Schnell and Heinritz cited in Flick (2014), assert that, ethical issues hinge on eight basic principles:

1. Researchers have to justify why research about their issue is necessary at all;
2. Researchers must be able to explain what the aim of their research is and under what circumstances subjects participate in it;
3. Researchers must be able to explicate the methodological procedures in their projects;
4. Researchers must be able to estimate whether their research acts will have ethically relevant positive or negative consequences for the participants;
5. The researchers must assess the possible violations and damages arising from doing their project – and be able to do so before they begin the project;
6. The researchers have to take steps to prevent violations and damages identified according to principle 5 above;
7. The researchers must not take false statements about the usefulness of their research;
8. The researchers have to respect the current regulations of data protection (see Flick, 2014, pp. 49-50)

These principles are often enshrined in codes of ethics of research institutions of which Durham University is of no exception. The codes of ethics of the University of Durham School of Education demand that research procedures should be based on informed consent and permissions and securing of participants' voluntary informed consent (i.e., participants in the study ought to approve and decide to take part considering the information to them by the researcher) prior to research is considered the norm for the conduct of research. In essence, ethical practice and ethical codes rest on the principles of assuring the free consent of participants to participate, guarding the confidentiality of the material, and protecting participants from any harm that may ensue from their participation. As a result, I obtained participants informed consent and permissions as I have outlined in the section that follows.

3.9.1 Informed Consent

As a precondition for subjects' participation in a study, informed consent refers to the situation where "subjects know and understand the risks and benefits of participation in the research. They must also understand their participation is voluntary" (Flynn & Goldsmith, 2013, p. 10). This means that the researcher must ensure that appropriate measures for obtaining informed consent and permissions are put in place in order to fulfil a critical condition and a requirement by the Ethics Committee of the University and the British Educational Research Association (BERA) – ethical guidelines. According to Rossman and Rallis cited in Walker-Gleaves (2009) and Allmark (2002), informed consent is conditioned on the following criteria:

1. The consent should be given by someone who is competent to do so;
2. Transparency of the purpose of the research, to the audience and the research community;
3. The person giving the consent should be adequately informed, that is, full understanding of the participant's agreement to participate;
4. The consent is given voluntarily or willingly;
5. Right to withdraw without penalty or consequence.

I therefore developed all the data collection instruments and questions within the study bearing these principles in mind. The questionnaire for the survey and the procedures for the conduct of the unstructured interviews were appraised and accepted by the Ethics Committee of the School of Education, Durham University in the academic year of 2012-2013.

Before the data collection, permission was sought from the college authorities in each of the ten colleges involved in the study. The academic boards of the colleges were then briefed on the aims of the study and the procedures the researchers would follow in sampling, collecting and handling of the data collected from their colleges. They were also informed of the target group and how they would be selected to get the required data. Bearing in mind that research has to be based on informed consent – thus, the participants in the study have to agree to partake based on the information to them concerning the research by me, during the interviews, participants were told that participation in the study and the interviews is purely voluntary. I then read to them the purpose(s) of the study. They were also assured of utmost confidentiality of the information they were about to give to me as the researcher throughout the study.

3.9.2 Assurance of Confidentiality and Anonymity

In any research, guarding the confidentiality and anonymity of participants is very crucial. There is the need to ensure privacy and guarantee that participants cannot be identified from any information in the study and that steps must be taken to ensure that specific details such as names, locations and identification and registered numbers are encrypted (Flick, 2014; Flynn & Goldsmith, 2013; Josselson, 2007; Rossman & Rallis, 2003). It is necessary to gain the trust of participants that data being collected would be used for the purpose(s) to which they have consented and readers and those outside the study would not be able to identify them from the study's reports. I aimed to satisfy all these requirements on the measures of survey data collection and the procedures of interviewing in this study. Every effort was made to protect the confidentiality of the participants as well as the data collected in the study. In this study, I tried as much as possible to protect the confidentiality of the participants in that protection of the respondents was very critical given that students' bio-data were collected and as well,

interviews conducted, and the fact that participants could be identified easily should their names or index numbers appear anywhere in the study.

This study utilized both quantitative and qualitative methods of data collection and in so doing, participants were asked to some background information such as registered numbers, that were used for the retrieval of the extant data (i.e., entry grades and CGPA of two semesters' work of students), which could give their identity away should such information about them appear in the study. To pay more respect to their privacy, I needed to assure them that, the index or registered numbers supplied on the questionnaires was for further data collection and would not be made available to anybody who is not meant to have access (see Appendix A). In addition, the study also collected interview data in narratives and there are instances where participants are quoted verbatim in the study. Students giving information about themselves (self-disclosure) and the activities of their school authorities and tutors under this situation can generate uneasiness and sense of vulnerability. According to (Josselson, 2007), "unless our participants trust that we will insure their anonymity, they would not tell us what they tell us" (p. 541).

In this research, where there are relatively few subjects selected for interviewing, the possibility of exposure is potentially great, so besides the precautions taken to protect the confidentiality aforesaid, I responded with sensitivity to all data collected and discussed at each stage of the study's progress with great care. Names and locations mentioned by the participants were anonymized; data collected were stores appropriately (e.g., pass-wording transcribed data in word documents and blotting out students' index numbers immediately their entry grades and GPAs were retrieved). All recordings, notes, writings, and interview data were kept in a safe place at the researcher's personal office.

3.9.3 Gaining Access and Entry

Research is an intervention into a social system and it is often perceived as a destructive factor for the system to be studied to which it reacts defensively. Wolf cited in Flick (2014), contend that, there is a mutual unreceptiveness between the research and the institutions or social systems to be researched and that exchanging a whole lot of

information on entering the research field does not reduce such postures. Instead, "it leads to increasing complexity in the process of agreement and may lead to increased immune reactions" (p. 160) – thus, both sides generate myths that are nursed by increased exchange of data, and in some cases, relationship between the researcher and male and female participants. A study is often seen as an intrusion into the fabric of the school to be studied. Most institutions perceive research as a disturbance and a disruption of its routines, with no immediate or long-term benefits at sight, especially, when the researcher is from outside the institution (Flick, 2014; Josselson, 2007). To Professor Flick, research projects unsettle institutions in three ways, these are:

1. The limitations of its own activities are to be disclosed;
2. That the ulterior motives of the "research" are and remain unclear for the institution;
3. That there are no sound reasons for refusing research requests (2014, p. 160).

These fears could put real impediments in the way of the researcher. There is therefore the need to establish rapport, reciprocity and maintaining professional reputation and credibility with gatekeepers and participants. In this regard, however, the professional background of this researcher as a teacher educator and assessment expert, and the working alliance I had forged with the colleges over the years eased access and entry to the colleges involved this study. The researcher had colleagues within the ten colleges in question and has worked closely with Principals, Vice-Principals and Assessment officers in administrative and management positions and that made it easy to agree on the purpose and necessity of the research project. They were both supportive of and enthralled by the research and some tutors were assigned to assist me and the institute of education staff to administer the questionnaires.

In MMR studies that involves the collection of qualitative data, the challenges of access is not resolved once the researcher has gained entry to the institution, since this by no means guarantees access to all the participants and data available within it. Not everyone may be willing to talk, and sometimes the most willing participant will not be ready, or perhaps even able, to disclose all the information available the researcher. In this case, I

relied heavily on the rapport and the cordial working relations with the authorities in the colleges were interviewees had been selected to get in touch with the individuals I needed to interview and as well offered me secured locations for a successful conduct of the interviews.

In terms of access to the entry grades and CGPAs, I needed to seek permission from the Director of the Institute of Education, who was the custodian of the data base on behalf of the GES and CoE. I had a meeting with the Director in July before the start of the collection of both the extant and survey data. I briefed the Director on the purpose of the study and the type of data I would want to retrieve from their database. After that meeting, a formal letter was written to seek permission to have access to the required data and to fully inform and assure the head of the fidelity and validity of the research procedures. Following that, a research assistant was employed to assist in the retrieval of the files that contain students' registration data as well as their corresponding CGPAs from the database.

3.10 Data Collection Procedures

The research design utilized three main data collection methods, namely: administering questionnaires; collecting extant data and conducting episodic interviews. Data were collected between mid-June and September, 2012. I have described each of the data collection processes in the ensuing sections.

3.10.1 Survey Measures

This research was based on the assumption that students' motivation and learning strategies are not only limited to situational, contextual condition but that students may have fairly stable dispositional self-regulated learning strategies that can be observed at the curriculum level as well. This assumption was based on findings from previous studies that compared the use of learning strategies between different subject domains. The findings suggest that besides some small variations, students have rather stable patterns of learning strategies when comparing them across different subject areas. I investigated whether it is possible to use a combined approach by using a highly detailed SRL instrument to measure students' general motivational beliefs and the use of self-

regulated learning strategies at the general curriculum level. To that end, I adapted many items from various instruments and literature to assess pre-service teachers' motivation, cognitive and metacognitive strategy use.

The Motivated Strategies for Learning Questionnaire (MSLQ), a self-report instrument designed to assess students' motivational orientations and their use of different learning strategies for a course was used to examine pre-service teachers' motivation and learning strategies in colleges. The MSLQ was developed by Pintrich, Smith, McKeachie and Garcia (1991, 1993). The 81-item original questionnaire was adapted and the intrinsic and extrinsic motivation items changed with items from the contextual measure of Vallerand and colleagues' academic motivation scale (AMS-C28).

The wordings of several items were also modified to reflect the studies purposes and setting. Four new items were added, after careful syntheses of literature to make a total of 85 items for the final instrument used for this study. There were two main sections to the instrument. The first part, the motivation section, which was made up of 33 items that assessed pre-service teachers' intrinsic and extrinsic goal orientations and evaluation of task value forming the *value component*; the *expectancy component* made up of control of learning beliefs and self-efficacy for learning and performance, and the *affect component* (i.e., test anxiety). The second part of the instrument was made up of nine subscales of 52 items, which composed of the *learning* and *resource management strategies* sections. These were: rehearsal, elaboration, organisation, critical thinking, metacognitive strategies, managing time and study environment; effort management, help-seeking and peer learning.

The 85-item self-report instrument was scored on a 7-point Likert scale, from 1-not at all true of me to 7-very true of me. The negatively worded items such as "I often find that I don't spend very much time on my studies because of other activities" were reversed during the coding to make the scale positively worded before scale scores constructed. In reversing the negatively worded items, a respondent who had circled 1 for that item now receives a score of 7 and so on. Accordingly, a 1 became a 7, a 2 became a 6, a 3 became a 5, a 4 remained a 4, a 5 became a 3, a 6 became a 2, and a 7 became a 1. Internal

consistency and confirmatory factor analyses were conducted and the results presented in the next section.

Survey data for the main study were collected in the months of July and August, 2012. The modified PST-MSLQ questionnaires were administered to 600 teacher training students in Ghana. In each of the ten colleges involved in the research, either the researcher or an Institute of Education staff with the help of two research assistants (tutors) selected from the colleges supervised the questionnaire distribution and collection. Students were made to wait after a general paper (e.g., GNS 221: Introduction to Information technology for year 2 and EPS 124: Principles and methods of teaching in basic schools for year 1) and this was particularly essential because of the systematic sampling procedure employed. Students whose index numbers were selected from the exam register were asked to stay in the hall for the assignment of responding to some questionnaires. Students were made to complete the questionnaires after their consent had been sought and also having gone through the instructions on the questionnaire with the supervisors. All questionnaires were completed in one sitting and handed in as and when a student completes.

Supervisors checked each and every completed questionnaire as respondents tendered them in to make sure that all sections and spaces are filled and where there were blank cells, respondents were made to fill them, if they were not left intentionally. This was not done to compel students to provide data, but to verify their responses. This process helped to deal with the nuisance of having to deal with missing data in self-report instruments. All the 600 questionnaires were received by the end of August, 2012. I checked each and every questionnaire for ceiling effects or acquiescence responding - where subjects show a tendency to agree with statements as offered, and social desirability responding (i.e. where respondents try to depict themselves in a more positive way) or floor effect or some respondents portraying themselves in an overly negative manner, perhaps because of low self-esteem (Locke & Baik, 2009). I also checked and removed those who did not write their registration numbers, because, without the numbers I could not retrieve their entry grades and their cumulative grade point averages

for the two semesters. In all, 500 respondents, 250 from year 1 (level 100) and 250 from year 2 (level 200) were accepted and included in the final analysis.

3.10.2 Archival Data

Rabinovich and Cheon (2011) contend that extant data exist usually before the formulation of research objectives and that the gathering of these data is typically thought of and carried out recourse to these objectives. As such, procedures based on archival data have unique advantages that can yield valuable insights into SRL and academic achievement studies. Literature indicates that, extant or archival data have the advantage of being less subjective and biases and ambiguity in measurements are often reduced to the minimum as they are usually collected through unobtrusive methods that do not interfere with the sources employed, while maintaining these sources independent from the research objectives. Again, extant data are removed from any aims and biases among those who originally collected the data that could skew the objectivity of the data collection processes, and collecting the data normally entails fewer resources than those involved in other methodologies such as surveys. Archival data are available in greater quantity and having access to greater volumes of data means researchers would be able to benefit by carrying out analyses with higher levels of statistical power (Rabinovich & Cheon (2011; Yin, 2009). Finally, if the data could be access by the public, it would give academics and other researchers the opportunity to carry out replication studies to validate the original findings that have been gotten from the data.

This research utilized extant data collected in two forms: students' academic achievement scores - CGPAs from two semesters and prior performance derived from students' entry grades. Students' academic achievement scores were derived from two end-of-semester examinations scores collected by the Institute of Education, UCC between January and August, 2012. On the average, an individual student took nine courses of two credit hours in a semester. Taken the two semesters together, a student took 18 courses with combined credit hours of 36 and a CGPA, representing academic achievement in this study, was computed using standardized software (SOIS) for grade point average generation and managing student information. Students' achievements were measured on a six-point scale and interpreted as:

1. < 1 is fail or unsatisfactory
2. 1.0 – 1.9 is pass or fair
3. 2.0 – 2.4 is third class or satisfactory
4. 2.5 – 2.9 is second class lower or good
5. 3.0 – 3.5 is second class upper or very good
6. 3.6 – 4.0 is first class or excellent.

The purpose of the original data was to assess pre-service teachers' academic and professional competency in teaching, and for the awards of certificate. The final CGPAs are also used to assign teachers' registered numbers – a form of licensure to qualify newly trained teachers to teach in basic schools. Further, students' entry aggregates were collected and used in the analysis. The requirements for entry into colleges are based on an aggregate of 36 or less, including at least credits in core science, core mathematics, and core English language. The minimum qualifying aggregate grade of '36' is derived from three core subjects (English, mathematics and science) and three elective subjects (either science or general arts programme). Grade designations for WASCE are as follows: A1, B2, B3, C4, C5, C6, D7, E8 and F9. For entry into colleges, a minimum grade of C6, which is a credit, is required. This means that, the six subjects considered for entry you yielded a minimum of 36 and a maximum of 6 – thus, the higher the aggregated score, the lower the performance and the lower the aggregated score, the higher the performance. The subjects a student took and the corresponding grades were recorded on their registration forms and sent to the institute of education by colleges of education prior to the conduct of each of the end-of-semester examinations.

The registration forms from the forty (40) colleges are kept in a room at the Institute of Education. A research assistant and I had to go through the forms, college by college in order to retrieve the selected colleges used in the study. There are three (3) programmes run by the Institute: Regular DBE, Sandwich and Untrained Teachers Diploma in Education (UTDBE), and registration forms from all the colleges were kept in one room. Meanwhile, the files containing the forms in the room were not grouped or arranged alphabetically or the programmes run at the colleges. It was such a laborious task locating the selected colleges and respondents registered forms to retrieve their entry grades.

There were instances, we had to sit or stand on heaps of files, and we did slip couple of times in an attempt to get access to files of some colleges. Since the files have been kept in the room for long, the place was stuffy and the files were dusty, but with determination, we were able to locate all the forms needed for the analysis. It took us about a week long to locate the selected colleges. We then had to go through the files to get the registration forms which have the names, index numbers and scores obtained for the various subjects in the West African School Certificate Examination (WASCE) of the students whose records were used in the analysis. This exercise also took us about five working days as we had to go to and fro the store room for some missing forms or send back those we did not need.

3.10.3 Interviews

Interviews are in-depth, rich and detailed form of gathering information rather than giving answer categories to specified questions (Flick, 2014; Rubin & Rubin, 2012). According to Patton (2002), interviews are conducted to ascertain the perspectives of individuals and seek from them issues we cannot directly observe such as feelings and emotion using survey methods and also know about the activities that took place prior to the conduct of the study and how individuals perceive and organize their world. Interviewing affords the researcher the opportunity to delve into the ideas, responses, motives, and feelings of a participant. In so doing, it serves as a way of visualizing and 'experiencing' the participants lived experiences (Walker-Gleaves, 2009). In this research study, the interviews were conducted to explore emerging themes of the contributory factors and values that lay behind some pre-service teachers' motivational orientations in greater detail and to illuminate findings from the quantitative analysis of students' self-regulatory processes in college.

Within this research, I employed interviews to collect verbal data (i.e., data that come essentially in the form of words) to answer questions pertaining to the contributory factors of beliefs and values that lay behind some pre-service teachers' motivational orientations and learning strategy use. In the interview, student teachers beliefs, values, and their learning experiences were explored, as well as their views on the challenges of teaching, learning and being an effective teacher in a school setting. Interviews invited

students to tell their stories and data were presented as narratives. Flick (2014, p. 199) emphasizes that narratives "involve a complex structure that links facts and details to an overarching whole." Narratives focus on values, making narrative analysis useful for highlighting the values expressed or implied in a particular text and in this research, it permitted students to report on events as they are constructed in their lives.

Personal or archetypal narratives, according to literature are identical to beliefs and identity formation, and while identity is not viewed as a pre-given attribute, it means that through life histories of persons, we become clear of how persons have become what they are and gain more insights into some concealments of important biographical patterns or social structures (Squire, Andrews, & Tamboukou, 2008; Miller & Glassner, 2004; Lawler, 2002). I believed that individualized accounts of experiences tend to be the most convinced of the significance of stories as a way of expressing and building personal identity and agency (Squire, et al., 2008). Therefore, a study like this one needs to employ retrospective accounts of events and/or life stories of individuals in the natural contexts since identity has to do with who one thinks one is; what one believes and does, which moves in tandem with what has happened to the individual (Flick, 2014; Riessman, 2008) and in line with narrative study as an investigation that concerns itself with the production, interpretation and illustration of storied accounts of lived experience (Shacklock & Thorp, 2005, p. 156).

Generally, life history narratives yield large volumes of data sets, most of which may not be relevant to the study's purposes. This is as result of the openness associated with the collection of narrative data that leads to a more comprehensive approach of data gathering. Considering the fact that the study's design is a mixed methodology, I felt it would be helpful to reflect on a rather economic approach to field, which means I only collected those data and consider aspects that are really necessary to help me answer the research questions in this study. I therefore turn to Flick (2014, p. 266, 2002) who suggested that instead of using a 'generative narrative question' to stimulate the interviewee's main narrative on the problem under study, that can lead to volumes of data produced, episodic interviews be used. According to Flick (2014), the beginning point of episodic narrative is the notion that experiences of participants of the area under study are

stored and recollected in forms of narrative-episodic and semantic knowledge. This I share with him, because, I believe that language shapes meanings and allows inter-subjectivity and the capacity of wilful persons to form and maintain identities and beliefs in a meaningful world (Miller & Glassner, 2004). Thus, in the episodic interview, narrations refer to situations and episodes, which start from episodic-situational forms of experiential knowledge, and telling them is rooted in questions to be answered for the episodic interview. Unlike ethnographic interviews that require considerable amounts of interviewing, episodic interviews yield context-related presentations in the form of narrative because of their proximity to experiences and their generative context. In the view of Professor Flick, episodic narratives make processes of construction realities more readily available as compared with other forms of qualitative data gathering that aim at abstract concepts and responses in sensu stricto (2014, p. 274).

As a core characteristic, the episodic narrative approach of data collection frequently probes the interviewee to present narratives of situations and contexts. For example, in this research, I asked questions like “so now that you are in college, what are your views or perceptions about teaching?” With the episodic-narrative, the interviewer concentrates on topical issues that he or she wants to study and restricts the account to areas of meaningful experiences and concrete situations through the use of purposive generative narrative questions which seek to elicit interviewee’s subjective meanings and abstractive relations (Flick, 2014, 2002) and interactions often appear to be a dialogue between the interviewer and interviewee (Shacklock & Thorp, 2005). In this research, I have adopted an interview approach that lies on the pure narrative interview and semi-structured interview continuum.

That is, even though I made use of some guided questions, they just served as generative queries to illicit interviewee’s initial response and further probing questions asked as and when they were needed. So the questions I penned down where just to serve as a guide to familiarize the interviewer to the topical domains which are founded on the research question in focus, and for which the narrative is needed. In this way, interviewer-interviewee roles become unobtrusive in the process. The interviewer has many ways of intervening and directing the interview process through a number of significant questions

relating to the situation the subject is to recount or define. This results in the co-construction of data through talk-in-interaction or dialogic interaction and the information generated are often devoid of the skewed and artificial situations that characterize narrative interviews (Flick, 2014; Rubin & Rubin, 2012; Squire, et al., 2008), and triangulation of various procedures as the bases of data collection also achieved through cross questioning.

The episodic interviews centred on students' motivations, beliefs and values about teacher education and their perspectives on becoming teachers and how they went about their studies whilst in college. I trusted that pre-service teachers had the competence to present experiences in their course and context as narratives. I paid particular attention to situations and contexts that were of essence to initial teacher training and on how students constructed their beliefs and values before and during training and how these had influenced their self-regulation in training.

As articulated in previous sections, interviews are often focused on what interviewee has experienced and perceived as essential in relations to the issues of the research, and with the aim of developing a fuller picture from participants' points of view, rather than just simple, short, or general and abstract answers to the researchers' questions. As described by Flick, (2014), these approaches allow the interviewer to approach the interviewee's experiential world in a more comprehensive way. Rubin and Rubin therefore state that in order to secure information that has depth and detailed and is nuanced and rich with vivid thematic material, there is the need to conduct "responsive interview"(2012, p. 37). In any interviewing situation, people who will participate in interviews need convincing that the research is of some value to them and assurances of the researchers integrity, so that they approach the interview situation in a spirit of cooperation. As Rubin and Rubin (2012) explain, conducting successful interviews is pivoted on the helpful attitudes of interviewers and that reminded me of the need to emphasize responsive interviewing:

> The importance of building a relationship of trust between the interviewer and the interviewee that leads to more give-and-take in the conversation. The tone of questioning is basically friendly and gentle… The pattern of

> questioning is flexible; questions evolve in response to what the interviewees have just said, and new questions are designed to tap the experience and knowledge of each interviewee (p. 37).

With this in mind, I went about the episodic interviews with greater caution and tact so as to get the best out of the six participants I selected for the interviews. Notwithstanding the fact that I could intervene and probe further on issues when interviewees were recounting their experiences, I tried as much as possible not to intervene unnecessary so as to allow the participants construct their own life stories in their own perspective. In keeping with Meuser and Nagel's (2009) suggestion that pragmatic approach to data analysis must be taken, I asked questions that mainly related to the purpose of exploring contributory factors of pre-service teachers' beliefs and values so as to transcribe only the essential passages and work with paraphrases, codes and thematic comparisons of the main statement. I therefore, framed two main questions about pre-service teachers' perceptions about teaching and factors that influenced their choice of colleges and teaching as a profession. During the interviews, concept of an 'ideal teacher' was also explored.

I conducted all the six interviews, one each of the participants in the second semester of 2011/2012 academic year. In each of the interviews, I first of had to explain the purposes of the study and the need to collect narrative data and make the interviewees comfortable and relaxed by asking general questions such as "how do you find the course?" I then sought their permissions to record the interactions and assured them of utmost confidentiality on the data to be collected and all the information they were to share with me. While aiming for that "naturalness," I also seek fullness in presentation in most aspects of students' motivation, beliefs and values, and use of self-regulated learning strategies by cross-checking viewpoints from some selected pre-service teachers from some selected colleges across three performance levels. By so doing, the trustworthiness of accounts students give is thus increased. Since "cross-checking" involves two or more students to reach saturation, at the bottom level of individuals, I do "member-checking" (Taylor, 2001, p. 112) by playing back what I have recorded or reading the summaries of the information I had written down during our interaction. When I needed their confirmation or clarification on certain issues that came up in the initial or during

interviewing, I restated the same questions and asked for their comments. I employed this meaning of credibility as referring to the association between the participants' actual points of view and what have been captured by the researcher. All interviews were recorded with a digital recorder and interviews lasted between 30 to 45 minutes.

3.11 Data Quality Procedures

3.11.1 Validity and Reliability of Pre-service Teachers' Motivation and Strategies for Learning Questionnaire (PST-MSLQ)

The validity and reliability of the first generation of SR assessment has been limited and several issues remain. One issue is that much research registers only the presence, absence, and frequency of specific components of the SR process. Although there has been sufficient research to address systematic errors, and the instruments used are easy to administer, in self-report questionnaires such as the motivated strategies for learning questionnaire (MSLQ), social desirability and response bias are difficult to eliminate. Validity remains an issue with all forms of self-report because student recall can be inaccurate; systematic error may result when students consistently under- or overestimate their strategy use (Boekaerts & Corno, 2005). I therefore conducted a pilot study to assess the robustness of the pre-service teachers' motivated strategies for learning questionnaire (PST-MSLQ).

The purpose of the preliminary study was to test the internal consistency of the main and subscales of the PST-MSLQ instrument developed for pre-service teachers. Confirmatory factor and coefficient alpha analyses were conducted to check the internal consistencies. The study was also conducted to check the skewness and the robustness of the items (Pintrich et al., 1993). Since Pintrich et al.'s (1993) scale was developed in the USA and it has not been used in teacher education context; there was a need for testing the employability in evaluating pre-service teachers' self-regulation and use of learning strategies in different cultural and academic environments. The data for this study was gathered from a validation sample of 250 (levels 100 and 200) students from a population of 450 pre-service teachers studying in a College of Education in Ashanti Region of Ghana. The instrument was administered to 160 pre-service teachers with the help of two college tutors who were briefed on the purposes of the data collection and how to

administer the questionnaire to bring a better understanding of the essence of the data collection. The questionnaire was administered in class during prep-hours in the evening of January 12, 2012 and it took approximately 30 minutes for the students to complete the instrument.

Even though the MSLQ was administered to a sample of 160 pre-service teachers, the questionnaire was completed by 45.4% level-100 (n = 69) and 54.6% level-200 (n = 83) pre-service teachers. Of the 152 respondents, 63.8% were males (n = 97) and 36.2% female (n = 55). In terms of programme distribution, 59.9% of the pre-service teachers offered general (n = 91) and 40.1% science related (n = 61) courses.

For the structure validity of the scale, a confirmatory factor analysis (CFA) using maximum likelihood factor analysis with varimax (Kaiser Normalization) rotations was performed with SPSS v17 programme. The compliance of data with factor analysis was tested by the use of Kaiser-Meyer-Olkin (KMO) sampling adequacy and Bartlett's test of sphericity. Conventionally, KMO values between 0.5-1.0 are considered to be high (Kline, 2011; Cerit, 2010; Pohlmann, 2004). The KMO measure of sampling adequacy was high (.684). The Bartlett's test of sphericity was $\chi^2 = 7337.39$, $p < 0.05$. These results indicate that the factor analysis is suitable for the group.

Two fit statistics were computed: the chi-square to degrees of freedom ratio (χ^2/df) and the goodness-of-fit index (GFI). A χ^2/df ratio of less than 3 is considered to be indicative of a good fit between the observed and reproduced correlation matrices (Kline, 2011). Constraining the 85 items to fall onto fifteen latent factors generated a χ^2/df ratio of 1.06. A GFI of $\chi^2 = 2544.754$, $p = .02$ are values that indicate that the model "fits" the input data well. The fifteen latent factors model appears to be the best fitting representation of the input data. The results from the confirmatory analysis are presented in Appendix B. As indicated in Appendix B, some of the manifest variables appear to be good indicators of the latent variables, while others need reframing or total removal from the instrument as suggested in the initial model of the study. The results show that 1, 16, 22, and 24 have high factor loading and appear to be good indicators of latent factor 8 (intrinsic motivation). Items 7, 11, 13 and 30 loaded together under latent factor 6 (i.e., extrinsic

motivation) with high factor loadings with the least regression weight being .75 and the highest, .86 (see Appendix B)

The results also show that items 4, 10, 17, 23, 26 and 27 fitted well onto factor 2 (Task Value). Latent variables such as Test Anxiety (factor 3), Control of Learning Believes (factor 12), Rehearsal (factor 5), Time and Study Environment management (factor 10) and Peer Learning (factor 9) had their observed variables loadings as conjectured before the study. Even though observed variables 47, 51, 66, 71, 84 and 85 presumed to be Critical Thinking loaded onto it, there were other variables such as items 56- "I try to change the ways I study in order to fit course requirements and tutors' teaching styles" and 78 - "I set goals for myself in order to direct my activities in each study period", which also loaded onto it. These items were initially aligned to Metacognitive Strategies.

Concerning the latent variable Metacognitive Strategy, six out of the twelve observed variables loaded onto it. These were items 41, 44, 54, 55, 76 and 79. The rest, two, 56 and 78 loaded onto Critical Thinking; item 36 loaded onto both Critical Thinking and Metacognitive Strategies with regression weights of .375 and .331 respectively. Item 61 loaded with items 53 and 81. Items 33 and 57 did not load onto any latent variable. Of the eight observed variable measuring the manifest variable – Time and Study environment Management, six variables (i.e., items 35, 43, 52, 65, 70 and 77) loaded to make it factor 4, while items 73 and 80 did not load onto any of the factors. Similarly, of the eight items believed to be Self-efficacy for Learning, five (items 6, 12, 15, 20 and 29) loaded onto it, while items 5, 21 and 31 loaded onto latent factor 15. Items 37, 48, 60, 74, and items 34, 45, 50 believed to be variables for Effort Regulation and Peer Learning respectively fitted well. The latent variable Help Seeking is manifested by only two observed variables (items 68 and 75). Item 58 – "I ask tutors to clarify concepts I don't understand well during lectures" loaded onto Effort Regulation but was kept under help seeking based on theoretical soundness and Item 40 did not load onto any factor but was included to form the help seeking subscale.

In conclusion, the following observed variables and their respective latent variables formed the final instrument for the main study. Items 1, 16, 22 and 24 formed the latent

variable Intrinsic Motivation; items 7, 11, 13, and 30 made Extrinsic Motivation; Task Value consisted of items 4, 10, 17, 23, 26 and 27; items 3, 8, 14, 19, 28, 82, and 83 formed Test Anxiety; items 2, 9, 18 and 25 form Control of Learning Beliefs; items 6, 12, 15, 20 and 29, Self-Efficacy for Learning; items 39, 46, 59 and 72 for Rehearsal; items 38, 47, 51, 66, 71, 78, 84, 85 and 56 formed Critical Thinking; items 41, 44, 54 and 55 were for Metacognitive Strategies; items 35, 43, 52, 65, 70 and 77 for Time and Study Environment Management; items 37, 48, 60 and 74 for Effort Regulation; items 34, 45 and 50 for Peer Learning; items 40, 58, 68, 75 formed Help seeking. However, items 5, 21, 31, 33, 40, 57, 61, 67, 76, 79, 73, and 80 were removed from the instrument leaving 73 items making the new instrument for the main study. The reliability for the 85-item MSLQ was evaluated using Cronbach's alpha. The internal consistency estimate for the instrument was .897. For the motivation part of the instrument, the reliability was .764 with 33 items and that of the learning strategy and resources management part was .908 with 52 items. The Cronbach's alphas based on standardized items for 32 motivation items was .866; that of the learning strategies component was .903 for 41 items and the overall for the final questionnaire (see Appendix A) made up of 73 items from 500 participants was .923.

3.12 Data Management and Analysis

Data management and analysis in any research, is driven by the research questions and/or hypotheses of the study.

3.12.1 Data Management

Data generated from the field needs to be documented and edited before one could analyze. This involves transcribing, auditing the survey instruments, codding, entering and editing in software. In this research, the entire five hundred 73-item self-report instruments were scored on a 7-point Likert scale, from 1-not at all true of me to 7-very true of me. The negatively worded items such as "I often find that I don't spend very much time on my studies because of other activities" were reversed during the coding to make the scale positively worded before scale scores constructed. In reversing the negatively worded items, a respondent who had selected 1 for that item now receives a score of 7 and so on. Accordingly, a 1 became a 7, a 2 became a 6, a 3 became a 5, a 4

remained a 4, a 5 became a 3, a 6 became a 2, and a 7 became a 1. Students' CGPA and entry grades were recorded on the questionnaires. Their gender and programmes of study were validated using the registration forms retrieved from the store room. Questionnaires were then numbered serially and data entered into the SPSS v17 software for analyses.

I interviewed six respondents face-to-face. Even though I did not have any structured questions on paper, I tried as much as possible to ask questions (episodic interviews) pertaining to students' beliefs and values about teaching and teacher training and the strategies they adopt in learning the course materials they are being taught in colleges of education. For each of the interviews, I explained the aims of the study and told the interviewees that the granting of the interviews was purely voluntary and therefore their consent is highly sort. Fortunately, all the six selected participants were more than excited to contribute to the study as they believed that the findings would contribute their professional growth and I used probing questions during the episodic interviews to triangulate and verified whether their answers to questions were not confounded by their ecstasy. I then proceeded by asking each interviewee the questions in relation to their motivation for coming to college, beliefs and values about teaching and perceptions about teacher-student, teacher-parents and teacher-teacher relations, and strategies of learning course materials. Qualitative studies such as this require a critical and in-depth analysis and reflection of thorough and true accounts. I therefore envisaged that recording the interviews could ease the flow of the narration, help me to get accurate, independent, naturalistic and full records of the interviews (Flick, 2014, p. 385) and make it possible for me to play back for transcription and also improve on the conduct of later interviews.

I recorded each of the interviews with a digital voice recorder (OLYMPUS, VN-712PC). During each of the interviews, I would ask permission from the respondents and gave them also, the reasons why I had to record the information and how I would treat the information they would give me and who would have access to the interview data. The recordings were uploaded and played over VCL media player 2.12, because this player afforded me the opportunity to regulate the speed of the play back (i.e., I could move slower, jump forward and backwards) to make sure that I transcribed what interviewees had said in its exact form, word-perfect. I indexed each interview's data with and

indicator such as PSL1 for first interviewee in low performing group, PSU1 for first interviewee in high performing group and PSM1 for first interviewee in middle or median performing group. I listened to the recordings and typed in Microsoft Word, going back and forth if the answers, words or sentence structures were not clear or audible enough in order to avoid guessing or hunches out of what has been said (see Bryman, 2008). It took me about 4 hours in transcribing each of the approximately one hour recordings and I spent about four days in transcribing the five-hour interviews. Some of the respondents answered the questions in great detail and some with short answers. The two sets of data were store in both hard and soft copies to serve as backups and for reference purposes.

3.12.2 Data Analysis

This study employed convergent parallel mixed design with concurrent timing of data collection. That is, both quantitative and qualitative data were collected at about the same time and each strand of data was analyzed and their results presented independently (Creswell & Plano Clark, 2011; Teddlie & Tashakkori, 2009; Bryman, 2006). The results were then used together during the discussion and final interpretation phase of the study to clarify, illustrate or put a flesh on some findings from either the quantitative or qualitative results (Creswell & Plano Clark, 2011; Greene & Hall, 2010).

In relation to the quantitative data, scores of the latent variables were constructed by taken the mean of the observed variables (items) that make up the sub-scale. For example, self-efficacy for learning (SEL) has five items. A student's score for self-efficacy was computed by adding the five items and taken the average. The 15 constructs were used singly or combined as and when it became necessary. Descriptive statistics of central tendency and dispersion were computed on the motivated and self-regulation learning strategies, entry aggregates (prior performance), and students' CGPA for two semesters (academic achievement). Percentages were computed for the students' biographic information with the aim of additionally defining the characteristics of the sample for the purposes of interpretation and generalizability where necessary and to reveal data patterns pertinent to other analyses of interactions and tests.

The second stage of the quantitative data analysis involved answering the research questions (see section 4.0). The question on the prevalence of motivated self-regulated strategy use among pre-service teachers was answered through mean and measures of spread. Independent t-tests were also conducted to ascertain whether differences exist between first year and second year students' SRL. Zero order correlations were performed to establish the relations between the components of self-regulated learning strategies. On the question of the relationship between self-regulated learning strategies and students' academic achievement, Pearson's product-moment correlation coefficients were estimated. The test of associations were conducted to assess the extent to which intrinsic motivation, extrinsic motivation, task value, control of learning beliefs, self-efficacy for learning, test anxiety, critical thinking, rehearsal, elaboration, metacognitive regulation, peer learning, help seeking, effort regulation, organization, and time and study environment management explain some of the variance in students' achievement. This is necessary because it will provide numeric explanation of trends (Creswell, 2009, p. 145) of a teacher trainee disposition (self-regulation) in relation to their performance whilst in college. The hypotheses were tested through mediation and moderation analyses and the details are presented in the next section. All statistical tests were conducted with SPSS v17.

3.12.3 Mediation and Moderation Analysis

Statistical moderation and mediation analyses involve the inclusion of two or more predictor variables in a model and examining their combined effect on a response variable (Field, 2013; Preacher & Kelly, 2011; Hayes & Preacher, 2010; Preacher & Hayes, 2008). Establishing relations between constructs in teaching and learning environments is very essential, since students learning outcomes are usually influenced by many different variables and situations (Zimmerman, 2008; Hattie & Timperley, 2007; Hattie, 2003). However, because correlation is a necessary but not sufficient condition to claim for causality, especially in ex post facto studies like this one, it is essential that appropriate statistical procedures be adopted to explain by what means a causal effect occurs between students' prior performance, their motivated self-regulation learning strategies and their academic achievement in colleges of education. To do this, mediation analysis, an examination of "the process by which some variables exert

influence on others through intervening or mediator variables" (Preacher & Hayes, 2008, p. 879) was employed within this research. For example, research evidence suggest that intrinsic motivation, test anxiety, self-efficacy for learning, critical thinking, effort regulation and peer learning all predict academic achievement. I think, however that, if I am able to claim that they exert their influence or effects through prior academic performance, it would be more informative and useful for practice.

Research and methodological evidence suggest that, conducting multivariate tests in a single multiple mediation tests model has several overarching benefits over separated mediation models (MacKinnon & Fairchild, 2009). According to West and Aiken cited in Preacher and Hayes (2008), examining multiple mediation affords the researcher to tease apart specific mediation effects usually associated with potential mediators that may overlap and also resolve as to the existence of indirect effects. Preacher and Hayes (2008, p. 881) propose the following as some of the advantages of using multiple mediation analysis:

1. Testing the total indirect effect of predictor variable (X) on outcome variable (Y) is analogous to conducting a regression analysis with several predictors, with the aim of determining whether an overall effect exists. If an effect (in this case mediation) is found, one can conclude that the set of **j** variables mediates the effect of **X** on **Y**;
2. It is possible to determine to what extent specific **M** variables mediate the **X→Y** effect, conditional on the presence of other mediators in the model;
3. When multiple putative mediators are entertained in a multiple mediation model, the likelihood of parameter bias due to omitted variables is reduced. By contrast, when several simple mediation hypotheses are each tested with a simple mediator model, these separate models may suffer from the omitted variable problem, which can lead to biased parameter estimates;
4. Including several mediators in one model allows the researcher to determine the relative magnitudes of the specific indirect effects associated with all mediators. In other words, including several mediators in the same model is one way to pit

competing theories against one another within a single model. Theory comparison is good methodical practice.

These make the choice of the application of multiple mediation analysis in this study a timely and critical one since all the studies in the area of SRL often involve the use of simple regression methods or analysis of variance (ANOVA) with some selected variables. Nevertheless, I am aware of the fact that a specific indirect effect of a predictor, prior performance (X) through a mediator (e.g., Task value, M_2) in a multiple mediation situation is not the same as the indirect effect of M_2 only. This means that, the specific indirect effects through any of the mediator variables, which represents the ability of that mediator (M_i) to intervene the effect of the predictor variable (X) on the outcome variable (Y) is conditioned on the presence of the other mediators in the model. As such, there is the likelihood of the presence of collinearity – the correlations among mediators, which could affect the multiple-mediation-model in the same way as in simple multiple regression, and compromise the significance of particular indirect effects. I am not by any means saying that investigating specific indirect is dependent on a significant total indirect effect as it is wholly possible to identify specific indirect effects even when there is no significant overall indirect effect (see Field, 2013; Preacher & Kelly, 2011; MacKinnon & Fairchild, 2009; MacKinnon, 2008; Preacher & Hayes, 2008). Within this research, both the individual and total indirect effects were of theoretical interest, and therefore were investigated. In this regard, I followed Preacher and Hayes' (2008) suggestion and investigated multiple interactions among the variables in the study in two stages:

1. Investigated the total indirect effect (the sum of all the indirect effects of mediators) or whether the set of mediators transmitted the effect of predictor(s) (e.g., Prior performance) to the outcome variable (i.e., academic achievement)
2. Tested hypotheses regarding individual mediators in the context of multiple mediator models.

The first step in mediation and moderation analysis is to establish a valid relation between the predictor variable (X) and the outcome variable (Y). There is the need to establish that some predictor (X) explains some or all the variation in outcome variable

(Y) through regression. Therefore, each pre-service teacher's prior performance (Aggr (X)) score was regressed on academic achievement (Aca_Achi (Y)) which could be represented in an equation as:

Test if X predicts Y: $Y_i = d_{Y.X} + cX_i + \varepsilon_i$

The second and third steps involve considering the mediation model which consist of examining the condition(s) by which the predictor variable (X) affects the outcome variable (Y) – thus, estimating the indirect effect of X on Y through one or more variables known as mediator(s) (M). In a one mediator (M), simple mediation, the M is regressed on X and separately regress Y on both X and M as represented:

Test if X predicts M: $M_i = d_{M.X} + aX_i + e_{M.X}$
Test if X still predicts Y if M is in the model: $Y_i = d_{Y.MX} + bM_i + c'X_i + \varepsilon_i$

The forth step involved estimating the total indirect effect (i.e., the indirect effect of X on Y via M known as the *index of mediation*) estimated as (*a*.*b*).

In this study, multiple mediation analyses were conducted based on the conceptual and theoretical framework and the nature of the SRL construct. First, the motivation variables (Intrinsic Motivation, Extrinsic Motivation, Task Value, Control of Learning Beliefs, Self-Efficacy for Learning, and Test Anxiety) were used as mediators (M_1 to M_j) to examine the relations between prior performance (X) and academic achievement (Y). Second, the regulated and learning strategies components (Organization, Peer Learning, Time and Study Environment Management, Rehearsal, Help Seeking, Metacognitive Regulation, Critical Thinking, Effort Regulation and Elaboration) were used as mediators as in the first model. The model used is like the one depicted in Figure 6.

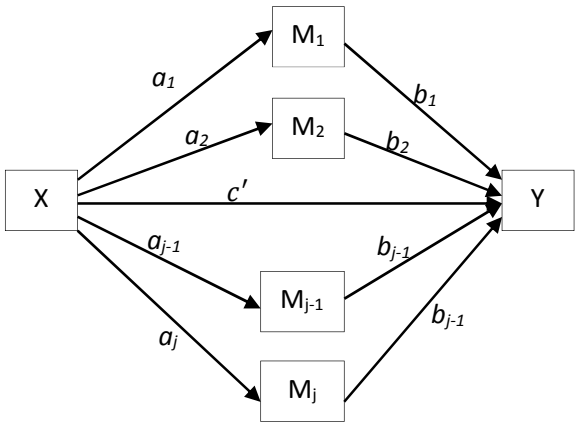


Figure 6: *A model of multiple mediation analysis of the effect of Prior performance on Academic Achievement by Self-Regulation Learning.*

Mathematically: $Y_i = b_0 + b_1M_1 + b_2M_2 + \ldots + b_{j-1}M_{j-1} + b_jM_j + c'X_i + \varepsilon_i$; where b_0 is the intercept of the model; b_1 to b_j are the regression coefficients of the mediators; M_1 to M_j are the mediators in the model; c' is the direct effect of the independent variable (X) on the response variable (Y) controlling for M_1 to M_j and ε_i is the residual (error estimate) in the model.

The product-of-coefficients approach (Preacher & Hayes, 2008) was used in estimating the total indirect effects as follows:

Total indirect effect (**f**) = $a_1b_1 + a_2b_2 + \ldots + a_{j-1}b_{j-1} + a_jb_j$ and the significance tested using kappa-squared (k^2).

From the two analyses, variables from both the motivation and the learning strategies components that did not show significant effect were omitted from the final analysis of the total indirect effect of pre-service teachers' self-regulation learning on academic achievement and a final parsimonious model established. Data analysis was conducted using a custom dialog, PROCESS Procedure for SPSS Release 2.10 (Hayes, 2013). All continuous variables except the outcome variable (academic achievement) were centered by their grand mean in order to clarify the interpretation of results. The data was bootstrapped for indirect effect with bootstrap samples fixed at 1000. The confidence

interval (CI) method used was the bias corrected (BCa) for all mediational analyses in this study. Results were interpreted using coefficients of determination (R^2) and/or kappa-squared (κ^2) in association with practical importance and theoretical reasonableness (Field, 2013; Preacher & Kelly, 2011; Preacher & Hayes, 2008; Remedios & Lieberman, 2008).

3.12.4 Qualitative Data Analysis

Analysis of qualitative data, according to Flick (2014, p. 370), is the interpretation and classification of linguistic (or verbal) material with the aim of making statements about implicit and explicit dimensions and structures of meaning making in the material and what is represented in it. The analysis of qualitative data consisted of comparing the cases selected for the study based on what teacher trainees shared in common about their motivational orientations and what beliefs- and value-factors have contributed to such perspectives on teaching and teacher education. The qualitative data further sort to identify conditions on which the differences between interviewees exist through the explanations offered. In this case, I can say that the analytical procedure used for the data analysis is the "coding" (Flick, 2014, p. 373) and constant comparative method (Fram, 2013; Walker- Gleaves, 2009; Creswell, 2007; Glaser & Strauss, 1967). According to Flick (2014), coding, which could be initial and focused or open and selective, is a way of labelling and categorizing the data as the first step in data analysis.

Charmaz (2006, p. 43) defines coding as "naming segments of data with a label that simultaneously categorizes, summarizes, and accounts for each piece of data." Similarly, Maykut and Morehouse cited in Walker- Gleaves (2009) assert that, the method of constant comparative (CCA) involves coding categories inductively and/ or deductively (Kelle, 2005) through the use of conceptual frameworks, and simultaneously comparing all elements of meaning found. This approach allows the researcher to refer precisely to what is common or different to a class of ideas as analysis progresses from which categories can be formed. This gives the researcher a general sense of reference and guideline and suggests directions along which to look for patterns and relationships in the data so as to clarify and refine classes in the analysis process. For this study, the qualitative data analysis was based on episodic interviews conducted in September, 2012.

Even though literature suggests several ways of analysing narrative interviews (Athens, 2010; Anfara & Mertz, 2006; Denzin, 1989a), in organizing, categorizing, making sense of, and interpreting (Willig, 2014b; Schwandt, 2007) qualitative data in this research study, I employed inductive coding, deductive coding and abductive coding - which "entails considering all possible theoretical explanations for the data, forming hypotheses for each possible explanation, checking them empirically by examining data, and pursuing the most plausible explanation" (Charmaz, 2006, p. 188). My abductive process, symbolic of procedures that several qualitative researchers employ, allowed the researcher to verify evidence to continually test categories and statements made and by so doing, reflexivity is enforced (Fram, 2013). I proceeded in the following steps.

First, I familiarized myself with the transcripts by reading and re-reading, immersing myself in the data and identified meaning units so as to establish initial codes or categories. Based on the episodic interview questions framed by my purpose of the study to explore the contributory factors of beliefs and values, I identified emergent themes, and concepts from the text, eliminating all the non-narrative passages and segmented the "purified" narrative text (Flick, 2014, p. 282) into unique lists of codes. Second, was the structural description of the contents of narrative data by tentatively, in a limiting process based on formal narrative connectors such as "and then". I did this deductive (i.e., a study founded on implicit knowledge and conceptual framework) and inductive (research that is based on narrative text) codes tagging to identified concepts, themes and meaningful patterns through a process Anfara and colleagues referred to as "pattern analysis" (Anfara et al. cited in Walker-Gleaves, 2009, p. 85) to extract the main ideas from the narratives for analysis.

The pattern analysis was to further identify, delineate themes, concepts, clarifications and noting links between codes and meaningful patterns in the data, and group them into an elaborate subcategories or themes (Palmer, 2010). After this analytic abstraction, I integrated the non-narrative parts into the analysis as these provided further avenue interrogate interviewees' submissions. Third, I compared and contrasted both intra- and inter-case analyses to build evidence and sequence, and to rebuild the "interrelation of factual processual courses" (Schutze cited in Flick, 2014, p. 282) in the data. As Walker-

Gleaves rightly asserted, at this point in the analysis, the interconnectedness between the literature and the narrative data changed, oscillating between “an initial concern for nuance and subtlety, toward developing a coherent framework synthesizing data, constructs and concepts” (p. 86).

CHAPTER 4: RESULTS

4.1 Overview

The results of an investigation into pre-service teachers' motivational orientations and cognitive strategies used in a professional training environment and how they impacted on their academic performance in a college of education are presented in this chapter. Both quantitative and qualitative data analysis approaches were used in answering the research questions and a hypothesis of the study. Results from qualitative data and quantitative data were presented separately following the procedures of presenting concurrent mixed method data and the findings discussed together in the ensuing chapter.

4.2 Background characteristics of Pre-service Teachers

Pre-service teachers' background characteristics such as entry aggregates, gender and programme speciality were examined and the descriptive statistics are as shown in Tables 1 and 2.

Table 1: **Descriptive Statistics of Gender and Entry Aggregates of Respondents**

Aggregate Score Range	Gender of Respondents				Total	
	Male		Female			
	F	%	F	%	F	%
6-11	5	1.0	-	-	5	1.0
12-17	11	2.2	5	1.0	16	3.2
18-23	46	9.2	27	5.4	73	14.6
24-29	92	18.4	72	14.4	164	32.8
30-36	116	23.2	126	25.2	242	48.4
Total	270	54.0	230	46.0	500	100.0

The results indicated that, of the 500 students in the study, only 5, representing 1% had at most a grade B2 in the six subjects used as prerequisite for entry into colleges of education. With this number, none was a female. Less than 20% of the students obtained

aggregates lower than 24 and a majority, 242 representing 48% entered colleges with aggregate 30 or higher. This suggested that students in colleges of education had weaker grades and were mainly people who could not have entered the main stream universities. Concerning gender distribution, 54% of the respondents were males and 46% were females. This represented a fair distribution in terms of gender representation for the study considering the total population and the proportions of males and females in the various colleges of education. However, with contingency coefficient (r) value of .153, χ^2 = 11.92, p = .02, α = .05, it does appear that male (M = 27.46, SD = 6.03) pre-service teachers were gaining admission into colleges with better grades than their female (M = 29.11, SD = 4.91) colleagues.

Students' background characteristics in terms of their programmes of specialisms in relation to their gender and entry aggregates were examined and the results are as shown in Table 2.

Table 2: **Summary Statistics of Aggregate Score Range by Programme of Specialization and Gender**

Aggregate Score Range	Programme of specialization				
	General		science		
	M	F	M	F	Total
6-11	3(0.6%)	-	2(0.4%)	-	5(1.0%)
12-17	2(0.4%)	3(.6%)	9(1.8%))	2(0.4%)	16(3.2%)
18-23	22(4.4%)	15(3%)	24(4.8%)	12(2.4)	73(14.6%)
24-29	55(11%)	51(10.2%)	37(7.4)	21(4.2)	164(32.8%)
30-36	70(15.4%)	93(18.6%)	46(9.2%)	33(6.6%)	242(48.4%)
Total	152(30.4%)	162(32.4%)	118(23.6%)	68(13.6%)	500(100.0%)

Of the 500 respondents who took part in the study, majority, and 62.8% read general related courses – that is one of the two programmes offered by colleges of education which seeks to train teachers to teach all subjects at the basic school level. The results showed that there were more females, about 52% of the 314 respondents who read general programmes than their male counterparts. On the other hand, there were more

males, 63.4% of the 186 students who read science related programmes than their female colleagues. Of those who had aggregate scores from 6-11, 3 read general programmes, whilst 2 read science programmes. For those who entered the college with aggregates 12 to 17, 11 read science and only 5 read general programmes. For aggregate score range of 30 to 36, the results indicated that they were mostly represented by students who read general related programmes. In all, a contingency coefficient (r) value of .164, χ^2 = 13.81, p < .05, suggested that pre-service teachers who read science (*M* = 27.15, *SD* = 6.11) related courses entered colleges with better entry grades than their colleagues who read general (*M* = 28.86, *SD* = 5.18) programmes.

4.3 Prevalence of Motivation and Self-Regulation Learning among Pre-service Teachers

The first question of the study examined the most prevailing motivational and self-regulated learning strategy use among pre-service teachers in the colleges of education. Differences in means between first and second year students were tested with an independent t-test. Table 3 displays the summary statistics and the independent t-tests for the motivational and self-regulated learning strategy use among pre-service teachers.

Table 3: **Summary statistics and independent t-tests for Motivational and Self-Regulated Learning (SRL) Variables**

SRL variables	Year	Rank	Mean	SD	t	p
IM	1		5.23	1.39		
	2		5.38	1.11	-1.374	.170
Total		9	5.31	1.26		
CLB)	1		5.07	1.43		
	2		4.67	1.39	3.146	.002
Total		13	4.87	1.42		
TA	1		4.94	1.35		
	2		4.68	1.28	2.172	.030
Total		15	4.81	1.32		
TV	1		5.88	.93		
	2		5.56	1.11	3.456	.001
Total		4	5.72	1.03		
SEL	1		5.58	1.2		
	2		5.36	1.04	2.162	.031
Total		8	5.47	1.13		
EM	1		6.25	.80		
	2		5.91	.94	4.329	.000
Total		1	6.08	.89		
ORG	1		5.70	1.21		
	2		5.43	1.20	2.503	.013
Total		6	5.56	1.21		
PL	1		5.19	1.77		
	2		5.11	1.54	0.531	.596
Total		11	5.15	1.65		
TSM	1		4.89	1.16		
	2		4.78	.97	1.141	.254
Total		14	4.83	1.07		
RE	1		6.09	.66		
	2		5.71	1.00	5.070	.000
Total		2	5.90	.87		
HS	1		5.50	1.00		
	2		5.00	1.43	4.517	.000
Total		10	5.25	1.26		
MCR	1		5.82	.74		
	2		5.56	.85	3.742	.000
Total		5	5.69	.81		
CT	1		5.67	.81		
	2		5.30	1.12	4.165	.000
Total		7	5.49	.99		
ER	1		5.05	1.46		
	2		4.98	1.37	0.601	.548
Total		12	5.01	1.40		
EL	1		5.86	.87		
	2		5.60	1.08	3.018	.003
Total		3	5.73	.99		

IM = intrinsic motivation, CLB = control of learning beliefs, TA = test anxiety, TV = task value, SEL = self-efficacy for learning, EM = extrinsic motivation, ORG = organization, PL = peer learning, TSM = time and study environment management, RE = rehearsal, HS = help seeking, MCS = metacognitive regulation, CT = critical thinking, ER = effort regulation. N = 250.

The results as indicated in Table 3 show that, students in the study reported high on extrinsic motivation (*M* = 6.08, *SD* = 0.89, *rank* = 1), than any other SRL variables. Students also reported as true their use of rehearsal learning strategy (*M* = 5.90, *SD* = 0.87, *rank* = 2) and task value (*M* = 5.72, *SD* = 1.03, *rank* = 4). As indicated in Table 3, pre-service teachers employed elaboration (*M* = 5.73, *SD* = 0.99, *rank* = 3), metacognitive strategy use (*M* = 5.69, *SD* = 0.81, *rank* = 5) and organization (*M* = 5.56, *SD* = 1.21) as their main form of learning strategies. The results from the descriptive analysis revealed that pre-service teachers reported the affective component as the least true of them - the fear for test or the prevalence of test anxiety (*M* = 4.81, *SD* = 1.32, *rank* = 15). This was followed by time and study environment management (*M* = 4.83, *SD* = 1.07), and control of learning beliefs (*M* = 4.87, *SD* = 1.42). In all, students indicated that extrinsic motivation, rehearsal, elaboration, task value and metacognitive regulation were the five topmost motivational and learning strategies they employed during their training. Although students reported as true of them, it was evident that test anxiety, time and study environment management, control of learning beliefs, effort regulation and peer learning were reported as the five least strategies used during the period of academic work in training.

An independent t-test was conducted on each of the variables to ascertain whether significant differences exist between the motivational and self-regulated learning strategy use between students in their first year of training and those in their final year of course work (i.e., the second year cohort). The tests were conducted to assess students' "development" of motivational strategies for learning over time. The results indicate that first and second year students differ on the use of some of the self-regulated learning strategies. Specifically, first year students (level 100) (*M* = 6.23, *SD* = 0.80) rated themselves as more extrinsically motivated than did second year students (level 200) (*M* = 5.91, SD = 0.94), $t(498) = 4.33$, $p < 0.05$. Thus, students reported a significant decrease in their level of extrinsic motivation. On the use of rehearsal as a strategy, the first year cohorts (*M* = 6.09, *SD* = 0.66) reported high on the variable than their second year counterparts (*M* = 5.71, *SD* = 0.99) and the independent t test results indicated that, the mean difference was statistically significant at the 0.05 alpha level. The results also showed that students differed on their use of metacognitive strategies, with level 100

students (M = 5.82, SD = 0.73) rating themselves more reflective than did level 200 students (M = 5.56, SD = 0.85), $t(498) = 3.74$, $p < 0.05$. There were mean differences in elaboration and task value; the first year students (M = 5.86, SD = 0.87) rated themselves more elaborative than did the second year students (M = 5.60, SD = 1.08), $t(498) = 3.02$, $p = .003$, and first year students (M = 5.88, SD = 0.93) perceived as more valuable the tasks they performed in college than did second year students (M = 5.56, SD = 1.11), $t(498) = 3.46$, $p = .001$. However, the mean difference for intrinsic motivation was not significant, even though second year students (M = 5.38, SD = 1.11) reported higher on the construct than did first year students (M = 5.23, SD = 1.39). First and second year students did not differ on three of the nine learning strategy use constructs (i.e., peer learning, time and study environment management and effort regulation) and one of the motivational orientation variables (i.e., intrinsic motivation).

In all, with the exception of intrinsic motivation where second-year students reported higher mean than the first year students, and even then, the mean differences was not statistically significant, all the mean scores reported show a lower mean for the second years than the first years. The graph of distributions shows that first year students tend to be high on help seeking strategies relative to their second year counterparts, with a mean higher than the overall average for the two groups. This indicates that, first students may seek assistance from other sources such as colleagues, seniors and teachers during their learning than do the second year students. In effect, second years in the study reported seeking less assistance with a mean lower than the overall mean for the two groups. Students control of learning beliefs showed a reduction as the second year students' mean score is lower than the first year student. The first years reported high on motivational orientation apart from intrinsic motivation. Time and study environment management skills, peer learning, effort regulation and intrinsic motivation seem to be stable across the years.

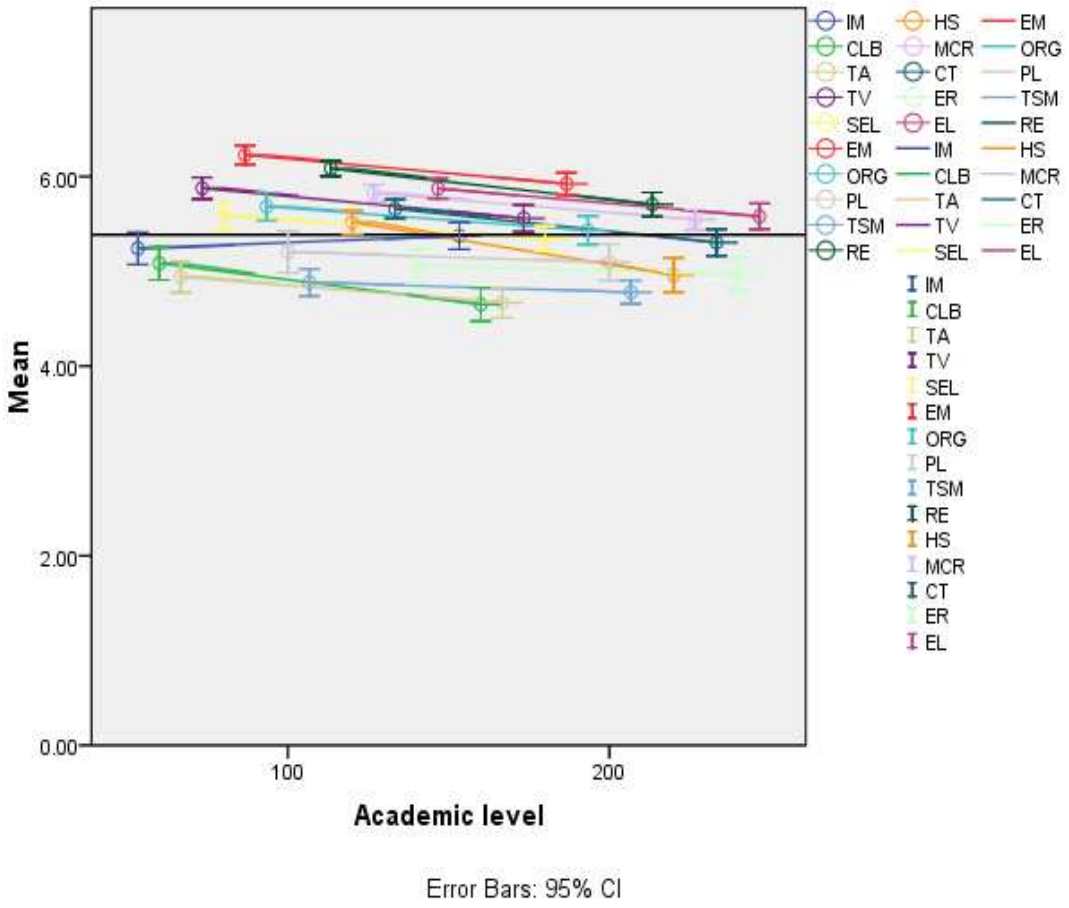


Figure 7: *Graphical representation of students' SRL*

The results from the graph indicate that first year students have high mean scores on both motivation and self-regulation strategy use than their second year counterparts during training. The results show a decline in students' motivational and strategy use as they progress on the programme.

4.4 Relationships between the Motivation and Learning Strategies components of Self-Regulation Learning of Pre-service teachers

The second question of the study concerned the relationships between the motivation and learning strategies components of pre-service teachers' self-regulation learning. Table 4 shows the Pearson's correlation coefficients for the motivational and learning strategies variables.

Table 4: **Zero-Order Correlations for Motivation and Learning Strategies Variables**

	IM	CLB	TA	TV	SEL	EM	ORG	PL	TSM	RE	HS	MCS	CT	ER
CLB	.232**													
TA	-.095*	-.040												
TV	.260**	.302**	-.051											
SEL	.421**	.237**	-.146**	.327**										
EM	.186**	.189**	.124**	.339**	.239**									
ORG	.226**	.168**	-.078	.221**	.285**	.144**								
PL	.215**	.118**	-.100*	.217**	.314**	.078	.446**							
TSM	.264**	.127**	-.189**	.197**	.289**	.063	.336**	.221**						
RE	.203**	.161**	.088*	.344**	.199**	.357**	.290**	.110*	.107*					
HS	.094*	.110*	-.015	.171**	.172**	.123**	.278**	.296**	.230**	.180**				
MCS	.265**	.148**	.050	.241**	.194**	.261**	.415**	.269**	.175**	.513**	.188**			
CT	.270**	.129**	.022	.258**	.287**	.231**	.416**	.310**	.204**	.360**	.217**	.568**		
ER	.227**	.116**	-.179**	.111*	.313**	.050	.239**	.152**	.412**	.089*	.222**	.213**	.208**	
EL	.284**	.228**	-.100*	.252**	.347**	.213**	.355**	.271**	.317**	.306**	.217**	.471**	.380**	.297**

IM = intrinsic motivation, CLB = control of learning beliefs, TA = test anxiety, TV = task value, SEL = self-efficacy for learning, EM = extrinsic motivation, ORG = organization, PL = peer learning, TSM = time and study environment management, RE = rehearsal, HS = help seeking, MCS = metacognitive regulation, CT = critical thinking, ER = effort regulation. N = 500**; **p< 0.01 level** (2-tailed); ***p< 0.05 level** (2-tailed).

Students' control of learning beliefs correlates significantly with their intrinsic motivation (r = .232, p < 0.01). On the motivation scale, the results indicated a positive significant relationship between students value for task and control of learning beliefs (r = .302, p < 0.01). This shows that control of learning beliefs variable has a stronger association with task value as compared with other motivation variables. As expected, the affect variable, represented by test anxiety had negative relationship with five of the six variables on the

motivation orientation scale. There was negative significant relationships between test anxiety and self-efficacy for learning (r =-.146, p =.001, α = 0.01). However, the relationships between test anxiety and students' control of learning beliefs, intrinsic motivation, as well as their value for task were not statistically significant at the 1% alpha level. Conversely, the results show that test anxiety correlated positively with extrinsic motivation, and the relationship (r = .124) was significant at the 1% alpha level. This indicates that students who reported high on extrinsic motivation also reported high on test anxiety. However, the shared variance of about 2% between extrinsic motivation and test anxiety is low. Self-efficacy for learning correlated high with intrinsic motivation (r = .421), and task value (r = .327), and as expected, with control of learning beliefs (r = .237), all at p <0.01. With r^2 = .1772, self-efficacy had about 18% of shared variance with extrinsic motivation. The results revealed that extrinsic motivation correlated high with task value (r = .339, p <0.01) with a shared variance of 11.5%.

Concerning learning and resource management strategies used, organisation significantly and positively correlated with five of the motivation variables. The relationship between organization and test anxiety was not significant (r = -.078, p = .08). Higher levels of peer learning significantly related to higher levels of intrinsic motivation (r =.215, p <0.01), task value (r =.217, p <0.01), self-efficacy for learning (r =.314, p <0.01) and organization (r =.446, p < 0.01). It is worthy to note that pre-service teachers' use of peer learning strategy explained about 20% of the variance in students organization strategy use. Peer learning was not associated with extrinsic motivation. However, students who reported high on peer learning reported low on test anxiety and the relationship was significant (r = -.100, p = .026, α = 0.05). In addition, a high score reported for time and study environment management related to a low score in test anxiety (r = -.189, p < .01). Paralleling these findings for peer learning, higher levels of organization (r = .336), self-efficacy for learning (r = .289), intrinsic motivation (r = .264) and control of learning beliefs (r = .127) were correlated with higher levels of time and study environment management and all associations were significant at α = 0.01. Students rehearsal use correlated weakly with test anxiety (r = .088) and time and study environment management (r = .107), albeit not at .01. Besides that, students who stated that they used rehearsal strategies also said they used metacognitive strategies (r = .513), critical

thinking (r = .360), and elaboration (r = .306) and the relationships were significant at 0.01 alpha. The positive relationship between rehearsal and metacognitive regulation is high. With r^2 = .2632, metacognitive regulation explains about 26% of the variation in rehearsal strategy use.

The results as indicated in Table 4 revealed that there was a weak positive statistically significant relationship between help seeking and rehearsal (r = .180, p<.01). Rehearsal positively correlated high with less desirable motivational belief, extrinsic motivation (r = .357), as well as "positive" motivational belief of task value (r =.344). Help seeking correlated positively with peer learning as expected with coefficient value of r = .296, p < .01. The results also showed that as students help seeking increased, their time and study management also increased and the relationship was positive, but moderate. The negative relationship between help seeking and test anxiety (r = -.015, p = .73) was not statistically significant. Metacognitive regulation had modest, positive associations with more desirable characteristics: intrinsic motivation (r = .265), control of learning beliefs (r = .148, p = .001), task value (r = .241), self-efficacy for learning (r = .194) and time and study environment management (r = .175). Peer learning and metacognitive showed a modest correlation (r = .269, p < .001). As expected, the association between metacognitive regulation and organization was high and positive (r = .415), but there was no statistically significant relationship between metacognitive regulation and test anxiety, even though they shared out of usual positive relation.

The results indicated that students who reported high on critical thinking also made use of peer learning and the relationship was significant (r = .310, p <.01). Critical thinking moderately and positively related with the desirable motivational beliefs of self-efficacy, intrinsic motivation and control of learning beliefs (see Table 4). Surprisingly, as the relationship between critical thinking and test anxiety was also positive and non-significant, the relation between critical thinking and extrinsic motivation (r = .231, p <.01) was positive a significant. As expected, students who indicated it was true of them on their critical thinking activities indicated same for organization and metacognition. The coefficients of determination (r^2) between critical thinking and metacognition is .323, and between critical thinking and organization is .172. This means that critical

thinking accounts for 32.3% of the variation in metacognitive regulation, and 17.2% in organization.

Students effort regulation (e.g., even when course materials are dull and uninteresting, I manage to keep working until I finish) related high with time and study environment management (e.g., I usually study in a place where I can concentrate on my course work). Thus, students who reported high on the use of effort regulation strategy, reported high on time and study environment management strategy (r = .412, p <.01, r^2 = .170). Students effort regulation and task value (e.g., I think I will be able to use what I learn in this programme in later in my career) did not correlate at .01 alpha level. The low non-significant correlation (r = .111) suggests that their effort regulation strategy use were not accounted for by interest or the importance they attached to courses of study on the programme. The results indicated that the shared variability between self-efficacy for learning and effort regulation was significant (r = .313, p < .01). With r^2 = .098 means that self-efficacy for learning shares 9.8% of the variability in students' effort regulation towards learning. Modest relationships were also detected between effort regulation and some desiderata motivation variables, intrinsic motivation (r = .227), control of learning beliefs (r = .116), and learning strategies variables, organization (r = .239), help seeking (r = .217) and metacognitive regulation (r = .213). It is worthy to note that there was moderate, negative significant relationship between test anxiety and effort regulation. This suggests that as students' effort at learning course materials increases, their anxiety towards examination decreases and vice versa.

In terms of elaboration, for example, "when I study, I bring together information from different sources," the results indicated a weak, negative significant relationship with test anxiety (r = -.100) albeit not at α = .01. However, there was a significant positive relationship between self-efficacy for learning (r = .347). The coefficient of determination r^2 is .120, which means that elaboration strategy use shared about 12% of the variability in students' self-efficacy for learning. Elaboration was moderately correlated with the other motivation variables and the learning strategies in the expected directions. An increase in students' elaboration use in learning related with an increase in their intrinsic motivation (r = .284), control of learning (r = .228), task value (r = .252),

and surprisingly, with their external motivation (r = .213). Students' elaboration strategy use significantly correlated with their metacognitive regulation with a shared variance of approximately 22% and with critical thinking with an estimated variance of 14.4%. An increase in effort regulation showed an increase in elaboration and the relations was statistically significant.

4.5 Relations between Pre-service Teachers' Programme of specialization, Gender, Academic Performance (GPA) and Motivation and Self-Regulation Learning Strategies

Question three of the study was to assess the relationships between pre-service teachers' programme of specialization, gender, their academic performance (GPA, with overall mean of 2.41 and standard deviation of 0.53) and motivation and self-regulation learning strategies. The results are presented in Table 5.

Table 5: **Summery of Correlations between Motivation and Learning Strategies of Pre-service Teachers and their Programme major, Gender and Academic Achievement**

Motivated learning strategies	Correlations (r_{pb}) with Programme	Correlations (r_{pb}) with Gender	Correlations (r) with GPA
Academic Achievement (GPA)	.098*	-.047	-
Intrinsic Motivation	-.121**	.061	.316**
Control of Learning Beliefs	-.056	.010	.186**
Test Anxiety	.019	.137**	-.342**
Task Value	.015	.140**	.044
Self-efficacy for Learning	-.091*	.113*	.345**
Extrinsic Motivation	-.092*	.087	-.100*
Organization	.106*	.008	.200**
Peer Learning	-.111*	.066	.220**
Time and Study Environment Management	.091*	-.028	.434**
Rehearsal	-.013	.151**	-.125**
Help Seeking	.141**	.174**	.110*
Metacognitive Regulation	.008	.012	.017
Critical Thinking	.050	-.022	.034
Effort Regulation	.123**	.074	.413**
Elaboration	-.053	.001	.171**

N = 500;**p<0.01; *p<0.05

As indicated in Table 5, the motivational variables showed significant associations with academic achievement, except for task value. Correlation between self-efficacy for learning and achievement was highest and positive among the motivation variables (r =

.345, $p < .01$). These two variables had $r^2 = .1190$, which means that self-efficacy for learning shared about 12% of the variability in pre-service teachers' academic achievement. Pre-service teachers who were more anxious were less likely to perform well in the end-of-semester examinations. Thus, the correlation between test anxiety (e.g., "When I take a test I think about items on other parts of the test I cannot answer) and academic achievement was in the expected direction and statistically significant ($r = -.342$, $p < .01$). This means that test anxiety shared about 11.7% of the variability in pre-service teachers' academic achievement. There was a significant positive correlation between intrinsic motivation and achievement.

Thus, students who approached their course work on the programme with an intrinsic drive were more likely to perform well. At the same time, pre-service teachers who reposted being extrinsically motivated were less likely to do well on the programme and correlation between the two variables were significant ($r = -.100$), albeit not at the .01 significance level. Pre-service teachers' value for tasks (e.g., "I am very interested in the content areas of courses in this programme" and "Understanding the subject matter of courses in this programme is very important to me") and their academic achievement did not correlate (see Table 5). With a mean of 5.72 and standard deviation of 1.03, students seemed to have reported high on the presence of task value; however, their interest and the importance they attached to the courses on the programme did not significantly influence their achievement.

In terms of pre-service teachers cognitive strategy use, the results indicate that most of the learning strategy variables showed the expected relations with academic achievement (GPA). Higher levels of time and study management was associated with higher levels of academic achievement ($r = .433$, $p < .01$). In addition, academic achievement correlated positively with effort regulation ($r = .413$), peer learning ($r = .220$) and organization ($r = .200$) all at $p < .01$, but not help seeking There was a moderate negative significant relationship between academic achievement and rehearsal strategy use (see Table3x), which suggests that students who relied on rehearsal strategies were more likely to perform poorly in the programme. Unpredictably, deeper processing strategies such as metacognitive regulation ($M = 5.69$, $SD = 0.81$) and critical thinking ($M = 5.49$, $SD =$

0.99) were not significantly related students' academic achievement, suggesting that a reliance on more involving information processing strategies was not helpful for academic achievement among pre-service teachers in the study.

Table 5 also displays the point-biserial correlation coefficients between academic achievement, motivation and cognitive strategies variables and students' programme of specialization as well as gender. The results revealed a weak positive relationship between students' academic performance and their programme of specialism, even though not at the 0.01 significant level. This means that students who read science related programmes had a slightly better performance (M = 2.477, SD = .496) compared to their counterparts in general related programmes (M = 2.371, SD = .568). Students' achievement did not differ across gender (r = -.047, p > .01). Concerning the motivation and cognitive strategies, only intrinsic motivation significantly correlated with a student's programme major (r = -.121, p < .01). The results indicated that students who read general courses had a higher mean score (M = 5.424, SE = .068) than students who read science courses (M = 5.109, SE = .098) and the mean difference was statistically significant, $t(498)$ = 2.712, p = .007, 95%CI [.087, .543]. This suggested that students who majored in general programmes were slightly intrinsically motivated than those who majored in science programmes. In terms of the cognitive strategy use, programme of specialism correlated with help seeking (r = .141) and effort regulation (r = .123) all at α = .01.

These significantly positive but moderate associations meant that science students were more likely to seek help (e.g., "I ask tutors to explain concepts I don't understand well during lectures"), with mean difference of -.439, $t(498)$ = -3.944, p < .05, 95%CI [-.658, -.220] and regulate their effort (e.g., "I try to relate ideas in one course material to other courses whenever possible"), mean difference was -.360, $t(498)$ = -2.773, p = .005, 95CI [-.609, -.111], in learning conditions than did general students. Gender of pre-service teachers did not correlate with intrinsic motivation, control of learning beliefs and extrinsic motivation. However, gender correlated with test anxiety (r_{pb} = .137) and task value (r_{pb} = .140). In terms of anxiety, on the average, female pre-service teachers reported high on test anxiety (M = 5.00, SE = .083), than male pre-service teachers (M =

4.642, *SE* = .082). This difference, -.361, 95%CI [-.592, -.131], was significant *t*(498) = -3.079, *p* = .002.

Compared to the males in the study (*M* = 5.588, *SE* = .069), females indicated a higher mean (*M* = 5.878, *SE* = .057) on task value, *t*(498) = -3.215, *p* = .001, 95%CI [-.454, -.057]. As such, females appeared to be more interested and attached importance to the courses on the programme than their male colleagues. Rehearsal, a surface information processing strategy correlated with gender of the participants in the study (r_{pb} = .151, *p* < .01). Male pre-service teachers (*M* = 5.778, *SE* = .056) were lower on the construct than the female pre-service teachers (*M* = 6. 040, *SE* = .051), suggesting that females appeared to have relied on more surface processing strategies such as "When I study, I practice saying the facts to myself over and over" than did their male counterparts. The mean difference of -.262, 95%CI [-.413, -.112], was significant *t*(498) = -3. 416, *p* = .001. Finally, the use of help seeking strategies correlated positively with gender (r_{pb} = .174, *p* < .01). Females described themselves as more help seeking (e.g., "When I don't understand any material when studying, I ask another student in class for help") than the male pre-service teachers. Nevertheless, the results indicated that effort regulation, metacognition and organization were not gender bonded.

4.6 How do dispositional beliefs and values manifest among pre-service teachers?

Research question four explored the contributory factors of beliefs and values that lay behind some pre-service teachers' motivational orientations. It is reckoned that teacher trainees enter initial training with diverse beliefs, values and metaphors of teachers, teaching and the teaching profession. Syntheses of literature on initial teacher education (see Anderson & Stillman, 2013; Avalos, 2011; Darling-Hammond, 2010; Malm, 2009) suggest that pre-service teachers come to training with past experiences, values and beliefs that serve metaphorically as telescope through which they view whatever they learn whilst in college. These beliefs and values form a critical foundation for their learning in colleges and mediating their achievements during the training period (Anderson & Stillman, 2013). There is therefore the need to explore such beliefs and values. This section of the study intended to do that by illuminating pre-service teachers' motives and purposes of choosing the profession and what factors influenced their agencies, believes and values; how they learn, their perceptions on children, what efforts they bring to their learning and how these energies were reflected in transformation of cognition and behavioural practices.

Dispositional Beliefs and Values among Pre-service Teachers

4.6.1 **An age-old problem still with us*:*** *I love to impart knowledge to the young ones*

Spanning through decades, studies have found out that teachers believe teaching is to transfer all that they have acquired during training to children they are teaching. For example, in a multi-site study conducted by Lewin and Stuart (2003), they found out that, teacher trainees perceived teaching as a processes of imparting knowledge to students. Over ten years now, the results from the episodic interviews in this study indicated that, majority of the pre-service teachers in the study mostly perceived teaching as a mode of transmitting knowledge from the teacher to students. For example, the following excerpt succinctly represents participants' views:

> *I chose this profession because I like imparting knowledge to people and then I think maybe I have something within me that helps or that will help me to impart knowledge to other people…There are different job opportunities, some are doctors…but you sit down and ask yourself, who*

> *trained all these people to become prominent people in the society?… and its only teachers who can help to impart knowledge to young people and they become useful citizens in the country.* (PSU2)

The idea of teaching as transmitting knowledge was so pervasive among students and they mostly held an image of a teacher as an embodiment of knowledge that needs to be given to students who need such knowledge. As one participant said *I want to impart all that I have learnt to other people. Yes! To impart all that I have to other people so that they can also impart to other people and it goes on and on* (PSL1). To them, teaching as a career affords them the opportunity to teach pupils facts that have been acquired; bequeath to children an unchanging knowledge for tradition to go on. However, this position of student teachers and their understanding of teaching in this way overtly portray how pre-service teachers are been taught in colleges in what Albert Bandura refers to as learning vicariously (Schunk, 2009) or what they might have learnt from their previous schooling experiences in what Dan Lottie terms as "apprenticeship of observation" (Hammerness, et al., 2005, p. 367). For example, one of the participants in an emphatic manner and a probable reflection of what has been taught them indicated that:

> *…I know if I teach…or teaching is a means of imparting knowledge or the skills you have to another one. So I know teaching is a good job for me to impart knowledge to others.* (PSL2)

These accounts point to an age long problem of teaching being perceived as giving facts to children instead of being a reflective practice of coproduction of knowledge and development of skills. It seems initial training institutions are not affording pre-service teachers participatory approaches to learning and create extensive avenues for guided practice to orient teacher trainees towards the need to coproduce knowledge with pupils rather than transmit learned facts to students (Harris & Sass, 2011). Beginning teachers come to training with beliefs and some understating of teaching and teacher training institutions are to serve as mediators between what pre-service teachers come in with and what quality they should go out with (Avalos, 2011).

As evident during the interviews, apart from choosing teaching with the hope of transmitting knowledge to the young ones, some of the participants revealed they chose

the teaching profession because they felt they could teach or their urge was born out of their previous experience in formal teaching. Even though, a majority of the students have not had teaching experience prior to entering college, the few who did indicated that, it influenced their decision of choosing teaching as career. For example, when asked why they wanted to be teachers, some participants indicated that:

> *For me I felt I could teach in the SSS, because it got to a point in secondary school that any time our teacher left the class…and then sometimes when my mates were sick and could not come to class and they came back, they asked me to explain whatever we learned to them and anytime I did that they understood it very well. So I thought I could do the teaching profession very well. So those made me come into the teaching profession.* (PSM2).

> *…I entered into 'pupil teaching' for about 2 years. Over there, and I realized that…'this [teaching] is my career so why don't I go for training so I become a better teacher?"…I bought the forms again and luckily I was admitted. (*PSM1).

4.6.2 **Motivation to teach**: *Not in my dreams*

According to the National Research Council (2010), the success of any blueprint for successful educational effects is contingent on the teachers who carry it out and thus on the skills of those "attracted to the field" and their training (p. 1). Yet, pre-service teachers in the study seem to have come to training not based on the fact that they were attracted, but mainly due to exigencies that are purely altruistic. Pre-service teachers' narratives presented some very interesting insights into how they entered into colleges of education to be trained as professional teachers. The stories revealed that majority of the trainees did not consider teaching as a future career. Their aspirations ranged from accountancy through journalism to nursing, but certainly not teaching. For those who would consider teaching, they did so because there were extreme circumstances that prevented them from going into their first choice careers. For example, one participant indicated she came into teaching because of her fear for blood (haemophobia). Quotes illustrating these views follow:

> *I didn't even dream of becoming a teacher…I completed school in 2009 and I wanted to go into nursing, but my brother said he didn't like it … he wanted me to be a teacher…And I went to buy forms because I was at home doing nothing...* (PSM2).

> *I completed school in 2007 and at first I wanted to be a banker or be something else but teaching wasn't in my mind. But the circumstances around me, even friends and relatives advised me to come to training college, so I was just following what they were saying.* (PSU2)

Teacher trainees' are often influenced by external factors when it comes to decisions related to the choice of the teaching career and teacher colleges as institutions for training (Lewin & Stuart, 2003). This situation was evident in many of the participants' narratives, and this situation seems to be quite prevalent in Ghana (Akyeampong & Stephens, 2002). Family related issues and economic circumstances often contribute immensely to a person's decision to attend a teacher training institution or not. So entry into the teaching profession is either done based on some humane situations such as making way for other siblings or getting payment from work to take care of other individuals in the family. As reflected in interviewees' stories and I quote:

> *…At times they would tell me because I have other four siblings and I am the oldest…and by then my mum was no more…my uncle advised me that I should come to training college because there are allowances [t]here…Although I didn't like it [teaching], I had no option because my brother was also preparing to go to school so having both of us in the university wouldn't be so easy…So I just bought the forms and I came here.* (PSU2)

> *I wanted to be a journalist, because, each time my father asked me, I told him that I want to be a journalist. But I applied for admission in Legon when I completed in 2007 and I wasn't offered admission… So as time went on I bought forms again and luckily I was admitted.* (PSM1)

Literature (e.g., Akyeampong et al., 2011) suggests that in most cases, students who opt for teacher training colleges are those who do have weaker grades especially in science, mathematics and English language. This situation became evident during the interviews as majority of the participants had stayed longer before enrolling into tertiary institutions. As one participant said *I had a problem also in maths and science, so I had no option than to come*…PSU2. With these weaker academic backgrounds, many students find it difficult to enter other tertiary institutions such as universities, which require prospective candidates to have determinate entry aggregates (often less than aggregate 24 in six subjects) and more competitive entry requirements. With this at hind sight, I sought to find out further to ascertain whether PSM1 was not considering teaching for the fact that

she was not selected for the university programme as Akyeampong and Stephens (2002) had found in their study in Ghana that teacher trainees considered entering teacher colleges because they did not meet the requirement of tertiary institutions and the question yielded the following response:

> *No. You see, I could have bought another one for the university admission…I could have bought another one, but I realized I could teach when I went to pupil teaching that is why I diverted…I changed my mind.*

Another issue that has bereft most prospective pre-service teachers in taking decisions on attending colleges has been the general perception that, if even one would want to become a teacher, it is better to obtain the certification from the university rather than going through a college of education. Although it is very difficult to explain this source of belief, this conception may be related to what Cohen and Moffitt (2009, p. 5) refer to as an "educational infrastructure" – thus, this may be due to the fact that most often than not in Ghana, teachers from the universities take appointments from secondary schools which are seen as superior to teaching in the basic schools with the same qualification and as found in Tanzania in a six nation study by Akyeampong et al. (2011) where pre-service teachers were reluctant to teach in lower primary as they saw it as lowering of status (p. 30). In this study, some of the participants indicated that they would have preferred going to university rather than entering colleges of education. Generally exemplifying this position was the view by PSU1 that, even though he had the inkling to move on the trajectory of the teaching profession, he had preferred going to the university and that idea nearly made him lost his motivation until he was advised and helped by a benevolent head teacher. He narrated position by saying:

> *…I liked the teaching…But after school, I went for a teaching appointment at a private school….At that particular place 'I wanted to go to college, but they[colleges] changed the rules on grades for admission – one could not enrol with grades 'D' or 'E' in some subjects.' I taught for 7 years and was so comfortable I had forgotten I was not a professional teacher. So the headmaster called and told me that, "XXX you are a teacher", and he 'told' me something that, it will get to a time, all teachers must hold diploma before they can teach… So our head master supported me; he bought the forms and said I can be in the training college because they give allowances, dining and the rest.*

4.6.3 **Pre-service teachers' perceptions about teaching and initial teacher training**: *We who go through college are the real teachers?*

Accounts of the participants suggested that pre-service teachers held some general beliefs and perceptions about teaching, and initial training in residential colleges. Their accounts seemed to portray teaching as demanding and a difficult job. It is plausible therefore that, many of these pre-service teachers are likely to leave the teaching profession, thereby increasing burnout rate and attrition (OLT, 2012; Beltman et al., 2011; Cobbold, 2010). Their accounts were characterized by lexes such as 'it is not easy at all' and 'it demands a lot'. This belief might stem from students' observation of or their vicarious experiences as their tutors teach in the colleges. It may also be that, they perceive teaching as a difficult job since they have been students before and have seen what their teachers went through and the high expectations stakeholders in education placed on them. This belief was reflected in students' accounts when they were asked of their views on the teaching profession. The following comments exemplify the point.

> *I see it [teaching] as a profession that demands a lot. Because the way I see my teachers; sometimes we sit at the back of the class and as some of the students will be disturbing, they [tutors] would keep quiet and look at us for some time, and then we look at him and we also become quiet, and I said eish! (*An expression of shock*), 'it's not that easy'…one day we will also become teachers and I wonder what our children will do to us.* (PSU1)

> *…As for this teaching, I can't oh! Because the job is too stressful, I can't do it*. (PSM2)

In a related manner, pre-service teachers in the study indicated that teachers need to be physically healthy and mentally sound; proposed that one needs to ensure total wellbeing for better performance. This belief might have been born out of the fact that they believe teaching is a daunting task as indicated in their previous narratives as there is scant evidence on this conception, and that one needs to be strong enough mentally and physically to as to be able to coordinate activities of teaching and learning effectively. For example, students believed that teachers do not take to classrooms their problems and worries from home as this may *influence the children and they will not get what you are teaching them*. (PSL1).

Some of their conceptions of teaching were that a teacher should dedicate his or her time to duty and the profession. Long term commitment to teaching by teachers, especially those in basic schools has been a major challenge in Ghana's education system (Cobbold, 2010). Maintaining teachers after their initial training is a herculean task for governments over the years (UNESCO, 2012). Therefore, these views could serve as starting points of developing teachers' long term commitment to teaching and harnessing it when they are on the job field. In an answer to a question which sought to find out participants perception about teaching, two comments clearly covered the views of other participants that:

> …*Every teacher must take his or her teaching job seriously. And dedicate his or her time to it. Do it and do it whole heartedly.* (PSL1).

> *And also, taking your work seriously and loving it and loving the fact that you are a teacher and going to school all the time, every day. You have to accept the fact that you are a teacher and do all the things expected of you. In that case you can call yourself… and others can call you a professional teacher.* (PSU1).

Student teachers have different values and aspirations for the career they are entering into. Some may come to college with the hope of securing a job in the profession, and others, to be able to get academic qualification that can enable them pursue further education (Akyeampong & Stephens, 2002). Data from the interviews suggested that initial training would afford then the opportunity to gain some perceived lucrative jobs like army or radio journalist. However, for pre-service teachers in the study who would want to remain in the teaching career, they believed that teaching would earn them veneration from the community where they would be posted. As one respondent said:

> *I see it that teachers are respected. Even though people say a teacher's salary is small, and they are not well paid and the rest, sometimes I feel that the teachers earn much respect. And as a man I feel that if your salary is sufficient for you, the next thing I think about is respect.*

In the Ghanaian situation, some praxis such as community service, regularity and punctuality to school, having children's at heart and pupils' academic achievement in examinations would often earn teachers such respects from the community (Dobber, Vandyck, Akkerman et al., 2012). The veneration and appreciation student teachers seem

to believe would be accorded them from local communities in terms of getting them involve in decision making processes and the community perceiving them as *a fountain of knowledge* make them feel that teaching would be good for them. The following was quoted to buttress this point:

> *So if people respect you…a certain friend of mine, who is also a teacher, he says in the village, when you are posted, they call you 'mister', 'mister' and then sometimes elders would come to you, and your views become final over there…And sometimes you become proud that you have been able to change someone.* (PSU1)

In line with Rest cited in Day (2007), who posits that, people who develop, are those who love to learn, another conception of student teachers about teaching was that, teaching requires constant learning. This point seemed to suggest that, pre-service teachers perceive teaching as a developmental process (Cheng, Cheng & Tang, 2010) and that one needs to be constantly engaged in seeking knowledge to be effective in the classroom. It is important and interesting that pre-service teachers did not view their initial training as an end in itself but are aware that they may still be required to learn after their training in colleges and that teaching involves lifelong learning. During the interviews, participants' stories indicated that, not only did they portray conceptions that are related to personal and affective needs, but also portrayed this lifelong learning nature of teaching. Comparing teaching to other job opportunities or professions, a participant said:

> *…it's a continuous process in which we can learn. Because when you go out there to teach, you can't just say you are going to sit down and wake up in the morning and say you are going to teach, you will fumble and have to always and always learn that will help you become very knowledgeable.*

Participants perceived teaching as being flexible in terms of time and the fact that she would have enough space to do other jobs. From the way this belief was expressed, it appeared that student teachers were interested in engaging in other occupations such as trading instead of committing fully to the teaching profession. The idea seemed to have learnt from students' experiences with other teachers or family member and the following excerpt from participants' narratives clearly illuminate the situation:

> *I have two uncles, they were all teachers, but aside teaching they could have other jobs…and I have one brother who is a nurse. For the nurse he cannot do anything because he can go to work midnight and also during the day, so can't do other things. But my uncles they chose teaching and had other jobs and that alone made me interested. Because when I close from school I can do other things.* (PSU2)

In response to a question that inquired about students' views on initial training in residential colleges, participants' answers revealed that pre-service teachers were of the view that, those who attended teacher training colleges become what in their words a "real" or "better" teacher. To teacher trainees, being trained in a college of education was seen as a better option than going straight to the university after completing secondary school, and also better than acquiring your professional certificate through distance education. The following submission and reasons given by a participant illustrates this situation:

> *…And then the weeding, going to dining, and the prescribed attire; you can't wear any attire…you have to take exeat before you go to town…sometimes when we are tired then we say "eish! Becoming a professional teacher is not easy." You have to go through all these training…so what we said then was that, "then those in the university…who go to Cape* (referring to the university of Cape Coast) *straight, they have had it so easy"…Or we those who are passing through college are the real teachers? And what they* [college authorities] *tell us is that, a real teacher must be disciplined, that is why they are disciplining us before we go out…* (PSU1).

These views were not based on any evidence of good professional practice, but based on their stories, one could deduce from the fact that they go through some unconventional practices during their stay on college campuses, they were made to believe that they were being discipline and trained to become 'professional' teachers. As could be inferred from their stories, some of the participants perceived the ordeal they went through in college such as weeding, and the regimented way of living on campuses (Akyeampong & Stephens, 2002) such as wearing uniforms and taken permission before leaving school as a way of becoming disciplined and professional teachers.

Again, in terms of their views about initial teacher training, some pre-service teachers in the study indicated that the training they are receiving had had behavioural and attitudinal

impact on them (Hiebert et al., 2007). It had made them to tolerate, socialize and communicate effectively with others. The following views were expressed:

> *For me, the training ground is a very good for socialization…At first it's not everything I could tolerate, but when I came to college I realized that at times, I have to agree with other people. You don't have to say as for me I like this or that, so if someone says something, I have to fight with the person. You just have to tolerate other people's views and other things.* (PSM2).

Next:

> *…from first year to second year we learnt a little about psychology - how human beings behave, so it has really helped me. Because from what we were taught, I learnt that all human beings are different so you cannot compare or group all human beings as one. XXX is different…and even the stages in development are different...So it has really helped me…From here we are going to the world to face it. So it will help me treat each and every one as a unique individual.* (PSU2).

Similarly, participants recounted that the initial training they have had, has changed some of them from being introverts to extroverts and have also learnt how to seek help from others on academic issues. On the issue of training making trainees extroverts it was not clear where such beliefs were coming from. However, the following statement conveyed the conception:

> *At first I didn't like talking, so when you talked to me I felt you were worrying me… But for me, coming here, and as a teacher, you have to talk because when you go to the classroom you have to chat with the people and then do a lot of activities, so I've learnt those things.* (PSL1)

Participants believed that training has helped them improve on their communication skills. They indicated that training has helped them to, as in their words *know how to talk* and that they would be called upon to perform leading roles in community gatherings and functions:

> *…For instance at a function, when you go they say Miss Amoah or Mr. XXX come and lead. They will call a teacher to come and give a talk and not a banker.*

Such beliefs indicated above by trainee teachers send signals about the role identity that are formed in pre-service teachers, even though they are not directly

articulated in teacher training curricula. These stories bring to fore some of the motivational beliefs of students that underlie their moral agenda to training that should in some way make them better attuned to teaching.

4.6.4 **Pre-service teachers' views about teaching children:** *If you pollute children, it is very serious than a doctor*

Not only did trainees narratives suggested they have learnt how to tolerate their colleagues and members of the community, they also indicated that they have learnt how to tolerate the views of their pupils. They believed dedication to teaching children is a blessing and recognizing diversity, motivating and varying methods are essential to meeting the needs of children. They chiefly considered themselves as surrogate parents of the children they would be teaching and that children need to be loved and cared for. They perceive teaching as an extended form of parenting – perceiving teaching as a way of promoting the psychosocial growth of the students entrusted in their care. Some of their views are:

> *…you have to care for the students, you are not only a teacher…you are a father as well to them. So sometimes you have to learn how to be a father to the children as well and mostly counselling…Sometimes when I sit down, I say eish!, will I be able to…if a child has a problem, especially children with special needs, how will I be able to take one or two of these children and help solve their problem… but sometimes, I do believe in myself…and I believe if at least one child is able to change through our interventions, then glory to God.* (PSU1).

> *I think as a teacher, you need to take your pupils as your children and when you are teaching them, you make sure you are doing your best. And you have to keep it in mind that in some years to come, they too will become teachers and may impart knowledge to your great grandchildren or something, it's a continuous something… So you have to do everything with your heart.* (PSM1).

Even though the reasons for children to be yelled at vary from teacher to teacher, participants were of the view that shouting should not be the solution for children who find learning a difficult process or simply lack of learning experiences. Literature shows that, children who are screamed at feel excluded and frightened because a teacher shouts at them, and therefore, students' awareness of this situation was deemed a major point to

note. Studies of teacher and students' co-learning through mutual collaboration and feedback (see for example, Dobber et al., 2012; Sato & Kleinsasser, 2004) have found a link between co-construction and instructional improvement (Dottin, 2009; McCaslin & Hickey, 2009), capacity building for judgement (Diez, 2007; Dottin, 2009), efficacy (Mansfield et al., 2012; Avalos, 2011), and collaboration (Boyd et al., 2008). A teacher and student who have the qualities of good communications, respect in a classroom, and show interest in teaching from the teacher's point of view and learning from a student would create a positive relationship in the classroom which could bring about enhanced learning (McCaslin & Hickey, 2009). In the interviews, pre-service teachers expressed the following views in support of these points:

> *I don't expect a professional teacher to shout at children and use cane…cane the children, especially on their heads for not performing…You should know every child has ability level…And be able to help children solve their problems…Ability to identify problems in the classroom and help the children to solve them.* (PSU1).

> *…As a teacher, you have to love and care for the children as your own by preparing the right materials for teaching for them to understand and always learn to give them the best. You have to do the work from your heart…have to devote your time too. I believe whatever you teach, which ever topic you are teaching, when you do it with love, and you vary the teaching method, whatever you do, sorry to say even the most stupid person in the class will understand whatever you are teaching.* (PSM2)

Another issue that runs through the narratives is teachers' relationship with their students. Studies, for example, Wenglinsky (2002), have found out that effective teachers are those who have had more professional preparation in how to work with diverse student populations. Participants in the study seemed to support this value through their belief that, children should be motivated through individual teacher's efforts and collaboratively with parents of children and be treated fairly. They were of the view that diversity in the classroom and in schools must be recognized. Pre-service teachers interviewed expected a trained teacher to understand the needs of the children she or he would be teaching and make adjustments wherever necessary in order to employ different approaches to meeting the diverse needs of children in the classroom and should not have favourites among the children. Some of the narratives that illustrated these beliefs are:

> *…You need to motivate the children, because at that very stage, they easily learn when they are being motivated…So I think aside that, parents too should contribute by motivating them at home to revise what they have been taught already.* (PSU2)
>
> *I think we should learn to treat each and every child differently. No partiality - you try to understand and treat them equally…both from rich and poor background…I think they will all understand...And then I realized that, with teaching if you don't make sure and you pollute* (teaching wrong concepts) *children it's very serious than a doctor, because a doctor's mistake kills one person, but when a teacher pollutes a class, in the next 20 years, they will also impart that same polluted knowledge and it goes on and on.* (PSL1)

In sum, students believed that they needed to learn in order to be knowledgeable so as to transmit such to other people (children). They came to college mainly through the influence of family and friends, they indicated they have chosen to stay in the teaching profession after training because they love to teach and also serve their country. These notwithstanding, pre-service teachers had some doubts about their ability to apply whatever they had learnt in college, more especially, when it has to do with children with special needs. It appears there are limited opportunities for progress and development of personal dispositions that can help trainees become confident and competent in their various professional duties. Training pre-service teachers should involve creating an enabling environment to help them study in more autonomous and proactive ways, so they experience themselves novel ways of learning and teaching (Avalos, 2011; Dembélé & Lefoka, 2007); they need to reflect in ways, and initiate strategies that would enable them to improve the quality and effectiveness of learning to teach.

4.7 There is no mediating effect of self-regulation learning on the relationship between prior academic performance and academic achievement of pre-service teachers in colleges of education.

The hypothesis of this research study sought to find out the intervening effect of pre-service teachers self-regulated learning on the relationship between prior performance measured from students entry grades, and their academic achievement, measured from their two end-of-semesters' examination scores (GPA). Typically, prior performance is a

good predictor of future performance. For this thesis, the practical issue was trying to assess what extra value (if any) there was in building motivationally-relevant skills and learning strategies among pre-service teachers. In terms of final performance, is there extra value in having these skills? Or can we just predict final performance based on the academic level the teacher arrives with? To examine this intervening relationship, I used prior performance as the initial variable, motivation and self-regulated learning strategies as the mediator variables, and the response variable was the final academic achievement.

In order to test the mediational relations, I followed three steps and tested three models to achieve a parsimonious model as represented in my conceptual model. The first step was to examine the relationships between the initial variable (prior performance), the motivation component (intrinsic motivation, control of learning beliefs, test anxiety, task value, self-efficacy for learning and extrinsic motivation) of the self-regulated learning construct. The results are as displayed in Table 6. The second step did not differ from the first step, except that I used the cognitive and learning strategies component (organization, peer learning, time and study environment management, rehearsal, help seeking, metacognitive regulation, critical thinking, and effort regulation) of students' self-regulated learning as the mediator variables in the model. The results from the output are as shown in Table 7. In the third and final model estimation, I investigated the mediational relationships between the mediator variables that showed specific significant effects on academic achievement. The total indirect effect and the overall coefficients are presented in Table 8. The path model showing the meditational relationships among variables is presented in Figure 8.

4.7.1 Mediational Effect of Motivation on the Relationship between Pre-service Teachers' Prior Performance and their Academic Achievement

As indicated in Table 6 and Table 7, pre-service teachers' prior performance predicted their academic achievement in college, b = -.044, t = -11.95, p < .05. The negative b value indicates that, the relationship is negative and thus, as students' prior performance (entry aggregate) increases, their academic achievement (GPA) decreases. A decline in prior performance, which is better entry aggregate leads to an increase in academic achievement. Without the mediators, the R^2 = .217, which suggested that about 22% of

the variability in pre-service teachers' academic achievement is explained by their prior academic performance.

Table 6**: Mediation of the Effect of Pre-service Teachers' Prior Performance on their Academic Achievement through their Motivation**

				95%CI		Indirect	BC *SE*	BC 95% CI	
Model 1	Estimate	*SE*	*p*	lower	upper	Effects		lower	upper
Model without mediators									
Intercept	3.6457	.105	.00	3.4385	3.8528				
Aggr→Aca_Achi	-.0438	.004	.00	-.0510	-.0366				
$\boldsymbol{R^2}$	.2173		.00						
Model with mediators									
Intercept	3.1578	.169	.00	2.8258	3.4897				
Aggr→IM	-.0068	.010	.51	-.0270	.0134				
IM→Aca_Achi	.0815	.017	.00	.0484	.1145	-.0006	-.0006	-.0023	.0010
Aggr→CLB	-.0098	.011	.38	-.0319	.0122				
CLB→Aca_Achi	.0331	.014	.022	.0048	.0615	-.0003	.0004	-.0015	.0003
Aggr→TA	.0336	.011	.00	.0126	.0546				
TA→Aca_Achi	-.0885	.015	.00	-.1186	-.0584	-.0030	.0010	-.0051	-.0010
Aggr→TV	.0224	.008	.01	.0059	.0388				
TV→Aca_Achi	-.0185	.020	.36	-.0583	.0213	-.0004	.0005	-.0017	.0003
Aggr→SEL	-.0129	.009	.14	-.0300	.0041				
SEL→Aca_Achi	.1027	.019	.00	.0648	.1406	-.0013	.0010	-.0034	.0003
Aggr→EM	.0294	.008	.00	.0136	.0453				
EM→Aca_Achi	-.0561	.021	.01	-.0978	-.0143	-.0016	.0008	-.0037	-.0004
Aggr→Aca_Achi	-.0365	.004	.00	-.0435	-.0295				
Indirect Effect (**f**)						-.0072	.0020	-.0114	-.0036
Effect Size ($\boldsymbol{\kappa^2}$)						-.0772*	.0208	-.1186	-.0381
$\boldsymbol{R^2}$	.4198		.00						

Aggr = Prior Performance, Aca_Achi = Academic Achievement, IM = intrinsic motivation, CLB = control of learning beliefs, TA = test anxiety, TV = task value, SEL = self-efficacy for learning, EM = extrinsic motivation; BC = bias corrected; 1000 bootstrap samples, *κ^2 values of .01, .09 and .25 were interpreted as small, medium and large effect sizes respectively (see Preacher & Kelly, 2011, p. 107).

Table 6 also shows the regression of achievement predicted from the motivation variables (intrinsic motivation, control of learning beliefs, test anxiety, task value, self-efficacy for learning and extrinsic motivation) and prior performance. The mediation test showed that

prior performance was a significant predictor of academic achievement with the motivation variables in the model, b = -.0365, t = -10.284, p < .05; academic achievement was predicted by self-efficacy for learning, b = .103, t = 5.329, p < .05; intrinsic motivation, b = .082, t = 4.838, p < .05. Controlling for prior performance and the other motivation variables, test anxiety significantly predicted pre-service teachers' academic achievement, b = -.089, t = -5.768, p < .05; so did extrinsic motivation, b = -.056, t = -2.636, p = .009. The negative b values for test anxiety and extrinsic motivation indicate that as students' level of test anxiety increases, their achievement outcomes decreases and vice versa, and a decline in their expectation of external motivation leads to an increase in their academic achievement and the converse is true. However, pre-service teachers' value for what was learnt on the courses did not significantly predict academic achievement.

I also examined whether prior performance has significant effect on the motivation variables. The results revealed that prior performance significantly predicted test anxiety, a = .034, t = 3.140, r^2 = .020, p = .002; extrinsic motivation, a = .029, t = 3.643, r^2 = .034, p < .05; somewhat surprisingly, prior performance significantly predicted task value, a = .022, t = 2.675, r^2 = .015, p = .008. This means that prior performance explained 2%, 3.4% and 1.5% of the variability in test anxiety, extrinsic motivation and task value respectively. Thus, pre-service teachers who entered college with poor performance in their previous studies reported high on test anxiety, extrinsic motivation and task value. Prior performance did not significantly predict intrinsic motivation, control of learning beliefs and self-efficacy for learning. In all, the model had an R^2 = .42, which suggested that the model with the mediators accounted for 42% of the variation in pre-service teachers' academic achievement.

Taken together, intrinsic motivation, control of learning beliefs, test anxiety, task value, self-efficacy for learning and extrinsic motivation mediated the effect of prior performance on pre-service teachers' academic achievement. As can be observed from Table 6, the total effect of prior performance on academic achievement was -.0438, p < .05, and the direct effect of prior performance on academic achievement controlling for the motivation variables was -.0365, p < .05. The estimated indirect effect from the

difference between the total and the direct effect was -.0072. There was a significant indirect effect of prior performance on academic achievement through the motivation variables (i.e., intrinsic motivation, control of learning beliefs, test anxiety, task value, self-efficacy for learning and extrinsic motivation), b = -.007, 95% BC CI [-.011, -.004]. Since the bias corrected confidence interval did not contain zero, I can claim that the difference between the total effect and the direct effect of prior performance on academic achievement through the motivation variables was different from zero. However, this difference represented a fairly moderate effect, κ^2 = -.077, 95% BC CI [-.119, -.038]. This means that approximately 16.4% of the change in the effect of prior performance on achievement was due to the presence of the motivation variables.

As with mediation analysis, I was not interested only in the total indirect effect of prior performance on academic achievement, but also with specific indirect effects (Preacher & Hayes, 2008) of the motivation constructs. The individual indirect effects of intrinsic motivation, control of learning beliefs, test anxiety, task value, self-efficacy for learning and extrinsic motivation were examined (see Table 6) to tease out how individual motivation variables depended on prior performance in their relations with pre-service teachers' academic achievement, and the completely standardized point estimates are presented in Appendix C. The results indicated that students' entry aggregates (prior performance) had minimal effect on the motivation constructs (and vice versa). Of the six motivation variables, two, test anxiety and extrinsic motivation significantly mediated the relationship between prior performance and achievement (GPA).

The ability of test anxiety to intervene the effect of prior performance on achievement was significant, b = -.003, 95% BC [-.005, -.001], and so was extrinsic motivation, b = -.002, BC [-.004, -.001] conditional on the inclusion of intrinsic motivation, control of learning beliefs, task value and self-efficacy for learning in the model. I further examined the contrasts of the indirect effects through pairwise comparisons (C1 to C15, see Appendix C) to determine whether the indirect effects through test anxiety and extrinsic motivation were significantly different from the other motivation variables; hence established which motivation variable to include and which to exclude in the final model. The results revealed that the specific indirect effect of prior performance on achievement

through test anxiety was larger than the specific indirect effect of control of learning beliefs, with a 95% BC CI of .001 to .005, and task value, with a 95% BC CI of -.005 to -.001. The specific indirect effect of test anxiety was not significantly different from that of intrinsic motivation, self-efficacy for learning and extrinsic motivation. I therefore removed only task value which was not a predictor of academic achievement directly or indirectly from the final model.

4.7.2 Mediational Effect of Self-Regulation Learning Strategies on the Relationship between Pre-service Teachers' Prior Performance and their Academic Achievement

The result from the analyses of the mediation effects of cognitive and learning strategies of the relations between prior performance and achievement is contained in Table 7.

Table 7: **Mediation of the Effect of Pre-service Teachers' Prior Performance on their Academic Achievement through their Self-Regulated Learning Strategies**

				95%CI		Indirect		BC 95% CI	
Model 2	Estimate	*SE*	*p*	lower	upper	Effects	BC *SE*	lower	upper
Model without mediators									
Intercept	3.6457	.105	.00	3.4385	3.8528				
Aggr → Aca_Achi	**-.0438**	.004	.00	-.0510	-.0366				
$\boldsymbol{R^2}$	**.2173**		.00						
Model with mediators									
Intercept	2.5910	.172	.00	2.2540	2.9279				
Aggr → ORG	.0063	.009	.49	-.0117	.0244				
ORG → Aca_Achi	.0338	.021	.10	-.0064	.0740	.0002	.0004	-.0003	.0016
Aggr → PL	-.0055	.014	.69	-.0320	.0211				
PL → Aca_Achi	.0376	.014	.01	.0097	.0655	-.0002	.0006	-.0016	.0007

Table 7 *cont'd*

Aggr → TSM	-.0219	.008	.01	-.0384	-.0054				
TSM → Aca_Achi	.1199	.022	.00	.0767	.1631	-.0026	.0012	-.0055	-.0007
Aggr → RE	.0276	.007	.00	.0133	.0420				
RE → Aca_Achi	-.0677	.023	.00	-.1132	-.0221	-.0019	.0008	-.0041	-.0006
Aggr → HS	.0077	.010	.46	-.0126	.0280				
HS → Aca_Achi	-.0069	.015	.65	-.0363	.0226	-.0001	.0002	-.0008	.0002
Aggr → MCS	.0119	.007	.10	-.0024	.0261				
MCS → Aca_Achi	-.0260	.028	.36	-.0819	.0298	-.0003	.0004	-.0016	.0002
Aggr → CT	.0073	.008	.35	-.0079	.0224				
CT → Aca_Achi	-.0457	.024	.05	-.0923	.0009	-.0003	.0004	-.0017	.0002
Aggr → ER	-.0279	.011	.01	-.0485	-.0073				
ER → Aca_Achi	.0911	.015	.00	.0614	.1208	-.0025	.0011	-.0050	-.0008
Aggr → EL	.0169	.008	.03	.0018	.0319				
EL → Aca_Achi	.0480	.022	.03	.0046	.0915	.0008	.0006	.0001	.0025
Aggr → Aca_Achi	**-.0368**	.004	.00	-.0437	-.0300				
Indirect Effect (**f**)						**-.0069**	.0020	-.0108	-.0026
Effect Size (**k^2**)						**-.0737***	.0215	-.1138	-.0278
R^2	**.4548**		.00						

Aggr = Prior Performance, Aca_Achi = Academic Achievement, ORG = organization, PL = peer learning, TSM = time and study environment management, RE = rehearsal, HS = help seeking, MCS = metacognitive regulation, CT = critical thinking, ER = effort regulation, EL = elaboration; BC = bias corrected; 1000 bootstrap samples, *κ^2 values of .01, .09 and .25 were interpreted as small, medium and large effect sizes respectively (see Preacher & Kelly, 2011, p. 107).

The regression of the achievement predicted from prior performance and the learning strategies variables (organization, peer learning, time and study environment management, rehearsal, help seeking, metacognitive regulation, critical thinking, effort regulation, elaboration) is displayed in Table 7. The results indicated that the strength of prior performance on pre-service teachers achievement controlling for cognitive and learning strategies was significant, b = -.0368, t = -10.631, p < .05 and marginally higher regression coefficient compared to that of the mediation test with motivation variables in the model. To establish that prior performance was related to the learning strategies (the hypothesized mediators), I regressed prior performance on cognitive and learning strategies (organization, peer learning, time and study environment management,

rehearsal, help seeking, metacognitive regulation, critical thinking, effort regulation, elaboration).

The results revealed that regression coefficient estimate associated with the relations between prior achievement and organization strategy use controlling for other variables was not significant, a = .006, t = .688, p = .492. Similarly, students' prior performance did not show significant predictive strength with peer learning, a = -.006, t = -.406, p > .05; metacognitive regulation, a = .012, t = 1.637, p = .102 and critical thinking, a = .007, t = .941, p > .05. In all, five out of the nine coefficients associated with the relations between pre-service teachers' prior performance and learning strategies were not significant (see Table 7). Conversely, the results showed that students who were admitted with high entry aggregates (poor prior performance) were less likely to use time and study environment management skills. That is, prior performance negatively predicted the use of time and study environment management skills, a = -.022, t = -2.601, p = .010. The coefficient associated with the relation between prior performance and effort regulation was negative and significant, a = -.028, t = -2.665, p = .008. Students who came to college with low entry aggregate (good prior performance) were more likely to put in more effort at college course work and vice versa. The use of rehearsal strategy was dependent on prior performance, a = .028, t = 3.797, p < .05. The positive significant beta indicated that pre-service teachers who had low prior performance were more likely to use rehearsal strategy than their colleagues who came to college with better entry aggregates.

Concerning the slopes of academic achievement regressed on the learning strategies controlling for prior performance, the results indicated that four of the learning strategies variables (organization, rehearsal, metacognitive regulation and critical thinking) did not predict students' academic achievement. The predictive values of peer learning, time and study environment management, effort regulation, rehearsal and elaboration strategies were in the expected directions. Time and study environment management skills positively and significantly predicted students' academic achievement, b = .120, t = 5.457, p < .05. This suggested that students who reported high in time and study environment management were more likely to perform better in college examination than

those who reported low in the construct. Students high academic performance were more likely to report high in effort regulation, b = .091, t = 6.033, p < .05; elaboration, b = .048, t = 2.171, p = .030 and peer learning, b = .038, t = 2.645, p = .008. In terms of rehearsal strategy use, the predicted value was in the negative direction, b = -.068, t = -2.918, p = .004, thus, students who reported high in the use of rehearsal strategies (e.g., "I memorize key words to remind me of important concepts in class") were more likely to perform poorly in college examinations than students who reported low in rehearsal strategy use.

Taken as a set, organization, peer learning, time and study environment management, rehearsal, help seeking, metacognitive regulation, critical thinking, effort regulation and elaboration mediated the effect of prior performance on pre-service teachers' academic achievement. As depicted in Table 7, the total effect of prior performance on academic achievement was -.0438, p < .05, and the direct effect of prior performance on academic achievement controlling for the cognitive and learning strategies variables was -.0368, p < .05. The indirect effect estimated from the difference between the total and the direct effect was -.0069. There was a significant indirect effect of prior performance on academic achievement through organization, peer learning, time and study environment management, rehearsal, help seeking, metacognitive regulation, critical thinking, effort regulation and elaboration, b = -.007, 95% BC CI [-.011, -.003]. The bias corrected confidence interval did not contain zero, I can therefore claim that the difference between the total effect and the direct effect of prior performance on academic achievement through the cognitive and learning strategies variables was significantly different from zero. However, this difference represented a fairly modest effect, κ^2 = -.074, 95% BC CI [-.114, -.028]. The change in the effect of prior performance on achievement with the learning strategies in the model was about 15.8%. The whole model explained about 45.5% of the variability in academic achievement.

The specific indirect effects of the cognitive and learning strategies variables in the model were examined (see Table 7) to determine how the cognitive and learning strategies variables depended on prior performance in their relations with pre-service teachers' academic achievement, and the completely standardized point estimates are

shown in Appendix D. As presented earlier in this section, of the nine variables that formed the cognitive and learning strategies component of the self-regulation learning strategies, five (peer learning, time and study environment management, rehearsal, effort regulation and elaboration) predicted academic achievement when prior performance was controlled. The effect of prior performance on pre-service teachers' academic achievement through peer learning was not statistically significant. The ability of time and study environment management to intervene in the effect of prior performance on academic achievement was significant, *b* = -.003, 95% BC CI [-.006, -.001]. The effect of prior performance on academic achievement via rehearsal strategy use was significant, *b* = -.002, 95% BC CI [-.004, -.001], and effort regulation, *b* = -.003, 95% BC CI [-.005, -.001]. The intervening strength of elaboration of the relationship between prior performance and academic achievement was statistically significant, *b* = .001, 95% BC CI [.001, .003], and all these estimates were computed conditioned on the inclusion of the other variables in the model.

A further test of the indirect effects of peer learning, time and study environment management, rehearsal effort regulation and elaboration through contrast analyses (C1 to C36, see Appendix D) indicated that the specific indirect effects of time and study environment management and effort regulation were higher than peer learning, rehearsal and elaboration. The difference between time and study environment management and peer learning was significant with 95% BC CI of .0003 to .0051, and elaboration with 95% BC CI of .0003 to .0051. By contrasts, the results did not show any significant indirect effect between rehearsal strategy use, effort regulation and time and study environment management skill. The differences between peer learning and rehearsal, 95% BC CI [-.0001, .0039], and peer learning and elaboration, 95% BC CI [-.0027, .0002] were not significantly different from zero and therefore peer learning, effort regulation, elaboration, rehearsal and time and study environment management were included in the final model (See Table 8).

4.7.3 Mediational Effect of Motivation and Self-Regulation Learning Strategies on the Relationship between Pre-service Teachers' Prior Performance and their Academic Achievement

The result from the analyses of the mediation effects of motivation, cognitive and learning strategies of the relations between prior performance and achievement is contained in Table 8.

Table 8: **Mediation of the Effect of Pre-service Teachers' Prior Performance on their Academic Achievement through their Motivation and Self-Regulated Learning Strategies**

				95%CI		Indirect		BC 95% CI	
Model 3	Estimate	*SE*	*p*	lower	upper	Effects	*BC SE*	lower	upper
Model without mediators									
Intercept	3.6457	.105	.00	3.4385	3.8528				
Aggr → Aca_Achi	-.0438	.004	.00	-.0510	-.0366				
$\boldsymbol{R^2}$	.2173		.00						
Model with mediators									
Intercept	2.6351	.174	.00	2.2937	2.9765				
Aggr → IM	-.0068	.010	.51	-.0270	.0134				
IM → Aca_Achi	.0618	.016	.00	.0302	.0934	-.0004	.0006	-.0019	.0008
Aggr → CLB	-.0098	.011	.38	-.0319	.0122				
CLB → Aca_Achi	.0286	.013	.02	.0041	.0532	-.0003	.0004	-.0014	.0003
Aggr → TSM	-.0219	.008	.01	-.0384	-.0054				
TSM → Aca_Achi	.0995	.020	.00	.0596	.1394	-.0022	.0010	-.0045	-.0006
Aggr → RE	.0276	.007	.00	.0133	.0420				
RE → Aca_Achi	-.0852	.020	.00	-.1245	-.0458	-.0024	.0008	-.0043	-.0011
Aggr → TA	.0336	.011	.00	.0126	.0546				
TA → Aca_Achi	-.0628	.013	.00	-.0885	-.0371	-.0021	.0008	-.0042	-.0008
Aggr → SEL	-.0129	.009	.14	-.0300	.0041				
SEL → Aca_Achi	.0589	.019	.00	.0218	.0960	-.0008	.0006	-.0022	.0001
Aggr → EM	.0294	.008	.00	.0136	.0453				
EM → Aca_Achi	-.0404	.020	.04	-.0789	-.0018	-.0012	.0007	-.0028	-.0002
Aggr → ER	-.0279	.011	.01	-.0485	-.0073				
ER → Aca_Achi	.0684	.014	.00	.0403	.0966	-.0019	.0008	-.0040	-.0006
Aggr → EL	.0169	.008	.03	.0018	.0319				
EL → Aca_Achi	.0042	.021	.84	-.0379	.0463	.0001	.0004	-.0008	.0009
Aggr → PL	-.0055	.014	.68	-.0320	.0211				
PL → Aca_Achi	.0204	.012	.08	-.0026	.0435	-.0001	.0003	-.0013	.0003
Aggr → Aca_Achi	-.0325	.003	.00	-.0390	-.0261				
Indirect Effect (**f**)						-.0112	.0023	-.0161	-.0069
Effect Size ($\boldsymbol{k^2}$)						-.1198*	.0243	-.1681	-.0737
$\boldsymbol{R^2}$	.5232		.00						

Aggr = Prior Performance, Aca_Achi = Academic Achievement, IM = intrinsic motivation, CLB = control of learning beliefs, TA = test anxiety, SEL = self-efficacy for learning, EM = extrinsic motivation, PL = peer learning, TSM = time and study environment management, RE = rehearsal, ER = effort regulation, EL = elaboration; BC = bias corrected; 1000 bootstrap samples, *κ^2 values of .01, .09 and .25 were interpreted as small, medium and large effect sizes respectively (see Preacher & Kelly, 2011, p. 107).

My aim was to identify the best model that could optimize pre-service teachers' academic achievement through use of motivation and self-regulated learning strategies in colleges of education. A three-step analysis yielded three results: the first step explored the mediational effect of the motivational beliefs component of the SRL construct on the relations between prior performance and academic achievement, and the model indicated that the motivation component had a moderate significant mediation effect. However, the importance and interest students' had in courses on the programme (task value) did not predict academic achievement and therefore was removed from the final model. The second step involved the assessment of the mediation effect of the cognitive and learning strategies component of the SRL construct. The results revealed that together, the nine variables in the component significantly intervened in the relation between prior performance and achievement, but the effect size was also moderate. In this model, organization, help seeking, metacognitive strategies and critical thinking did not predict achievement nor showed significant indirect effect. They were subsequently removed from the final model. In the third and final step, I examined the mediational effect of the remaining ten SRL variables on the relationship between prior performance and students' academic achievement and the results are as displayed in Table 8.

As expected, the model without the mediators indicated that pre-service teachers' prior performance (entry aggregates) predicted their academic achievement, b = -.044, t = -11.953, p < .05. Thus, teacher trainees who entered colleges with high aggregate (poor prior performance) had scored low in grade point average (GPA - academic achievement) in two semesters course work. Conversely, students who were admitted to college with low entry aggregates (good prior performance) also scored high in GPA. With r^2 = .217, prior performance accounted for 21.7% of the variability in students' achievement. The model was tested with the mediators and the results showed that the predictive patterns of prior performance of the SRL constructs did not change and this was as expected in a mediation analysis. However, the predictive values of the self-regulation variables (intrinsic motivation, control of learning beliefs, test anxiety, self-efficacy for learning, extrinsic motivation, elaboration, peer learning, rehearsal, effort regulation and time and study environment management) changed compared with their values in the previous models. The least predictive variable was elaboration, which predicted less than 1% of

the variation in academic achievement when other variables were controlled. Peer learning, did not predicted academic achievement, b = .020, t = 1.744, p = .082.

Similarly, extrinsic motivation and control of learning beliefs showed weaker predictive values with b = -.040, t = -2.055, p = .040 and b = .029, t = 2.290, p = .022 respectively. The negative b-value of extrinsic motivation suggested that, for a unit increase in a student's score on the scale of 1 to 7 for the extrinsic construct, the students achievement decreased by a proportion of .04 conditioned on other constructs in the model. On the other hand, the positive b-value of control of learning beliefs meant that, for a unit increase in the reported score of a student on the control of learning beliefs scale (1 to 7), the student's academic achievement also increased by a proportion of .02. Time and study environment management significantly predicted achievement, b = .100, t = 4.898, p < .001; effort regulation also predicted achievement, b = .068, t = 4.773, p < .001. An increase in rehearsal strategy use indicated a decrease in students' achievement, b = -.085, t = -4.252, p < .001; so did test anxiety, b = -.063, t = -4.799, p < .001. The R^2 = .523 for the whole model (see Appendix E) indicated that, approximately 52.3% of the variance in students' academic achievement was explained by the model, which was significantly higher than any of the two models alone.

In terms of the intervening abilities of the mediator variables, the results indicated that of the ten constructs, five significantly mediated the impact of prior performance on academic achievement (see Figure 8). The indirect effect of prior performance through test anxiety was significant, b = -.002, 95% BC CI [-.004, -.001]. There was significant indirect effect of prior performance on achievement via time and study environment management, b = -.002, 95% BC CI [-.005, -.001]; effort regulation, b = -.002, 95% BC CI [-.004, -.001], extrinsic motivation, b = -001, 95% BC CI [-003, -001] and rehearsal strategy use, b = -.002, 95% BC CI [-.004, -.001]. The overall indirect effect of prior performance on academic achievement through the SRL constructs was significant, b = -.011, 95% BC CI [-.016, -.007]. The effect size, kappa-squared (κ^2) of -.120, BC CI [-.168, -.074] was greater than .09 which could be interpreted as medium effect but less than .25 which represents large effect size (Preacher & Kelly, 2011, p. 107). The indirect

effect therefore represented relatively large impact. The final model is represented in Figure 8.

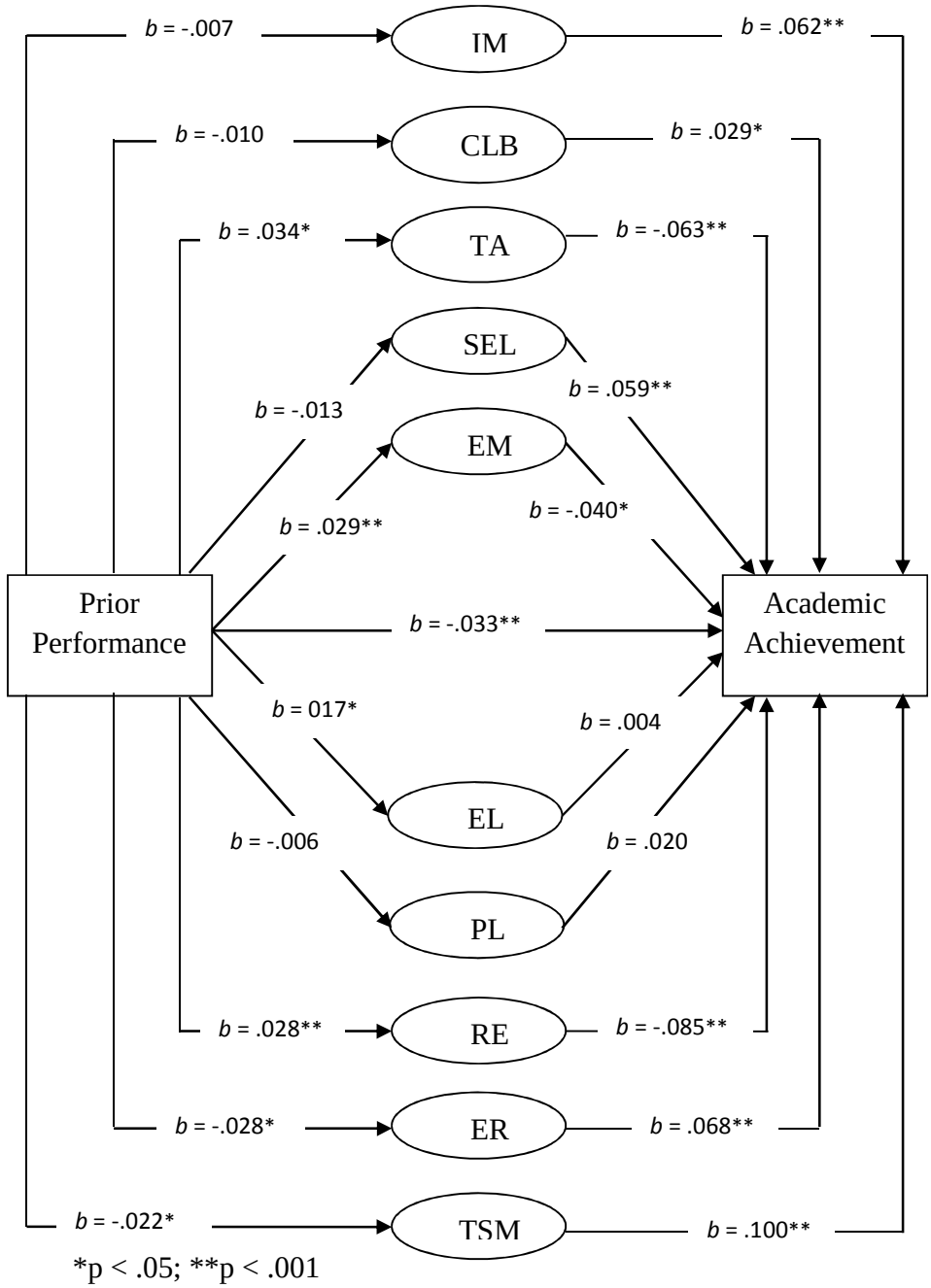


Figure 8: *Mediational Relations between Prior Performance, Motivation and Self-Regulation Strategies and Pre-service Teachers' Academic Achievement.*

Figure 8 presents a parsimonious model which indicates that time and study environment skills, effort regulation, rehearsal, peer learning, elaboration, extrinsic motivation, self-

efficacy for learning, test anxiety, control of learning beliefs and intrinsic motivation significantly mediate the influence of prior performance on college GPA. The figure also shows that time and study environment skills, effort regulation, rehearsal, self-efficacy for learning, test anxiety and intrinsic motivation influenced pre-service teachers' academic performance at the 0.001 alpha level.

CHAPTER 5: DISCUSSION

5.1 Overview

This chapter presents the discussion of the study's findings from the data analysis. As a convergent mixed study, both the qualitative and the quantitative strands of findings were discussed together. The purpose of this exploratory study was to examine pre-service teachers' motivational orientations and cognitive strategies used in a professional training environment and how they impacted on their academic performance in a college of education. Three main purposes that were built from a conceptual framework of self-regulated learning (SRL) guided this study:

- To examine the relationships between the motivational orientations, gender, programme-majors and self-regulated learning strategies of pre-service teachers in Colleges of Education.
- To determine how prior attainment, motivation and self-regulated learning components may operate independently or jointly to influence pre-service teachers' academic performance.
- To explore the contributory factors of beliefs and values that lay behind some pre-service teachers' motivational orientations.

The study looked at four research questions and one hypothesis in exploring these purposes:

1. What are the most prevailing motivational and self-regulation learning strategies among pre-service teachers in the colleges of education in Ghana?
2. How are the motivational components related to the components of self-regulated learning strategies?
3. What self-regulated learning strategies are related to gender, students' programme-majors and academic performance?
4. How do dispositional beliefs and values manifest among pre-service teachers?

The study's hypothesis:

> **H_0**: There is no mediating effect of self-regulation learning on the relationship between prior academic performance and academic achievement of pre-service teachers in colleges of education.

A review of literature suggests that, students' learning function under the supposition that the growth and development trajectories are linear. To this end, it is believed that students who enter colleges with high grades are likely to achieve high at the end of their training period, and students who enter with low grades would end up having low performance at the end of the training session (The Mathew Effect)(Tol, 2009; Cromley & Azevedo, 2007) in both academic and practice performances (Avalos, 2011; Darling-Hammond, 2010; Bembenutty, 2007; Randi, 2004; Dembo, 2001; Lewin & Stuart, 2003). In the educational context, the Matthew effect signifies that students with comparatively high academic ability at a certain time point of interest continue to increase academically faster than less able students. In this way, differences in achievement that already exist among students when they enter a school become increasingly greater as they progress through school. Studies (see He & Tymms, 2014; Li et al., 2008; Zwick & Sklar, 2005; DeBerard, Spielmans, & Julka, 2004) that frequently assess students' gain in learning in relation to prior attainment have clearly shown this. Over the years, literature has it that achievement scores are deemed only to mirror the current attainment of a student in relation to the time of testing and do not give a complete depiction of the influence of other factors on the learning continuum such as the school, teachers and resources on the student's performance throughout the study period in the school (see, He & Tymms, 2014; Crane, 2002).

In view of this, "value-added measures which involve the comparison of students' present or outcome achievement with their prior achievement to assess the effect of schooling for the specified period of study in the school" (He & Tymms, 2014, p. 26) are often used as prior performance is presumed to be a good predictor of future performance (Moos & Ringdal, 2012). However, as suggested by some researchers, even though students' academic achievement in college requires some prior competencies, and even

when these are clearly in evidence, these abilities alone do not often distinguish high-performing students from low-performing students (Kitsantas et al., 2008). As asserted by He and Tymms (2014), students' assessment scores are a reflection of the "combined influences of a number of factors such as the learning environment in the school, the socioeconomic background of the students, the student's attitudes towards study, the academic achievement attained before entering the school, and many others" (p. 26). Again, students' achievements in colleges are sometimes influenced by other cognitive and motivational variables and the learning context through their active and constructive engagement in learning (Pintrich, 2004). Thus, an extensive body of research with regard to academic achievement suggests that differences in students' achievements are, amongst other elements, closely related to an individual's degree of self-regulation (Zimmerman & Schunk, 2009; Boekaerts & Corno, 2005; Pintrich, 2004).

Typically, it is problematic to offer a precise estimation of the impact of a student's prior achievement on his/her current academic performance - that has led to many different conceptual and theoretical models being formulated in understanding the impact of school, teachers, and students' learning on their performance (He & Tymms, 2014; Zimmerman & Schunk, 2009; Boekaerts & Corno, 2005; Pintrich, 2004). The lack of clarity in the estimation of students' academic performance has led to various propositions on the predictive value of students' prior attainment of their current performance. For example, existing literature suggests that, students who enter colleges with high entry aggregates could still perform poorly and those with low entry grades could also perform better at the end of the study period. This means that the high-high and low-low performances by high achievers and low achievers respectively could be due to the use of the conventional regression methods - making effect detection in such studies an artefact (He & Tymms, 2014, p. 36; Preacher & Kelly, 2011; MacKinnon & Fairchild, 2009; MacKinnon, 2008; Preacher & Hayes, 2008).

These notwithstanding, not much has been done in terms of research to model concurrently the effect of prior attainment and self-regulation learning on final academic achievement. In the teacher training context, it is believed that trainees actively construct or build new ideas or concepts from their current and past experiences (Avalos, 2011;

Schunk, 2009; Roberts, 2006); connect new knowledge to prior knowledge and incorporate the new experiences into an already existing framework with alterations in the existing structures (Schunk, 2008). Or pre-service teachers pre-service preconceptions developed in their "apprenticeship of observation" (see Hammerness et al., 2005, p. 367) are not being shaped, but rather reinforced. That means it may be possible for pre-service teachers' motivation and self-regulation of learning to partially or completely (Preacher & Kelly, 2011; Preacher & Hayes, 2008) mediate the influence of prior attainment on final college achievement or there could be no significant effect at all.

In this study, I investigated the tempering of theories of prior performance by current behaviour, self-regulatory and dispositional orientations. The thesis attempted to understand the relationship between the two, and how this impacted on pre-service teachers' performance. This study therefore assessed first, the incidence of motivation and self-regulation learning strategy use among teacher trainees in residential colleges, as well as differences, if any, between first and second year students to ascertain the development of SRL among students (Barnett & Koslowski, 2010; Zimmerman, 2008). Second, the study examined the correlations between the motivation and the learning strategies components of the self-regulated learning variable. This was to add empirical data on how pre-service teachers' motivational orientations relate to their use of cognitive, meta-cognitive and resource management strategies during their study of courses whilst on campuses (Moos & Ringdal, 2012; Zimmerman & Schunk, 2009; Boekaerts & Corno, 2005).

Third, relationships between pre-service teachers' gender, programme of specialism, SRL and academic achievement were studied to establish whether there were any shared variances as suggested by some literature (e.g., Scott & Levy, 2013; Zimmerman, 2009; Kitsantas et al., 2008; Pintrich & Zusho, 2007; Bembenutty, 2007). The fourth research question was to explore the contributory factors of beliefs and values, which is seen as an essential component of occupational competency (Avalos, 2011; Dreeben, 2005; Lizzio & Wilson, 2004) that lay behind some pre-service teachers' motivational orientations. As indicated earlier in the chapter, findings from this research question are discussed together with other findings from the quantitative data. Lastly, the study examined the

mediation of the effect of pre-service teachers' prior performance on academic achievement through motivation and self-regulation learning strategies.

5.2 Prevalence and development of Motivation and Self-Regulation Learning among Pre-service Teachers

This section discusses the findings in relation to research questions one ("What are the most prevailing motivational and self-regulation learning strategies among pre-service teachers in the colleges of education in Ghana?") and four ("How do dispositional beliefs and values manifest among pre-service teachers?"). Research question one sought to find out the incidence and growth trajectories of motivation and self-regulatory behaviours amongst pre-service teachers. In fact, research question four thread through all the sections under discussion as it was posited to exemplify the main findings of the quantitative data in the study.

Literature on students' learning highlights the importance of motives/goals (i.e., combined form of values, beliefs, attributions, and affects/emotions that direct behavioural intents) as one most essential element in educational environments (Sitzmann & Ely, 2012; Fenollar et al., 2007; Valle et al., 2003). It is generally reckoned that students make use of some elementary criteria in the initial cognitive-motivational analysis of the learning task based on contextual situations or personal variables of a cognitive, motivational (expectations), and affective form. As often observed (Vandevelde et al., 2013; Schunk, 2009; Zimmerman, 2008; Bembenutty, 2007; Pintrich et al., 1993), students report high on extrinsic motivation in studies of motives and goal related achievement. The negatively skewed report of extrinsic motivation was replicated in this present study. Extrinsic motivation, a reflection of activity or behaviour undertaken for some instrumental value or external reason was ranked as number one self-regulatory activity among pre-service teachers.

This finding suggests that students' reasons for learning course materials and their choice of colleges to be trained as teachers mostly were influenced by extrinsic motives (getting good grades, .preparing for future career, and increases in salaries), altruistic and less autonomous forms of regulation (Vandevelde et al., 2013). External motives such as

students wanting to do well to show their ability to friends and family, desire to transmit (impart) knowledge to children and earning respect from the communities they would be teaching after training also featured high in both students' narratives and self-reports. Even though my cross-sectional data cannot address causal change in motives, it does appear first year students reported high on the extrinsic motive variable than their colleagues in second year on the extrinsic motivation variable. Accordingly, students' development of extrinsic motivation was assessed through the use of independent t-test and the results indicated that first year students reported to have had higher levels of external motives than students in the their second year on the programme. These findings supported the notion that when students feel less in control of their learning, they are motivated extrinsically rather than intrinsically (Zimmerman, 2008; Bembenutty, 2007; Pintrich, 2004). Likewise, teacher candidates in the study could be said to have not assumed control of their learning and reported to have relied on external factors as catalysts for learning course materials during training.

Again, pre-service teachers' idea of teaching as imparting knowledge to young ones might have been borne out of what Lewin and Stuart (2003) found in their study that many of the curricula analysed from a number of teacher training institutions in Africa including Ghana were premised on the belief that if pre-service teachers are given enough knowledge and some pre-defined behaviours and skills, they could apply them without any doubt of failure, like "recipes" to any teaching situation (p. xxix). Initial teacher training should concern itself with giving teacher trainees perspectives that view teaching as an interactive and constantly evolving approach to solving problems and creating knowledge that require thoughtfulness and reflection on approaches and practices. That is, in an environment where students are learning how to teach, they should not be taught only how to acquire knowledge in particular fields of study, but also, they should be involved in contextual understanding of children and how they learn, in line with range of attitudes and strategies that they could use in dealing with diverse situations (European Commission, 2012; UNESCO, 2011; Darling-Hammond & Bransford, 2005). Further, pre-service teachers ranked high the use of rehearsal strategies such as reading notes and course materials over and over again during studying. This finding attest to the fact that teacher trainees concern on learning materials in college is mainly performance oriented

(Corno, 2009; Zimmerman, 2009; Fenollar et al., 2007) and their actions seem to involve the use of declarative knowledge geared towards passing end-of-semester examinations (Schunk, 2009).

As suggested by literature, students exercise contextual control to make the learning situation more favourable to their particular strengths or to achieve what they believe to be important (Zimmerman, 2008; Pintrich & Zusho, 2007). In the present study, it appears the strategies used by teacher trainees in the control of meeting their external motives was the use of less deep processing approaches (such as remembering facts for examinations and reading repeatedly class notes and course materials) that would optimize their chances of passing tests and examinations. Pre-service teachers' concentration on the use of rehearsal strategies for learning has implications for college examinations. The findings probably suggest that pre-service teachers had performance-goal orientation and that they resorted to the use of superficial and surface learning strategies—for instance, mechanical and repetitive remembering of facts and course materials (Moos & Ringdal, 2012; Zimmerman, 2008; Valle et al., 2003; Pintrich & De Groot, 1990) and/or college examinations did not require students to reflect on issues, but to reproduce what has been taught them, or what was found in their course materials. Again, first year students scored higher than the second year students and the difference was significant.

In furthering of accomplishing their specific goal of improving their performance in examinations, pre-service teachers reported high on other task-oriented strategies such as such as elaboration (ranked 3rd out of 15 variables). This result is quite surprising considering the fact that pre-service teachers have reported high on extrinsic motivation and the use of rehearsal strategy in learning course materials. This is so, in that, elaboration involves understanding materials and concepts by making connections and looking for patterns, bringing together information from different sources, relating ideas across subjects and writing summaries of ideas from course materials and learning situations. However, the findings corroborate with studies of SRL (Englehart et al., 2012; Guo et al., 2011; Zimmerman, 2008; Ross et al., 2003) which found that students use different cognitive and learning strategies such as rehearsal and elaboration to control

their mental processes and learning and these controls usually involve the selection and adaptation of strategies to fine-tune and continuously adjust their cognitive engagement in learning and for managing motivation and affect (Bembennuty, 2007). This finding therefore suggests that pre-service teachers in the study employed the strategy of bringing together materials from all sources that they deemed would help them achieve their performance goal. The next SRL variable ranked among the top five was task value.

According to Sitzmann and Ely (2012) learners' beliefs about the rewards or values of learning have a direct effect on learning, in that trainees tend to show dwindling interest in activities that they deem not worth of their time and resources. The results from the current study demonstrate this situation as students ranked as fourth their value for tasks on their training programmes (e.g. "I think the course materials in this programme are useful for me to learn"). Like other motivation variables in the SRL construct, task value has a major influence on the decision to use a particular strategy or not (Moos & Ringdal, 2012; Zimmerman, 2009; Bembenutty, 2008). This implies that pre-service teachers are likely to employ strategies as they deem appropriate to enable them achieve their goals, and in relation to the importance they attach to course content and materials they are given to learn. However, if not modelled well to suite the aims of the training programme being offered, students are likely to tailor the importance of the programme in their own direction and decide on which parts of the programme are important or not. For example, students in the study indicated as the second highest ranked apart from the general importance of the materials on the programme, the fact that what they were learning would help them in other courses later. Thus, their utility value (i.e., the usefulness of the acquired skill in future goals (Kitsantas et al., 2008; Eccles, 2005) lay in what pre-service teachers would be using their knowledge gained on other future course rather than their chosen career.

This finding parallels that of Akyeampong and Stephen's (2002) study which found out that, teacher trainees often believed their initial training would afford them the opportunity for higher education that could gain them other more well-paid jobs. Judging from the narrative results, it is clearly shown that, pre-service teachers in the study seem to have come to training not based on the fact that they were attracted, but mainly due to

exigencies and goals that were purely external. Thus, socio-economic determinants often contributed immensely to a person's decision to attend a teacher training institution or not. So entry into the teaching profession was either done based on some humane situations such as making way for other siblings or getting payment from work when one becomes a teacher to take care of other individuals in the family. This implies that pre-service teachers value for course contents could be influenced and tailored towards contents that could help them reach their objectives of reaching such extrinsic needs, and if not managed well, they are likely to narrow their focus of study and hence narrow the curriculum to just the areas of interest (Anane, 2014; Yogev & Michaeli, 2011) which could eventually affect the knowledge, skills and dispositions they need to acquire for their practice in the teaching profession (Darling-Hammond & Bransford, 2005). Regarding year of study and differences in task value, first year students reported higher than second year students. The finding therefore suggests that pre-service teachers' value for tasks seems to decline as they progress on the programme.

Another finding was that teacher candidates in the study reported high on learning strategies such as metacognitive regulation (ranked 5), organization (ranked 6) and critical thinking (ranked 7) out of 15 variables. According to Zimmerman and Schunk (2009), students' effective learning includes the processes of planning, monitoring and reflecting on their own learning by providing tools for analysis of events and situations that enable them to understand and weave through the complexities of life in the classroom. As Watkins (2002) points out, effective learners have to gain understanding of the individual and social practices essential to become active learners and this does not involve just an acquisition of particular strategies, but the monitoring and reviewing of learning to see whether strategies are working as intended (Kramarski & Michalsky, 2009).

As Phelan cited in Dottin (2009) rightly puts it, an education that embraces practical judgment prepares pre-service teachers to dwell within the rough ground of experience, to appreciate its complexity and deep interpretability and to respond ethically in their chosen profession. In view of these positions, it is no surprise that pre-service teachers listed meta-cognitive strategy use amongst the top five strategies they employed in

learning course materials. Students in the study reported that they made use of reflective strategies (such as “when studying, I try to determine which concepts I don’t understand well” and “I ask myself questions to make sure I understand the materials I have been studying”) to enable them get a better grasp of the course contents on the programme. This finding indicates that pre-service teachers in the study did self-regulate during their learning as students tried to understand their own cognitive skills, including memory, attention and problem solving to enable them to make the best use of their knowledge and skills in the context they found themselves (Pintrich, 2004).

Thus, students took necessary actions to master the information or tasks they had to perform on the programme and appeared to be more keenly aware of the relations that exist between specific behaviours (i.e., the use of some particular strategies) and how to succeed academically, and generally in society. This finding is in line with the notion that, students are more likely to employ regulatory behaviours systematically and properly if they found them to be useful in achieving their goals (Zimmerman & Schunk, 2009; Lai, 2011). Again, the study’s findings corroborate other studies of self-regulation (Zimmerman, 2009; Kitsantas et al., 2008; Bembennuty, 2007; Pintrich, 2004; Pintrich & De Groot, 1990) that have found meta-cognitive strategy use - which involves making judgments (such as deciding to return later to a course materials when one does not understand, and changing ways of study in order to fit course requirements and tutors’ teaching styles) so as to be pronounced of the learning strategies to employ in their learning (Zimmerman & Schunk, 2008).

Pre-service teachers in this study reported metacognitive strategy use as the third most common cognitive-metacognitive strategy they employed during learning. Consequently, they reported trying to determine the concepts they did not understand well; asked themselves questions to make sure they understood the materials they were studying and changed the ways they studied in order to fit learning styles to teaching processes. However, students’ narratives did not reflect this situation as indicated by the results from self-reports. Of the six students interviewed during the episodic narratives, only 1 indicated an instance of reflection on study processes. This finding casts doubts as to the accuracy (i.e., the absolute levels of correctness of students’ judgments, Zimmerman,

2008, p. 171) of their report of the use of meta-cognitive strategies, especially the aspects on reflection.

For pre-service teachers in the current study, organization was the next common strategy used after meta-cognitive regulation, and was ranked as the sixth self-regulation strategy employed during learning. As one of the components of meta-cognitive processes, organization includes an individual's ability to put together learning tasks, materials and processes and carry out actions that are essential to achieve given educational objectives (Darling-Hammond et al., 2013; Skaalvik & Skaalk, 2010). Research evidence indicates that an organizational strategy is one of the most important strategies of cognitive conditions of meaningful learning (Kitsantas et al., 2008; Valle et al., 2003). Literature suggests that meaningful learning involves a process by which the student employs ways of selecting appropriate information, organizing that information into a logical whole, and incorporating that information into the structure of prior knowledge (Kitsantas et al., 2008; Goldfinch & Hughes, 2007).

The results from this present study seem to suggest that pre-service teachers understood the importance of outlining important ideas and concepts and organizing them into a meaningful whole to foster understanding. The finding is therefore consistent with other studies stating that adoption of learning-ends (goals and expected outcomes) influences students to select and use cognitive strategies learn the material. Learning-oriented individuals tend to use deep processing strategies that enhance their understanding and require some agency, such as perusing learning materials, integrating information by the use of charts, diagrams or tables and directing understanding (Duckworth et al., 2009; Kitsantas et al., 2008; Zimmerman, 2008; Bembennuty, 2008; Pintrich, 2004; Valle et al., 2003; Pintrich & De Groot, 1990). In the context of teacher education, the finding accords with Hattie (2003) who says:

> …experts do differ in how they organize and use [this] content knowledge. Experts possess knowledge that is more integrated, in that they combine new subject matter content knowledge with prior knowledge; can relate current lesson content to other subjects in the curriculum; and make

> lessons uniquely their own by changing, combining, and adding to them according to their students' needs and their own goals (p. 5).

Nonetheless, Corno (2009) asserts that students also use various coping or action control strategies to control their emotions and affect in order to deal with negative affect such as fear and examination anxieties. A look at the pattern of pre-service teachers' report of the prevalence of SRL variables seem to suggest that their use of organization strategy was to support the achievement of their performance goals but not as a deep processing strategy of wider professional knowledge. In terms of the development of the organization construct, the finding shows that, first year students appeared to be more organized than their second year counterparts. The t-test results indicated a significant difference between the mean reported score of first and second year students in the study. This suggests that first year students were more able to outline the materials being learnt, reorganize their problem solving and thoughts in relation to current classroom activities, could readily formulate a more extensive range of likely solutions to tasks, and were more able to check and test out their hypothesis or strategies than that of second years. As newly recruited trainees, first year students were likely to be stacked to class notes and materials given by tutors, and thus were very setting bound, and probably found it hard to think outside the specifics of their college classrooms and activities therein. This finding is similar to what Hattie (2003) found that experienced teachers were more focused on specificities than newly qualified teachers who often would pull together various methodologies learnt in college to approaching teaching and learning.

Critical thinking is perceived as one of the essential skills needed in the 21st century world (World Bank, 2013; European Commission, 2012; UNESCO, 2011). Zimmerman and Schunk (2009) assert that students must be active agents in their learning during training, and think critically about all the available information to them in other to make sound judgments about their own learning (i.e., they should be multiperspective thinkers). Critical thinking involves planning what one needs to learn, setting task specific goals, and deciding which learning approaches and taking appropriate actions to achieving those objectives. The reports of pre-service teachers in this present study reflected this situation. Teacher trainees in the current study reported as somewhat true of them the use

of critical thinking approaches (e.g., “Before I begin studying, I think about the things I will need to do to learn” and “When studying, I work on practice exercises and answer end of chapter questions”) to learning. Critical thinking was ranked in similar ways as other studies (Moos & Ringdal, 2012; Atputhasamy, 2006; Pintrich et al., 1993). Pre-service teachers ranked high extrinsic motivation such as getting good grades and showing ability to friends and family members and ranked as seventh, critical thinking approaches such as searching for evidence in support of theories and suppositions.

These findings parallel the work of Atputhasamy (2006), who found that students who reported high on an achievement goal orientation or extrinsic motivation used fewer self-regulatory strategies such as organization and critical thinking. Judging from the further analysis of the constructs that made up the critical thinking variable in this study, it does appear the only reason why students in the current study made use of the critical thinking approach was to gain skills in the practice of model questions of end-of-semester examinations but not to gain deeper understanding of what they learnt. Thus, pre-service teachers probably did not find it attractive, useful and motivating enough to employ some cognitive processes (for example, “when a theory, interpretation, or conclusion is presented during lecture or in course materials, I try to decide if there is good supporting evidence”) that they deemed would not inure to attaining their set goals.

However, it generally required of teachers to provide instruction across a more extended variety of contexts, integrate a wider set of perspectives, which requires the teacher not to accept the prevailing picture of reality but to question it and strive for its improvement, and apply a more extensive set of instructional strategies than has traditionally been the case (UNESCO, 2012; Musset, 2010; Avalos, 2011; Coulter et al., 2007; Day, 2007; Diez, 2007; Darling-Hammond & Bransford, 2005). It is therefore worrying that pre-service teachers in the present study were just focusing on strategies that would enhance their chances of passing external examinations. The finding seems to support the notion that tutors in colleges might have an inadequacy in the encouragement and nurturing of creative and critical thinking among their students (Akyeampong et al., 2011; Dottin, 2009), or the whole system is examination-driven and that pre-service teachers did not find beneficial employing deep processing approaches to learning (Englehart et al., 2012;

Guo et al., 2011; Zimmerman, 2008; Ross et al., 2003), hence students' unwillingness to employ such strategies in their learning of course materials on the programme.

Mansfield et al. (2012) suggest that self-efficacy is an essential factor of teacher development of resilience based on their analyses of survey data collected and that self-perceived competence in a variety of core teaching skills is critical in self-efficacy. The way students manage and control their effort on classroom academic tasks (self-efficacy for learning and control of beliefs) has been projected as another important component of SRL (Zimmerman & Schunk, 2009; Higgins & Leat, 1997). Trainees' beliefs as regards their capability to succeed in training and perform training-related tasks are an important component of students' learning. However, students' report of abilities and capabilities to learn course materials in this study appeared to be low. Pre-service teachers' rating concerning their self-efficacy for learning and performance was moderate as they ranked their self-efficacy for learning at the fiftieth percentile. In fact, they were almost unsure whether they could understand the most difficult material presented in the courses for their training programme and showed a lack of confidence in understanding materials they deemed complex that were presented by their tutors. A further analysis of the observed variables that make up the construct indicated that pre-service teachers were more concerned about how to improve their GPAs (e.g., "I expect to get a high GPA in this programme," mean of 5.84, standard deviation of 1.41) as compared to their self-conceptions about their understanding of subject matter knowledge (e.g., "I am certain I can understand the most difficult material presented in the courses for this programme," mean of 4.77, standard deviation of 1.68) and how to develop high levels of competence in core teaching knowledge and skills (Price et al., 2012).

Perhaps, teacher trainees in the present study did not consider their self-perceptions about content knowledge the most paramount in studying the course materials. This finding is at variance with most studies of SRL in terms of students' ratings of motivation and learning strategy use variables. For example, a review of several studies by Sitzmann and Ely (2012) revealed that students who self-regulate usually report high on self-efficacy for learning (Zimmerman, 2009; Zimmerman & Schunk, 2009; Kitsantas et al., 2008). But that could not be said of the current students in this study. Nevertheless, the findings

corroborate other researchers (Pajares, 2009; Lynch, 2008; Zimmerman, 2008; Bembenutty, 2007; Pintrich, 2004) who have found out that, students who are less efficacious tend to employ surface learning strategies such as rehearsal in achieving their performance goals, because self-efficacy serves as a mechanism that plays a central role in the exercise of personal agency (Moos & Ringdal, 2012; Pintrich, 2004; Ryan & Deci, 2000). First-year students reported slightly higher than their second-year counterparts, yet the mean difference of 0.14 was statistically significant at 0.05 confidence level. This implies that the self-efficacy variable is a dynamic construct under classroom learning conditions (van Dinther et al., 2011; McCombs, 2009; Zimmerman, 2009) and seems to decline as a student progresses the academic ladder, probably due to demanding upper level classes or more demanding courses (Kitsantas et al., 2008; Lynch, 2008).

Another finding was that pre-service teachers here ranked intrinsic motivation 9th among 15 variables. This is expected, and perhaps an obvious pattern considering the sequence of students' report of the self-regulation variables and given existing work linking students' motivation to their selection of learning and cognitive strategies use. Generally, it is expected that pre-service teachers display intrinsic interest in academic tasks associated with their teaching programmes if they had willingly chosen that path as their future career, and that intrinsic interest would be associated with pre-service teachers' motivational beliefs and self-regulation of learning (Bembenutty, 2007; Dembo, 2001).

According to Beltman et al. (2011) and Day and Gu (2010), teachers who are intrinsically motivated tend to have high sense of resilience and adaptive abilities and as asserted by Zimmerman (2009), students who self-regulate report high on intrinsic task interest and also high on their beliefs about their locus of responsibility, degree of self-determination, and sense of agency in creating positive possibilities for self-development and self-regulation. That is, when pre-service teachers are mindful of the fact that they are in control of their own learning, they are likely to become efficacious, feel competent and internalise learning goals (Zimmerman, 2009). This suggests that learners must be responsible for seeing to it that they actually go through all the stages of learning. It is important that, learners feel they are in control of their learning, and are motivated intrinsically rather than extrinsically (Vandevelde et al., 2013; Zimmerman & Schunk,

2009). However, the findings seem to be the converse of these notions. Pre-service teachers rather rated high on extrinsic motivation and low on intrinsic motivation.

In this study, this situation is very evident from students' ratings of intrinsic and extrinsic motivations and self-efficacy for learning as well as the application of some deep processing strategies for learning such as metacognitive regulation and organization. As indicated in the narrative and survey reports, pre-service teachers were profoundly influenced by external agents in their choice of college of education for training, and that, their report on intrinsic motivation is not surprising. This finding is consistent with earlier reports in the study when pre-service teachers reported high on extrinsic motivation and the use of rehearsal strategies, and also consistent with researches which found that students with a high sense of self-efficacy for learning show greater tenacity, effort and intrinsic interest (Zimmerman, 2009; Kitsantas et al., 2008; Zimmerman, 2008; Stoeger & Ziegler, 2008; Bembenutty, 2007). In this case, students have shown the reverse - thus, students with low sense of efficacy have also shown low intrinsic interest for learning college materials. Even though second year students had a mean score a bit higher than their first year counterparts, the mean difference was not statistically significant. It appears possible that intrinsic motivation is stable over time on the programme. This probably means that, pre-service teachers' interest and satisfaction with the courses did not make any significant gains as they progressed through the programme. However, further research would be required to explore the nature of this relationship utilizing a longitudinal study, which is beyond the scope and intent of this current study.

According to Schunk (2005), students need support at times, to comprehend course material and when uncertain about what to do when studying in college. Looking for help from others such as teachers and peers appears to be an expected response; however, wide individual differences occur in students' rate, extent, and form of help seeking. These differences bring to fore a complex interaction between social and motivational dynamics. In line with this, another important discovery related to students years in school and their level of help seeking was made in this study. The results indicated that first year students tend to be high on help seeking strategies relative to their second year counterparts, with a mean higher than the overall average for the two groups. This

indicates that, first year students may seek assistance from other sources such as colleagues, seniors and tutors during their learning than do the second year students. In effect, second year students in the study reported seeking less assistance with a mean lower than the overall mean for the two groups. This finding on help seeking is probably so, because, first year students needed to learn how to adjust to their new environment and use strategies such as setting goals, planning and organising effectively in their early years in college.

First year pre-service teachers may be requiring help in order to find their bearings on campus, and about courses because, they may have little task familiarity (Zimmerman & Schunk, 2009). They may use help seeking as a helpful adjustment approach, and to boost their self-efficacy beliefs in carrying out their course requirements (Avalos, 2011; Duckworth et al., 2009; Zimmerman & Schunk, 2009; Hattie, 2003). Second year students may feel they have achieved autonomy and mastery over the environment and courses and therefore needed less help or as Schunk (2005) contends, "students exert contextual control by choosing peers to work with and settings in which to work and by departing a situation if it appears antithetical to learning" (p. 3). For example, students in the study reported they identified and sought help from other students on materials they did not understand in class and this situation was evidenced in both narrative and survey reports. This finding parallels the work of Kitsantas et al. (2008) who found that first year undergraduate students in their study sought for help more than the continuing students. Another finding, needing highlight, is that, pre-service teachers during the interviews indicated that they consulted their colleague students for help more often than seeking help from tutors.

A post hoc analysis of the variables that made up the help-seeking construct was performed and the results corroborated the finding. The results showed that students in the study indicated as true of them asking other students for help on course materials they did not understand in class and making efforts to identify students whom they could ask for help when needed. However, they indicated as somewhat true of them asking tutors for clarifications on concepts during lectures. These probably suggest that students found it more convenient contacting other students for help and that tutors did not make room

for students to ask questions and seek clarifications during lessons; this situation could be attributed to time constraints comparing the volume of task to be completed before end-of-semester examinations or tutors' perceptions of teaching as imparting knowledge, and therefore did not see the need for using interactive approaches to teaching and allowing students to ask questions as and when necessary. When such an unfavourable environments are created in the classroom, it would diminish pre-service teachers' help seeking strategy use and self-efficacy (Sitzmann & Ely, 2012; Schunk, 2005). In all, pre-service teachers in the present study ranked help seeking as the 10th most prevalent self-regulatory strategy they employed when studying. This is not unusual considering the reports from both quantitative and qualitative data. The finding supports Schunk's (2005) assertion that students with performance goal orientation tend to seek less help, because they are extrinsically motivated and are concerned with how others assess them.

Literature concerning models of students' self-regulation suggests that a learner's interaction with their peers, and the learning environment supporting the activities of the learner, are important in increasing cognitive development (Zimmerman & Schunk, 2009; Schunk, 2005; Pintrich, 2004; Piaget, 2000). McCombs (2009) adds to this view by stating that, actions and active participation, not just responding to environmental spurs, results in thinking. Empirical findings (Brown & Sitzmann, 2012; Schunk, 2008; Stoeger & Ziegler, 2008) have revealed that unstructured learning and peer construction of training materials (e.g., the use of internet resources to enhance teaching and learning) are also becoming more prevalent. Compared to existing studies of students' use of strategies mostly from elementary or secondary schools (see Stoeger & Ziegler, 2008; Pintrich et al., 1993), pre-service teachers in this current study seem to have rated help seeking strategy higher. This appears to suggest that student teachers seem to know of the need and benefits to consult with peers when studying course materials. Students' narrative reports confirmed this as interviewees indicated they joined study groups on campuses to discuss course materials and lecture notes.

Overall, students' rating of peer learning strategy was low and consistent with previous work on SRL. Peer learning was ranked 11th out of 15 variables by students and indicated as somewhat true of them their use of student consultations on materials they considered

challenging when studying (e.g., “I try to work with other students to complete the course assignments”). Peer learning attribute could be considered as stable as the mean difference between first and second year students did not show any significant difference. The finding implies that both first and second year students consulted their peers for help when needed, but on a lower rate. This perhaps suggests that pre-service teachers did not find peer learning as useful in relation to their goals or did not find peer role models to enhance their efficacy or they felt reluctant because they had low self-efficacy beliefs and reckoned peers would have interpreted their actions to mean they lacked competence (Kitsantas et al., 2008; Schunk, 2005).

Zimmerman and Schunk (2009) assert that self-regulated learning involves more than a capability to execute a learning response by oneself (i.e., self-control) and to change learning responses to novel situations or negative feedback, but it involves conscious efforts to find out ways of learning as well as gaining from learning. Consequently, it is not enough for individuals to have confidence in their ability to accomplish the task successfully, but they must also perceive a need or value gained by continuing to apply full effort and attention to the task. Without such motivation, high self-efficacy may have functioned as a signal that success was guaranteed and continued commitment of full attention and effort was unnecessary (Sitzmann & Ely, 2012). Pre-service teachers’ reports on SRL variables mirror this notion. Pre-service teachers in the study evidenced effort regulation, control of learning beliefs and time and study environment management, constructs which are often reported high (see Sitzmann & Ely, 2012; Zimmerman, 2008; Pintrich et al., 1993) as low in prevalence during their learning in college. Perhaps, this is so because students effort regulation is a function of their self-efficacy beliefs and their persistence based on the outcome expectations on a given task.

That is, students tend to put in much effort to learning course materials they deem relevant and beneficial to their cause. The present finding therefore suggests that, pre-service teachers probably do not attach value to many of the course materials they are learning or as it became evident in their narratives, they were not motivated in choosing the teaching profession, hence, their low enthusiasm in expending effort, time and study resources in achieving college goals and learning tasks (Zimmerman & Schunk, 2009).

The findings support Sitzmann and Ely's (2012) view that having confidence in one's ability to accomplish a task effectively is not enough, but also, individuals' perception of the need and value gained by persisting to applying full effort and attention to the task is necessary. And also in line with what McCombs (2009) has posited that will and skill are integrated parts of self-regulation. Thus, a high level of determination is needed to maintain the necessary effort, attention, and focus to achieve the desired goal (Valle et al., 2003). At the pre-service training level, students should be involved in goal setting and in activities that would arouse their interest in courses of study so that they could increase their efforts and time in studying the materials on the courses.

Even though the findings of this study and others (Sitzmann & Ely, 2012; Zimmerman & Schunk, 2009; Pintrich et al., 1993) seem to differ on students' report of some self-regulation variables, they converge on student's report of test anxiety. Like the other studies, pre-service teachers reported low on test anxiety and first year students were more likely than second year students to prioritize their fear for examinations. As such, first year students were more likely to use rehearsal and other coping strategies such as help seeking to enable them control their fear and anxiety (Anane, 2013; Zimmerman, 2009; Pintrich, 2004). The implication of this finding is that, newly entrants to colleges are often not aware of the consequences associated with failing the tests. In fact, the prevalence of test anxiety might have resulted from the need for pre-service teacher to satisfy external agents as shown in Section 4.1.2 in this study and others (Anane, 2014, 2013; Pekrun et al., 2009), which might have resulted in their use of coping strategies in order to protect their self-worth (Pintrich, 2004).

Overall, pre-service teachers in the study prioritized and evidenced extrinsic motivation, rehearsal, elaboration, task value and metacognitive strategy use as the most common SRL variable employed during their studies in college. This represents a mixture of skewedness in the report of motivation and learning strategy use variables. These findings are at variance with studies of students' motivation and strategy use (Sitzmann & Ely, 2012; Remedios & Lieberman, 2008; Pintrich et al., 1993), which often indicate that motivation variables tend to be negatively skewed when reported by students. These suggest that pre-service teachers are no different from other students in an academic

environment who employ task oriented strategies in accomplishing their specific learning goals (Zimmerman, 2009; Kitsantas et al., 2008) and in the case of this study, it does appear passing external examinations was the focus of pre-service teachers.

5.3 Relationships between the Motivation and Learning Strategies components of Self-Regulation Learning of Pre-service teachers

Data from the study were analysed to ascertain the relationships between pre-service teachers' motivational orientations and their use of learning strategies (cognitive/metacognitive and resource management) with the intent of answering research question two which was raised in section 5.1. The results offer a systematic foundation for the description and explanation of the theoretical and empirical relations between individual differences in pre-service teachers' motivation, and their cognitive and metacognitive commitment and self-regulation in academic (e.g., classroom) situations (Zimmerman & Schunk, 2009; Duckworth et al., 2009; Darling-Hammond & Bransford, 2005; Pintrich, 2004). Pre-service teachers' control of learning beliefs related in important ways to their value for tasks and courses they studied on the training programme, self-efficacy for learning, intrinsic interest, and use of elaboration strategies in learning course materials. Control of learning beliefs was positively associated with student value for task. Thus, students who believed they could understand course materials if they studied hard or controlled the way they approached their learning (e.g., "If I study in appropriate ways, then I will be able to learn the courses materials in this programme") were more likely to report attaching value to tasks or courses being learnt on the programme.

This finding suggests that students' control of cognition and learning seem to facilitate students' task value as proposed by models and theories of SRL (Zimmerman, 2009; Pintrich, 2004; Bandura, 1997; Pintrich & De Groot, 1990). This implies that, giving students an exposé about the value and utility of the courses and tasks they perform in academic settings, they may enhance their cognitive control and beliefs about learning, in that, pre-service teachers' motivation to perform academically may be made up of their expectation for achievement and how much value they place on high achievement

(Kitsantas et al., 2008; Eccles, 2005). Students high in control of cognition or beliefs about learning were more likely to report being self-efficacious and intrinsically motivated; tend to persist more often at most difficult and complex materials and academic tasks.

Even though course materials and academic tasks may be uninteresting, pre-service teachers who believed in their abilities in relation to the demands of the programme were more likely to believe in themselves and that when they studied in appropriate ways, they would be able to learn course materials in their training programme (Moos & Ringdal, 2012; Sitzmann & Ely, 2012; Zimmerman, 2009; Bembenutty, 2008). This finding is in support of Zimmerman's (2009) assertion that when students are mindful of the fact that they are in control of their own learning, they are likely to become efficacious, feel competent and internalise learning goals. In addition, pre-service teachers who reported high on control of learning beliefs and believed that course work and academic tasks were important and captivating, used more elaborative strategies (e.g., "When I am studying, I try to understand by making connections between the materials and the concepts from the lectures" and "When I study, I bring together information from different sources, such as lectures, pamphlets, and discussions"). These findings are in line with prior research on SRL (Sitzmann & Ely, 2012; Bembenutty, 2007; Pintrich et al., 1993).

Literature on SRL has it that, in terms of motivational processes, learners who self-regulate report of high self-efficacy (Zimmerman, 2009; Zimmerman & Schunk, 2009; Kitsantas et al., 2008), self-attributions, and intrinsic task interest (Zimmerman, 2009; Vansteenkiste, Lens & Deci, 2006; Vallerand, 2000). Self-efficacy for learning also correlated highly with intrinsic motivation. Pre-service teachers who were high on intrinsic interest, that is, were more satisfied in learning course materials were more likely than those with less intrinsic interest to believe in their capabilities in performing academic tasks and learning course contents. In fact, in the present study, intrinsic motivation has a shared variance of approximately 18% with self-efficacy for learning. Considering the multidimensional nature of students' efficacy beliefs (Kitsantas et al., 2008; Zimmerman, 2008), this value of shared variance is significantly important in pre-

service teacher education context. Thus, even though intrinsic interests and self-efficacy beliefs are distinct variables, they are intricately linked and that students' interests in course work and academic tasks are very essential in developing their self-belief during and after training (Day, 2008; Flores, 2006; Darling-Hammond & Bransford, 2005; Tschannen-Moran & Woolfolk 2001). Self-efficacy was positively related to student task value. Pre-service teachers who believed they were capable were more likely to report to be interested and deemed course work as relevant for future studies.

Although modest relations, self-efficacy was negatively linked to test anxiety, that is, students who reported high on self-efficacy for learning were less anxious for taken tests. Self-efficacy for learning was positively related to elaboration, effort regulation and peer learning. Pre-service teachers who reported believing in their abilities to learn course contents also reported high on the use of elaboration strategies (e.g., "When I am studying, I try to understand by making connections between the materials and the concepts from the lectures"); reported high on the way they expended energy and persisted on difficult academic tasks (e.g., "I work hard to get a good grade, even when I do not like the course"), and often collaborated with other students in learning course materials; used time and resource management, and cognitive strategies such as critical thinking and organization. These findings support what Bembenutty (2008) and Pintrich and Zusho (2007) found that students with high levels of self-efficacy for learning purposefully selected causes of action and approaches to learning. This implies that, teaching pre-service teachers to be efficacious is good, but it is not enough unless students are trained in how to set meaningful goals with specified efforts required in achieving such targets and selecting appropriate learning strategies (Sitzmann & Ely, 2012; Pintrich & Zusho, 2007; Schunk & Ertmer, 2000; Bandura, 1991).

Task value is often reported to correlate highly with some perceived desirable SRL variables such as intrinsic motivation, elaboration, metacognitive strategies and effort regulation by studies of SRL (Zimmerman, 2008; Schunk, 2005; Pintrich et al., 1993). Nonetheless, the findings from the current study are at variance with previous studies and literature. Pre-service teachers who reported high on task value were more likely to report high on extrinsic motivation, and on the use of rehearsal methods in studying course

materials. This means that students' views about the importance, utility and interest in course contents were related to external factors, and the need to attain high grades. This is likely as task value was also found to relate very highly to rehearsal strategy use. Pre-service teachers in the present study probably were more concerned about performing high in examinations, and had high attainment-value for course contents than having to think of learning for professional development and future career in teaching (utility-value)(Kitsantas et al., 2008; Eccles, 2005). There were, however, moderate relationships between task-value and critical thinking, elaboration, metacognition, organization and peer learning. The findings suggest that, a heuristic approach of teaching pre-service teachers to value whatever they learn on their programme for varied purposes in a balanced way is necessary.

Literature suggests that we are living in a test-conscious age in which the lives of many people are not only greatly influenced, but are also determined by their test performance (Rana & Mahmood, 2010; Pekrun, Elliot & Maier, 2009; Fenollar et al., 2007; Bembenutty, 2008; Pintrich, 2004; Pintrich & De Groot, 1990). As Rana and Mahmood (2010) contend, tests and examinations at all stages of education, especially at higher education levels have been considered an important and powerful tool for decision making in our competitive society, with people of all ages being evaluated with respect to their achievements, skills and abilities; such tests and examinations come with it, stress, which is thought to prevent some individuals from reaching their academic potential. Test anxiety has been found to be one of the most debilitating factors of students' learning. In this study, it was found that students who reported to be extrinsically motivated were more likely to report of test anxiety. This implies that students who are motivated by external and performance factors are likely to be tenser emotionally, cognitively, physiologically and behaviourally in response to anticipating non-favourable results in end-of-semester examinations (Bembenutty, 2008). Thus, an increase in surface information processing and motivation through extrinsic ways was likely to lead to an increase in fear for tests. Prior research on test anxiety suggests that students who exhibit high levels of test anxiety may also have varied motivational beliefs and values and learning skills than those have less levels of anxiety (Rana & Mahmood, 2010; Kitsantas et al., 2008, p. 48).

As expected, test anxiety was negatively related to self-efficacy for learning, time and study environment management and effort regulation. These suggest that pre-service teachers who were very anxious of tests were those who probably had less confidence in their abilities to cope with course work; had fewer skills in managing time and resources and expended less effort at academic work. These findings corroborate what Bembenutty (2008) found in his study that students who experienced high levels of test related anxiety were less on the use of adaptive task values, and used fewer cognitive learning strategies compared with students who experienced lower levels of test anxiety and that of Lizzio and Wilson (2004) who found that students who generally lacked self-confidence had high levels of test anxiety. The data revealed non-significant relationships with critical thinking; organization and metacognitive strategy use as well as help-seeking. These findings are in support of the notion that, even though the expectancy and value components of learning will be positively related to the cognitive/metacognitive learning and resource management components, but research on test anxiety does not suggest such simple relations (Bembenutty, 2008; Pintrich, 2004; Pintrich & De Groot, 1990).

Notwithstanding the fact that works on student learning suggest that it is important for learners to feel they are they are masters of their own learning, and be motivated intrinsically rather than extrinsically, one motivational orientation that was dominant in students' reports of their values and belief systems during the progress of the study was their extrinsic motivation. Students' report of extrinsic motivation related highly with their use of rehearsal strategy of learning. Approximately 13% of the variation in the use of rehearsal strategy of learning college materials was explained by students being extrinsically motivated or not. That is, pre-service teachers who reported high on extrinsic motivation used more rehearsal approaches to learning than those who reported low on extrinsic motivation. The relations between extrinsic motivation and effort regulation, time and study environment management and peer learning were not statistically significant. The implication of this situation is exemplified by Vandevelde et al. (2013) who assert that pre-service teachers may be varying in their degree of relative autonomy and that there is the need to look at the quality of motivation rather than on the quantity of motivation (Ryan & Deci, 2000b). For example, Pintrich contends that self-regulated (SR) students try to increase their extrinsic motivation for the task by promising

themselves extrinsic rewards or positive results reliant on their academic achievement (Schunk, 2009, 2005; Zimmerman, 2008; Bembenutty, 2007; Pintrich, 2004). However, pre-service teachers' submissions in the current study suggest a much more focus on achieving high in end-of-semester examinations and tests rather than gaining content knowledge relative to professional practice.

In terms of pre-service teacher motivation and learning strategies used, the data revealed that peer learning was very strongly related to organization. Students' engagement in peer learning explained about 20% of their application and use of organizational strategies. Pre-service teachers who were motivated to learn with their colleagues (e.g., "When studying a course, I often set aside time to discuss course materials with a group of students") were more likely to use organizational strategies in learning course materials (e.g., "I make simple charts, diagrams, or tables to help me organise course material"). In addition, students who used organizational strategies were more likely to employ metacognitive self-regulation skills and to report that they used critical thinking. The high relationships between organization and metacognitive and critical thinking skills are not unexpected as they are all part of the cognitive engagement construct. However, in an academic environment and in teacher's professional practice, organizational strategy use explaining about 17% of pre-service teachers' cognitive engagement in activities is worthy of note. This implies that teaching students about the use of various organizational strategies is likely to improve or up their use of processes of planning, monitoring and reflecting on their own learning by providing tools for analysis of events and situations that enable them to comprehend and handle the complexities of life in the classroom (Zimmerman & Schunk, 2009; James & McCormick, 2009; Flores & Day, 2006; Hammerness et al., 2005).

In relation to the resource management variables, organizational strategy correlated high with time and study environment management and elaboration. The results from the present study indicated that pre-service teachers who reported high on the use of organizational strategy also reported high on appropriately managing time and study environment. This probably suggests that classroom environments and time available to students influence how they organize their course materials for learning. These findings

are in accord with what a body of literature indicates that situational and contextual variables such as assessment system, the tutor's attitude, classroom structure and organization, time available to students to study course materials and the type of tasks to be studied influence the type of learning strategies to be adopted by students (Vandevelde et al., 2013; Davies, 2011; Lampert, 2010; Corno, 2009; Schmidt & Maier, 2009; Pajares, 2009; Schunk, et al., 2008; Zimmerman, 2008; Fenollar et al., 2007; Darling-Hammond & Bransford, 2005; Pintrich, 2004; Hammerness et al., 2005; Hattie, 2003). The findings therefore support studies of SRL that there are interactions between contextual factors such as tasks demands and value, assessment systems, teaching and learning strategies and available resources; the management of ends (such as achievement outcomes) and metacognition as well as the implementation of motivational and cognitive learning strategies suitable to the demands of the task at hand (Englehart et al., 2012; Robson et al., 2012; Guo et al., 2011; Zimmerman, 2008; Ross et al., 2003). In a similar way, peer-learning correlated positively and highly with cognitive skills (critical thinking). This finding supports Psychologist Jean Piaget's claim that a student's interaction with their peers, and the learning environment supporting the activities of the learner, are important in increasing cognitive development (Piaget, 2000).

The data revealed non-significant relationship between peer-learning and rehearsal strategy use. And the relationship between peer-learning and help-seeking was positive and significant at the 0.05 level. This means that pre-service teachers who employed collaborative learning strategies with peers were more likely to report high on the use of help-seeking strategies. This probably explains the weak relationship found between help-seeking and the use of rehearsal strategies of learning in the present study. Notable among the results is the finding that peer-learning was weakly associated with effort regulation. The weak relationship perhaps suggests that students who were overly involved in peer-learning did not put in much effort in their own studies and depended mostly on other colleagues for support and motivation to learning or students who believed in their own efforts and self, did not seek help from their colleagues. These findings corroborate with studies of students' co-learning through mutual collaboration and feedback (see for example, Dobber et al., 2012; Sato & Kleinsasser, 2004) which have found a link between co-construction (Dottin, 2009; McCaslin & Hickey, 2009),

capacity building for judgement (Diez, 2007; Dottin, 2009), efficacy (Mansfield et al., 2012; Avalos, 2011), and collaboration (Boyd et al., 2008). However, over reliance on others could be detrimental to the course of the individual involved. In fact, this notion is supported by data from the qualitative section in the current study when interviewees indicated that, their "excessive" involvement in group studies nearly cost them their performance in end-of-semester examinations. This might have stemmed from the fact that they did not know how to apply peer learning and help-seeking strategies (Zimmerman, 2008), but in as much as collaborative learning is essential in classroom context and on the field of practice, one needs to balance it with enhanced effort and dedication to learning course materials by self.

As indicated in the preceding section, pre-service teachers in the current study appeared not to have understood the importance of time and study environment management in achieving their goals in college and therefore ranked it amongst the least (14^{th} out of 15 variables). However, literature on SRL suggests that study skills and effective time and resources management are some of the key elements of students' continuing stay in college and achieving their goals (Sitzmann & Ely, 2012; Kitsantas et al., 2008; Zimmerman, 2008; Pintrich & Zusho, 2007). Time and study management is a form of behavioural control whereby students engage in activities that involve the making of plans for studying and allotting time for various activities (Sitzmann & Ely, 2012; Pintrich, 2004).

Zimmerman and Schunk (2009) have shown that high achievers and self-regulating learners do engage in time and study resources management activities, and as part of time and study management, students may make decisions and create intents about how they will allocate their effort and concentration on their work. The result from the present study illuminates this exposé. Pre-service teachers who reported high on the effective use of time and study resources (e.g., "I make sure that I keep up with the weekly exercises and assignments for this course") also reported high on effort regulation (e.g., "Even when course materials are dull and uninteresting, I manage to keep working until I finish"). The data revealed that time and study environment management explained about 17% of the variation in effort regulation. This implies that pre-service teachers who

managed their time and study resources effectively were more likely to expend more effort in studying course materials and would work harder to get good grades even if course materials are not interesting.

Another finding of the study is the positive statistically significant relationship between time and study environment management and elaboration. Teacher trainees who monitored their time and effort in order to meet task deadlines (knowing that by willingly deferring an intended course of agency would lead to being worse off for the delay and inaction (Sitzmann & Ely, 2012; Steel, 2007, p. 66)) were more likely to employ elaboration approaches such as making connections between materials from different sources (e.g., lecture notes, books, discussions and modules) when studying course materials. In order to avoid procrastinating causes of action, pre-service teachers appeared to have used the strategy of writing brief summaries of main ideas from course materials as a way of making good use of time, and meeting deadlines. This finding implies that if pre-service teachers are trained on how to use their time and learning strategies effectively, they are likely to be involved in critical thinking and use of deep processing strategies like effort regulation and elaboration to optimize academic performance whilst in college and possibly transfer it to the field of practice (Avalos, 2011; James & McCormick, 2009; Deci & Ryan, 2000; Vansteenkiste et al., 2004).

In other findings, metacognitive regulation correlated very highly with rehearsal strategy used and critical thinking. Pre-service teachers who reported high on cognitive strategies (i.e., critical thinking and metacognition were more likely to report highly on the use of rehearsal strategy when studying materials. This finding is in contrast with what was expected from trainees. Literature suggests that, the nature of the teaching work and how occupational development supports the accomplishment of the central tasks and supports in the management of “hard cases” that rely on professional judgment and discretion should be the focus of training (Sykes et al., 2010, p. 465). Thus, ‘being competent’ involves possessing the range of acceptable skills (e.g., resilience, conscientiousness, persistence, reflective thinking, collaboration/co-operative and communicative skills) necessary to carry out one’s duty on daily basis (World Bank, 2013; European Commission, 2012; Englehart et al., 2012; Mansfield et al., 2012; UNESCO, 2012; Moos

& Ringdal, 2012; Avalos, 2011; Barnett & Koslowski, 2002; Dottin, 2009; Zimmerman & Schunk, 2009; Hammerness et al., 2005; Day, 2004). Trainees were expected therefore to develop meta-adaptive skills (Avalos, 2011; Dreeben, 2005; Lizzio & Wilson, 2004).

These required students to employ deep processing strategies such as critical thinking/metacognitive strategies, elaboration, organization, and peer-learning, and manage time and resources through persistence and self-belief to achieving academic and professional dispositional ends (outcomes). However, the findings are not as surprising as they seem to reflect the situation in colleges under study, where students used surface processing strategies in studying course materials, yet reported high on the use of critical thinking and metacognition strategies. Probably, they did not understand or know or tell the differences between activities that could be referred to as critical thinking/metacognitive and those that were rehearsal and/or preparatory oriented (Zimmerman, 2008; Pintrich & Zusho, 2007). Overall, evidence from this study seems to suggest that the major concern for students was to ensure that they progress through their diploma programme, do well, and ultimately graduate (Kitsantas et al., 2008).

5.4 Relations between Pre-service Teachers' Programme of specialization, Gender, Academic Performance (GPA) and Motivation and Self-Regulation Learning Strategies

In order to provide a detailed profile of pre-service teachers' motivation and self-regulation learning (SRL), the study examined their basic background information such as gender and programme majors in relation to academic achievement and SRL. A body of literature indicates that many unobserved characteristics such as pre-service teachers' conceptions on how they could earn respect from the community may influence their choice of college and the amount and type of programme they choose to read which may influence their future motivation, strategy use and performance in the classroom (Duckworth et al., 2009; Kitsantas et al., 2008; Harris & Sass, 2011). However, very little is known about sub-group variation on how SRL develops and those few studies to date which do look at interactions with background characteristics indicate that the potential

benefits of, and innate capacity for, self-regulation do not vary systematically with socio-economic background, ethnicity or gender (Duckworth et al., 2009).

However, the present study's findings on the relations between gender and the SRL variables appear to be mixed. Of the 15 constructs studied in the current study, four (test anxiety, task value, rehearsal and help-seeking) showed statistically significantly positive relationships with gender. In terms of test anxiety, female pre-service teachers compared to their male counterparts were more likely to report high on feeling anxious and engaging in activities which indicated they had fear for end-of-semester examinations. The finding corroborates the work of Anane (2013) in a female college of education which showed that there was a high prevalence of test anxiety among students. This finding also supports Pintrich and De Groot (1990) who found in their study of 173 seventh graders that boys rated themselves feeling less test-anxious than did girls. Even though, it is not an easy task explaining this relation between test anxiety and gender, a plausible implication could be that female pre-service teachers were inclined to worry more about test as they are found to have high levels of emotionality than males (Buhle et al., 2013; Mak, Hu, Zhang, Xioa, & Lee, 2009; McRae, Ochsner, Mauss, Gabrieli, & Gross, 2008; Cassady & Johnson, 2002).

In terms of gender and task value, female students in the current study reported higher on the average than did male students. This means that female pre-service teachers perceived the courses on the training programme to be important to them relative to their career aspirations and future job performance. This probably explains the reason why females more often than not stay longer in the teaching profession, especially at the basic school level than their male colleagues (Cobbold, 2010). Perhaps, this situation persists because task value seems to influence teacher resilience which in turn impacts on the level of attrition among teachers (OLT, 2012; Beltman et al., 2011; Cobbold 2010). Thus, teachers who lack resilience are more likely to leave the teaching profession than those who are high on the attribute, in that those who value the tasks on the courses or in the field of practice tend to sustain their commitment to academic work and to the profession, and with this, their effectiveness (Day & Gu, 2009, p. 449; Sammons et al., 2007). Again,

the data from the present study revealed that females did seek help and resorted to the use of rehearsal strategies of learning compared with their male counterparts.

Even though gender shared about 2% of the variance in rehearsal and 3% of the variance in help-seeking, these findings indicate that gender plays important role in students' decision to seek help from other students or tutors and also on whether to use rehearsal strategies in learning course materials or not, considering the number of variables that influence students' choice of learning strategies during classroom learning. These findings support previous research that generally indicates that males and females differ in motivational orientations and use of learning strategies, where females usually fall stereotypically along the lines of having "elevated levels of motivation" (Kitsantas et al., 2008, p. 62) and use of surface processing strategies. Overall, students' performance did not differ across gender, a finding which validates Pintrich and De Groot's (1990) finding of non-significant difference between boys and girls on their classroom performance. However, the finding is in contrast with other prior studies of students' academic achievement. For example, Kitsantas et al. (2008) found in their study of undergraduate students, a significant gender differences in college GPA. But the result from the current study is surprising considering the fact that students' prior performance was gender bonded (See section 5.1). Perhaps, by implication what students do in college account for more of their performance than the grades they came in with in relation to their gender.

In this study, pre-service teachers' programme of specialization was correlated with motivation and learning strategies used and academic achievement. The data revealed that a student's programme of specialism weakly correlated with student cumulative college GPA for two semester, albeit, not at the 0.01 level. This means that, students who were studying for science certificate performed better than students who were studying for general certificate. This difference in performance might have stemmed from the fact that science students probably believe the contents of the materials they studied had a higher difficulty level and therefore put in much effort and time to achieving their goals or just that course contents were different in terms of content structure and load (MoE, 2011; Lewin & Stuart, 2003; Wenglinsky, 2002). Concerning the motivation and learning strategies for learning, pre-service teachers who read general and science programmes

differed on three out of the 15 variables at the 0.01 level of significance. Science students on the programme reported seeking more help than did general students on the programme.

Again, pre-service teachers who specialised in science reported higher on effort regulation than did students who specialised in general programmes. This means that the programme or the subject matter a student is studying influences his or her decision to seek for help when needed and also the amount of energy to be expended on the tasks found on the courses of the programme. On the other hand, pre-service teachers who read general courses were more likely to be intrinsically motivated compared with students who read science programmes. This is probably so, as there may be forced choices in the selection of programmes at the time of entry into colleges. During the selection of programmes to read in the colleges, students make their own choices based on the courses they read at the senior high school level. But more often than not, especially with colleges which offer science programmes, they tend to assign students to science related programmes, even though they might have chosen general related programmes, because of shortfalls in the number of students required to mount the science programmes (Institute of Education, 2013; MoE, 2011; Republic of Ghana, 2002). Therefore, pre-service teachers in the general programmes expressing intrinsic interest is not surprising since they had willingly chosen that path (to be trained as generalist teachers) as their future practice (Zimmerman & Schunk, 2009; Remedios & Lieberman, 2008; Randi, 2004; Dembo, 2001). Science students indication of use of some deep learning strategies such as effort regulation probably suggest that they might have assumed responsibility of achieving their stated goals, with high levels of determination, tenacity and persistence in line with their motivation (Mansfield et al., 2012; Yogev & Michaeli, 2011; Valle et al., 2003).

In the present study, the results revealed a high association between some motivation variables (intrinsic motivation, test anxiety and self-efficacy for learning) and students' academic performance (GPA). Teacher trainees who reported high in intrinsic interest were more likely to perform better in end-of-semester examinations (GPA), with about 10% of the variance in pre-service teachers' performance shared by their intrinsic interest

in course materials on the programmes. Students' performance in college had a shared variance of 11.7% with test anxiety, with students who reported high on feeling anxious during examinations performing poorly in end-of-semester examinations. Self-efficacy for learning correlated positively with students' GPA, with a shared variance of approximately 12%. These findings support previous studies suggesting that test anxiety has a debilitating association with students' achievement, whilst intrinsic motivation and self-efficacy for learning have positive relations with achievement (Sitzmann & Ely, 2012; Bembenutty, 2008; Kitsantas et al., 2008; Remedios & Lieberman, 2008; Stoeger & Ziegler, 2008; Zimmerman, 2008; Pintrich & DeGroot, 1990). Data from the study revealed that task value did not significantly correlate with GPA. Considering that this study included pre-service teachers enrolled in different programmes, this outcome may be as a result of trying to measure a multidimensional construct holistically across different courses rather than as context-specific variables (Kitsantas et al., 2008, p. 20) or that even though students reported high on the use of the construct, yet they did not know how to apply it in context (Zimmerman, 2008).

Time and study environment management correlated significantly with GPA. In fact, the highest explained variance in students' GPA was posted by their ability to manage time and resources when studying course materials, with a shared variance of approximately 19%. Pre-service teachers who made use of their study time and kept to their schedules, for instance, performed better than students who did not. Again, effort regulation correlated significantly with GPA and explained 17% of the variation in pre-service teachers' GPA. This implies that teaching teacher trainees about different motivation and learning strategies may be essential in improving their performance in college courses, but that improving their skills in time and resource management and effort regulation may lead to higher academic performances (Sitzmann & Ely, 2012; Kitsantas et al., 2008; Valle et al., 2003; Pintrich & De Groot, 1990). Metacognitive regulation and critical thinking, however, did not correlate with GPA. This finding corroborates previous research by Kitsantas et al. (2008) but contradicts others that suggest that cognitive variables are more related to academic performance (Moos & Ringdal, 2012; Kornell & Metcalfe, 2006; Pintrich, 2004; Pintrich & De Groot, 1990). It must be noted, however, that, this variance might have been borne out of the fact that metacognitive regulation

was measured globally or due to the non-use of such cognitive variables by pre-service teachers during training as suggested by Zimmerman (2008).

5.5 Mediating Effect of Pre-service Teachers' Self-Regulation Learning on the Relationship between Prior performance and Academic Achievement

There is an extensive body of research regarding students' academic performance that has alerted us to the prominence and power of prior attainment (Moos & Ringdal, 2012; Avalos, 2011; Lai, 2011; Zimmerman & Schunk, 2009; Kitsantas et al., 2008). Research findings (e.g., Sitzmann & Ely, 2012; DeBerard, et al., 2004; Hattie, 2003; Pintrich & De Groot, 1990) suggest that students' prior abilities are among the highest predictors of school achievements. However, there is also literature on SRL that draws our attention to the potential impact of self-regulation learning on academic achievement and performance. Research shows, at least at the elementary level, that, students who are independent, proactive and use different forms of learning strategies such as effort regulation, time management, collaborating and organizing (Zimmerman & Schunk, 2009; Kitsantas et al., 2008; Bembennuty, 2007) perform better than students who do not. For instance, it has been said that, capable students who persist at a difficult task or maintain their cognitive engagement in the task and keep to study schedules in the midst of distractive obstacles and noxious experiences perform better (Zimmerman, 2009; Bembennuty, 2007; Bandura, 1997; Pintrich & De Groot, 1990).

Also, the essence of SRL becomes prominent in the sense that, in the classroom environment, little can be done in improving students' prior achievement such as entry grades, however, student motivation and self-regulated learning are subject to change through processes and interventions (Kitsantas et al., 2008; Sitzmann & Ely, 2012; DeBerard, et al., 2004; Tuckman, 2003). The present study explored the mediating effect of pre-service teachers' self-regulatory processes (i.e., motivation and learning strategy use) on the relationship between prior academic performance and final academic achievement (GPA). Further, the study employed a general framework of measuring motivation and self-regulated learning to predict pre-service teachers' college GPA, which is a wide-ranging, multidimensional result (Price et al., 2012; Barnett &

Koslowski, 2002; Kitsantas et al., 2008; Hammerness et al., 2005; Rice, 2003) controlling for their prior attainment (entry aggregates). Collectively, partial support was found for the hypothesis, as five of the SRL variables did not contribute in predicting final academic achievement.

Taken together, the motivation components of students' self-regulation learning contributed unique variance in predicting academic achievement over and above the impact of prior attainment (student entry aggregate). In terms of student motivation constructs, the results indicated that when predicting final academic achievement, intrinsic motivation, test anxiety, self-efficacy for learning, task value, extrinsic motivation and control of learning beliefs mediated moderately in the effect of prior attainment, and each variable, with the exception of task value, contributed significantly to the model. In all, the model explained about 42% of the variance in students' academic performance. However, task value did not predict pre-service teachers' GPA (for two semesters). Self-efficacy for learning, test anxiety, intrinsic motivation, control of learning beliefs and extrinsic motivation accounted for approximately 36% of the variance in student GPA, after controlling for student prior performance (entry aggregate).

It was evidenced that a pre-service teacher's intrinsic interest, control of learning belief and self-efficacy predicted his or her GPA independent of prior performance. This finding seems to imply that, these variables are harnessed based on the academic tasks in context. These results support Sitzmann and Ely's (2012) findings that motivation variables such as self-efficacy for learning and intrinsic interest play an independent and essential role in student learning and academic performance. On the other hand, test anxiety and extrinsic interest were found to be dependent on prior performance. Thus, a pre-service teacher's entry grade predicted positively a student's level of test anxiety and extrinsic interest. That is, students who entered college with high aggregates (poor entry grades) were more likely to report high feeling anxious during tests and examinations, and also report high being extrinsically motivated.

Founded on these findings, tutors and college administrators should devote attention to building students' efficacy beliefs (Avalos, 2011; Dottin, 2009; Duckworth et al., 2009; Dembélé & Lefoka, 2007; Darling-Hammond & Bransford, 2005) as many of the students they recruit into training usually come in with low grades (see section 5.1; Lewin & Stuart, 2003) in order to optimize their learning during training and possibly transfer it to the field of practice (Avalos, 2011; James & McCormick, 2009; Schunk, 2009; Deci & Ryan, 2000). Overall, the results revealed that a student's entry aggregate (prior performance) had minimal predictive value for the motivation variables such as self-efficacy for learning, control of learning beliefs and intrinsic motivation. This probably suggests that these constructs are task and context specific and may be dynamic across time (Zimmerman, 2009; Butler & Winne cited in Zimmerman, 2008; Hattie & Timperley, 2007; Pintrich, 2004). However, task value, extrinsic motivation and test anxiety were predicated on prior performance.

In model 2, the study investigated the direct and indirect effects of pre-service teachers' learning strategies used. Findings in the current study in relation to the predictive validity of learning strategies used and academic achievement replicated outcomes of prior research. As for the effect of pre-service teacher's learning strategies on final academic achievement, it was found that peer learning, time and study environment management, rehearsal, effort regulation and elaboration directly predicted academic achievement. Of the five learning strategies that predicted students' achievement, time and study environment management (i.e., how effectively students regulate study time and the surrounding environment to successfully accomplish learning goals, Kitsantas et al., 2008, p. 46; Pintrich et al., 1993) had the highest proportion of .1199 of the total explained variance of .4548 of the nine learning strategies variables in the model.

This means that time and study management predicted academic achievement over and above all the learning strategies variables and explained 26.4% of the variance in pre-service teachers' academic achievement and this finding supports research evidence that time and study management strategies are strong predictors of academic achievement (Sitzmann & Ely, 2012; Kitsantas et al., 2008). It is important to note that this explained variance is even higher than when prior performance alone was used in the model to

predict achievement. This means that the way trainees manage their time and available resources and surroundings should be of utmost concern to teacher educators as a possible target for intervention to help them select, structure, and create environments that optimise learning (Sitzmann & Ely, 2012; Zimmerman, 2009, p. 5).

Effort regulation was another strong positive predictor of pre-service teachers' achievement and so was rehearsal strategy used, but in the negative direction. Thus, trainees who were persistent and allocated effort and attention towards course materials performed better than those who expended less effort to studying course materials. On the other hand, those who used more rehearsal strategies performed poorly and had low cumulative GPA for the two semesters. The finding on effort regulation validates the work of Sitzmann and Ely (2012), who found a positive effect of effort on learning performance. But that of the rehearsal contradicts theories and research on SRL, which suggest that students who were more cognitively engaged in trying to learn by using coping strategies and transforming task materials through the use of rehearsal, performed better than students who did not use such strategies (Schunk, 2009; Corno, 2009; Bembenutty, 2007; Pintrich, 2004; Ross et al., 2003).

Even though trainees had reported using organization, help-seeking, critical thinking and metacognitive regulation, these variables did not predict academic achievement directly or indirectly, contrarily to existing theories and research evidence (Sitzmann & Ely, 2012; Schunk, 2009, 2005; Winne & Hadwin, 2008; Zimmerman & Schunk, 2009; Pintrich, 2004; Pintrich et al., 1993). This could be explained in line with Zimmerman's (2008) suggestion that an individual student may report knowing a strategy on an SRL ability questionnaire, but may not know how to apply it to work in a specific academic situation. Overall, the learning strategies variables showed a moderate intervening effect on the impact of prior performance on students' academic achievement, and together explained a higher proportion of the variation in pre-service teachers' performance than prior performance, but that of time and study environment management was the strongest.

In the final and parsimonious model, the study found that ten SRL variables and student prior performance together explained approximately 52% of the variance in a pre-service final achievement (GPA). This finding supports the notion that, what students bring onto a programme of study and their personal characteristics such as self-regulation have enormous impact on their learning of course materials and eventual performance (Sitzmann & Ely, 2012; Diez, 2007; Darling-Hammond & Bransford, 2005; Schunk, 2005; Hattie, 2003). The study also validates the finding from Hattie's (2003) meta-analysis of studies that have asked the question of where the greatest variances in students' performances lie, and found that 50% of the variation was determined by the student and what he or she brings to the task at hand. The finding in this current study makes clearer as to which areas and how much of students' attributes contribute to achievement. Specifically, the model indicated that, pre-service teachers who controlled their time and study environment effectively raised their performances considerably (Kitsantas et al., 2008). This means that pre-service teachers' time management skills are very important for their academic performance and continued stay in college. It is important to note that, when both the motivation and learning strategies variables were added in the final model, the negative impact of rehearsal strategy used on academic achievement increased from -.0677 to -.085. This implies that, trainees who relied mostly on remembering facts during examinations were more likely to perform poorly than those used the strategy minimally.

Taken together, ten SLR variables out of the 15 hypothesized SRL variables in the study showed a moderately large effect size and thus, mediated significantly the impact of prior performance on pre-service teachers' academic achievement in college. That is, pre-service teachers' prior academic performance indirectly influenced their final college achievement through time and study environment management, effort regulation, rehearsal, extrinsic motivation and test anxiety controlling for all intrinsic motivation, self-efficacy for learning, control of learning beliefs, peer learning and elaboration strategies used. Implications of the findings are offered for teacher education in general, teacher education curriculum and assessment and for teacher educators.

5.6 Significance of the Study for Teacher Education

This thesis has pursued the argument that teachers' capacity to support learners who are self-regulated through learning is tied to teachers' own self-regulation. If teachers are incapable of self-regulating their own learning and illogical about their own beliefs and practices, it would be difficult, if not impossible, for them to develop these capabilities among their students, since they must acquire a deep understanding of cognitive and motivational principles of teaching and learning and assessment in order to help their students to acquire the needed skills of learning.

The findings of this study extend those of previous research in many important areas for teacher education. This study provides an ecological and empirical foundation for the specification and explanation of the theoretical connections between pre-service teachers' prior attainment, motivational orientations and self-regulation learning strategy use and their academic achievement in professional training context. Thus, the findings will help teacher educators and researchers in explaining how pre-service teachers' personal initiative in acquiring knowledge and skills in preparatory context affect their performance in college, and if possible, transfer of such regulatory abilities into professional practice after college. This thesis adds to the existing research on teacher preparation programmes and how initial teacher education could contribute to the development of the right dispositions (i.e., resilience, persistence, reflective thinking, collaboration, control of belief systems) and agencies (Mansfield et al., 2012; Akyeampong et al., 2011; Avalos, 2011; UNESCO, 2011; Dottin, 2009; James & McCormick, 2009; Diez, 2007; Zimmerman & Schunk, 2009; Day, 2007; Dembélé & Lefoka, 2007; Flores & Day, 2006; Darling-Hammond & Bransford, 2005; Claxton & Carr, 2004).

The ways in which pre-service teachers achieve, maintain and develop their identity, their sense of self, which includes motives (Pinnegar et al., 2011; Beauchamp & Thomas, 2009) in and through initial training, are of vital significance in understanding the actions and commitments of teacher trainees in their work, which could influence the way they teach in the future. The data provided in the present study, therefore, serves as the

foundation for rethinking the way teachers are admitted into professional programmes, taught and developed to meet the 21st century challenges in the classroom, school and community. The present findings reveal the essential contribution of some constant factors such as prior attainment and pre-service teachers' motivational orientations and self-regulatory processes on their academic performance. The findings unveil how individual factors, collectively or independently support or hinder pre-service teachers' learning outcomes in colleges of education. The findings imply that students' motivation and learning strategies used are interdependent processes (Zimmerman, 2008)

Clearly, time and resource management skills, control of belief systems and anxiety as well as raising ones effort on task have been found to be of paramount importance for preparing teacher for the future. The findings bring to fore how we could possibly train teachers in different ways to act effectively use their discretionary judgement which is seen as central to their professionalism, and the need for the development of motivations and "habit of heart"(desire for teaching and care)(Dottin, p. 86; Walker-Gleaves, 2009), dispositions and transferable skills that will help the pre-service teachers to access and effectively engage with learning opportunities throughout their lives and possibly help their students enhance such structures in their learning (James & McCormick, 2009). Teacher education programmes should be offered through different modes of delivery and in additional contexts.

Identifying, harnessing, and assessing self-regulatory skills in professional education programmes is premised on the notion that trainee teachers will transfer their habits formed in their learning to the field of practice. However, the findings from the present study seem to suggest that teacher candidates did not use metacognitive and critical thinking in their learning situations as they ranked these variables low, and did not contribute in predicting their college academic performance, directly or indirectly. Consequently, teacher education policies and programmes through teacher education institutions should get pre-service teachers, and teacher educators, to demonstrate reflective practice and deep processing strategies (such as metacognitive regulation, critical thinking, organization and elaboration), and resource management skills (such as help-seeking) to foster better attitudes in future teachers through curriculum reforms and

direct teaching, and should less focus on teaching to test practices, for what is learned and employed in an occupation having an aim and involving cooperation with others is moral knowledge and acquisition of adaptive expertise, whether so regarded or not (Dewey, 1944, p. 356).

Teacher education policies should strike the balance of knowledge acquisition and the development of important professional dispositions and self-regulatory behaviours among teacher trainees. It should engender professional educators to engage in policy formulation and participate in improving communities of practice (as practiced in some states in America and Australia) so as to clarify the professional knowledge, skills, practice, relationship and leadership required for effective teaching and learning (Dottin, 2009). Even though some teacher education policies have outlined some professional dispositions (e.g., in Ghana, MoE, 2011), they seem not to be implemented during actual teacher training, as revealed in this study. Teacher education should be transformed from a collection of courses (Avalos, 2011; Cobbold, 2010; Zeichner, 2010; Grossman & Loeb, 2008; Lewin, 2005; Hammerness et al., 2005) and avoid modelling courses as if they are 'miniature' university degrees (Akyeampong et al., 2011) modelled around what is done in the universities without recourse to the needs of colleges and the peculiarities of the knowledge needed by trainees (Avalos, 2011; Dottin, 2009; Walker-Gleaves, 2009; Darling-Hammond, 2006) to function well in a complex and heterogeneous classrooms (OECD, 2010; Zimmerman & Schunk, 2009; James & McCormick, 2009; Hammerness, Darling-Hammond, Bransford, Berliner, Cochran-Smith, McDonald & Zeicher, 2005).

A rethink about assessments and assessment procedures in teacher training environments is also needed. There is the need to move away from the high-stakes nature and the accountability pressures (Anane, 2011; CEU, 2010; Darling-Hammond & Bransford, 2005; Claxton & Carr, 2004; Hattie, 2003) so as to avoid the situation of tutors teaching to the contents of 'credentialing' (end-of-semester) examinations and narrowing the curriculum, and bearing in mind that, that which is learnt in college are all not assessed at the end of the semester. Therefore, training programmes should seek to train adaptive individuals who can initiate actions in solving learning related problems and to boost their efficacy for effective practice. And a trainee who exhibits reflective thinking,

persistence and resilience, conscientiousness, adaptive expertise, time management and promptness and control of belief systems in his or her training will possibly act similarly on the job (Avalos, 2011; Beltman et al., 2011; Dottin, 2009; Schwille & Dembele, 2007; Darling-Hammond & Bransford, 2005; Morais, Neves & Afonso, 2005; Lizzio & Wilson, 2004).

5.7 Implications for Teacher Education Curriculum, Implementation and Teacher Educators

Overall, the findings of the current study suggest that teacher education curricula and how they are implemented need to be re-examined. The teacher education curriculum, thus the set of learning experiences (which comprises what is taught in ITE programmes) encountered by the prospective teachers; how it is taught and assessed, and how it is practised by teacher trainees (Darling-Hammond & Bransford, 2005) ought to be made clear in terms of its stated goals and objectives to tutors and students alike. This will enable beneficiaries of such curriculum to know the utility, and demands of the contents to be able to fashion teaching and learning so as to achieve the desirable abilities required by it. The curriculum should be tried and tested by academics and researchers in relation to national policies and goals in order to do away with superfluous contents and focus on what matters so that essential dispositions could be developed in prospective teachers for effective teaching and learning. This should be done by the National Council for Tertiary Education (NCTE) in conjunction with the implementing body – thus, the Institute of Education, University of Cape Coast. The trial of the curriculum content could be done through research and development programmes with principals, tutors and especially, prospective teachers, who are at the centre of activities towards the shaping of training curriculum and capacity building and assessment.

Teacher educators (i.e., administrators and tutors and other stakeholders) should pay attention to getting teacher trainees to proactively get involved in their training and developing appropriate regulatory behaviours for college courses and eventual transfer to the field of practice and for lifelong learning. Students should be made to be in control of their own learning and be proactive in selecting and executing tasks and setting goals

during training. For example, the study has revealed that time and study management skills is one of the most important self-regulatory behaviours students need in order to be successful on their training programme. However, the study has shown that it is among the least prevalent self-regulatory variables pre-service teachers in the study know of and use. College administrators, with the help of other academics and professionals, should provide information delivery sessions and orientations in the form of seminars and workshops, in an effort to teach teacher trainees how to manage their time and study resources effectively for optimal performance (Vandevelde, et al., 2013; Zimmerman & Schunk, 2009; Corno, 2009; Pintrich & Meece, 2008; Pintrich, 2004).

Tutors, during lecture interactions, should emphasize the need for students to strategically plan their learning efforts to make good use of their study time, be disciplined and concentrate on course work in the face of distracting situations and keep up with projects, exercises, assignments and avoid procrastinating, and to avoid dropping out of college because of poor performance. Students should know how to control and organise the environment in ways that expedite goals and task completion. Time and study environment management skills are particularly important because other studies have validated the findings in this present study, and have shown that first year college students who had poor time management skills did not return to college in the subsequent academic years (Kitsantas et al., 2008).

Again, the findings indicated that effort regulation, control of learning beliefs and collaboration strategies (help-seeking and peer learning) were rated as low in prevalence in colleges of education. Yet effort regulation and control of belief systems are believed to the bedrock of a pre-service teacher's development of resilience, optimism, and perseverance in the face of adverse situations (Beltman et al., 2011; Day & Gu, 2010; Castro, Kelly, & Shih, 2010; Cohen & Moffitt, 2009; Sinclair, 2008; Tschannen-Moran & Woolfolk Hoy, 2007; Yost, 2006). In addition, the outcome of initial teacher education, that is, the quality of the graduates, "always depends in part on candidates' interactions with one another and how they make sense of their experiences" (Cochran-Smith & Zeichner, 2005, p. 3). These notwithstanding, the final model from the present study has shown that effort regulation is one of the strongest predictors of pre-service

teachers' achievement in college. Therefore, administrators should organize workshops and seminars for trainees on the values of the courses they are to study for their professional and academic development, and tutors should create opportunities for students to be taught directly how to willingly exert effort in learning materials, heighten their task interests, and give useful feedbacks to increase their self-efficacy.

Given that, in general, the majority of the students enter colleges with low grades, as revealed in this present study, administrators and tutors should provide workshops that offer adaptive strategies to better prepare individuals to be able to deal with the myriad of challenges and the complexities of the new learning environment. In the view of social cognitive theorists, self-regulation influences outcome expectation, which refers to individuals' beliefs that their course of action will result in attainment of desirable outcomes and self-regulatory mechanisms of self-monitoring, self-evaluation and self-reaction, which mediate the effects of most external factors (e.g., prior beliefs, anxiety and accountability pressures) that influence behaviour and offer the base for purposeful actions (Zimmerman, 2009: Corno, 2009; Boekaerts & Corno, 2005; Bandura, 1999). The findings in the present study have shown that, teacher educators' understanding of pre-service teachers' motivation and self-regulation of learning would be beneficial to students who enter college with either high or low entry grades; considering the fact that pre-service teachers' motivation and learning strategies used explained over and above the variance in achievement shared with prior performance.

Considering also the fact that a majority of the pre-service teachers in the study rated extrinsic motivation as the most prevalent of the self-regulatory variables, college administrators and tutors should be aware of trainees' prior beliefs and their understating of teaching (not as imparting knowledge to young ones), and teach them how to reconcile those with training objectives and research evidence. Tutors should create opportunities (i.e., conferences, in-class-presentations and monitored group activities) for students to collaborate in performing activities and tasks on the programme to foster self-efficacy, peer learning and critical thinking. Thus, teaching in teacher training institutions should be more interactive and candidates given the autonomy over training courses and how they participate in learning the content, structure, and pace of material in the training

environment (Kraiger & Jerden, 2007; Sitzmann, et al., 2006). Teacher training institutions should serve as mediators between what pre-service teachers come in with and what quality they should go out with (Avalos, 2011) for effective teaching and learning.

Again, it appeared as though pre-service teachers in the study lacked exposure to activities that required reflective and critical analysis of course materials (cognitive and metacognitive skills), help-seeking skills and peer learning. The findings on students' low ratings of metacognitive, critical thinking and help-seeking skills appear to support the notion that candidates are still leaving initial teacher education without the skills, knowledge, or attitudes needed to work with all of their future students (Jones & Fuller, 2003 cited in EADSNE, 2010). Nonetheless, these are the aspects of their preparation that are needed to enable them develop strong intellectual self-image, resilience, awareness of social engagement, care and commitment to public activity (Mansfield et al., 2012; Yogev & Michaeli, 2011; Walker-Gleaves, 2009; Day & Gu, 2009; Tschannen-Moran & Woolfolk Hoy, 2007; Flores & Day, 2006; Darling-Hammond & Bransford, 2005) and in training teachers who are ready to teach children with diverse backgrounds.

However, these capabilities and competencies are not spontaneously acquired (Leat et al., 2012; Zimmerman, 2008), hence opportunities should be created for teacher trainees to develop their problem solving, creativity, reflective thinking, risk assessment in teaching and learning environments, decision making and constructive management of feelings. Initial training institutions should nurture these cognitive and metacognitive behaviours in pre-service teachers. Tutors should modify their lecture rooms and teaching activities to bring about increases in self-regulated leaning and development of learning how to learn and acquisition of lifelong learning behaviours among their students. Pre-service teachers are to benefit from self-monitoring, self-instruction, self-reinforcement, self-evaluation and self-correction actions (van Dinther et al., 2011; Duckworth et al., 2009; McCombs, 2009; Zimmerman, 2009) and these competencies could be fostered by college tutors by creating environments that are "variously affording, inviting or potentiating" (Claxton & Carr, 2004, p. 87) by explaining, orchestrating, commentating on, modelling and reifying learning responses and feedback to students. in this way, pre-

service teachers' self-regulatory behaviours (such as time and study environment management skills, effort regulation, *appropriate* use of rehearsal, intrinsic interests, self-efficacy, control of test anxiety and external beliefs, peer learning and collaborative and elaborative skills) could be developed so that pre-service teachers may transfer to practiced settings.

5.8 A Reflection on the Use of Mixed Methods in this Study

In answering the four research questions and one hypothesis, the study employed convergent parallel mixed design with concurrent timing of data collection to explore the prevailing relations and impacts of motivation and self-regulation learning strategies use, prior performance, and academic achievement. In addition, the contributory factors of beliefs and values that lay behind some pre-service teachers' motivational orientations were examined through episodic narratives. The mixed methods approach showed strengths, and unveiled opportunities in studying pre-service teachers' beliefs and learning as a real world practice. The descriptive statistics, independent t-tests and the mediational analyses revealed patterns of students' prior performance, motivational and self-regulated learning in colleges of education, which would have been difficult to examine without the use of such quantitative approaches.

Without the shrewd interviewing of students selected from the upper, median and lower performing groups, the meanings and philosophies undergirding pre-service teachers' motivational orientations, values and beliefs about initial teacher training and teaching as whole would have been difficult to unravel. The narratives revealed the depth of the situation, for example, pre-service teachers' beliefs and values and dispositions about attending college and teaching young children, and in some instances illuminated and exemplified teacher trainees' motivation of selecting teaching as career, and dispositions of reflective thinking in college and towards what is being learnt.

However, the used of the combined methods was not without challenges. The two forms of data would sometimes diverge and when that occurred, it was very difficult to juxtapose the results or make meaning of the findings. For example, when pre-service teachers in the study reported high on extrinsic motivation, they also reported low on test

anxiety, which was quite puzzling and counterintuitive to existing literature on students' motivation and self-regulated learning. Why was students' report of extrinsic motivation not related to their anxiety towards end of semester examinations? The possible way out, notwithstanding the inadequacies of the data on hand, was to examine the lived experiences (narrative data) about contributory factors of beliefs and values that lay behind pre-service teachers' motivational orientations. Nonetheless, that was just a way out of resolving the conflict in the findings, there might be alternatives, or even better, clarifications, which were somewhat hard to find.

This study provides an ecological and empirical foundation for the specification and explanation of the theoretical connections between pre-service teachers' prior attainment, motivational orientations and self-regulation learning strategy use and their academic achievement in professional training context. I also adapted the MSLQ and assessed its validity and reliability in teacher education context in order to establish the replicability and generalizability of the results from the instrument, which has contributed to knowledge and existing research on teacher education and students' learning.

5.9 Summary

This chapter presented the discussion of the findings from the data analysis in relation to the purposes, research questions and hypothesis of the study. A convergent mixed method was used to examine pre-service teachers' motivational orientations and cognitive strategies used in a professional training environment and how they impacted on their academic performance in a college of education. The accounts from pre-service teachers in the study point to an age-old problem of teaching being perceived as giving facts to children instead of being a reflective practice of co-production of knowledge and development of skills. The study also revealed that pre-service teachers were mainly extrinsically motivated, entered colleges with low grades and performed satisfactorily (average GPA of 2.41, SD = 0.53). The findings, therefore, suggested the need for college administrators and tutors, in conjunction with university academics and researchers and policy makers, to have a rethink as to who to admit and how to select prospective candidates into colleges for training. The study also highlighted the need to identify pre-service teachers' prior beliefs in order to synchronize them with training aims and

objectives. It is believed that students' report of high levels of extrinsic motives reflect how students came to colleges of education and the choice of teaching as their career paths. From students' narratives, it became evidently clear that, the majority of the students came to college due to the influence of either a family member and/or financial difficulties.

One question that the study raises is whether self-regulatory behaviours are pervasive in pre-service teacher training institutions and the effect such regulatory agencies have on candidates performances. Students' ratings indicated that task value, metacognitive regulation, organization and critical thinking strategies were mostly prevalent. However, none of these variables contributed in the prediction of college GPA. The findings suggested that pre-service teachers were not aware of these capacities and behaviours and/or did not employ them when studying course materials, possibly due to the fact that teaching, learning and assessments and accountability pressures did not encourage such regulatory abilities. Students, therefore, resorted to the use of rehearsal methods which in effect had a negative impact on their academic achievement. On the other hand, teacher candidates rated low behaviours in relation to self-efficacy for learning, intrinsic interest, time and study environment management, effort regulation and test anxiety. However, these were the variables that explained the most variance in their college GPA.

These findings suggest a needs disparity between the teachers we are training in colleges and the competent teachers we are envisaging for the 21st century classroom. It seems initial training institutions are not affording pre-service teachers participatory approaches to learning and creating extensive avenues for guided practice to orient teacher trainees towards the need to coproduce knowledge with pupils rather than transmit learned facts to students. Taken together, my findings suggest that there is the need to rethink teacher education curricula by incorporating self-regulatory behaviours into courses, and by training college administrators and tutors on how to provide more discriminate and focused approaches to nurturing and assessing self-regulatory behaviours for optimal performance whilst in college and possible transfer to the field of practice. This they should do by organizing workshops, seminars, and conferences and symposia to bring to fore the need to helping candidates to realize the connection between their beliefs and

agencies, their proactiveness and effectiveness of their actions within the learning setting and the profession.

Tutors should engage students in direct teaching of self-regulation learning strategies by creating learning conditions that can increase the use of self-regulatory behaviours and also model and reify learning responses as students learn vicariously. In general, the debate rages on, on the need for teacher education to identify, nurture and assess behaviours necessary to develop the quality of teachers and improving teaching and learning in schools and students' performances and I hope this study has contributed to unravelling the some of the major issues, especially on identifying variables that 'work' and in considering where and how to help prospective teachers develop self-regulatory attitudes.

CHAPTER 6: CONCLUSION

6.1 Overview

This chapter draws together the findings and discussions of the study. The chapter summarises the study and draws conclusions on the findings. The study's findings and discussions were based on three main purposes that were built from a conceptual framework of self-regulated learning (SRL) framed by interconnected bodies of theory and empirical research in relation to students' learning and pre-service teacher education presented in the literature. The study explored the relationships between pre-service teachers' motivational orientations, gender, programme-majors and self-regulated learning strategies use in colleges of education; how prior attainment, motivation and self-regulated learning components operated independently or jointly to influence pre-service teachers' academic performance and the contributory factors of beliefs and values that lay behind some pre-service teachers' motivational orientations. Implications for teacher education practice, teacher education curriculum and implementation and for teacher educators have been offered. Suggestions for further research are also offered under this section for teacher educators, academics and researchers.

The main supposition of this study has been to gain an in-depth understanding of the relation between the main components of self-regulated learning and how trainee teachers of colleges of education in Ghana self-regulate their learning, and the impact such self-regulated characteristics have on their academic performance. This study has followed the belief that behaviours of self-regulation and autonomous learning need to be constructed and experienced by student teachers, and for pre-service teachers to nurture the same development in their students, they need to discuss among themselves, their tutors and others for a better understanding. In the teacher training context, it is believed that trainees actively construct or build new ideas or concepts from their current and past experiences; connect new knowledge to prior knowledge and incorporate the new experiences into an already existing framework with alterations in the existing structures. Therefore, identification of the motivational and learning strategies adopted by the pre-service teachers would provide a concrete profile of the self-regulated strategies for learning of prospective teachers in guiding policies and practices in training them for

eventual transfer to the field of practice. However, the thesis has shown that, the processes of inculcating proactive behaviours in pre-service teachers appear to be non-existent and students are mainly focused on agencies intended to help them perform well in end-of-semester examinations.

Generally, it is expected that pre-service teachers display intrinsic interest in academic tasks associated with their teaching programmes if they had willingly chosen that path as their future career, and that intrinsic interest would be associated with pre-service teachers' motivational beliefs and self-regulation of learning. Teachers who are intrinsically motivated tend to have high sense of resilience and adaptive abilities and students who self-regulate usually report high on intrinsic task interest and also high on their beliefs about their locus of responsibility, degree of self-determination, and sense of agency in creating positive possibilities for self-development and self-regulation. That is, when pre-service teachers are mindful of the fact that they are in control of their own learning, they are likely to become efficacious, feel competent and internalise learning goals. But this could not be said about the students in the present study. Teacher trainees in the present study did not consider their self-efficacy about content knowledge the most paramount in studying the course materials and therefore resorted to the use of surface learning strategies such as rehearsal, to accomplish tasks. This is not surprising, because pre-service teachers are likely to employ strategies as they deem appropriate to enable them achieve their goals, and in relation to the importance they attach to course content and materials they are given to learn. Therefore, courses should be modelled well to suit the aims of the training programme being offered. Other than that, students are likely to tailor the importance of the programme in their own direction (i.e., personal beliefs and values) and decide on which parts of the programme study or not.

The findings suggest that pre-service teachers perceive themselves to be extrinsically motivated and are mostly influenced by external factors in their actions relative to career choice and studying course materials during training. The study has demonstrated that even though pre-service teachers reported high on some self-regulated learning strategies, such behaviours did not influence their college performances, which suggest that they may not have known and applied such strategies in learning course materials.

Specifically, students rated high critical thinking, metacognitive and task value but these variables did not predict academic achievement. It appears possibly that, time and study environment management skills, peer learning, effort regulation and intrinsic motivation are stable over time on the programme. This probably means that, pre-service teachers' interests and satisfaction with the courses did not make any significant gains as they progressed through the programme. However, as suggested in the directions for future phases of this study, further research would be required to explore the nature of these relationships utilizing a longitudinal study, which was beyond the scope and intent of this current study.

From the study it emerged that the motivation components of students' self-regulation learning contributed unique variance in predicting academic achievement over and above the impact of prior attainment (student entry aggregate). In terms of student motivation constructs, the findings showed that when predicting final academic achievement, intrinsic motivation, test anxiety, self-efficacy for learning, task value, extrinsic motivation and control of learning beliefs mediated moderately in the effect of prior attainment, and each variable, with the exception of task value, contributed significantly to the model. As for the effect of pre-service teacher's learning strategies on final academic achievement, it was found that, peer learning, time and study environment management, rehearsal, effort regulation and elaboration directly predicted academic achievement. Of the five learning strategies that predicted students' achievement, time and study environment management predicted academic achievement over and above all the learning strategies variables as well as prior performance and explained 26.4% of the variance in pre-service teachers' academic achievement.

Even though trainees had reported using organization, help-seeking, critical thinking and metacognitive regulation, these variables did not predict academic achievement directly or indirectly contrary to existing theories and research. This could be explained in line with the suggestion that a pre-service teacher may report knowing a strategy on an SRL ability questionnaire but may not know how to apply it to work in a specific academic situation. The learning strategies variables were found to have showed moderate intervening effect on the impact of prior performance on students' academic

achievement, and together explained a higher proportion of the variation in pre-service teachers' performance than prior performance, but that of time and study environment management was the strongest. Overall, approximately 52% of the variance in a pre-service final achievement (GPA) was explained by pre-service teachers' prior academic performance, time and study environment management, effort regulation, rehearsal, extrinsic motivation and test anxiety, intrinsic motivation, self-efficacy for learning, control of learning beliefs, peer learning and elaboration strategies used. These ten SRL variables showed moderately large effect size and thus, mediated significantly the impact of prior performance on pre-service teachers' academic achievement in colleges of education.

The study findings have provided contextually valid and empirical evidence for the specification and explanation of the theoretical connections between pre-service teachers' prior attainment, motivational orientations and self-regulation learning strategy use and their academic achievement in professional training. It has become evidently clear that pre-service teachers' academic performance is closely tied to time and study skills, effort regulation, their efficacy beliefs about their abilities to accomplish tasks and their beliefs that these tasks are important to be learnt and interesting as well. At the same time, the study has shown that when pre-service teachers' self-regulatory behaviours are modelled together with other background characteristics such as prior beliefs and achievements, their learning could be optimized in the college setting. Consequently, I have suggested that, teacher education policies and programmes, both in Ghana and internationally, could be restructured to incorporate self-regulated behaviours that have been identified in this study in teacher training curricula, and such behaviours be nurtured and assessed by teacher educators so that teacher trainees may develop and possibly transfer their self-regulatory behaviours to their future students and professional settings.

6.2 Improvements for Future Phases of this Research

The overall aim of this research was to investigate pre-service teachers' motivation and self-regulation learning and its impact on their academic achievement during their professional training in colleges of education. The overall research design was to use multistage sampling procedure to select participants and subsequently to use parallel

mixed methods with concurrent timing of data collection to collect survey data (quantitative) and interview data (qualitative) to elicit the 'lived' experiences of pre-service teachers to explore and illuminate the intervening links and influences of motivation and self-regulation learning strategies use, prior performance, and academic achievement.

However, in relation to the measure for the quantitative data collection, the Pre-service teachers' Motivated Strategies for Learning Questionnaire (PS-MSLQ) has never been used with a group of teachers (pre-service or in-service). As such, the soundness and usefulness of the interpretations derived from the study's findings would be limited. Certainly, anyone wishing to draw comparisons with this work should employ exploratory and confirmatory factor analyses, considering the background characteristics of the samples of pre-service teachers and the contextual and geographical features of the study so as to solidify the soundness and usefulness of this measure for such a group.

Again, in the present study I see some congruence between pre-service teachers' academic level and self-regulated learning, but the capacity to explore what pre-service teachers are actually doing in college to develop self-regulatory competencies is beyond the scope of this study. Therefore, a further improvement in the research design may have to utilize more closed observed scenes of students in action with other instruments, such as observation schedules, journal reports, stimulated recall procedures, structured interviews and think aloud protocols. However, that being said, it is important to note that the mixed methods employed in this study were to answer my research questions and hypothesis. Thus, to examine the prevalence and mediation of self-regulation learning on the impact of prior performance on college academic achievement, and to illuminate the contributory factors of beliefs and values that lay behind some pre-service teachers' motivational orientations, and this has been achieved.

6.3 Directions for Future Phases of this Research

This cross-sectional study represents a first step in exploring pre-service teachers' motivational orientations and the impact of self-regulated learning on their academic achievement in teacher training institutions. But the need exists for future research

examining the structural reliability and predictive validity of the pre-service teachers' motivational orientations and self-regulated learning questionnaire. Future research recommendations also focus on on-going investigations into pre-service teachers' motivational orientations and self-regulated learning in teacher education contexts. For example, do self-regulatory behaviours differ between students who have prior teaching experience and those who do not? Are there interaction effects of the motivation components and the learning strategies components of the self-regulation measures on students' academic achievement? How do students become masters of their own learning processes? Longitudinal research approaches should be used to examine the development of self-regulatory interventions incorporating various strategies that teacher educators and academics could use to increase pre-service teachers' self-regulation learning and agencies. In closing, all of these would not only add to the wider literature and knowledge on the importance of self-regulation learning in teacher education context, it would also be of significance to others such as students, academic educators, researchers and teacher education policy makers, who may reconceptualise the spaces and places in curricula and teaching and learning environments potentiating enough for self-regulatory behaviours to develop.

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APPENDICES

Appendix A: Pre-service Teachers' Motivation and Learning Strategies Questionnaire (PS-MSLQ)

Dear Student,

Please you are required to respond to some questions on *pre-service teachers' self-regulation and learning strategies and its impact on their academic performance*. Your responses are very important for this study and remember there are no right or wrong answers - it is your opinion that counts. The main survey will take approximately 25 minutes.

All your answers will be kept entirely confidential.

Thank you.

PART A: **MOTIVATION**

The following questions ask about your motivation for and attitudes about this programme. Remember there are no "right" or "wrong" answers; just answer as accurately as possible. Use the scale below to respond to the items. If you think the statement is very true of you, circle 7; if a statement is not at all true of you, circle 1. If the statement is more or less true of you, find the number between 1 and 7 that best describe you.

		1	2	3	4	5	6	7
1.	On this programme, I feel satisfied if I am able to go through course materials that really challenge me so I can learn new things.							
2.	If I study in appropriate ways, then I will be able to learn the courses materials in this programme.							
3.	When I take a test I think about how poorly I am doing compared with other students.							
4.	I think I will be able to use what I learn in this programme in other courses later in my career.							
5.	I believe I will receive an excellent class at the end of this programme.							
6.	I am certain I can understand the most difficult material presented in the courses for this programme.							
7.	Getting good grades in this programme is the most satisfying thing for me right now.							
8.	When I take a test I think about items on other parts of the test I cannot answer.							
9.	It is my own fault if I do not learn the material in this programme.							
10.	It is important for me to learn the course materials in this programme.							
11.	College education will help me better prepare for the career I have chosen.							
12.	I am confident I can learn the basic concepts taught in courses.							

13.	If I can, I want to get better grades in courses than most of the other students.							
14.	I want to do well on this programme in order to have a better salary later on.							
15.	When I take tests I think of the consequences of failing.							
16.	I am confident I can understand the most complex materials presented by Tutors in this programme.							
17.	In a programme like this, I prefer course material that arouses my curiosity, even if it is difficult to learn.							
18.	I am very interested in the content areas of courses in this programme.							
19.	If I try hard enough, then I will understand the course materials.							
20.	I have an uneasy feeling when I take an end-of-semester examination.							
21.	I am confident I can do an excellent job on the assignments and tests in this programme.							
22.	I expect to get a high GPA in this programme.							
23.	The most satisfying thing for me in this programme is trying to understand the contents of the courses as thoroughly as possible.							
24.	I think the course materials in this programme are useful for me to learn.							
25.	When I have the opportunity in this programme, I choose course assignments that I can learn new things I have never seen before.							
26.	If I do not understand any of the course materials, it is because I did not try hard enough.							
27.	I like the subject matter of courses in this programme. They are relevant for my career.							
28.	Understanding the subject matter of courses in this programme is very important to me.							
29.	I feel my heart beating fast when I take an examination.							
30.	I am certain I can master the skills being taught in courses in this programme.							
31.	I want to do well in this programme because it is important to show my ability to my family and others.							
32.	Considering the difficulty levels of the courses and my skills, I think I will do well in this programme.							

PART B: **LEARNING STRATEGIES**

The following questions ask about your learning strategies and study skills for this programme. Again, there are no "right" or "wrong" answers. Answer the questions about how you study in this class as accurately as possible. Use the same scale to respond to the remaining items. If you think the statement is very true of you, circle 7; if a statement is not all true of you, circle 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you.

		1	2	3	4	5	6	7
33.	When studying, I outline the material to help me organise my thoughts.							
34.	When studying, I often try to explain the material to a classmate or friend.							
35.	I usually study in a place where I can concentrate on my course work.							
36.	When I study, I practice saying the facts to myself over and over.							
37.	Even if I have trouble learning the materials, I try to do the work on my own, without help from anyone.							
38.	When I become confused about something I am reading for this programme, I go back and try to fit it together.							
39.	When I study, I go through the materials and my class notes and try to put the most important ideas in my own words.							
40.	I make good use of my study time for this programme.							
41.	If course materials are difficult to understand, I change the way I read the material.							
42.	I try to work with other students to complete the course assignments.							
43.	When studying, I read my class notes and the course materials over and over again.							
44.	When a theory, interpretation, or conclusion is presented during lecture or in course materials, I try to decide if there is good supporting evidence.							
45.	I work hard to get a good grade, even when I do not like the course.							
46.	I make simple charts, diagrams, or tables to help me organise course material.							
47.	When studying a course, I often set aside time to discuss course materials with a group of students.							
48.	I treat course materials as starting points and try to develop my own ideas about them.							
49.	I find it hard to stick to a study time table.							
50.	When I study, I bring together information from different sources, such as lectures, pamphlets, and discussions.							
51.	Before I study new course material thoroughly, I often read quickly through it to see how it is organised.							
52.	I ask myself questions to make sure I understand the materials I have been studying							
53.	I try to change the ways I study in order to fit course requirements							

	and tutors' teaching styles.							
54.	I ask tutors to explain concepts I don't understand well during lectures.							
55.	I memorize key words to remind me of important concepts in class.							
56.	When course work is difficult, I either give up or only study the easy parts.							
57.	I try to relate ideas in one course material to other courses whenever possible.							
58.	When I am studying, I go over my lecture notes and make an outline of important concepts.							
59.	I have a regular place set aside for studying on my own.							
60.	When I am studying, I write brief summaries of the main ideas from course materials and my lecture notes.							
61.	When I don't understand any material when studying, I ask another student in class for help.							
62.	When I am studying, I try to understand by making connections between the materials and the concepts from the lectures.							

BIO DATA

College ID:……/……/……

Sex:

1. Male ☐
2. Female ☐

Programme of Study:

1. General ☐
2. Science ☐

Academic Level:

1. 100 ☐
2. 200 ☐

Thank you for your time and contribution!

Appendix B: Results of CFA of Pre-service Teachers' Motivation and Learning Strategies Questionnaire (PS-MSLQ)

Scale	Factor	% of variance
Intrinsic Motivation (IM)		**3.16**
1. On this programme, I prefer course materials that really challenge me so I can learn new things	.736	
16. In a programme like this, I prefer course material that arouses my curiosity, even if it is difficult to learn.	.770	
22. The most satisfying thing for me in this programme is trying to understand the contents of the courses as thoroughly as possible	.703	
24. When I have the opportunity in this programme, I choose course assignments that I can learn from even if they do not guarantee a good grade.	.528	
Extrinsic Motivation (EM)		**3.60**
7. Getting good grades in this programme is the most satisfying thing for me right now.	.860	
11. The most important thing for me right now is improving my overall grade point average, so my main concern is getting good grades.	.807	
13. If I can, I want to get better grades in courses than most of the other students.	.745	
30. I want to do well in this programme because it is important to show my ability to my family and others.	.816	
Task Value (TV)		**5.33**
4. I think I will be able to use what I learn in this programme in other courses later in my career.	.822	
10. It is important for me to learn the course material in this programme.	.873	
17. I am very interested in the content areas of courses in this programme.	.614	
23. I think the course materials in this programme are useful for me to learn.	.680	
26. I like the subject matter of courses in this programme.	.707	
27. Understanding the subject matter of courses in this programme is very important to me.	.736	
Control of Learning Beliefs (CLB)		**2.44**
2. If I study in appropriate ways, then I will be able to learn the courses materials in this programme.	.389	
9. It is my own fault if I do not learn the material in this programme.	.672	
18. If I try hard enough, then I will understand the course materials.	.507	
25. If I do not understand any of the course materials, it is because I did not try hard enough.	.519	
Self-efficacy for Learning (SEL)		**2.82**
6. I am certain I can understand the most difficult material presented in the readings for this programme.	.519	
12. I am confident I can learn the basic concepts taught in courses.	.595	
15. I am confident I can understand the most complex materials presented by Tutors in this programme.	.331	

20. I am confident I can do an excellent job on the assignments and tests in this programme.	.569	
29. I am certain I can master the skills being taught in courses in this programme.	.663	
Test Anxiety (TA)		**4.83**
3. When I take a test I think about how poorly I am doing compared with other students.	.643	
8. When I take a test I think about items on other parts of the test I cannot answer.	.628	
14. When I take tests I think of the consequences of failing.	.529	
19. I have an uneasy feeling when I take an end-of-semester examination.	.647	
28. I feel my heart beating fast when I take an examination.	.662	
82. Even though I don't always think about it, I am concerned about how others will view me if I do poorly on examinations.	.721	
83. I often do not feel confident and mentally relaxed before a test.	.653	
Rehearsal (RE)		
39. When I study, I practice saying the facts to myself over and over.	.696	
46. When studying, I read my class notes and the course materials over and over again.	.779	
59. I memorize key words to remind me of important concepts in class.	.555	
72. When I study for a test, I try to remember as many facts as I can.	.613	
Elaboration (EL)		**2.15**
53. When I study, I bring together information from different sources, such as lectures, pamphlets, and discussions	.515	
62. I try to relate ideas in other courses whenever possible.	.404	
64. When reading, I try to relate the materials to what I already know.	.435	
Organization (ORG)		**2.28**
69. When I am studying, I try to make connections between the materials and the concepts from the lectures.	.471	
32. When studying, I outline the material to help me organise my thoughts.	.481	
42. When I study, I go through the materials and my class notes and try to put the most important ideas in my own words.	.416	
49. I make simple charts, diagrams, or tables to help me organise course material.	.424	
63. When studying, I go over my lecture notes and make an outline of important concepts.	.311	
Critical Thinking (CT)		**6.16**
38. I often find myself questioning things I hear or in this course to decide if I find them convincing.	.485	
47. When a theory, interpretation, or conclusion is presented during lecture or in course materials, I try to decide if there is good supporting evidence.	.561	
51. I treat course materials as starting points and try to develop my own ideas about them.	.467	
66. I ask myself questions to make sure I know the materials I have been studying.	.541	
71. Whenever I read or hear an assertion or conclusion in this programme, I think about possible alternatives.	.626	

84. When studying, I work on practice exercises and answer end of chapter questions.	.524	
85. Before I begin studying, I think about the things I will need to do to learn.	.724	
Metacognitive Regulation (MCR)		**2.98**
41. When I become confused about something I am reading for this class, I go back and try to fit it together.	.321	
44. If course readings are difficult to understand, I change the way I read the material.	.448	
54. Before I study new course material thoroughly, I often read quickly through it to see how it is organised.	.462	
55. I ask myself questions to make sure I understand the materials I have been studying	.550	
Time and Study environment Management (TSM)		**3.73**
35. I usually study in a place where I can concentrate on my course work.	.673	
43. I make good use of my study time for this programme.	.664	
52. I find it hard to stick to a study time table.	.578	
65. I have a regular place set aside for studying on my own.	.655	
70. I make sure that I keep up with the weekly exercises and assignments for this course.	.626	
Effort Regulation (ER)		**3.21**
37. It is hard for me to decide what main ideas are in what I read.	.454	
48. I work hard to get a good grade, even when I do not like the course.	.443	
60. When course work is difficult, I either give up or only study the easy parts.	.473	
74. Even when course materials are dull and uninteresting, I manage to keep working until I finish.	.501	
Peer Learning (PL)		**3.02**
34. When studying, I often try to explain the material to a classmate or friend.	.598	
45. I try to work with other students to complete the course assignments.	.718	
50. When studying a course, I often set aside time to discuss course materials with a group of students from the class.	.620	
Help Seeking (HS)		**2.42**
68. When I don't understand any material when studying, I ask another student in class for help.	.738	
75. I try to identify students whom I can ask for help if necessary.	.713	

Appendix C: Output of Mediation Analysis of Motivation Variables (Model 1)

```
Run MATRIX procedure: PROCESS Procedure for SPSS Release 2.11

*************************************************************************
Model = 4
    Y = Aca_Achi
    X = Aggr
   M1 = IM
   M2 = CLB
   M3 = TA
   M4 = TV
   M5 = SEL
   M6 = EM
Sample size
        500
*************************************************************************
Outcome: IM
Model Summary
          R       R-sq          F        df1        df2          p
      .0303      .0009      .4422     1.0000   498.0000      .5064
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.4993      .2879    19.1020    .0000    4.9337     6.0649
Aggr         -.0068      .0103     -.6650    .5064    -.0270      .0134
*************************************************************************
Outcome: CLB
Model Summary
          R       R-sq          F        df1        df2          p
      .0388      .0015      .7681     1.0000   498.0000      .3812
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.1505      .3156    16.3196    .0000    4.5304     5.7705
Aggr         -.0098      .0112     -.8764    .3812    -.0319      .0122
*************************************************************************
Outcome: TA
Model Summary
          R       R-sq          F        df1        df2          p
      .1426      .0203     9.8587     1.0000   498.0000      .0018
Model
              coeff         se          t        p      LLCI       ULCI
constant     3.8610      .3121    12.3721    .0000    3.2478     4.4741
Aggr          .0336      .0107     3.1399    .0018     .0126      .0546
*************************************************************************
Outcome: TV
Model Summary
          R       R-sq          F        df1        df2          p
      .1213      .0147     7.1538     1.0000   498.0000      .0077
Model
              coeff         se          t         p     LLCI       ULCI
constant     5.0900      .2516    20.2296     .0000   4.5956     5.5843
Aggr          .0224      .0084     2.6747     .0077    .0059      .0388
*************************************************************************
Outcome: SEL
Model Summary
          R       R-sq          F        df1        df2          p
      .0640      .0041     2.2257     1.0000   498.0000      .1364
```

```
Model
              coeff         se          t        p      LLCI       ULCI
Constant     5.8332      .2406    24.2400     .0000    5.3604    6.3060
Aggr         -.0129      .0087    -1.4919     .1364    -.0300     .0041
************************************************************************
Outcome: EM
Model Summary
          R       R-sq          F        df1        df2          p
      .1853      .0343    13.2707     1.0000   498.0000      .0003
Model
              coeff         se          t          p       LLCI
ULCI
Constant     5.2478      .2448    21.4340      .0000     4.7668
5.7289
Aggr          .0294      .0081     3.6429      .0003      .0136
.0453
************************************************************************
Outcome: Aca_Achi
Model Summary
          R       R-sq          F        df1        df2          p
      .6479      .4198    55.0653     7.0000   492.0000      .0000
Model
              coeff         se          t       p       LLCI       ULCI
Constant     3.1578      .1690    18.6899    .0000    2.8258     3.4897
IM            .0815      .0168     4.8384    .0000     .0484      .1145
CLB           .0331      .0144     2.2991    .0219     .0048      .0615
TA           -.0885      .0153    -5.7683    .0000    -.1186     -.0584
TV           -.0185      .0203     -.9120    .3622    -.0583      .0213
SEL           .1027      .0193     5.3289    .0000     .0648      .1406
EM           -.0561      .0213    -2.6361    .0087    -.0978     -.0143
Aggr         -.0365      .0036   -10.2841    .0000    -.0435     -.0295
************************** TOTAL EFFECT MODEL **************************
Outcome: Aca_Achi
Model Summary
          R       R-sq          F        df1        df2          p
      .4662      .2173   142.8617     1.0000   498.0000      .0000
Model
              coeff         se          t          p       LLCI
ULCI
Constant     3.6457      .1054   34.5779     .0000    3.4385     3.8528
Aggr         -.0438      .0037   -11.9525      .0000  -.0510     -.0366
***************** TOTAL, DIRECT, AND INDIRECT EFFECTS *****************
Total effect of X on Y
     Effect         SE          t          p       LLCI       ULCI
     -.0438      .0037   -11.9525      .0000     -.0510     -.0366
Direct effect of X on Y
     Effect         SE          t          p       LLCI       ULCI
     -.0365      .0036   -10.2841      .0000     -.0435     -.0295

Indirect effect of X on Y
          Effect    Boot SE   BootLLCI   BootULCI
TOTAL     -.0072      .0019     -.0110     -.0031
IM        -.0006      .0009     -.0025      .0012
CLB       -.0003      .0004     -.0014      .0002
TA        -.0030      .0011     -.0057     -.0011
TV        -.0004      .0005     -.0018      .0004
SEL       -.0013      .0010     -.0036      .0002
```

EM	-.0016	.0008	-.0038	-.0003
(C1)	-.0002	.0009	-.0020	.0015
(C2)	.0024	.0014	-.0005	.0055
(C3)	-.0001	.0011	-.0022	.0021
(C4)	.0008	.0010	-.0011	.0029
(C5)	.0011	.0013	-.0014	.0039
(C6)	.0026	.0012	.0004	.0052
(C7)	.0001	.0007	-.0010	.0016
(C8)	.0010	.0010	-.0007	.0031
(C9)	.0013	.0010	-.0003	.0036
(C10)	-.0026	.0012	-.0053	-.0004
(C11)	-.0016	.0015	-.0048	.0012
(C12)	-.0013	.0014	-.0043	.0013
(C13)	.0009	.0011	-.0013	.0032
(C14)	.0012	.0010	-.0004	.0037
(C15)	.0003	.0014	-.0025	.0031

Partially standardized indirect effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TOTAL	-.0138	.0036	-.0207	-.0060
IM	-.0011	.0017	-.0047	.0023
CLB	-.0006	.0008	-.0028	.0005
TA	-.0056	.0021	-.0105	-.0019
TV	-.0008	.0010	-.0033	.0007
SEL	-.0025	.0018	-.0067	.0005
EM	-.0031	.0016	-.0072	-.0007

Completely standardized indirect effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TOTAL	-.0772	.0201	-.1156	-.0341
IM	-.0059	.0092	-.0266	.0124
CLB	-.0035	.0043	-.0151	.0027
TA	-.0316	.0118	-.0591	-.0106
TV	-.0044	.0054	-.0187	.0039
SEL	-.0142	.0101	-.0365	.0028
EM	-.0176	.0088	-.0405	-.0036

Ratio of indirect to total effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TOTAL	.1656	.0415	.0724	.2469
IM	.0127	.0198	-.0300	.0544
CLB	.0075	.0093	-.0059	.0325
TA	.0679	.0253	.0237	.1259
TV	.0095	.0121	-.0077	.0417
SEL	.0304	.0213	-.0064	.0765
EM	.0377	.0195	.0079	.0886

Ratio of indirect to direct effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TOTAL	.1984	.0601	.0781	.3278
IM	.0152	.0241	-.0312	.0682
CLB	.0089	.0114	-.0069	.0415
TA	.0814	.0330	.0262	.1611
TV	.0113	.0146	-.0090	.0529
SEL	.0364	.0267	-.0073	.0971
EM	.0452	.0243	.0086	.1116

```
Normal theory tests for specific indirect effects
          Effect         se          Z          p
IM        -.0006      .0009     -.6454      .5187
CLB       -.0003      .0004     -.7587      .4481
TA        -.0030      .0011    -2.7264      .0064
TV        -.0004      .0005     -.8138      .4158
SEL       -.0013      .0009    -1.4137      .1574
EM        -.0016      .0008    -2.0847      .0371

Specific indirect effect contrast definitions
(C1)    IM          minus      CLB
(C2)    IM          minus      TA
(C3)    IM          minus      TV
(C4)    IM          minus      SEL
(C5)    IM          minus      EM
(C6)    CLB         minus      TA
(C7)    CLB         minus      TV
(C8)    CLB         minus      SEL
(C9)    CLB         minus      EM
(C10)   TA          minus      TV
(C11)   TA          minus      SEL
(C12)   TA          minus      EM
(C13)   TV          minus      SEL
(C14)   TV          minus      EM
(C15)   SEL         minus      EM

******************** ANALYSIS NOTES AND WARNINGS **********************

Number of bootstrap samples for bias corrected bootstrap confidence
intervals:
     1000

Level of confidence for all confidence intervals in output:
    95.00

NOTE: All standard errors for continuous outcome models are based on
the HC3 estimator
```

Appendix D: Output of Mediation Analysis of Learning Strategies Variables (Model 2)

```
Run MATRIX procedure: PROCESS Procedure for SPSS Release 2.11

Model = 4
    Y = Aca_Achi
    X = Aggr
   M1 = ORG
   M2 = PL
   M3 = TSM
   M4 = RE
   M5 = HS
   M6 = MCR
   M7 = CT
   M8 = ER
   M9 = EL

Sample size
        500
**************************************************************************
Outcome: ORG
Model Summary
          R       R-sq          F        df1        df2          p
      .0293      .0009      .4733     1.0000   498.0000      .4918
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.3819      .2572    20.9221    .0000    4.8765     5.8873
Aggr          .0063      .0092      .6880    .4918    -.0117      .0244
**************************************************************************
Outcome: PL
Model Summary
          R       R-sq          F        df1        df2          p
      .0186      .0003      .1651     1.0000   498.0000      .6847
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.3063      .3801    13.9607    .0000    4.5595     6.0531
Aggr         -.0055      .0135     -.4063    .6847    -.0320      .0211
**************************************************************************
Outcome: TSM
Model Summary
          R       R-sq          F        df1        df2          p
      .1144      .0131     6.7655     1.0000   498.0000      .0096
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.4496      .2360    23.0931    .0000    4.9860     5.9133
Aggr         -.0219      .0084    -2.6011    .0096    -.0384     -.0054
**************************************************************************
Outcome: RE
Model Summary
          R       R-sq          F        df1        df2          p
      .1790      .0320    14.4153     1.0000   498.0000      .0002
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.1183      .2201    23.2549    .0000    4.6858     5.5507
Aggr          .0276      .0073     3.7968    .0002     .0133      .0420

**************************************************************************
```

```
Outcome: HS
Model Summary
          R       R-sq          F        df1        df2          p
      .0342      .0012      .5512     1.0000   498.0000      .4582
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.0288      .2993    16.8004    .0000    4.4407     5.6169
Aggr          .0077      .0103      .7424    .4582    -.0126      .0280
**************************************************************************
Outcome: MCR
Model Summary
          R       R-sq          F        df1        df2          p
      .0825      .0068     2.6786     1.0000   498.0000      .1023
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.3537      .2150    24.9022    .0000    4.9313     5.7760
Aggr          .0119      .0073     1.6366    .1023    -.0024      .0261
**************************************************************************
Outcome: CT
Model Summary
          R       R-sq          F        df1        df2          p
      .0411      .0017      .8847     1.0000   498.0000      .3474
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.2804      .2236    23.6173    .0000    4.8411     5.7197
Aggr          .0073      .0077      .9406    .3474    -.0079      .0224
**************************************************************************
Outcome: ER
Model Summary
          R       R-sq          F        df1        df2          p
      .1107      .0123     7.1031     1.0000   498.0000      .0079
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.8020      .2954    19.6383    .0000    5.2215     6.3824
Aggr         -.0279      .0105    -2.6652    .0079    -.0485     -.0073
**************************************************************************
Outcome: EL
Model Summary
          R       R-sq          F        df1        df2          p
      .0957      .0092     4.8323     1.0000   498.0000      .0284
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.2549      .2244    23.4124    .0000    4.8139     5.6958
Aggr          .0169      .0077     2.1982    .0284     .0018      .0319
**************************************************************************
Outcome: Aca_Achi
Model Summary
          R       R-sq          F        df1        df2          p
      .6744      .4548    50.4898    10.0000   489.0000      .0000
Model
              coeff         se          t        p      LLCI       ULCI
constant     2.5910      .1715    15.1095    .0000    2.2540     2.9279
ORG           .0338      .0205     1.6531    .0990    -.0064      .0740
PL            .0376      .0142     2.6452    .0084     .0097      .0655
TSM           .1199      .0220     5.4571    .0000     .0767      .1631
RE           -.0677      .0232    -2.9181    .0037    -.1132     -.0221
HS           -.0069      .0150     -.4572    .6477    -.0363      .0226
```

```
MCR          -.0260      .0284     -.9156    .3603    -.0819      .0298
CT           -.0457      .0237    -1.9283    .0544    -.0923      .0009
ER            .0911      .0151     6.0330    .0000     .0614      .1208
EL            .0480      .0221     2.1709    .0304     .0046      .0915
Aggr         -.0368      .0035   -10.6309    .0000    -.0437     -.0300
************************** TOTAL EFFECT MODEL **************************
Outcome: Aca_Achi
Model Summary
          R       R-sq          F        df1        df2          p
      .4662      .2173   142.8617     1.0000   498.0000      .0000
Model
             coeff         se          t        p      LLCI       ULCI
constant    3.6457      .1054    34.5779    .0000    3.4385     3.8528
Aggr         -.0438      .0037   -11.9525    .0000    -.0510     -.0366

***************** TOTAL, DIRECT, AND INDIRECT EFFECTS *****************
Total effect of X on Y
     Effect         SE          t          p       LLCI       ULCI
     -.0438      .0037   -11.9525      .0000     -.0510     -.0366

Direct effect of X on Y
     Effect         SE          t          p       LLCI       ULCI
     -.0368      .0035   -10.6309      .0000     -.0437     -.0300

Indirect effect of X on Y
          Effect    Boot SE   BootLLCI   BootULCI
TOTAL     -.0069      .0020     -.0111     -.0031
ORG        .0002      .0004     -.0003      .0015
PL        -.0002      .0006     -.0018      .0007
TSM       -.0026      .0012     -.0054     -.0008
RE        -.0019      .0008     -.0038     -.0007
HS        -.0001      .0002     -.0007      .0002
MCR       -.0003      .0004     -.0017      .0002
CT        -.0003      .0004     -.0016      .0002
ER        -.0025      .0010     -.0050     -.0008
EL         .0008      .0006      .0000      .0022
(C1)       .0004      .0006     -.0005      .0018
(C2)       .0028      .0012      .0009      .0058
(C3)       .0021      .0009      .0006      .0042
(C4)       .0003      .0004     -.0003      .0016
(C5)       .0005      .0006     -.0003      .0023
(C6)       .0005      .0006     -.0004      .0024
(C7)       .0028      .0011      .0010      .0052
(C8)      -.0006      .0006     -.0019      .0005
(C9)       .0024      .0012      .0004      .0053
(C10)      .0017      .0010     -.0001      .0038
(C11)     -.0002      .0006     -.0016      .0009
(C12)      .0001      .0007     -.0012      .0017
(C13)      .0001      .0008     -.0015      .0017
(C14)      .0023      .0012      .0002      .0049
(C15)     -.0010      .0007     -.0026      .0002
(C16)     -.0008      .0015     -.0040      .0021
(C17)     -.0026      .0012     -.0053     -.0006
(C18)     -.0023      .0013     -.0050     -.0001
(C19)     -.0023      .0013     -.0051     -.0001
(C20)     -.0001      .0014     -.0030      .0025
(C21)     -.0034      .0012     -.0060     -.0014
```

(C22)	-.0018	.0008	-.0036	-.0005
(C23)	-.0016	.0010	-.0036	.0000
(C24)	-.0015	.0009	-.0034	.0001
(C25)	.0007	.0014	-.0019	.0036
(C26)	-.0027	.0010	-.0049	-.0009
(C27)	.0003	.0005	-.0004	.0016
(C28)	.0003	.0004	-.0004	.0015
(C29)	.0025	.0011	.0007	.0049
(C30)	-.0009	.0006	-.0024	.0000
(C31)	.0000	.0006	-.0009	.0015
(C32)	.0022	.0012	-.0001	.0048
(C33)	-.0011	.0008	-.0033	.0000
(C34)	.0022	.0012	.0001	.0049
(C35)	-.0011	.0008	-.0031	.0000
(C36)	-.0034	.0011	-.0057	-.0016

Partially standardized indirect effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TOTAL	-.0131	.0038	-.0210	-.0060
ORG	.0004	.0007	-.0005	.0029
PL	-.0004	.0010	-.0032	.0013
TSM	-.0050	.0022	-.0101	-.0014
RE	-.0036	.0015	-.0072	-.0013
HS	-.0001	.0003	-.0014	.0003
MCR	-.0006	.0008	-.0032	.0004
CT	-.0006	.0008	-.0032	.0005
ER	-.0048	.0020	-.0095	-.0015
EL	.0015	.0010	.0001	.0042

Completely standardized indirect effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TOTAL	-.0737	.0217	-.1182	-.0319
ORG	.0023	.0040	-.0027	.0157
PL	-.0022	.0058	-.0176	.0073
TSM	-.0280	.0124	-.0578	-.0081
RE	-.0199	.0084	-.0409	-.0072
HS	-.0006	.0020	-.0074	.0019
MCR	-.0033	.0045	-.0177	.0024
CT	-.0035	.0045	-.0177	.0026
ER	-.0271	.0112	-.0536	-.0085
EL	.0086	.0058	.0004	.0237

Ratio of indirect to total effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TOTAL	.1580	.0436	.0738	.2512
ORG	-.0049	.0089	-.0372	.0056
PL	.0047	.0124	-.0161	.0390
TSM	.0600	.0255	.0179	.1211
RE	.0427	.0188	.0149	.0886
HS	.0012	.0043	-.0040	.0162
MCR	.0071	.0099	-.0052	.0392
CT	.0076	.0097	-.0057	.0368
ER	.0581	.0238	.0176	.1132
EL	-.0185	.0132	-.0528	-.0007

Ratio of indirect to direct effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI

TOTAL	.1877	.0623	.0797	.3355
ORG	-.0058	.0104	-.0406	.0067
PL	.0056	.0150	-.0190	.0477
TSM	.0712	.0336	.0201	.1552
RE	.0508	.0230	.0177	.1117
HS	.0014	.0051	-.0047	.0196
MCR	.0084	.0115	-.0060	.0461
CT	.0090	.0116	-.0065	.0443
ER	.0690	.0306	.0201	.1448
EL	-.0220	.0150	-.0597	-.0009

Normal theory tests for specific indirect effects

	Effect	se	Z	p
ORG	.0002	.0004	.5545	.5792
PL	-.0002	.0005	-.3762	.7068
TSM	-.0026	.0011	-2.3165	.0205
RE	-.0019	.0008	-2.2648	.0235
HS	-.0001	.0002	-.2558	.7981
MCR	-.0003	.0004	-.7051	.4807
CT	-.0003	.0004	-.7662	.4435
ER	-.0025	.0011	-2.4103	.0159
EL	.0008	.0006	1.4696	.1417

Specific indirect effect contrast definitions

(C1)	ORG	minus	PL
(C2)	ORG	minus	TSM
(C3)	ORG	minus	RE
(C4)	ORG	minus	HS
(C5)	ORG	minus	MCR
(C6)	ORG	minus	CT
(C7)	ORG	minus	ER
(C8)	ORG	minus	EL
(C9)	PL	minus	TSM
(C10)	PL	minus	RE
(C11)	PL	minus	HS
(C12)	PL	minus	MCR
(C13)	PL	minus	CT
(C14)	PL	minus	ER
(C15)	PL	minus	EL
(C16)	TSM	minus	RE
(C17)	TSM	minus	HS
(C18)	TSM	minus	MCR
(C19)	TSM	minus	CT
(C20)	TSM	minus	ER
(C21)	TSM	minus	EL
(C22)	RE	minus	HS
(C23)	RE	minus	MCR
(C24)	RE	minus	CT
(C25)	RE	minus	ER
(C26)	RE	minus	EL
(C27)	HS	minus	MCR
(C28)	HS	minus	CT
(C29)	HS	minus	ER
(C30)	HS	minus	EL
(C31)	MCR	minus	CT
(C32)	MCR	minus	ER
(C33)	MCR	minus	EL

```
(C34)   CT          minus       ER
(C35)   CT          minus       EL
(C36)   ER          minus       EL

******************** ANALYSIS NOTES AND WARNINGS **********************

Number of bootstrap samples for bias corrected bootstrap confidence
intervals: 1000

Level of confidence for all confidence intervals in output: 95.00

NOTE: All standard errors for continuous outcome models are based on
the HC3 estimator
```

Appendix E: Output of Mediation Analysis of Combined Variables (Final Model 3)

```
Run MATRIX procedure: PROCESS Procedure for SPSS Release 2.11

Model = 4
    Y = Aca_Achi
    X = Aggr
   M1 = IM
   M2 = CLB
   M3 = TA
   M4 = TSM
   M5 = RE
   M6 = SEL
   M7 = EM
   M8 = ER
   M9 = EL
  M10 = PL

Sample size
        500

**************************************************************************
Outcome: IM
Model Summary
          R       R-sq          F        df1        df2          p
      .0303      .0009      .4422     1.0000   498.0000      .5064

Model
              coeff         se          t        p      LLCI       ULCI
constant     5.4993      .2879    19.1020    .0000    4.9337     6.0649
Aggr         -.0068      .0103     -.6650    .5064    -.0270      .0134

**************************************************************************
Outcome: CLB
Model Summary
          R       R-sq          F        df1        df2          p
      .0388      .0015      .7681     1.0000   498.0000      .3812

Model
              coeff         se          t        p      LLCI       ULCI
constant     5.1505      .3156    16.3196    .0000    4.5304     5.7705
Aggr         -.0098      .0112     -.8764    .3812    -.0319      .0122

**************************************************************************
Outcome: TA
Model Summary
          R       R-sq          F        df1        df2          p
      .1426      .0203     9.8587     1.0000   498.0000      .0018

Model
              coeff         se          t        p      LLCI       ULCI
constant     3.8610      .3121    12.3721    .0000    3.2478     4.4741
Aggr          .0336      .0107     3.1399    .0018     .0126      .0546

**************************************************************************
Outcome: TSM
Model Summary
          R       R-sq          F        df1        df2          p
      .1144      .0131     6.7655     1.0000   498.0000      .0096
```

```
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.4496      .2360    23.0931    .0000    4.9860     5.9133
Aggr         -.0219      .0084    -2.6011    .0096    -.0384     -.0054

**************************************************************************
Outcome: RE
Model Summary
          R       R-sq          F        df1        df2          p
      .1790      .0320    14.4153     1.0000   498.0000      .0002
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.1183      .2201    23.2549    .0000    4.6858     5.5507
Aggr          .0276      .0073     3.7968    .0002     .0133      .0420

**************************************************************************
Outcome: SEL
Model Summary
          R       R-sq          F        df1        df2          p
      .0640      .0041     2.2257     1.0000   498.0000      .1364
Model
              coeff         se          t          p       LLCI
ULCI
constant     5.8332      .2406    24.2400      .0000     5.3604
6.3060
Aggr         -.0129      .0087    -1.4919      .1364     -.0300
.0041

**************************************************************************
Outcome: EM
Model Summary
          R       R-sq          F        df1        df2          p
      .1853      .0343    13.2707     1.0000   498.0000      .0003
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.2478      .2448    21.4340    .0000    4.7668     5.7289
Aggr          .0294      .0081     3.6429    .0003     .0136      .0453

**************************************************************************
Outcome: ER
Model Summary
          R       R-sq          F        df1        df2          p
      .1107      .0123     7.1031     1.0000   498.0000      .0079
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.8020      .2954    19.6383    .0000    5.2215     6.3824
Aggr         -.0279      .0105    -2.6652    .0079    -.0485     -.0073

**************************************************************************
Outcome: EL
Model Summary
          R       R-sq          F        df1        df2          p
      .0957      .0092     4.8323     1.0000   498.0000      .0284
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.2549      .2244    23.4124    .0000    4.8139     5.6958
Aggr          .0169      .0077     2.1982    .0284     .0018      .0319
```

```
**************************************************************************
Outcome: PL
Model Summary
          R       R-sq          F        df1        df2          p
      .0186      .0003      .1651     1.0000   498.0000      .6847
Model
              coeff         se          t        p      LLCI       ULCI
constant     5.3063      .3801    13.9607    .0000    4.5595     6.0531
Aggr         -.0055      .0135     -.4063    .6847    -.0320      .0211

**************************************************************************
Outcome: Aca_Achi
Model Summary
          R       R-sq          F        df1        df2          p
      .7233      .5232    47.4434    11.0000   488.0000      .0000
Model
              coeff         se          t        p      LLCI       ULCI
constant     2.6351      .1738    15.1662    .0000    2.2937     2.9765
IM            .0618      .0161     3.8422    .0001     .0302      .0934
CLB           .0286      .0125     2.2901    .0224     .0041      .0532
TA           -.0628      .0131    -4.7993    .0000    -.0885     -.0371
TSM           .0995      .0203     4.8976    .0000     .0596      .1394
RE           -.0852      .0200    -4.2515    .0000    -.1245     -.0458
SEL           .0589      .0189     3.1180    .0019     .0218      .0960
EM           -.0404      .0196    -2.0553    .0404    -.0789     -.0018
ER            .0684      .0143     4.7727    .0000     .0403      .0966
EL            .0042      .0214      .1973    .8437    -.0379      .0463
PL            .0204      .0117     1.7438    .0818    -.0026      .0435
Aggr         -.0325      .0033    -9.8801    .0000    -.0390     -.0261

************************** TOTAL EFFECT MODEL ***************************
Outcome: Aca_Achi
Model Summary
          R       R-sq          F        df1        df2          p
      .4662      .2173   142.8617     1.0000   498.0000      .0000
Model
              coeff         se          t        p      LLCI       ULCI
constant     3.6457      .1054    34.5779    .0000    3.4385     3.8528
Aggr         -.0438      .0037   -11.9525    .0000    -.0510     -.0366

***************** TOTAL, DIRECT, AND INDIRECT EFFECTS *****************
Total effect of X on Y
     Effect         SE          t          p       LLCI       ULCI
     -.0438      .0037   -11.9525      .0000     -.0510     -.0366

Direct effect of X on Y
     Effect         SE          t          p       LLCI       ULCI
     -.0325      .0033    -9.8801      .0000     -.0390     -.0261

Indirect effect of X on Y
          Effect    Boot SE   BootLLCI   BootULCI
TOTAL     -.0112      .0023     -.0155     -.0062
IM        -.0004      .0007     -.0020      .0008
CLB       -.0003      .0004     -.0014      .0002
TA        -.0021      .0008     -.0040     -.0008
TSM       -.0022      .0010     -.0044     -.0004
```

RE	-.0024	.0008	-.0043	-.0010
SEL	-.0008	.0006	-.0024	.0002
EM	-.0012	.0007	-.0028	-.0001
ER	-.0019	.0009	-.0040	-.0006
EL	.0001	.0004	-.0006	.0011
PL	-.0001	.0003	-.0009	.0004
(C1)	-.0001	.0007	-.0016	.0012
(C2)	.0017	.0010	-.0004	.0037
(C3)	.0018	.0011	-.0003	.0040
(C4)	.0019	.0012	-.0001	.0045
(C5)	.0003	.0008	-.0013	.0019
(C6)	.0008	.0010	-.0013	.0029
(C7)	.0015	.0010	-.0002	.0037
(C8)	-.0005	.0007	-.0020	.0009
(C9)	-.0003	.0007	-.0021	.0009
(C10)	.0018	.0009	.0002	.0037
(C11)	.0019	.0010	.0001	.0041
(C12)	.0021	.0010	.0003	.0043
(C13)	.0005	.0007	-.0008	.0020
(C14)	.0009	.0008	-.0004	.0027
(C15)	.0016	.0009	.0002	.0036
(C16)	-.0004	.0005	-.0015	.0006
(C17)	-.0002	.0005	-.0013	.0006
(C18)	.0001	.0012	-.0025	.0024
(C19)	.0002	.0012	-.0018	.0028
(C20)	-.0013	.0010	-.0034	.0005
(C21)	-.0009	.0010	-.0031	.0011
(C22)	-.0002	.0012	-.0025	.0020
(C23)	-.0022	.0009	-.0041	-.0007
(C24)	-.0020	.0009	-.0038	-.0005
(C25)	.0002	.0014	-.0024	.0031
(C26)	-.0014	.0011	-.0035	.0008
(C27)	-.0010	.0013	-.0034	.0016
(C28)	-.0003	.0012	-.0025	.0021
(C29)	-.0022	.0010	-.0043	-.0003
(C30)	-.0021	.0010	-.0043	-.0003
(C31)	-.0016	.0012	-.0041	.0006
(C32)	-.0012	.0010	-.0035	.0008
(C33)	-.0004	.0013	-.0033	.0021
(C34)	-.0024	.0010	-.0049	-.0009
(C35)	-.0022	.0009	-.0047	-.0007
(C36)	.0004	.0010	-.0015	.0025
(C37)	.0011	.0009	-.0003	.0033
(C38)	-.0008	.0007	-.0024	.0004
(C39)	-.0006	.0007	-.0024	.0004
(C40)	.0007	.0012	-.0015	.0030
(C41)	-.0013	.0008	-.0032	.0001
(C42)	-.0011	.0008	-.0028	.0002
(C43)	-.0020	.0009	-.0040	-.0005
(C44)	-.0018	.0009	-.0039	-.0002
(C45)	.0002	.0005	-.0008	.0012

Partially standardized indirect effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TOTAL	-.0214	.0043	-.0291	-.0120
IM	-.0008	.0013	-.0038	.0016
CLB	-.0005	.0007	-.0026	.0005

TA	-.0040	.0015	-.0074	-.0015
TSM	-.0041	.0019	-.0083	-.0009
RE	-.0045	.0016	-.0083	-.0020
SEL	-.0014	.0012	-.0044	.0004
EM	-.0023	.0013	-.0053	-.0001
ER	-.0036	.0016	-.0075	-.0011
EL	.0001	.0008	-.0011	.0021
PL	-.0002	.0006	-.0018	.0008

Completely standardized indirect effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TOTAL	-.1198	.0243	-.1636	-.0667
IM	-.0045	.0072	-.0205	.0084
CLB	-.0030	.0040	-.0140	.0026
TA	-.0224	.0082	-.0430	-.0086
TSM	-.0232	.0107	-.0462	-.0047
RE	-.0251	.0088	-.0475	-.0113
SEL	-.0081	.0067	-.0245	.0019
EM	-.0126	.0071	-.0292	-.0011
ER	-.0204	.0091	-.0421	-.0061
EL	.0008	.0043	-.0062	.0113
PL	-.0012	.0035	-.0097	.0045

Ratio of indirect to total effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TOTAL	.2569	.0472	.1575	.3440
IM	.0097	.0157	-.0199	.0440
CLB	.0064	.0087	-.0061	.0308
TA	.0482	.0180	.0176	.0889
TSM	.0497	.0220	.0110	.0990
RE	.0538	.0200	.0232	.1076
SEL	.0174	.0142	-.0042	.0526
EM	.0271	.0160	.0017	.0665
ER	.0437	.0195	.0127	.0898
EL	-.0016	.0097	-.0263	.0136
PL	.0026	.0075	-.0107	.0201

Ratio of indirect to direct effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TOTAL	.3457	.0865	.1869	.5244
IM	.0130	.0218	-.0258	.0624
CLB	.0087	.0121	-.0081	.0452
TA	.0648	.0263	.0237	.1285
TSM	.0669	.0327	.0126	.1384
RE	.0724	.0277	.0312	.1496
SEL	.0234	.0200	-.0056	.0743
EM	.0365	.0220	.0021	.0926
ER	.0587	.0286	.0159	.1323
EL	-.0022	.0128	-.0332	.0188
PL	.0035	.0103	-.0147	.0276

Normal theory tests for specific indirect effects

	Effect	se	Z	p
IM	-.0004	.0007	-.6347	.5256
CLB	-.0003	.0004	-.7579	.4485
TA	-.0021	.0008	-2.5885	.0096
TSM	-.0022	.0010	-2.2607	.0238

```
RE         -.0024      .0008    -2.7893      .0053
SEL        -.0008      .0006    -1.2928      .1961
EM         -.0012      .0007    -1.7410      .0817
ER         -.0019      .0008    -2.2889      .0221
EL          .0001      .0004      .1790      .8580
PL         -.0001      .0003     -.3455      .7297

Specific indirect effect contrast definitions
(C1)    IM          minus       CLB
(C2)    IM          minus       TA
(C3)    IM          minus       TSM
(C4)    IM          minus       RE
(C5)    IM          minus       SEL
(C6)    IM          minus       EM
(C7)    IM          minus       ER
(C8)    IM          minus       EL
(C9)    IM          minus       PL
(C10)   CLB         minus       TA
(C11)   CLB         minus       TSM
(C12)   CLB         minus       RE
(C13)   CLB         minus       SEL
(C14)   CLB         minus       EM
(C15)   CLB         minus       ER
(C16)   CLB         minus       EL
(C17)   CLB         minus       PL
(C18)   TA          minus       TSM
(C19)   TA          minus       RE
(C20)   TA          minus       SEL
(C21)   TA          minus       EM
(C22)   TA          minus       ER
(C23)   TA          minus       EL
(C24)   TA          minus       PL
(C25)   TSM         minus       RE
(C26)   TSM         minus       SEL
(C27)   TSM         minus       EM
(C28)   TSM         minus       ER
(C29)   TSM         minus       EL
(C30)   TSM         minus       PL
(C31)   RE          minus       SEL
(C32)   RE          minus       EM
(C33)   RE          minus       ER
(C34)   RE          minus       EL
(C35)   RE          minus       PL
(C36)   SEL         minus       EM
(C37)   SEL         minus       ER
(C38)   SEL         minus       EL
(C39)   SEL         minus       PL
(C40)   EM          minus       ER
(C41)   EM          minus       EL
(C42)   EM          minus       PL
(C43)   ER          minus       EL
(C44)   ER          minus       PL
(C45)   EL          minus       PL

******************** ANALYSIS NOTES AND WARNINGS **********************
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```
Number of bootstrap samples for bias corrected bootstrap confidence
intervals: 1000

Level of confidence for all confidence intervals in output: 95.00

NOTE: All standard errors for continuous outcome models are based on
the HC3 estimator
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