Problem-based learning and education reform in Taiwan an exploration in one medical school

Lin, Jin Jin

Problem-based Learning

and

Education Reform in Taiwan

An exploration in one medical school

By
Jin Jin Lin

Supervisor
Professor Richard Gott

A thesis submitted for the degree of Doctor of Education
School of Education
University of Durham
2008

Abstract

Medical schools in Taiwan accelerated their reform after the year 2000. This thesis focuses on the origin and process of medical education reform in Taiwan and probe the development of medical students. One new medical school that adopted PBL (Problem-based Learning) was chosen as the research target.

Qualitative in-depth interviews were conducted on five students from the target school and twelve educators/teachers from nine medical schools/organizations. The target school adopted PBL and the data showed that under the new teaching format and more humanistic approach to the course arrangement, the students did exhibit some different characteristics. Whether or not these would persist remains questionable under the current healthcare environment and in the light of the influence that cultural capital exerts on students and educators alike.

Moreover, because of the nature of a hegemonic medical society, not only does a free communication environment between doctors and patients that the reform aims to reach seems impossible, but also a patient-centred healthcare system looks unattainable. However, the dialogue inherent in PBL offers a possibility for both teachers and learners to be inspired and liberated.

What emerges from this research is that PBL has influenced students' communication skill, willingness to cooperate, and habits of active learning. It is hoped that medical education will take a less utilitarian view and focus on the education itself. Only after more medical students benefit from the process and become critical thinkers will a fundamental healthcare reform be possible.

Keywords

Medical Education; Education Reform; PBL (Problem-based Learning); Curriculum; Cultural Capital; Hegemony.

Statement of original authorship

This thesis results from my own work and has not been offered previously in candidature for any other degree in this or any other university.

Acknowledgments

When reading other theses, I used to question why all the candidates have to put the name of their supervisor on the first page. Now I know the reason why.

Those who have been in the Curriculum Analysis class on July of 2002 would understand why I consider Professor Richard Gott terrifying. However, he has turned into a kind mentor after becoming a supervisor. If not for his patient guidance, this thesis would have been impossible, honestly.

Richard responds to my queries almost instantly and always gives the most pertinent comments. He is the best supervisor I could ever think of, including his handwritings, misallocated words, the overseas phone calls, e mail chatting, and above all, the 'not to teach' teaching style. He himself set an example in critical pedagogy by showing me the joy of dialogue and giving me the strength to keep on fighting in the corner.

I would like to thank Professor Michael Byram for taking me into this program and coming to my rescue when I was almost being kicked out. He has given this thesis a lot of valuable comments too.

For all the interviewees who share their wisdom and time, I appreciate their unselfishness and contribution to this thesis. I must say that they are the consciousness of the medical society in Taiwan.

I would like to dedicate this thesis to my parents. They are always supportive on all the things I like to do. Also, I hope my experience in Durham will mean something to my two sons. They are suffering from Taiwan's education system now and I hope some day they will find out that learning itself should be a joyful journey.

1. Introduction

1.1 Background of the research

Due to the rapid developments of medical technology and rising consumerism, the urge for medical education reform accelerated a few decades ago by different parties around the world (WFME 1998; Rees 2000; AAMC 2004). People focused increasingly on the humanistic component in medical education with the intention of producing not only knowledgeable doctors who could cure diseases, but doctors who are able and willing to communicate effectively with patients and their families (Ludmerer 2000; Burger 2001; Wear and Kuczewski 2004).

Medical education in Taiwan has been somewhat left behind in the reform. No changes were put into effect until Taiwan was deemed 'non comparable' by the National Committee on Foreign Medical Education and Accreditation of the United States in 1998. This is a standard used by the US for the accreditation of medical schools in other countries. As a consequence, an independent organization TMAC (Taiwan Medical Accreditation Council) sponsored by the Ministry of Education was founded in 2000 to oversee how medical schools in Taiwan improved their courses (TMAC 2006). This can be seen as the time serious medical education reform officially started in Taiwan, although individual schools underwent curriculum reform sporadically earlier in 1990s (Hsieh 2002).

Taiwan has an advanced medical care system serving 23 million people. There are currently eleven medical schools graduating 1300 doctors every year, and the admittance rate is extremely competitive at 2% (Huang 2003). Among them, FJU (Fu-Jen University) is the youngest medical school founded in 2000 and choosing to adopt PBL (Problem-based learning) as its primary teaching and learning style.

PBL is a teaching philosophy that aims to foster active learning, critical thinking and teamwork (Barrows and Tamblyn 1980; Albanese and Mitchell 1993). During the teaching, students can decide their own learning pace and learning issues. But growing up in the rote learning environment, medical educators in Taiwan have been concerned about students' ability to adapt to this teaching

method, even though previous studies had shown it should not be an issue (Hsieh 2002; Khoo 2003).

What happened in the first class of FJU thus becomes a unique experience worth probing. The research was performed in the summer of 2005 when the students were having hospital experiences for several months. It is hoped that through the reflections of students' learning under PBL, some problem issues in medical education reform will be uncovered. The experience of FJU can then be of use to other schools interested in similar curriculum change.

1.2 Research problem and research questions

Given the above background, the overarching research problem addressed in this thesis is:

- **What are the goals of medical education reform in Taiwan and how do teachers and students in FJU perceive them?**

The more detailed research questions emerging from this are:

- ***1. What are the goals for medical education reform in Taiwan and what are the forces behind it?***
- ***2. What are the key characteristics of medical education and how is medical professionalism taught in medical schools?***
- ***3. What is PBL and how will it relate to medical students' future practice as competent doctors?***
- ***4. What are the lessons learned from FJU and what is the implication of it?***

1.3 Justification for the research

1.3.1 Examine the reform initiated in 2000

Medical education in Taiwan is similar to that in many other countries in the world; it attracts brilliant people, requires large investments, and is often the focus of public attention. In Taiwan, medical schools follow a seven-year structure and admit high school graduates. Most of the medical schools are offering discipline-based and teacher-centred lectures.

Over the past ten years, the number of higher education institutions in Taiwan has risen from 140 to 168. Due to this rapid expansion, the overall quality has been negatively affected (Huang 2003). But medical schools seem to be another story. The number of medical schools is frozen at eleven under a policy of the Ministry of Health on restricting the number of doctors. Because of this policy, some people feel that the quality of students in medical schools has not deteriorated as much as in general universities (Leung and Chen 2003).

However, the relationship between physician and patient has worsened during the same period. The malpractice cases sent to Ministry of Health for review have more than doubled from 147 in year 1987 to more than 400 in year 2001 (Lin 2003). The scope and soundness of medical education thus is being questioned. Both the Ministry of Education and TMAC were urging all medical schools to start their curriculum changes, the purpose of the changes and the role of TMAC should be interesting to look into.

1.3.2 Identify medical professionalism in Taiwan

There are accreditation reports jointly published by the Ministry of Education and TMAC every other year after 2000 (Education 2006; MOE 2006). Every medical school has their strategic projects regarding plans for curriculum change with the purpose of having better doctors. However, given the current healthcare system in Taiwan, what are the requirements of a better doctor? What is the definition of better?

Ever since the National Health Insurance Program launched in 1995, the practice of medicine has been different for many doctors in Taiwan. Not that the basics of treatment have changed, but the system has caused doctors to modify their behaviour (Huang 2002).

This is part of the reason why TMAC wants schools to teach their students differently. All eleven medical schools are having their curriculum change now, but will it make any differences? It was one of the major points that this research aims to find out. Consequently, FJU which has the most extensive curricular change is being chosen as the research target.

1.3.3 Explore the PBL in FJU

As the most recently founded medical school in Taiwan, FJU uses full scale PBL in students' two basic science years, and is the first school in Taiwan ever to adopt this approach. Considering all schools are heading for curriculum change, why would FJU take the most dramatic full scale PBL? What PBL actually being done in FJU?

PBL is a teaching philosophy developed in western medical schools. Active learning and critical thinking are two main characteristics of PBL, but for students growing up in a passive learning environment, can they adapt to it? It is a question that interests not only researchers in both medicine and education fields, but also the general public who will have to be taken care of by the resulting doctors.

Without knowing how FJU did PBL and without a standard to evaluate the effectiveness of this teaching method, people tend to have speculations and misunderstandings about it. This thesis helps in clarifying the situation. There are research papers published by tutors from FJU (Lin 2005), but there is no study done by external researchers on the students' perception of PBL. An independent review from someone who is not a member of the faculties should be helpful if FJU intends to make their work recognized.

1.3.4 Implication of FJU's PBL experience

What FJU did is unable to replicate in other medical schools, but it does not make this issue less important.

Being a new school, FJU did not have to struggle with existing structures, but did not have supporting resources either. However, it is not how FJU managed the changing process that is the main concern in this thesis. The main focus is on FJU's experience to others. It is noticed that when FJU decided to adopt PBL, almost everyone thought they were doomed to fail. There is hardly any evidence today about their performance, but what is the significance of FJU's experience to others?

This research is a case study by its design and the findings are unable to be generalized. But it is the researcher's belief that FJU's experience should not be confined to medical schools only. The importance of critical thinking and active learning should be emphasized in all education organizations. This thesis focuses neither on medical education nor on PBL alone, but on the basics of education as a whole.

1.4 Key assumptions and delimitations of the research

As noted in the section 1.3.1, the quality of medical students in Taiwan is better than students from general universities, at least as defined by their scores in the entrance test. During the unified exam, only the upper 2% students are eligible for medical schools.

The first assumption made in this thesis is to consider medical students as a largely homogenous group, and the main difference between FJU and the other ten medical schools is PBL. The researcher understands the individuality each medical student holds and each medical school has its own culture which influences its students greatly. However, they share more similarity than difference in terms of intelligence, background and general values (Hsieh 2002; Chang 2005). It is understood that there are other confounding factors between FJU and other medical schools, but PBL is treated here as the critical dimension.

Secondly, the five students in this research are seen as representative of the class of forty-eight. Efforts were made to get a stratified sample according to gender, socio economic status and school performance, but failed because the data are not available to the researcher. However, the researcher tried to collect information during the interviews by asking questions such as 'do you know what others think about?' It is assumed that the data collected will be reasonably representative within the context of this qualitative case study.

The delimitations of this thesis are thus numerous. First, the medical reform initiated by MOE and TMAC covers a wide range of issues, for instance, from how medical schools should be funded to how to modify the entrance exam, from how to break the departmental structure to how should ethics be taught (Huang 2003). There are several issues concerning curriculum change too, but only the PBL part of the curriculum issues is discussed in this thesis.

Second, only five students of the first class of FJU were interviewed. But due to the assumption that they are representative of the whole class of forty-eight, things discovered will be considered as the characteristic of FJU and will be attributed to the adoption of PBL. The researcher understands that it bears the risk of over-generalization even within FJU and as a case study. But since PBL

is new to Taiwan and the previous data are extremely limited, the assumption was made with the intention of answering the research questions.

Third, as all the data are collected from interviews, it is not straightforward for another researcher to replicate the research. Even if the same students were being interviewed and the same questions being asked, the time and person specific nature of the interview makes the research unable to be replicated by others. Thus researcher bias is constantly reminded by the researcher through the research process.

Finally, the researcher understands that the opinions from those who did not accept the interview could be important. They are very likely those who hold negative attitudes toward PBL. Some precautions and procedures were taken during the interviews to increase the variety of the data obtained.

1.5 Conclusion

In this chapter the background and importance of this research has been concisely described. Medical education reform is a world trend and Taiwan is two decades behind western countries. Considering the speed of medical technology and the effect of globalization, medical education indeed is a field that merits special attention.

This thesis is about the medical education reform in Taiwan but focuses on one recently founded school that adopted PBL. PBL is something very new to people in Taiwan. What are the goals of medical education reform and how are they set? How are medical students taught? Moreover, what is PBL and how it can be related to medical reform? All the enquiries will start from the literature search that follows.

2. Literature review

2.1 Introduction

In the first introductory chapter, the researcher explained the background of medical reform in Taiwan and identified four research questions in this thesis. Here the researcher tries to search for answers to the questions referring to the reform in Taiwan, and PBL conducted in FJU in particular.

This chapter starts from the urge for medical reform, why it is needed and how some groups are trying to enforce their power out of good intentions. The technocratic nature of medical education, the clarification of liberal education together with the concept of hegemony will be examined here.

Then there will be some reviews of the characteristics of medical education. The neglect of teaching in medical schools is a worldwide phenomenon and is closely reviewed here. The concept of cultural capital will be applied in explaining the power relationship within the medical system and between doctor and patient. The culture within medical schools and the influence of hidden curriculum will be examined here too.

The third part of this chapter will be centred on issues in curriculum and PBL in particular. This section starts from some general reviews on what people generally know as curriculum. Then there is a detailed review of the theories behind PBL along with how PBL is actually being done in the classroom. The major concern some people have about detriment in the learning of basic science will be examined from the aspect of knowledge hierarchy.

Finally, some practical issues of PBL within the existing education system will be discussed here, not only on the cultural issue of how students in Taiwan adapt to this 'western' style of teaching, but if the schools and teachers can get used to this teaching philosophy. The disputes on the effectiveness of PBL will also be reviewed.

2.2 The forces behind medical education reform

2.2.1 Need to reform and resistance to change

Medical education has been the focus of examination throughout the 20th century. From the famous Flexner Report to more recent declarations, the requests for change have never ceased (Flexner 1910; AAMC 2004).

It is after Flexner that medical education worldwide started to include basic science teaching and clinical learning in teaching hospitals. Some countries may have different education systems and the length of schools years varied from four to eight, but the basic structure remains the same (Curry 2002).

From that time on, medical society has kept on trying to make this system more reflective of society's need. In the early 1980s, the AAMC (Association of American Medical Colleges) empanelled a group of distinguished educators to review medical education and to make recommendations on changes that might be needed. The Panel issued its final report (known as the GPEP Panel) in 1984. However, GPEP's critique was largely ignored by the medical education community (Ludmerer 2000).

During the same period, society's expectations of medicine have changed greatly. The public has come to recognize that the promises of modern curative medicine were somewhat overstated. The emphasis placed on "biomedicine" resulted in a devaluation of the humanistic dimensions of medical care (Burger 2001). Instead of asking doctors to cure their diseases, people now want physicians who are able and willing to communicate clearly with them and their families, who will respect them as persons and honour their wishes about their care, and who will continue to care for them when medical treatment is no longer working or desirable (Ludmerer 1999; Wear and Kuczewski 2004).

WHO (World Health Organization), WFME (World Federation of Medical Education) and AMA (American Medical Association) have on several occasions advocated the need for changes in medical education (Rees 2000). GMC (General Medical Council) published "Tomorrow's Doctors" in which it

defined the mission of medical education as

to produce doctors who have attitudes to medicine and learning that will fit them for their professional career and commit them to a lifetime of learning and development (GMC 2003, p.2).

And in 2004 the official report of the AAMC stated that the mission of the medical education system of the United States is

to serve society by educating and training a diverse medical workforce capable of meeting the country's need for physicians engaged in the practice of clinical medicine, public health practice, biomedical and health services research, medical education and medical administration; and for physicians who can contribute to fields such as ethics, law, public policy, business and journalism (AAMC 2004, p.7).

The social expectations for physicians are getting diversified and the practice of medicine has become very different in the past twenty years. However, medical educators have agreed that medical education has changed very little (Hamilton 1976; Bloom 1988; Ebert 1992; Enarson and Burg 1992; Christakis and Burg 1995; Abrahamson 1996; Ludmerer 1999). It is not to say that medical knowledge or technology remained unchanged during this period, on the contrary, biomedical science has been developed with an amazing speed, but the learning experiences of medical students remain remarkably similar.

It is clear at this point that the problems are being identified, suggestions for improvements are being made, and some experiments are being tried too. But in spite of all the efforts, almost all the reports show that nothing really changed in terms of how schools teach and how students learn.

For understanding the resistance to change, WFME outlined some obstacles to change including conservatism of faculty, lack of budgets and teaching incentives, insufficient leadership and management of institutions (WFME 1998). However, these are mainly management issues of the organization. There should be some other fundamental reasons that keep medical schools and students from evolving to meet social expectations.

2.2.2 Technocratic nature of medical schools

The origin of this profession may answer the question of resistance to change. Medicine is considered as a 'major' profession that is grounded in systematic, scientific knowledge (Schon 1988). Hirst pertinently compares education with medicine and states that medicine and education share something in common (Hirst and Peters 1970). For instance, in the practice of medicine, doctors are concerned with making people better or curing them. Similarly, educating people is sometimes connected with the development of desirable qualities in people.

However, in medicine, the cure usually means to restore the patient back to his original status, physically, socially or psychologically. But in education, there is no pre-set condition and that is why the purpose of education is so widely discussed.

So what is education for? Generally speaking, there are three broad fields about purposes of education. First, education helps people to reach the desirable conditions. Second is about the acquisition of knowledge. A definition about knowledge thus is needed. And thirdly education usually is seen as the development of the educated man (Hirst and Peters 1970; Kelly 1989).

It could be difficult for medical educators to accept such a view of education. For them, medical education is for the production of competent doctors. Such a technocratic view of medicine is the heritage of Positivism that stands within the empiricist tradition embraced by medical society.

The Frankfurt School defined Positivism as forms of logical empiricism and pragmatism that composed of the validation of cognitive thought by experience of facts, the orientation of cognitive thought as a model of certainty and the belief that progress in knowledge depends on this orientation (Giroux 2003). Under such belief, medical society believes scientific evidence, believes technology brings progress. It coincides with Giroux's descriptions of a model of technocratic rationality that education should be developed around the search for 'scientific facts'.

He gives three models of rationality: technocratic rationality takes the elements

of control, prediction and certainty as its guiding interest, interpretive rationality has an interest in understanding the communicative and symbolic patterns of interaction, and reproductive rationality focuses on how dominant classes reproduce existing power relations in an unjust and unequal society (Giroux 1981).

How medical schools set their goals show the technocratic nature too. The aim of medical schools is to 'produce doctors who will promote the health of all people' which corresponds with the basic assumption of technocratic rationality that school is viewed as factory and students as raw material. Furthermore, just as Giroux describes that every rationality has intention to 'get out', when medical society senses the importance of communication and ethics, when they try to change the lectures and rote learning, they are trying to 'get out' from technocratic rationality and move towards interpretive rationality.

However, when all medical schools in Taiwan start their 'liberal education stage', the spontaneous rationality alone seems unable to fully explain it. There should be some other reasons behind it.

2.2.3 Liberal education, ideology and hegemony

As stated in the section 1.1, the Ministry of Education and TMAC are the organizations that lead medical reform in Taiwan and both of them strengthen the importance of liberal education (Huang 2003; TMAC 2006). Responding to the request from both of them, medical schools now set the first two of seven school years as the 'liberal education stage' and students can take only humanistic courses at the first two years.

The notion of liberal education came from the Greeks, and is about the knowledge for the mind and the relationship between knowledge and reality. It is based on what is true and not on uncertain opinions or temporary values. The Harvard Report (1946) identified three areas of knowledge in the liberal education (or general education): the natural science, the humanities and social studies.

However, liberal education may have become a slogan today and bears

different meanings according to its immediate context. Whatever the definition is, liberal education is *not* a vocational education, and *not* a specialist education in any sense (Hirst 1974).

The main purpose of general education is for the cultivation of certain aptitudes and attitudes of mind. And students are expected to think effectively, to communicate thought, to make relevant judgments and to discriminate among values (Hirst 1974, P.34).

Such an objective-oriented view of liberal education is used quite often now in Taiwan. The scope of general education is considered as an important indicator when the school is being accredited. The disciplines in the liberal education are composed of the study of paradigm examples of all the various forms of knowledge.

It seems that the purpose of liberal education contradicts students' intention to become experts. But the fact that all medical schools in Taiwan have already introduced the liberal education stage, there are two possible explanations.

First, schools consider two years' liberal education important. Second, schools are forced to do it. In both situations, there are forces exercised during the process and the notions of ideology and hegemony are worth looking into.

The word ideology was first introduced by Antonie Destutt de Tracy in 1796 that referred to "a new science of ideas". He believed that this new science would be like Biology or Zoology eventually (Sargent 1969).

This original meaning has little effect on later usage. Ideology is referred to as the production of sense and meaning recently. It is about ideas and values that are accepted as fact or truth by some groups. It provides the believer with a picture of the world both as it is and as it should be. And when doing so, it organizes the tremendous complexity of the world into something simple and understandable. Ideology now is viewed as a system of ideas that distorts reality in order to serve the interest of a dominant class (Giroux 1981; McLaren 2003).

The concept of hegemony is built on ideologies and is about the relationship between the dominant and dominated class. Hegemony was elaborated most

productively by Gramsci (1971). It refers to the ability of the dominant groups in society to establish the 'common sense' or 'doxa' of a society so that the disadvantaged also believe in a system which oppresses them. The dominant group is not only financially better off, they decide on which language is better, and what taste or culture are good or bad, and so on.

According to Gramsci, hegemony refers to a process within society where a class exercises control through its moral and intellectual leadership over the allied classes. An alliance is formed among ruling groups as a result of the power and ability of one class to manipulate/shape the interest of other social groups to its own (Giroux 1981).

In this case, when the Ministry of Education and TMAC strengthen the importance of liberal education, they are acting as the intellectual and moral groups to impose their ideologies upon medical schools. Likewise, when schools set the first two years as liberal education stage, they articulate a hegemonic principle that it is for the interests of students. The production of hegemonic ideologies hides behind the claim by dominant classes that their interests represent the interests of all.

Freire's concept of education for critical consciousness (Levine and Nanavi 2004), not surprisingly, is not taken into account during the process. While the philosophy of education has moved from domestication to liberation, people in Taiwan still consider schooling at its reproductive model and consider it as the process of capital accumulation and ideological legitimation (Giroux and McLaren 1989).

2.2.4 Summary

There are three concepts discussed in this section. First is on how medical schools respond to the urgency of reform. Medical education reform is an unavoidable world trend. However, owing to medical schools' technocratic nature, they are reluctant to change.

Second is about the introduction of liberal education. It is a concept not widely known and recognized in Taiwan. But when the Ministry of Education and TMAC proposed it, all the medical schools followed. This then leads to the third

concept discussed in this section, hegemony, that how the dominant classes impose their values upon the dominated classes.

The exploration in this section helps one to answer part of the first research question in this thesis which is about the goals of medical education reform in general. It is noted that if the objective of medical schools remains to be producing doctors, if the technocratic rationality still prevails that products are the major concerns, then the means seem to contradict the ends.

The introduction of liberal education is a sign that the educationists are trying to move towards interpretive rationality so as to build an environment which allows dialogue and interactions. However, it is very likely that those who make the decision would become the hegemonic power that try only to impose their value on students out of good intentions.

The literature search seems to be helpful in explaining the reforming process, but it is not clear at this point if it indeed happened in Taiwan. The concept of liberal education is justified but how schools perceive it when they set the first two years as the liberal education stage is not clear either. Furthermore, there is no evidence of hegemonic group during the process at this point. Further queries into the power structure in the medical education system in Taiwan are needed. But before that is to be done, how medical schools are different from other educational organizations could be worthwhile to look into.

2.3 The characteristics of medical education

2.3.1 Tripod of medical education

Medical education is a very special kind of education, in terms of its complexity, its time required and the homogeneity of students' prospects where almost all of them will become physicians after graduation.

Flexner stated in his influential report that the professional education in medicine is 'more difficult' than general college education. He compared medicine with engineering and argued that,

...the engineer deals mainly with measurable factors and the factor of uncertainty is within fairly narrow limits, but the issues of life and death are all in the day's work for a young doctor, the training of the doctor is therefore more complex and more directly momentous than that of the technician (Flexner 1910, P.24).

Such a viewpoint needs critical review, especially because people now are required to take more responsibilities for their health and the importance of doctors' roles in saving people's life is decreasing. But it serves as a starting point to look into the details of medical education.

The basic structure for medical education has remained unchanged after Flexner: two years of basic medical sciences and two years of clinical application. As the most important person in medical education, Flexner was not a physician himself. He was a schoolmaster and agreed with John Dewey on many concepts in education.

For instance, he believed that learning should be at the bedside and students should learn medicine by doing. He believed too that medical practice should be based on science, that it should be taught as a scientific discipline at both preclinical and clinical stages, and medical schools should be an integral part of its parent university, which should have a university hospital (Curry 2002).

After Flexner, there were more than twenty major reports on undergraduate medical education in the United States alone. Most of them have identified

similar problems and prescribed similar solutions. In general, these reports suggested that medical education should prepare doctors for the abilities for lifelong learning and the expectations of society, to cope with the explosion in medical scientific knowledge and technology, to ensure training in the new information technologies, and to adjust medical education to changing conditions in the health care delivery system (Enarson and Burg 1992; Christakis and Burg 1995; WFME 1998; Maudsley 1999).

In conclusion, the prescriptions to the above goals are basically in three directions: curricular content and the process of instruction, the internal structure of medical school, and the relationship between medical schools and external organizations. The curricular issue will be discussed later; the main concern here is on the fundamental aspect of medical schools, which is that **teaching stands low on medical school's priority.** This neglect of teaching has its origin in the structure and objectives of medical schools.

Nowadays, almost every medical school has three missions stated very much like a tripod under a camera: teaching, service and research. But the tripod is not in equilibrium most of the time.

Traditionally, medical schools have to work with hospitals in the education process. Students as well as faculties have to engage much of their time in offering services to patients. Service thus becomes the social responsibility of medical schools as well as a medium of education. On the other hand, research has become an important part of the work in medical schools too, as biological science is advancing at a tremendous pace. Professional recognition and public acclaim all go first to those who succeed in research (Irby, Cooke et al. 2004).

Medical faculties thus are occupied by research and service and can hardly find time for teaching. Unlike most of the schools that have education as their prime and sometime their sole mission, medical schools bear the name of 'school' but pursue a much broader range of activities.

If there were a few teachers who devoted their time to teaching, they might be unable to meet the current criteria for scholarships. Furthermore, when it comes to teaching, departments tend to give priority to those learners who are directly associated with the department, such as graduate and postgraduate

students in basic science departments, and residents and fellows in clinical departments (Irby, Cooke et al. 2004).

Under such circumstances, Flexner's original idea of a teaching hospital and encouraging research has come to a point that schools now have to choose among the three different directions that quite often seem incompatible with each other. Changes in health care financing have worsened the situation by putting more pressure on clinicians to generate revenues and thus leaving less time for research, let alone teaching (Watson 2003).

Not only are teachers busy for research or service, so is the dean as well, and education becomes the item receiving least attention. Those who are hired to devote their time to education soon realize that building contracts or dealing with state finance officers absorb most of their time. The reason teachers and deans were hired became the item receiving the least attention (Rosinski 1971).

In fact, more and more medical schools are now under the name of AMCs (Academic Medical Centres), where education is subservient to research and clinical missions (Bloom 1988). Some schools are making efforts in changing the underlying structure. The departmental structure that separate basic science and clinical science is fading out, and more and more disease-based centres (e.g., cancer centre, diabetic centre) have developed that are attracting clinicians and researchers to work together (Davis and White 2002).

The structural problem requires a structural remedy. Some suggest creation of a new organizational entity, dedicated to education and independent but supportive of existing departments. Such entities, known as academies, have recently been established in the United States with encouraging results. They appear to attract high quality faculties and provide them with incentives to devote more time to the educational mission of the medical school (Irby, Cooke et al. 2004).

From the above review it is clear that, unless there are structural changes within medical schools, change is unlikely. In the following paragraph, the character of physicians will be examined, specifically from the cultural angle, and try to explore its relationship to the change.

2.3.2 The changing roles of physicians

The discussion of the medical profession has been focused on evidence based care, accountability, empathy, teamwork, and communication (Boelen 1992). Resulting from technological and economical impact, along with the rising consumerism, the old norm of 'what a doctor should be' has become much more complicated than before.

Doctors have traditionally held key positions in shaping and operating health systems, and have enjoyed respect and obedience from society (Boelen 1992). The medical professionalism consists of three main domains: a high level of intellectual and technical expertise, autonomy in the practice and regulation of the discipline, and a commitment to public service (Stephenson 2001).

However, the calls for the 'new doctors' have shed light on this profession. For instance, after a strike for 'extra billing' by Ontario's physicians in 1987, the province's five medical schools launched a collaborative project and came out with eight roles a physician should play, which are: medical expert, communicator, collaborator, health advocator, learner, manager, scholar and physician, all in one person. And along with above roles, they should also be altruistic, knowledgeable, skilful and dutiful (Neufeld, Maudsley et al. 1998).

In the view of the GMC's 'Tomorrow's Doctors', a doctor's communication ability is highly desirable: 'he should listen to patients and respect their views, give patients information in a way they can understand and respect the rights of patients to be fully involved in decisions about their care' (GMC 2003, p.2). As to the character a doctor should have, one should keep one's professional knowledge and skills up to date, recognize the limits of his professional competence, and be honest and trustworthy. What's more, one has to make sure one's personal beliefs will not prejudice patient's care, and avoid abusing his position as a doctor. In contrast, AAMC list ten things that doctors should be able to do, from 'provide culturally sensitive and appropriate care' to 'balance individual and population health needs when making patient care decisions' (AAMC 2004, p.7).

The topic of professionalism has figured significantly in publications during the past decade. Developing professionalism is seen as a worthy educational

project and needs to be taught explicitly (Wear and Kuczewski 2004; Cruess and Cruess 2006).

According to Goode (1957), there are two basic characteristics in explaining a specific professionalism: prolonged training in a body of specialized, abstract knowledge, and an orientation toward providing a service. Once a professional group is established, it begins to consolidate its power by formalizing social relationships that govern the interaction of the professionals with their clients, colleagues and official agencies outside the professions (Cockerham 1995).

The medical profession has met Goode's criteria in that it is a service supported by prolonged training in a specialized knowledge. Moreover, it has determined its standard of education, training and licensing. In many places, physicians form their own interest group and become the dominant group in health care. It is almost impossible for outsiders to get to know what is going on in this profession.

The rising consumerism and the introduction of management into the practice sites break its isolation to outside world. And if they are ready for all the new challenges, the nature of biomedical science that urges them to make objective diagnosis contradicts behaviour science on how to treat patients (Burger 2001). Physicians indeed are facing an environment that they have never experienced before.

The situation in Taiwan is even more complicated. For many Taiwanese, doctors are not only healers; they are usually leaders in the society (Ido 1994). It has its historical and political origin and merits attention. There are fundamental reasons within the medical profession that make them difficult to respond to environmental changes, and it is related to where they come from, and how they grow up. It is the concept of cultural capital that will be discussed in the following section.

2.3.3 Cultural capital and reproduction

The social, historical and cultural environment has major impact on what kind of physician one will become. Under the existing selection system, medical schools worldwide tend to admit students from similar backgrounds; they

share similar values and living experiences. A recent study showed that 58 percent of the medical students in Taiwan come from high socioeconomic families, and it is 11 percent higher than a similar study done four years ago. (Chang) Furthermore, most of them come from doctor, teacher and governmental official families (Hsieh 2002).

According to Bourdieu, each family transmits to its children a certain cultural heritage that helps them to define their attitudes and values and it is the initial inequality in children. Other than the value system, parents' choices such as which school to attend, which neighbourhood to live in, what to do after school all contribute to the development of the children. And these are what he called cultural capital (Bourdieu 1976). More specifically, cultural capital represents ways of talking, acting, moving, socializing, and use of knowledge, language and values (McLaren 2003).

Such traits are culturally inscribed and are often linked to social class. Class refers to the economic, social and political relationships that govern life in a social order. It reflects the income level, occupation, place of residence and other indicators of status and social ranks (McLaren 2003). Students from the dominant class inherit different cultural capital than do economically disadvantaged students, and schools generally value and reward those who exhibit that dominant cultural capital. Generally, children from families of intellectuals, teachers or members of liberal professions have better chances to become better educated. And it is the school that contributes to the reproduction of the cultural capital and of the structure of social space (Giroux 1981; Bourdieu 1998).

Furthermore, the schooling process helps one to understand who has power and how it is reproduced and manifested in the social relations that link schooling to the wider social order. Under this view, schools are not merely sites imposing dominant meanings and values upon relatively passive students and teachers, schools are places where different ideologies compete and students can choose to accept or resist them. But very often, students have no choice but to accept, and usually they accept the dominant value unconsciously.

Therefore, one should know that culture here refers to

...a set of practices, ideologies and values from which different groups draw to make sense of the world (McLaren 2003, P.74).

Culture and power are linked through the reproduction process of schooling and the dominant culture is able to exercise domination through a process known as hegemony that is discussed in section 2.2.3. Schools are not places to increase one's social mobility, but organizations to replicate or sometimes worsen the social inequalities.

2.3.4 Hidden curriculum and dehumanization

The notion of the hidden curriculum is not new. One of the definitions given by Giroux states that

...the non-academic norms and attitudes that are systematically and effectively taught to students but is not openly stated in a school's or teacher's statement of objectives (Giroux 1981, P.73).

Kelly on the other hand, considers hidden curriculum as the things which

...pupils learn at school because of the way in which the work of the school is planned and organized but which are not in themselves overtly included in the planning or even in the consciousness of those responsible for the school arrangements (Kelly 1989, P.11).

It is arguable that the 'hidden' curriculum is only hidden to the students. Some argue that teachers are deliberately planning the school's expressive culture, so it is not hidden to the teachers. However, others take a less definite line that only some of the values and attitudes learned are directly intended by the teachers. But since these are learned as a by-product of what is planned, teachers should be aware of and accept the responsibility for what is going on (Fraser and Bosanquet 2006).

To uncover the school's hidden curriculum, one can examine the following four areas: institutional policies, evaluation activities, resource allocation decisions and institutional slang (Hafferty 1998). But why does the hidden curriculum in medical schools need special attention?

Almost all sociology of medical education bases itself on the classic study by Becker's 'Boys in white' (Becker 1961). It shows how school culture and how the hidden curriculum influence medical students. Hidden curriculum indeed is a common feature that exists in all schools, but it is much more important for medical schools because much of the work taking place within medical schools involves underlying value judgement.

When a medical school begins a new program, starts a building, or develops new policies in research, implicit messages are being disseminated throughout the school about what is important or what is not important (Stephenson 2001). In the hidden curriculum of medical education are the processes, procedures and constraints that are embedded within the formal curriculum. It includes social, cultural, educational, structural aspects that lie beyond formal teaching.

Some sociological researchers notice that one of the effects of the hidden curriculum is a '**loss of idealism**', or to put it more neutrally, 'more realistic to the real world'. However, no matter how it is expressed, students indeed become more pragmatic and sometimes even cynical as they go through medical school years (Cribb and Bignold 1999).

Such students' emotional socialization is an aspect that needs special attention. For instance, how to deal with physical contact and closeness to other people and their bodies, living or dead, is one important thing for medical students. They have to remain '**detached**' because the development of emotional 'neutrality' is important in practicing medicine. In other words, when facing the patient, one has to explain scientifically but in an understanding tone, such '**bilingualism**' is required and encouraged and becomes the culture of medical schools (Cribb and Bignold 1999).

Some sociologists believe that the medical school environment is the source of the medical student's **dehumanization**. Bloom thinks the solution lies in changing the structure of medical education (Bloom 1988); however, some disagree and believe that the problem would be solved if medical schools would select individuals who already have a well-developed caring capacity (Colombotos 1988). All these indicate that medical schools exert much more influence on students than other schools.

2.3.5 Summary

In this section, there are four concepts being discussed. First is on the tripod of medical education showing that medical schools have the tradition of neglecting teaching. Other than the research factors that also exist in all universities, medical schools have an additional mission that is to serve patients. And very often it has become the major work of the faculties.

This phenomenon may have existed for some time. But as the medical professionalism is challenged by the rising consumerism and the changing healthcare system, doctors' role require re-examination.

The third concept raised in this section is about cultural capital. Previous researches have already shown that medical students generally come from special social classes that are economically better off. Moreover, the schooling process helps to reproduce the cultural capital they already possess.

And finally it is about the hidden curriculum in medical schools. Other than how they become detached during the schooling process, medical students learn things that are not explicitly taught in schools. And quite often, they will become dehumanized during the school years.

In conclusion, the above search has answered the second research question about the characteristics of medical education. Other than the technocratic nature of medical education stated in section 2.2, it is clear too that medical schools worldwide tend not to put teaching as their first priority. Furthermore, medical students are being reproduced because of the cultural capital they possess. And they are taught through the hidden curriculum to become detached to human feelings. All these explain why it is difficult to produce doctors that understand patients' sufferings.

But this is what previous studies have shown, will a liberal education proposed by the reform group (TMAC) makes any difference? Or a different teaching philosophy such as PBL in this research offers another possibility? Before one to move on, an exploration on what is PBL is required.

2.4 The curriculum and PBL

2.4.1 Curriculum with objectives and under collection code

Knowledge explosion is one of the reasons curriculum issues have become popular. And it is especially true for medical education when there are so many things need to remember.

For many years, the general thrust for change in medical school curriculum has been towards reducing the factual load and encouraging students' of problem solving abilities, critical thinking and communication for personal and professional development (Papa and Harasym 1999).

Some researches on the history of medical education give us a picture on how it evolved into the present situation. Medicine started with apprenticeship model. Since Flexner's suggestion of separating basic and clinical science so that medical students can be better equipped, the recommendations to centralize curriculum management were first noted in 1940s (Davis and White 2002). The first major reform in curriculum was made in the late 1950s by Case Western Reserve University in the US, later classified as organ-based curriculum because the teaching is centred on human organs. It incorporated basic and clinical science but the method of instruction was still mainly lectures (Boud and Feletti 1998).

And then in the late 1960s, McMaster University in Canada had an innovation called PBL (Problem-based Learning). It is the most significant innovation in medical education that has occurred in many years. To date, PBL has come to represent a major development in higher education that goes across subjects and disciplines around the world.

However, most medical schools in Taiwan still have a curriculum which contains building blocks based in departments. Courses are named for and taught by the faculty from these specific disciplines. The departmental structure was organized to support the research mission in the basic science department, which usually consists of Anatomy, Physiology and Pharmacology etc. and memorization and didactic teaching is the shared experience.

Traditionally, people consider the curriculum as the syllabus or the totality of subjects taught in schools. Such an over-simplified content view of the curriculum is widely accepted in Taiwan. The subjects taught in medical schools are organized into blocks and the setting of the first two years as the liberal education stage may be seen as the extreme of collection code under a strong frame according to Bernstein's classification.

Bernstein uses classification and frame in examining the power structure in a curriculum. For classification he refers to the degree to which curriculum contents are separated and bounded. In the strongly classified curriculum, the collection code, the structure of knowledge is more hierarchical and teaching moves sequentially from basic facts to deeper structure. An integrated code curriculum is weakly classified and tends to be organized around themes and emphasizes the knowledge construction process rather than accumulation of facts and concepts (Sleeter and Stillman 2005).

Frame on the other hand, refers to the selection, organizing, pacing and timing of the knowledge transmitted and received in the pedagogic process. More specifically, it reflects if teachers or students have the authority to ask their own questions or points of view to the curriculum. Under a strong frame, teachers and students learn to work within a set of received knowledge, but under a weak frame, they are encouraged to have their own pace and process (Sleeter and Stillman 2005).

In terms of curricular content, the changes introduced in medicine after the 1960s forward can be seen in two ways, one centred on the 'what' of medicine and the other on the 'how' (Bloom 1988).

For the 'what' approach, people focused on the biomedical knowledge and technology responding to the explosion of knowledge. They believed that the physician is to be trained as an applied biological scientist and ought to possess a scientific problem solving ability. The 'how' approach however, promoted a different set of values. They thought social, cultural and behavioural considerations of an illness should be as important as the biological aspect, and ethical issues are not just opinions but should be an issue with rational discourse.

However, discourse is hard to find in the strongly classified curriculum under a strong frame in medical schools. But PBL seems to belong to an integrated code with weak frame. The following section helps in clarifying it.

2.4.2 What is PBL and the theories behind it

The term PBL consists of different concepts and different meanings. At the most fundamental level, PBL is a conception of knowledge, understanding and education different from subject based learning.

In the context of medicine, PBL is an instructional method that uses the clinical cases to learn problem solving skills and acquire knowledge about the basic and clinical science. A PBL medical curriculum thus should meet at least three goals:

- Acquire the factual knowledge in the process of analyzing typical cases
- Apply the knowledge in patient care
- Become lifelong learners (Barrows and Tamblyn 1980; Norman and Schmidt 1992; Albanese and Mitchell 1993; Donner and Bickley 1993; Margetson 2000)

Some important spirits of PBL are listed here:

- Learning is open-minded, reflective, critical and active.
- Students are sharing knowledge, feelings and interests with teachers.
- Knowledge is not just information transmitted, and learning is not just information absorbed (Margetson 2000)

Before looking into the details about PBL, here is a short description about how PBL actually goes on in the classroom based on the researcher's classroom observation.

A typical PBL consists of a number of five to eight students, and a tutor who facilitates the discussion. The number of sessions a group remains together varies, but it has to be long enough for them to have group dynamics. Students will elect a chair for each PBL case and a 'scribe' to record the discussion. The roles will be rotated for each case.

In the beginning of each case, one student will be assigned to read the script. Here is a typical case in the first scene:

A 44 year old man went to a hospital ER complaining about stomach pain. The pain became less when he bent his back. His wife told the nurse that he just returned from a trip to China.

Students will try to identify the '**facts**', make the '**hypotheses**', find the '**need to know**' and come to an agreement on '**learning issues**'. The chair has to control the whole process so that the group can accomplish all these within a certain time frame, and the scribe has to write down issues identified by the group members.

The tutor overlooks the discussion and interferes only when it cannot go on or they are obviously totally lost. One cannot act as the traditional teacher who gives the directions. Nevertheless, he or she can ask open questions and encourage everyone to participate in the discussion.

Usually a PBL case consists of three or four scripts about a patient's history, symptom or treatment etc. At the first script, students get some general descriptions such as symptoms or background. When the students generate all the possible hypotheses and learning issues from the first script, they will request the tutor for the second script. The following script contains more data of the patient, so the hypothesis and learning issues will change accordingly.

At the end of the session, students have agreed on all the things they need to find out. They have to look for the answers and come back two or three days later to share the information with other group members.

When looking into the theories behind PBL, there are at least a few elements that need to be reviewed. First, for the acquisition of factual knowledge and its later use in a clinical context, elaboration and transfer are important. Second, on solving patient's problems, problem solving and backward reasoning skills have to apply. Finally, in how to become self-directed learners, adult learning theory should be discussed in detail.

2.4.2.1 Elaboration and transfer

For medical students, how to remember all the trivial facts is one of their major concerns. There is an enormous literature on factors affecting memory and recall and thus cognitive theory is the most cited theory as the theoretical framework for PBL (Norman and Schmidt 1992; Albanese and Mitchell 1993; Hmelo 1997).

There are three core concepts in Cognitive theory: information processing, memory representation and problem solving. In the cognitive theorist's view, learning is seen as an active and constructive process. They use metacognition to describe how learners actively select, organize, construct the information and learn new things. And a more basic cognitive process called **elaboration** is seen as the key for effective learning strategies (Custers and Boshuizen 2000).

But how does learning start in the beginning? In young children, they learn by acquiring different concepts called concept formation. It involves hypothesis generation, testing and generalization from specific instances. After a child has acquired one or two thousand concepts, concept assimilation will be used to differentiate their newly formed concepts. So the rote learning and meaningful learning is a continuum process and not a dichotomy (Entwistle and Ramsden 1983).

Rote learning is not without its value. There are always things one has to memorize without any meaning. For instance, telephone numbers or some new information that one cannot link to existing cognitive structure. On the other hand, there is no 'pure' form of rote learning either, because even for telephone numbers, there are some prior concepts linked to it, such as area code or digit numbers. And when one only wants to pass exams, rote learning is efficient sometimes.

Elaboration is a learning process of adding things to the already known. This addition can be an inference or an example that connects to the new information. It is a major mechanism that accounts for the cognitive effect of PBL by providing students with a similar context; medical students will be better able to incorporate the new information into existing knowledge

(Norman and Schmidt 1992).

The more pathways one constructs to elaborate, the easier one can remember and transfer. **Transfer** is especially complicated for medical students, because in solving patients' clinical problems, they have to transfer the basic science knowledge into clinical knowledge, and then from clinical knowledge to clinical practice (Ausubel, Novak et al. 1978).

According to cognitive psychologists, knowledge is stored in **schemas** when being transferred. A schema is an abstract knowledge structure that covers the similarities between two or more instances of concepts. It enables one to categorize quickly and make predictions (Custers and Boshuizen 2000).

It is assumed that things learned in the similar context will be easier to transfer later in the practice. Thus clinical cases discussed in PBL will help students to recall when they see someone in the future.

2.4.2.2 Prior knowledge and backward reasoning

How do doctors make hypothesis from the symptoms, how do they weigh different factors and come to a treatment? The concept of prior knowledge should be looked into first.

Barrows (1986) states that prior knowledge can be activated during PBL and it will facilitate understanding and retention of new, problem-related information (Barrows 1986). Dochy (1996) defines prior knowledge as something dynamic and structured. It is available before a certain learning task, both explicit and tacit, and can exist in multiple states and contain conceptual and metacognitive knowledge components (Dochy 1996).

Having prior knowledge is a necessary but not sufficient condition for learning to take place. Research shows that the clinical context and group discussion in PBL have the effect of activating a student's prior knowledge (Norman and Schmidt 1992). Prior knowledge thus is important when making a hypothesis and will lead to problem solving. In medicine, it is called the reasoning process.

Usually people use data to form hypotheses. If one reasons from the data, it is

a data driven reasoning statement. And in medicine it is called forward reasoning process. (If someone has elevated blood sugar, then he has diabetes.) However, not all people derive their conclusion from the data; they form the hypotheses first and then try to find data to support it. In such a hypothesis driven reasoning statement, the symptoms come after the diagnosis. (If he has diabetes, his blood sugar will be elevated) (Hmelo 1997)

During PBL, students are trained to make hypothesis when they have only limited data and knowledge and then try to find information to support it. Thus they are very likely to develop the habit of backward reasoning even when they have gained more knowledge on the issue. Such backward reasoning process is one of the criticisms of PBL (Patel 1991; Eva, Neville et al. 1998; Papa and Harasym 1999). People worry that it will be prone to erroneous results especially when knowledge is inadequate.

Opposite to backward reasoning, forward reasoning is characterized by making inferences forward from data to the diagnosis solution. It is a characteristic of expert performance in many domains and is not confined to medicine.

How does the forward reasoning process occur? Barrows (1980) in his book gives detailed descriptions. At the onset of the first encounter, the doctor perceives a variety of **cues** from observation of the patient, referral note or comments, or prior records. All the cues he selects are perceived almost unconsciously and are assembled into an 'initial concept.' With the initial concept, the doctor then

...generates anywhere from two to five hypotheses that literally pop into his mind as possible explanations for the patient's problem (Barrows and Tamblyn 1980, p.23).

The hypotheses mentioned here refer to ideas, guesses, impressions or even diagnoses and usually are the products of his past experience. Moreover, they are processed in parallel form but not sequentially.

It is during the third step that a doctor starts to search for more data to verify or reject his hypotheses. This is also the stage that differentiates a novice from an expert. When more information is obtained, at one point the doctor will make a decision.

There are many studies showing that novice medical students and expert doctors do not think in the same way. Experts generate better hypotheses from the beginning and make a systematic inquiry because they have seen it before, not because they have more profound basic science knowledge or better skills. It seems that diagnosis accuracy is 'content specific' and that success in the first problem will not lead to success in the next (Elstein, Kagan et al. 1972; Norman 1988).

Taking into the context of medical education, some think that teaching students the process of reasoning or the skills of problem solving may be less important than engaging students with many problems, which are carefully sequenced to optimise learning and transfer (Norman 2005). But since it is impossible to learn 'all' the problems, active learning thus becomes the most important element if one wants to become expert.

2.4.2.3 Active learning and adult learning theory

The concept of life-long learner has become overwhelming in medical education recently. Under the technological revolution, doctors must commit themselves as self directed life long learners. However, some educationists wonder if adult learning theory is being misused here (Colliver 2002; Miflin 2004).

Knowles describes the adults as 'responsible for their own decisions, for their own lives' and develops a theory later that known as adult learning theory. The adults he referred to are individuals over 30 years of age who have a greater volume and a different quality of experience (Knowles 1990). Such persons are motivated to learn by factors like job satisfaction, self-esteem, and quality of life. His well known conclusion is that for such adults, effective learning is self-chosen and self-directed. Medical students however, do not have these characteristics.

Moreover, Miflin argues that if the goal of PBL is to be self-directed learning, the learners should have self-management competencies and be familiar with the subject matter. Medical students do not possess especially the latter ability when in medical schools. She concludes that teachers in medical schools who

uncritically accept and promote adult learning theory will mislead people's understanding of PBL (Miflin 2004).

The fundamental issue is that self-directed learning is the result of a well designed PBL approach. Medical students may become lifelong learners because of PBL, but adult learning theory is not a theoretically framework that PBL can be based on (Berkson 1993; Miflin 2004).

2.4.3 Worry about insufficiency in basic sciences

The first concern in PBL, according to Barrows and Tamblyn, is the detriment to learning in basic sciences. But they contend too that if PBL is correctly implemented and properly guided by good teachers, students can learn basic or clinical sciences in any area to any depth (Barrows and Tamblyn 1980).

For a narrow view of basic sciences, Anatomy, Biochemistry, Microbiology, Physiology and Pharmacology are included. But when taking a broader view, disciplines such as Statistics, Psychology and Sociology should be seen as basic too (McCrorie 2000).

Tracing the history of medicine, basic science is not always the 'basics'. During the 18th century under the apprenticeship model, basic science was not even considered particularly relevant in medicine. German university-based medical schools started to use the discipline-based structure and the goal was to have students acquire a scientific knowledge base as the foundation of clinical medicine (Small and Suter 2002). All the medical schools in Taiwan still have a similar departmental structure even today.

Then in the 1950s came the organ-based model by Case Western Reserve in the US that aimed to integrate basic and clinical science. Later PBL also requires collaboration of basic science and clinical teachers (Bordage 1987). Teaching basic science in the context of real cases has the advantages of enabling students to practice gathering relevant information and integrating them into the cases. It appears to encourage reasoning skills too (Johnstone and Biggs 1998).

Thus it is understandable that faculties in the department of basic science felt

their territory was being challenged when clinical teachers joined the teaching in the so called pre-clinical years.

Students too, feel insecure in PBL (Margetson 1999). In the traditional curricula, even though studies show they forget most of the basic science learned, students think they will recall it all by checking their notes. But PBL students find that they have nothing left after the discussion, no correct answers most of the time and are unable to reach the correct diagnosis with what they know.

But these insecurities are not for PBL students only. From the Harvard's New Pathway program one can see that passive attendance at basic science lectures cannot guarantee learning, and memorization of increasing numbers of facts cannot necessarily provide the knowledge base required for future clinical practice or research (Armstrong 1998). The things medical students memorize during schools years are not correlated to their future performance.

There indeed is evidence showing that PBL students have lower scores on some basic science examinations (Albanese and Mitchell 1993). In the ten studies they review, six of them show lower scores in basic science examination for PBL students than those in traditional curricula. But again, the difference is in the test results and is not related to later years of practice.

Nonetheless, the dispute in the basic science to a certain degree reflects the need for PBL to be more critically examined on how medical society considers knowledge.

Hirst considers the acquisition of relevant concepts to be the origin of knowledge. A person's mind is not a room waiting to be furnished with the right ideas; Hirst argues that understanding can only be achieved through a categorical and conceptual apparatus (Hirst 1974). Having such an apparatus is a necessary part of what it means to have a mind. He differentiates the development of the mind into seven different but interrelated cognitive structures, or forms, and such differentiation is the prime form of knowledge. Therefore, he argues that one should offer students courses that will direct their attention away from the details and towards the general and basic mode of thought.

In contrast, Phenix uses realms of meaning in constructing his theory. He

argues that human beings have the abilities to grasp meanings from their experience through conceptual understanding. The curriculum should, according to Phenix, be designed under the hierarchical patterns of human understanding that emerge with increasing complexities, which are symbolics, empirics, esthetics, synnoetics, ethics and synoptics (Phenix 1975). Furthermore, he logically combines the above six realms of meaning into quantity and quality, and divides all the meanings into nine generic disciplines: language, mathematics, life and social science, literature, psychology, ethics, history, religion and philosophy.

While starting from differing bases, Hirst and Phenix have come to a quite similar viewpoint on how knowledge can be differentiated. Hirst's forms of knowledge put too much emphasis on cognition which seems to be insufficient for general education. Phenix's realms of meaning, though more confusing, are useful when planning a total curriculum (Whitfield 1971). However, for curriculum purposes, Bloom's Taxonomy of Educational Objectives is considered most useful because it takes students' behaviour into consideration (Popham 1972).

Bloom's taxonomy is basically a classification of educational abilities within the three domains of human experiences: **cognitive**, **affective** and **psychomotor**. They are used as instructional goals for evaluating or generating curriculum objectives (Popham 1972). It is the first attempt ever made and offers the evaluator a way of detecting omissions or overemphasis in a curriculum. Both Harvard and Johns Hopkins medical schools used this domain idea in the planning stage when they undertook the curriculum reform in 2000s.

Mapping of domains with objectives is an immensely complex task. Firstly, these categories are all interrelated; a fulfilment in one domain usually comes with achievements in the others. And for anyone who wants to reach a higher level in any domain, the exposure to a cross-domain will be equally important. For instance, one may not need the knowledge of anatomy to play basketball; however, the knowledge may not only prevent him from sport injury but also help him towards a better performance. The surgeon is a somewhat similar but quite different example. A surgeon must first have profound knowledge of human anatomy and physiology before he can operate. The operating skills may be categorized as belonging to the psychomotor domain; however, his development in the cognitive and the affective domain is important too for his

being a surgeon.

The above philosophical enquiry to the essence of knowledge helps one to see how different forms of knowledge contribute to professional performance. The importance of basic science may be overemphasized if one considers how knowledge is integrated but not brick by brick. However, for medical students, basic sciences are the most important knowledge they need to become professionals, and it leads to the concept of expert forming which follows.

2.4.4 Expertise forming

On the way from a novice to an expertise, intelligence seems to play a role. Intelligence is a highly recognized characteristic in the oriental society. People believe that only those that are intelligent can perform well in schools. However, as the society becomes diversified, the concept of intelligence has changed accordingly.

Traditionally, intelligence is considered as hereditary, some are just born to be intelligent. But from critical theorists' view, intelligence is seen as socially influenced, politically inscribed and constructed in part by the nature of one's relationship to power. The closer a student operates to dominant power, the more likely he is to be labelled intelligent (Kincheloe 2005).

Compared to the above two extremes, Sternberg takes a more pragmatic stance on intelligence and considers it as something that can be developed. In his theory of successful intelligence, the intelligence is viewed as having three aspects: analytical, creative and practical (Sternberg 1999). They are similar to Bloom's Taxonomy of cognitive, affective and psychomotor domains.

Sternberg in his developing-expertise model identifies five key elements showing how one develops from novice to expert. They are metacognitive skills, learning skills, thinking skills, knowledge and motivation. This model is valuable in raising motivation and learning skills as the main elements, and both are important in medical education and are what PBL is based on. It shows too that knowledge alone cannot make one an expert.

But in medical society, the importance of basic knowledge has been over

emphasized. For instance, Boshuizen and Schmidt raise a three-phase process of expertise development in physicians which are basic technical knowledge with experience-based knowledge, resulting in knowledge encapsulation (Johnstone and Biggs 1998).

Medical people believe that only through the process of encapsulation, a novice becomes an expert. For them, the basic technical knowledge obtaining is the most important of all. It is thus understandable of the medical students' worry on the learning of basic sciences.

2.4.5 Summary

There are several points reviewed in this section. First is on how curriculum is classified and organized. Traditionally, medical knowledge is transmitted in a strong collection code and through a strong frame. Different disciplines are taught in a brick by brick sequence to ensure the thoroughness of the knowledge acquired.

However, from the above review of theories behind PBL and how it is taught in classroom, it is clear that PBL is weakly structured and under a weak frame. To medical society, PBL is not just a syllabus change but a revolution that affects almost everyone.

And then there is clarification on theories behind PBL. Though adult learning theory is widely referred to PBL, recent studies show they are not correlated. Other points include that transfer is easier for PBL students, and backward reasoning process is prone to mistakes.

Furthermore, detriment to learning in basic sciences is one of the students' major concerns. It should be no surprise to the positivistic medical society that knowledge on human bodies be classified as more important, and it has to go through a knowledge encapsulation process that enables students to become experts.

The above searching has answered part of the third research question in this thesis on what PBL is and how it contributes to medical students' future practice. Basically, the loosely structured PBL equipped students with different abilities from the traditional lectures. Under such circumstance, will students in Taiwan benefit from PBL? More specifically, will the introduction of PBL in FJU help the students to become the doctors the reform aims to reach? Some inquiries focus on the practice of PBL has to be examined first.

2.5 Practical issues when doing PBL

2.5.1 There is no pure form of PBL

After more than three decades, PBL has become a philosophy in education and does not equate to a specific instructional method, though many still think it is. Basically, there is no 'pure' form of PBL. Any educational activities that are problem-centred, student-centred, collaborative, integrated, utilize small groups and operate in a clinical context are all components of it (Distlehorst, Dawson et al. 2005; Gijbels 2005). The possible permutations and combinations of variables in PBL are endless.

Barrow uses four objectives of PBL as criteria to examine the **PBLness** in different situations such as lecture-based cases, case-based lectures, case method, modified case-based, problem-based and close-loop problem-based (Barrows 1986). Such taxonomy is not intended to compete for PBLness but to help teachers to choose one best learning method for their students (Margetson 1998; Maudsley 1999). However, there are many case studies or small group discussion modules that are also using similar formats. It is thus difficult to identify PBLness of a school by just observing students' activities in the classroom.

So is there any standard format of PBL? As described above, PBL is conducted in a small group and case discussion format, but neither small group nor the case are the major components of a PBL. Though originally tailor-made for medicine, PBL has evolved to an approach that is no longer confined to medical schools and can be applied to all disciplines.

Ideally, PBL has many advantages. By working with an unknown problem, students are forced to develop problem-solving, diagnostic or clinical reasoning skills. They have to get information, look for cues, analyze and synthesize the data available, develop hypotheses and apply deductive reasoning to the problem. It is true that students carry out much of what was the teacher's activity during PBL, but they become motivated, mature, develop clinical reasoning and learning skills, and acquire an impressive groundwork of basic knowledge (Barrows 1986).

However, Barrows admits that the above responses depend on students disciplining themselves. And the teacher must have the necessary skills to orient and guide students in the process.

2.5.2 Tutoring in PBL is not easy

Responding to the changing roles of doctors, more and more teachers know that they have to teach beyond the pure academic content and address more the interpersonal and professional behaviour skills (Small and Suter 2002). Teachers know they have to be role models, but under the PBL metaphor that 'not to teach' seems to be a golden rule, teaching is facing a dilemma.

Very often people consider that writing a PBL script is no more than finding a story to tell. For them, the problem in PBL is merely a curriculum device in helping students understand certain basic knowledge of the human body and disease. However, the acquisition of medical knowledge is not only in learning how to solve some clinical situations, but a development of competence on interrelated understanding, knowledge and skill (Margetson 1999).

Thus when PBL is defined as the learning that results from the process of working toward the understanding or resolution of a problem, the problem then should serve as a focus or stimulus for the application of problem-solving or clinical reasoning skills, and finding an answer to the problem is not PBL (Barrows and Tamblyn 1980). For example, though the most used problems in medical education are patient problems, but how can students reach the right diagnosis is not the major concern.

Therefore, one can see that the tutoring in PBL is challenging. The practice of 'non-teaching' may look restful for both teacher and student, but it usually requires of both parties more time and effort than conventional instruction. Teachers usually have to spend more time in planning and imagination but their efforts are difficult to get recognized (Hemker 1998).

Tutors from basic sciences are unfamiliar with clinical issues and clinical teachers lack a profound basic science knowledge base (Ludmerer 2000). But whether tutors in PBL should be experts or not is always under debate. Expert

tutors are those who are considered highly knowledgeable in the subject matter. They are better at helping students to identify learning issues and detecting student knowledge structure deficiencies (Albanese and Mitchell 1993; Johnstone and Biggs 1998). However, expert tutors tend to dominate their tutorials, leaving no room for students to develop initiative. What the PBL tutors need is expertise as a facilitator of learning rather than expertise in the topic (Hamilton 2005).

Currently, there is experimentation with 'student peer tutors', and this is seen as an attractive and cost-effective form of PBL (Solomon and Crowe 2001). Some other teaching models are being proposed. The Learning Oriented Teaching model is one of them. It raises a shared guidance concept that requires awareness of what students know, what to learn and how to learn from both parties. Shared guidance will not lead to a fixed set of teaching activities, but will create a dialogue between teachers and students so that teachers can monitor their progress and help them to achieve the goal (Cate 2004).

No matter if there is an ideal tutoring in PBL, the tutor's role needs more clarification to satisfy both parties. In contrast to studies that focus on students' learning and effectiveness, research on the effect of PBL on tutors is scarce. It is a field needing special concern.

2.5.3 The effectiveness of PBL

Almost all the researches state that the students love or enjoy the learning process of PBL. In an extensive review on effectiveness of PBL shows that PBL graduates tend to perform as well or sometimes better in clinical examination but score lower in basic science examinations in a few cases (Albanese and Mitchell 1993). Another review shows that in terms of student attitudes, class attendance and student mood or distress, the PBL group is more positive. Their scores on basic and clinical science are also higher (Vernon and Blake 1993).

In a more recent study of a medical school using both PBL and standard curricula, nine classes of PBL graduates performed significantly better in clinical performance, clinical reasoning and non-cognitive behaviours

(Distlehorst, Dawson et al. 2005).

If one considers a matched control group more convincing, then Harvard's result is worth a look. The research team randomly selected one hundred 1989 and 1990 Harvard graduates and undertook telephone interviews. 50 had New Pathway program, i.e. PBL, and 50 had traditional curriculum. Result shows that among 22 measurements, only 5 differed significantly among the two groups. Basically, they are more alike than different, and the major differences are in the domain of humanistic medicine such as ethics or communication skills (Moore 1994; Peters, Greenberger-Rosovsky et al. 2000).

The LTSN01 Special Report systematically reviews 91 papers and includes only 12 in the meta-analysis (Newman 2003). This report does not address the theoretical educational issues but seeks to investigate if PBL meet the defined end points. The result shows that PBL has an advantage in student satisfaction. However, some argue that the strict methodological approach is not appropriate for complex educational interventions (Farrow and Norman 2003).

It is indeed a major concern. Norman insists that there is no randomized blind intervention in education, and that there is no outcome which can be attributed to any single intervention. Furthermore, there is no comparison between interventions (Norman and Schmidt 2000). Anyone who has visited more than one PBL class can attest to this, not to mention PBL in different schools. And accordingly, if one tries to use effective size to quantify the outcomes, it will arrive at only minimal differences (Colliver 2000; Norman and Schmidt 2000).

Not all studies consider PBL a promising intervention. In one earlier review paper the author uses problem solving, knowledge acquiring, motivation and self-directed learning in comparing PBL and traditional curricula and concludes that they are not distinguishable (Berkson 1993). The high cost and non-expert tutors are the main weakness PBL has from this research. However, what this paper suggested that PBL and traditional curriculum would come to resemble each other, have not happened in Taiwan yet.

As to another objective of PBL namely for students to become life-long learners, it is even more difficult to assess the outcomes. Neither continuing education nor up-to-date medical knowledge is seen as proper indicators to be looked at because its connection with PBL is weak (Woodward 1998).

Thus one can see that after almost four decades' exposure to PBL, educators still have not reached a consensus about the effectiveness of PBL. Not only about what are they but also on how to measure them. Instead of questioning the effectiveness of PBL, or using examinations on recall of factual knowledge in the traditional system to assess PBL students, it is important to develop a modern assessment method into PBL. First of all, there has to be consensus on the components to test. Examples include: standardized patient-based tests, essay questions, problem-analysis questions and computer simulations. Some of these methods are already being used in licensing exams (Norman 1998; Kaufman 2000).

2.5.4 Cultural aspect of PBL

PBL originated in western countries and there is doubt on if students come from Oriental cultural background compatible with it.

Considering the impact of Chinese culture on Taiwanese, some assumptions on the stereotypical learning behaviour are worth looking into here. Chinese students are said to rarely ask questions or question on textbooks. The teacher-student relationship appears to be authoritarian, and critical thinking generally is not encouraged (Watkins and Biggs 1996).

However, little research has been published that addresses the issue of the Chinese cultural relevance of using PBL. A study on mature nursing students in Hong Kong shows that PBL helps in critical inquiry, cooperative, active learning and independent thinking (Wong, Lee et al. 2001). The authors think that these adult learners have internalized the Chinese philosophy of learning as personal growth, but the effect on younger students requires further study. As to research on students from Taiwan, there is only one published paper showing cultural difference that students consider PBL tutors should have certain personalities (Lin 2005).

In terms of learning style and educational system, Taiwan and Hong Kong both use passive rote learning, and rely on examinations to select students. To what extent will students benefit from PBL, is a question unresolved.

2.5.5 Summary

Four main issues are being discussed in this section. First is mainly on what is the genuine form of PBL. PBL has become a widely used and very often misused term. Small group discussion, problem solving and case studying are good teaching strategies but they are not the main element of PBL. It is thus difficult to tell if one is doing PBL only from how things are going in the classroom.

Tutoring in PBL is challenging and requires extra time and efforts. However, many have misunderstood the 'not-to-teach' and 'non-expert' principles and thought there was no teaching in PBL. And PBL's effect on tutors should be an interesting topic too but rarely being discussed.

Then it is about the effectiveness of PBL. There are a lot of disagreements among different studies. It is not only on the 'how to' but 'what to' measure in PBL. Considering the spirit of PBL, it is not just the change of syllabus or teaching methods. The implementation of PBL consists of structural change within the school departments, conceptual change of the tutors and attitude change in the students. Setting a standard or a measurement can not answer the problem of the effectiveness of PBL.

Finally it is about the cultural aspect of PBL. There is not much data on the compatibility of Oriental culture and PBL. How will students who grow up in Taiwan adjust themselves to this learning method requires more researches.

All the above information helps one in understanding the fourth research question about the lessons learned in FJU. It provides a sound theoretical background about what to look for in FJU and how to explain what have observed. A research to uncover the story of PBL in Taiwan is now possible.

2.6 Conclusion

From the above analysis of the literature, the technocratic nature of medical education and the neglected teaching in medical schools can be identified. Both are able to answer part of the first and the second research question in this thesis about the goal of medical education reform and the characteristics of medical education.

The need for medical education reform with the ultimate goal to enhance the doctor-patient relationship is widely accepted now. It is the reason why both The Ministry of Education and TMAC urge the liberal education stage to be applied in Taiwan. Taking Gramsci's theory of hegemony, it is possible that there is power being exercised in medical society when schools comply with it. Further inquiries into the phenomenon will be helpful to answer the first research question.

As to the second question about how to teach professionalism in schools, the hidden curriculum effect is important and medical students are prone to become dehumanized during the schooling process. The literature shows that medical students in Taiwan generally come from families of doctors, teachers and government officials. Theoretically, the cultural capital they hold will make them resemble each other. When the new school FJU adopted PBL, what is the main purpose? But before this question can be answered, the theory and spirit of PBL need clarifications.

PBL is a teaching philosophy developed by medical society in helping medical students to learn efficiently. In theory, things learned in the clinical context should be easier to recall than in traditional lecturing. The third research question on what PBL is and its relationship with students' future performance is largely answered from the literature. However, when referring to experience in FJU, there are quite a few gaps between how other studies show and what really happened.

FJU is the first school in Taiwan adopting PBL. Other than the official report made by MOE and TMAC regularly, reflections on the reform from students and tutors basically remains silent. Moreover, from the literature one can see that there are disputes on the definition, tutoring and effectiveness of PBL, and

how FJU cope with them. All these are important to answer the fourth research question, which is about the lessons learned from FJU.

So far, the search in the literature has helped the researcher answer part of the research questions. Here is a concise summary showing what is already known and what else needs to be found.

- ***1. What are the goals for medical education reform in Taiwan and what are the forces behind it?***

The purpose of reform is clearly identified and Taiwan is trying to follow the standards set by the western countries. TMAC asked all medical schools to give students only humanistic courses at the first two years and named it as the liberal education stage. Is TMAC the major force behind education reform? Research with teachers and students in FJU will help to answer this question. For instance, how they are told to set the liberal education stage and how they have been accredited will uncover the forces behind the reform.

- ***2. What are the key characteristics of medical education and how is medical professionalism taught in medical schools?***

It is a worldwide phenomenon that teachers in medical schools tend to spend their time on research and service instead of teaching. And social expectation for doctors has been different because of the changing healthcare system. Under such circumstances, are medical schools able to produce the so-called good doctors? Theoretically, schooling process will not help. But when FJU adopt PBL, is reproducing medical students among their goals? Does PBL offer a possibility for students to become more attached to patients?

- ***3. What is PBL and how will it relate to medical students' future practice as competent doctors?***

The strength, weakness and theories of PBL are thoroughly reviewed in this chapter. Quite often, medical students worry about if they have learned enough in basic science, and it is related to what is seen as more important knowledge in medical society. Though there is scepticism about the theory behind PBL, how FJU does PBL is a topic worth looking into, especially from the view of students and teachers.

- ***4. What are the lessons learned from FJU and what is the implication of it?***

FJU is by far the only school in Taiwan adopt full scale of PBL. There is no answer yet about their PBL experiences. And as the nature of this study, the data collected from FJU can hardly be generalized to other schools. But it is able to serve as an example if other schools want to make the similar move. Furthermore, what have seen in FJU will help to know if students grown up in a highly technocratic environment adapt to this teaching philosophy.

But before further research to go on, what West (1966) has said is suitable to have a look here.

In medical education, there is too much medicine and too much teaching and not enough education, because

- ***Only a small portion of the current body of medical knowledge can be taught in four years.***
- ***Much of the knowledge which will be employed in the student's future career is not known today and, therefore, cannot be taught.***
- ***Not all that is taught is learned.***
- ***A small part of what is taught is erroneous.***
- ***A portion of what is learned will soon be obsolete.***
- ***Of that which is taught and learned, and relevant, much is quickly forgotten (West 1966, p.766).***

The above quote is a reflection on what and how to teach in medicine. Though approaching from a positivist's view, West raises the importance of education in medicine more than fifty years ago. It echoes with the issues reviewed in this chapter about the knowledge hierarchy, the hidden curriculum, the role of medical schools and the objective of medical education and so on. It attests to the resistance nature of medical education too. And these make the study on FJU justified, what have FJU done and how it related to medical education reform in Taiwan is the focus of this research.

3. Research methodology

3.1 Introduction

From the literature search in chapter 2, several issues have surfaced that need further study. This chapter describes the methodology used to investigate them and is organized around justification of the qualitative method chosen and the research procedures.

This research started from a pilot in the oldest medical school in Taiwan and finally conducted in the most recently founded school that has adopted PBL. The researcher did try to use a questionnaire to obtain some 'scientific evidence' but soon gave up because it was unable to answer the research questions raised and listed in section 1.2. The in-depth interviews were then taken and the representativeness of each interviewee was analyzed to show the reliability of the data collected.

Finally, there are some reflections on the limitation of the methodology. The ethical concern is discussed too. It is the first time for the researcher ever to conduct a research, and the difficulty was underestimated at first. As an independent researcher, there is no support and the accessibility to the research targets is extremely limited. 'Doing research is a privilege' is the first lesson the researcher has learned. However, the researcher knew later that being independent is strength in terms of the trust from the interviewees. And the trust helps in gathering quality data.

This chapter tells a journey of exploration and experimentation. The research process is full of mistakes, unexpected outcomes and memories.

3.2 Justification of the methodology

3.2.1 Classroom observation stage, the pilot stage

Talk of the reform of the medical schools' education in Taiwan has been heard of for sometime but not seen in general publications. Being a part-time lecturer in one of the eleven medical schools, the researcher has only limited information about curriculum change from students, which makes it impossible to have a full picture of the issue. Therefore, at the onset of the research, an on-site observation was planned at the oldest medical school that claims to have the reform as early as 1992.

Whether observation is a technique or a method sometimes causes confusion. The researcher considers observation as method for gathering information necessary for further research and tries to observe students' behaviour under a non-participatory condition in its natural setting. The researcher's presence however will interfere with the natural setting even though some precautions have been taken. These include revealing the purpose of the observation in the beginning and trying to sit at the back of the class to decrease possible interferences (West 1992). There are field notes too, that focus on students' reaction in the classroom.

Things turned out quite different from what was expected. In short, at first the researcher tried to find a correlation between changes in the general curriculum and their impact on medical students. But PBL became the main component of the research and the target school was also changed from the oldest school to the most newly founded. Observations in the two medical schools lead to these changes.

3.2.1.1 NTU, the first medical school in Taiwan

The NTU (National Taiwan University) has the oldest tradition and is the leading medical school in Taiwan. With curriculum reforms initiated on 1992, NTU considers itself ahead of other medical schools in every aspect.

The first observation was on September 2004, in the "Family, Society and Medicine" module for year 5 medical students. This specific module was chosen because the school considered it was the most representative module of the changed curriculum.

From the materials prepared by the school, the purpose of the observed module has three dimensions: to know health issues at the family and society level, to know the humanistic side of the medicine, and to know the hospital's role within a community (University 2004). After two weeks classroom observation, however, the researcher decided for several reasons to look for another medical school to be the research target.

Firstly, though integrated under the Family, Society and Medicine format, this module basically is still taught in a traditional way. The module covers issues ranging from Law and Culture to Health Insurance issues which they will face in the future, and tutors are experts from different specialties trying to give the students all they know. The interactions between students and tutors are rare if any.

Second, students under observation generally do not possess the personality the researcher was looking for in medical students. The traits of caring, willing to help and curiosity were hard to find in most of the students. They were generally indifferent to what was happening and the lectures were going at a dull and slow pace. Discussion were rare, they seldom laughed and seemed to be under huge pressure all the time. The researcher could not see the change and decided to look for another research target.

3.2.1.2 FJU, a new school doing PBL

The FJU (Fu Jen University) is a Catholic university that founded its medical school in 2000, and is now the youngest among the eleven medical schools in Taiwan. The FJU has nine colleges with more than 25000 students that make it the second largest university in Taiwan. Located in the vicinity of Taipei, the FJU will have her first class of graduates in the summer of 2007.

FJU is known for its adoption of PBL. Wondering about how they did it, the researcher contacted the department director and was approved to undertake

classroom observation first before taking any further research decisions. The first PBL classroom observation took place in December 2004.

Although it was in the midst of the semester, FJU arranged a session with case-opening so that the researcher had a chance to observe a full process of PBL. Furthermore, four classes from different years and with tutors from different backgrounds were chosen to demonstrate the diversities.

The interaction among group members is intense and everyone seemed willing and eager to express their viewpoints. They were sharing what they have learned from the books and were actually discussing about their findings. But the researcher was not possible to tell if they acted differently because someone was watching.

The verbal ability was the second impressive part. The case script was written in English, one of the members had to read it aloud and the rest of the team had to respond to it. Other than English capability, the students showed a great deal of technique in quickly producing feedback. They reviewed their own performance that day and had comments on others too, but the wordings of the critique were positive. Communication skill seemed to be learned from the feedback time unconsciously.

The third point was about leadership. In each PBL one chairperson was being elected. A good chairperson had to manage the time allocation so that the discussion would not stall. He encouraged the silent ones to talk and knew when to interrupt too. Students learned from each other on how to be a good chairperson.

Without much understanding about what PBL was, the researcher decided to undertake the research at FJU. A proposal and a sample questionnaire were submitted to the school for review and approval.

3.2.2 Qualitative or quantitative, words or numbers?

When set for the research, the researcher determined to do it 'scientifically' that medical schools culture familiar with, that the conclusions draw from significant evidence showing the superiority of PBL. However, as the research

went on, the methodology was modified several times and the original understanding of PBL has been challenged too. The research has stopped for some time because of frustrations encountered during the process.

The researcher came to know later that there are different methods to achieve scientific goals, and quantitative methods are certainly not superior to qualitative ones as many used to think. The confusion returned when the researcher was trying to choose one qualitative method to analyze the data. For the researcher, it is a journey of discovery and exploration. The research started in traditional way, a questionnaire.

3.2.2.1 Questionnaire did not help

Two different questionnaires were constructed for this research. The first one was adapted from a communication scale attitude scales (CSAS) used in the UK and several other countries testing medical students' attitude towards communication skills (Rees, Sheard et al. 2002). There were 26 questions in the original CSAS. The researcher translated these into Chinese and tried them out on ten students for clarity. The results were not favourable because the students did not like the duplicate questions. These were designed for testing internal validity but two students suggested to take them away.

Direct use of a pre-existing scale has its advantage and disadvantage. For an inexperienced researcher, it is a good way to obtain a reliable testing tool and avoid gathering useless information. Direct comparison is possible too. However, after weighing the benefits and cultural differences, the researcher decided to take the risk to construct another questionnaire.

The revised questionnaire focused on students' attitude toward basic science, communication skill and PBL. It consisted of twenty two 5-point Likert scale attitude questions and eight open-end questions asking their 'feelings' about PBL and their perceptions on what a good doctor should be. Students were expected to finish it within 15 minutes. This questionnaire was tested again on another ten students.

The questionnaires were then distributed to year 3 and 4 students with assistance of the school. Almost all the students attending the class filled out

the questionnaire, 32 for year 3 and 24 for year 4, representing a 70% response rate. A few students refused to do the questionnaire when they knew it was not mandatory. The questionnaires for year 5 were sent via e mail but without any response.

Preliminary analysis showed that students generally consider communication skills to be important for a good doctor and is considered a core skill. They considered knowledge of basic science to be important and what they had received was not enough for future practice.

Though little information could be drawn from the numbered data, the results from the open-ended questions were rather impressive. Students wrote down their feelings about PBL in their own words. However, this information offered more questions than answers. The researcher decided to undertake detailed interviews to know more about these issues. It was at this point that the researcher started to think hard about what the research would become, would it be a quantitative with numbers or a qualitative with words?

3.2.2.2 A qualitative study was chosen

Traditionally, medical society prefers quantitative methods over qualitative ones under the positivist paradigm. Doctors search for the 'right' answer for a specific condition, and usually the evidence will reveal itself with no need for further explanation. And when biomedical research became the dominant ideology, the value of quantitative method was even more obvious (Bligh and Parsell 1999).

In educational research it is quite a different story. First, much of the research done is qualitative and does not use randomized controlled trials. Furthermore, the outcomes of educational interventions are difficult to evaluate and variations detected are impossible to express in numbers (Moustakas 1994; Norman 1998; Murray 2002).

In educational research, experience matters and data from experience can be seen as evidence for further scientific investigations. But such word evidence is difficult for the positivist-oriented people from medical society to accept as 'scientific'. For them, educational research is not only soft and informal, but

also lacks theory building (Bligh 1999).

Soft and informal, contrasting with hard and formal, refers here to the format of the research design. Double blind and randomized sampling may be the golden rule in most of the medical research, but in education there is no such thing as a blind or uniform intervention (Albanese 2000; Norman and Schmidt 2000). Moreover, over-emphasis on randomized controlled trials will not get sufficient evidence for medical education and sometimes may even be misleading because it does not take into account the social, culture and organizational types in which learning takes place (Leung 2002).

As to the causal relationship of the educational intervention, it is unrealistic to assume that any educational outcomes can be attributed to a specific intervention, because almost all interventions are complex and interrelated. And the desirable outcomes such as team working, doctor patient relationship or empathy, compassionate are difficult to define too (Norman and Schmidt 2000).

Another criticism on educational research is that many researches are located neither within a theoretical or conceptual framework. Without a theoretical context, research efforts will be difficult to aggregate into consistent themes, directions and ideas. Furthermore, it will be impossible to transfer research into interventions that could lead to organizational or institutional changes (Prideaux and Bligh 2002).

So the main issue in education research is not on which methodology chosen, but on the metaphor and context in which it takes place. And even though qualitative research has a history of being subject to researcher's bias, lacking reproducibility and causality, and that findings cannot be generalized, it can still be a *scientific* research (Mays and Pope 1995; Goulding 2002).

But considering the positivist tradition in medical society, it is no surprise that people are looking for evidence in numbers in the field of medical education research (Hart 1999; Petersen 1999). An examination of mainstream medical education journals (Medical Education and Medical Teacher) found that a majority of articles are written under a broadly positivist framework (Cribb and Bignold 1999).

Research in PBL has been initially positivist too. The studies on medical students' improvements in clinical performance and better clinical examination skills are just two examples (Albanese and Mitchell 1993; Vernon and Blake 1993). Later quite a few papers started questioning the effectiveness of PBL. The main argument is not on the credibility of the evidence but on the tools for assessment and on the methodology used. They argue that the research needs to establish the connections between teaching factors and learning outcomes (Colliver 2000). More specifically, medical people are trying to build a causal relationship in education; they want to see a measurable change that connected with an intervention.

However, in terms of evidence, there should be no dichotomy between quantitative and qualitative research. One should not face the choice between numbers and words. When deciding which is appropriate for a particular research, one should depend on the nature of the event, on the purpose and on the resources available, but not on the ideological commitment to certain methodology (Hammersley 1990).

This is how 'Best Evidence Medical Education (BEME)' comes to play a role. Some researchers try to promote the concept of evidence-based research in medical education and set a platform for medical people and educators to have a discourse. The intention to take evidence impartially is timely, but the dispute on word or number will not be solved unless the ideology on what can be seen as evidence can be re-examined (Harden 1998; Hart 1999; Petersen 1999).

As for the researcher, the review of pro and cons of qualitative method helps in understanding the nature of educational research. Especially in Silverman's warning that when handling the qualitative data, the researcher should treat it differently from a journalist (Silverman 2001).

Being a journalist for more than twenty years, the researcher did not think of this connection until reading of it. Basically all the interviews are trying to uncover the underlying facts. But the interpretation of data will be different and dependant on the purpose of the interview. For instance, a reporter will show greatest interest in something that is unusual, but a researcher may be more interested in the usual details. And the different focus of interest and purpose will affect how the questions are asked, how the deductions are made and how

the reports are written.

There may have a lot of discrepancies between a researcher and a journalist in terms of how to collect and interpret their data. But as long as they keep an open mind and try to be sensitive and honest to the data, there should be no difference on their roles, let alone what methodology one chooses to apply. What is important to a research is the attitude of the researcher, not the method used.

3.2.3 From grounded theory to phenomenological case study

After setting on a qualitative research, the researcher went for an ethnographical method when starting the classroom observation (Hammersley 1990). However, the researcher soon realized the practical problems of time permitted and the school factor. Ethics is one of the researcher's major concerns because any on-site observation will interfere with teaching and learning.

Later when the interviews finally get started, the researcher was puzzled about how to analyze the data in order to meet the purpose of this research. The researcher spent some time on the grounded theory and using the theoretical sampling method in choosing interviewees. However, everything became clear when the researcher found the following paragraph:

...choosing a methodology is a time-consuming, personal and reflective process. It requires an evaluation of self in terms of convictions, beliefs and interests. It means honesty about these beliefs, about what you know, and what you think you can know, and demands commitments to the process once a decision has been made (Goulding 2002, p.36).

Furthermore, considering that grounded theory have been considered as a 'current popularization that is based on power, privilege and authority' (Greckhamer and Koro-Ljungberg 2005), the researcher decided to leave the theory of methodology aside and kept on with the inquiries on PBL. The interview data accumulated gradually and more key informants emerging for more inquiries. The process of finding the key informants and persuading them

to be interviewed is a time consuming process. When it finally came to the point that the new interviewees did not give different information from the others, the so-called saturation, the researcher then stopped and went back to search for a methodology. Then the term phenomenology emerged.

Phenomenological research differs from ethnographic approaches in its emphasis on the individuals and on subjective experience. The experience contains both the outward appearance and inward consciousness based on image, memory and meaning. Phenomenology explores the variations that people have about a particular phenomenon at a particular time (Tesch 1990; Creswell 1998).

The researcher had determined to focus on medical education and picked the case on FJU. As multiple techniques are recommended in the data gathering process in a case study, the researcher had tried classroom observation and questionnaire but finally decided on interview. Case study research helps one to understand a complex issue and emphasize on detailed contextual analysis of a limited number of events (Yin 2003). It is known that the study of a small number of cases cannot establish reliability or generality of the findings. Yet as an independent researcher who is unfamiliar with the issue under study, a carefully planned case study exerts better chance to answer the research questions.

Theoretically, phenomenological research emphasizes the individual's subjective experience. This methodology seeks disparate views, so that the researcher can collect and analyze data from an explorative angle, to study direct experience and see behaviour as determined by the phenomena of experience rather than by external, objective and physically described reality (Cohen, Manion et al. 2003). The experience contains both the outward appearance and inward consciousness based on image, memory and meaning. Phenomenology explores how people react to a particular phenomenon at a particular time (Tesch 1990; Creswell 1998).

Phenomenology started with the German mathematician Edmund Husserl who was regarded as the founder. His catch phrase was 'back to the things' which meant finding out how things appear directly to us rather than through the media of cultural and symbolic structures (Goulding 2002).

In the domain of phenomenology, however, there is disagreement about the meaning and definition of it, and it could be attributed to the fact that this term has been used so widely. It has been referred to as a philosophy, a paradigm and a methodology (Ehrich 2003).

Considered as a methodology, phenomenology consists of three core processes, epoche, reduction and imaginative variation. **Epoche** is a Greek word meaning to refrain from judgment, to stay away from ordinary ways of perceiving things. Reduction is to suspend or **bracket** these phenomena temporarily, or to transform the world into mere phenomena and back to the source of meaning and existence of the experienced world. Finally, one has to use **imagination, intuition and reflection** to explore the essential structure of the experience lived through (Moustakas 1994; Ehrich 2003).

Before the actual work begins, the researcher was at the state of Epoche by all means. Unlike the general education reform in Taiwan that many discussions have already been made, reform in medical education is rarely being noticed. Except for keeping oneself refrain from judgment, the researcher tried to get to know the issue through reading. Reading in phenomenology is not just taking note of the content, but is actually being immersed in the data, reading and rereading and analyzing the data until finally a 'closeness' to them and a sense of the whole is achieved. What comes next is to pick up the 'meaning units' in the data and transform them into 'themes'. In one interview, one can pick up many 'meaning units' and those similar ones are clustered together. Finally, all the themes will tie together into a 'descriptive statement' (Tesch 1990).

The researcher has learned later that such process is similar for different kinds of qualitative methodologies. Comparing and contrasting actually applied in all the intellectual tasks during analysis: forming categories, assigning data to categories, summarizing the content of each category, finding negative evidence and so on. And it is no doubt that imagination, intuition and reflection will be required during the analysis and writing stages.

The researcher cannot agree more with the view that there is no one 'right' way of doing the research. Each qualitative analyst will and must find his/her own process. In the following section, how this research was actually done will be described in details.

3.3 Research procedures

3.3.1 Purposeful sampling strategy

Just as systematic randomized sampling is crucial to a quantitative research, data collecting methods are important in qualitative research too. Samples in phenomenological research must be individuals who have experienced the phenomenon being explored and can articulate their conscious experience (Creswell 1998). Statistical representative is not a prime requirement in qualitative research when the objective is to understand social processes (Mays and Pope 1995).

But even under the above understanding, the researcher did consider the representativeness during the student sampling process. The interview students were sampled from the first class of medical students in the FJU. They were admitted in 2000 and are expected to graduate in June of 2007. The class has forty-eight students with twelve females; the gender ratio is similar to other medical schools in Taiwan.

The researcher tried to stratify samples of students in the beginning. Gender, academic performance and parents' occupation are three indicators for stratification. The performance in the previous four years may be correlated to their attitudes toward PBL. However, the researcher gave up the stratification method when FJU declined to offer information on students' transcripts. What FJU agreed to disclose was only the name list.

Without knowing any of the candidates, the researcher randomly chose eight names from the list and sent e mails to each of them stating the research design and asking if they could spend one hour taking the interview. Two days later, one student responded giving his cell phone number. This was the starting point of the data collection in this research, and this interviewee was labelled as S1.

S1 was the first year intern at Department of Surgery in one teaching hospital when he was interviewed. The interview lasted for about two hours. After S1, there were four more students who agreed to be interviewed; the first two were

on the original random list and the other two were chosen mainly because of their gender.

Though being a case study in its nature, the interviewees were not confined to students and teachers from FJU. Teachers from different medical schools with different PBL experience were interviewed too. And in order to know about medical education reform in Taiwan, some educators were interviewed who might not be familiar with PBL. Each person interviewed has his significance in helping the researcher to find the answers to the research questions.

There were twelve teachers/educators included in the interview, labelled as T1 to T6 and E1 to E6. The categorization is based on if one has experience of PBL. For those in T group, they are either doing PBL in FJU or in other schools. And for those in E group, they have heard of PBL or see someone doing it. All of them were not pre-selected. In other words, the researcher did not consider anyone as a must-be-included in this study. It follows the criteria of the grounded theory that after the initial selection of the informants and analyses of the data, then based on findings one decides which further data to collect and from whom (Mays and Pope 1995).

Such sampling strategy is common for qualitative research, and known as theoretical sampling in the grounded theory (Strauss and Corbin 1990) or purposeful sampling in phenomenology, that new samples add up one after the other, the first one will lead one to find the other, and this process stops only when the information is saturated, that no more data can be found from the added informants(Goulding 2002).

The purposeful sampling as opposed to theoretical sampling is identified here because during the sampling process, the researcher did not have a theory but only with the purpose in mind. The guideline for the sampling was that the interviewee must have firsthand experience with the phenomenon under investigation, which is PBL or medical education reform in this case.

The researcher listened and observed carefully in order to identify what was told or untold, and looked for different opinions as far as possible. It was until November 2006 that the saturation was finally reached. Trying to be objective and impartial, to make comparison all the way through, to check carefully during and after the interview, all these were applied to increase the reliability

and validity, or more specifically, the credibility of the data.

3.3.2 Reliability, validity and triangulation

For people familiar with quantitative research, reliability means the result is replicable and validity implies that the measurement is not only accurate, but is really measuring what is intended to measure (Golafshani 2003). But in a qualitative study where no measurement exists, how can one construct the credibility of the data?

Reliability and validity usually are not treated separately in qualitative research. Some equate the researcher in qualitative research with the instrument, thus the ability and effort of the researcher will decide the creditability of the research (Patton 2002). Others use terms including Neutrality, Consistency, Dependability and Applicability or Transferability to be the essential criteria for quality (Lincoln and Guba 1985). The researcher considers however, different data source and constant comparison are ways to increase the credibility of the data. And it is called data triangulation.

Triangulation is a strategy when one wants to apply data to construct some meaningful explanations about the social world.

The researcher is left with the task of making sense of the evidence regardless of what the outcome is. So whether the data converge, are inconsistent, or are contradictory, the researcher must attempt to construct the explanations for the data and about the data (Mathison 1988, P.15).

As in this research, the data obtained from students and teachers are inconsistent most of the time. But it is for the researcher to build up her own explanation about the phenomena through further digging, either from the informants or from the documentation, to have a holistic understanding and general background knowledge about PBL and the medical society as a whole.

For instance, the five student interviewees were interviewed alternately with teachers/educators. It offered an opportunity for the researcher to examine the credibility of the data. The data obtained from the first one will be checked with the second interviewee. When one student mentioned that the attendance rate

in lecture is low, the researcher would always check with other interviewees to see if it did occur. And if the data were inconsistent or contradictory, try to find supporting evidence from the following interviewees. Only through such constant triangulation process will the credibility of data possible.

Generally there are three stances how one sees the interview data: positivism, emotionalism and constructionism (Silverman 2001). It is hard to say which paradigm the researcher belongs to, but with an enquiring attitude and treating all the gathered data impartially seem to be the crucial element here. Because if one self-consciously sets out to collect and double-check findings, uses multiple sources, then the data-gathering process can be seen as the verification process and little need to be done than to report on the procedures (Mathison 1988).

And there is one final point. At the beginning of the research, the researcher did feel the disadvantage for not being a school member. But it turned out to be an advantage because students generally would really talk about their feelings. If the interview were done by school teachers, some negative opinions will more likely be withheld. It thus increase the creditability of data obtained too.

3.3.3 Interview process and justification for each interviewee

In this research the researcher tried to explore the lived experiences of each interviewee with an attempt to uncover the story behind medical education reform. The researcher did not set a highly structured format so that everyone can express his opinion freely. There were only two main questions would be asked: What is your biggest worry about PBL? What is your opinion about medical education reform?

Under the interview strategy, almost all the interviewees can freely talk about whatever they want to say. And an unstructured interview format also allows a more investigatory possibility during the process. For instance, when a student said FJU had PBL was because of TMAC loved it, this opinion did not accepted uncritically but checked with teachers from FJU for credibility. And when an examiner mentioned that PBL was no more than case reporting, the researcher would ask him if the impression from FJU or just general impression. Thus the data triangulation is kept on going during and even after

the interviews.

Almost all the interviews were proceeding in a relaxed and safe environment. In the beginning of each interview, the researcher would explain the purpose of the interview and briefly describe the research, what had been done and what remained to be accomplished. The confidentiality of the conversation was reinforced in advance. It is not only for ethical concern, but to create a mutual trust between the interviewer and the interviewee.

All the interviews were tape recorded and transcribed. As mentioned in the section 3.3.1 that S1 was the first interviewee, the validation was done in all the subsequent interviews. What was gathered from one interviewee will be validated by at least another interviewee to ensure its accuracy. If the data inconsistent or contradictory, the researcher tried to find evidence from other interviewees. Such triangulation process was applied too all the interviewees.

For instance, S1 complained that school still had no plan for their sixth year. Instead of taking this view, the researcher asked this question to school director about their future plan for year six. And indeed she replied that school haven't thought about it yet because there was basically no one in charge of it.

Such a humanistic approach that respects all the interviewees' experience, basically follow the spirit of phenomenological research. However, it does not mean that the researcher will take all the data uncritically. Silverman keeps on reminding his readers that

...social scientist may uncritically take ..... accounts of human experience. This leads to analytic laziness in considering the status of interview data' (Silverman 2001, p.93).

To avoid such 'laziness', the researcher intentionally chose those known to have different opinions in advance. For instance, teachers from FJU said that some educators have prejudice upon PBL. Instead of avoiding these named educators, the researcher tried to approach them in order to know their real opinion toward PBL. It was part of the reason that the interview period lasted for eighteen months because some of the educators were difficult to approach.

In the following paragraphs, the reason for each interviewee being chosen will be concisely described and categorized into three main groups, students (S),

teachers (T) and educators (E). The distinction between teacher and educator has already been made in section 3.3.1.

Students interviewed

As mentioned in section 3.3.2.1 that some stratification was attempted to have a representative sample of the students in FJU but did not success. However, the researcher did try to make the samples as varied as possible in terms of their gender, background and so on. They are listed according to the date interviewed.

S1: He is the first and the only one who voluntarily accepts the interview. (Interview time 2005/05/17)

S2: He transferred from Department of Dentistry at another medical school four years ago. He is also the president of the class. (Interview time 2005/05/23)

S3: He accepted the interview only because he was in the list. (Interview time 2005/05/31)

S4: She reluctantly accepted the interview and showed up accompanied by her boy friend. (Interview time 2005/08/15)

S5: She retook the entrance exam to enter FJU and thus was one year older than the other student interviewees. (Interview time 2005/08/19)

Teachers interviewed

As to the six teachers interviewed, three came from FJU and the others came from two public medical schools with different degree of PBLness. Public schools are sponsored by the government and are generally better equipped and structured. The private ones, such as FJU, have to rely on students' tuition to cover all the costs of the schools and thus are deficient in resources. There are currently nine private medical schools in Taiwan and FJU is the only one that affiliate with a general university. Teachers from other schools are interviewed to get data for triangulation.

T1: The key person in FJU's curriculum design. She was the director of the department. (Interview time 2005/06/13)

T2: A clinical PBL teacher from one public medical school and was organizing a new integrated curriculum for year 4 students. (Interview time 2005/08/11)

T3: Colleague of T2. She is also a medical doctor. (Interview time 2005/08/11)

T4: He is the vice-president of FJU and an advocator of PBL. A full scale of PBL was his idea. (Interview time 2005/08/08 and 13)

T5: He works in one public medical school located at southern part of Taiwan. He is a neurologist and a curriculum organizer too. (Interview time 2006/02/16)

T6: A young PBL tutor joined FJU in 2003. His specialty is pharmacology, the so-called basic science. (Interview time 2006/11/14)

Educators interviewed

Interviewees in this group are mainly prestigious people in medical society in Taiwan except E2 who is a young medical doctor. It is important to note that among the twelve teachers/educators listed here, ten of them are medical doctors from different specialties. The other two are teachers in medical ethics (E3) and pharmacology (T6). The proportion reflects how medical education is managed in Taiwan, not only that doctors are dominant and basic science rarely can have their say, but that no educational profession is involved during the process.

E1: The president of an medical education promotion foundation. He is also an examiner from TMAC and has made several on-site accreditations in FJU. (Interview time 2005/08/02)

E2: A chief resident in a teaching hospital who supervised some students from FJU but had no direct experience of PBL. (Interview time 2005/08/07)

E3: A professor in medical ethics from one private medical school located in central Taiwan. He is an examiner from TMAC and has experience in the accreditation of FJU. (Interview time 2005/09/01)

E4: The president of one major private medical school who was interested in setting up a department of medical education in his school. He is an examiner from TMAC too. (Interview time 2005/09/05)

E5: A professor in one public medical school who initiated curriculum reform as early as 1992. He is NOT a member of TMAC. (Interview time 2006/03/20)

E6: The secretary of TMAC. He is interested in medical education and writes a lot on it. (Interview time 2006/06/21)

3.3.4 Method of data analysis

The aim of the analysis is to account for all the different points of view raised by the interviewees and to try to avoid research bias as much as possible. Efforts were made to cut away dross that did not directly bear on the research topic.

All the interviews are mainly in Mandarin but with some Taiwanese. The data was transcribed into Chinese after each interview and checked from time to time. Analysis started after all the interviews were accomplished except for T6 which was added to validate some main points.

When the analysis finally began, the researcher printed out all the transcribed data, read them and started to make the 'meaning units' on the paper. The researcher tried to stay in an Epoche state and then to bring all the meaning units into Bracket. When the meaning units were located, it would be marked in sequence from 1, 2 etc. When several meaning units clustered, then it would become a category and be marked with a new number before the original number. For instance, the meaning point 1 and 2 may both fall into the fifth category and be categorized as 5-1 and 5-2.

As the number of categories grew, the categories would again be grouped into different themes. The theme number then will again put before the category numbers. For instance, in the theme 4 one can see 4-5-1, 4-5-2 etc.

However, for each meaning unit to be categorized, they did not stick to the

same set of numbers. For instance, remark 4-5-1could be marked as 2-3-1 at first, but during the organizing process, it could be re-assigned and changed its number accordingly. But even though the number was changed, the content of the statement kept the same all the time. The researcher kept on tracking all the statements until they are finally being assigned to the appropriate and reasonable themes.

The first two processes, making meaning points and categories, were comparatively simple compared to the later task, which was to organize the categories into the major themes and to see if they were able to answer the research questions. It indeed required the imagination and reflection to have to work done (Moustakas 1994; Ehrich 2003).

And it was at the last stage when all the themes were constructed then the data were translated into English. Because in phenomenological study, the researcher has to immerse herself in the data (Tesch 1990), but data written in English was unable for the researcher to produce the closeness required in constructing the themes. The translation was made by the researcher when the ten themes were formed. But as the writing went on to the discussion chapter, the themes were reorganized into eight with different sequence. All the quotes were remained unmodified even though they were categorized into different themes and the researcher considered it was one way to show the credibility of the data.

The translation was made by the researcher when the ten themes were finally formed. But as the writing went on to the discussion chapter, the themes were reorganized into eight with different sequence. Two themes that focused on the management and assessment issues were taken out because they were considered unable to directly answer the research questions raised and it was related to the researcher's observation and perception of the issue under investigation.

Under such circumstance, the researcher understands fully that if the same data was analyzed by another researcher who holds a different stance toward the issue, a very different set of themes and results could be reached. Apart from this, there are limitations of this research and will be elaborated in the following section.

3.4 Some limitations

3.4.1 Unable to replicate or generalize

From a positivist perspective, the result of a scientific research should be able to replicate if others redo the study. However, in this research it is impossible for another researcher to come to the same findings, even if he/she duplicates everything including interviewing the same interviewees and asking the same questions.

It seems to be the nature of all qualitative researches. First of all, an interview is a special mutual trust and communication process. It is person, place, and time specific and unable to be replicated. The students were interviewed when they just started clinical training. The reflections were expressed at that time and unable to rewind. The teachers too, their perceptions of PBL were changing and the opinions were time specific. But on the other hand, it is why interview data is valuable.

To what extent can the findings from this research be generalized to other medical schools is questionable. The researcher did try to collect data from teachers in other schools, but the evidence is mainly from students of FJU. Though there is an assumption that medical students generally resemble with each other, but school culture still play a role here. It is thus unable to draw a big picture on the outcome of medical education reform in Taiwan as a whole.

3.4.2 The unheard voices

The researcher must point out that the students interviewed are basically favourable or neutral to PBL. However, not all students in FJU like PBL. Some even have negative attitude toward it and perhaps this is reflected on their transcripts. The researcher has gotten some names and tried to contact one of them but he declined to accept the interview.

To uncover the negative opinions lies not in the methodology used or skills had, but on if they have the altruistic thinking. The researcher's determination and

the combination of luck and strategies are important too. Once the interview was declined, the researcher tried to learn the negative voices from those being interviewed but the information was limited and may not reflect what they really thought. Considering that altruism is one of the characters required in doctoring that already been discussed in section 2.3.2, the student refused to accept the interview signified the deficiency of it.

It is important for the researcher to be systematically aware of the unheard voices all the time. Constantly reminding oneself during the data collection and analysis stages that what was heard was only part of the story. Only in that way could one remain objective and clear through the research process (Mays and Pope 1995).

3.4.3 The researcher bias

There is one final point that pertains to the researcher. Even though the researcher tried her best to stay impartial during the process, it is almost impossible for one to not take sides. Moreover, as Weber pointed out, although all research will be contaminated by the value of the researcher, it is almost impossible for the researcher to remain value-free all the time (Silverman 2001).

Given the same data, it is very likely that a different researcher will come out with different meaning units, themes and even different conclusions. Very often it is not the matter of skills or perception about the issue, but the researcher's personal values.

The value of the researcher does not only affect how the interviews went, it also influences how the data will be analyzed. However, the researcher does not take it as a shortcoming. On the contrary, the researcher must admit that only through these values do certain problems get identified and studied. The conclusions and implications drawn from the research are largely based on and rooted in the moral and political beliefs of the researcher.

3.5 Conclusion

In this chapter the researcher tries to describe an exploratory journey on how the research was conducted. Started from not knowing what medical education reform was and what PBL was, the researcher came to have a clearer picture after all the sharing.

In each interview, the students told the researcher what PBL was, why they liked or dislike it. The teachers shared their experience about PBL and their observation of the students. And the educators expressed their worry about medical education in Taiwan. It was through all the sharing that the researcher obtained understanding of the phenomena under study, the medical education in Taiwan.

This chapter is about how this research was done and about the precautions taken to increase the variety of the data collected, to enhance the credibility of the information obtained so as to avoid possible errors and misconceptions. It is a case study in its nature but on the other hand, the researcher attempts to explore things exist in the medical society as a whole but not just in FJU. How not to over-generalize evidence is a thought kept in the researcher's mind all the time.

Finally, there are reflections on the unheard voices and the researcher's personal values, both will influence the result greatly but unable to solve. The researcher understands that most of the interviewees are in favour of the spirit of PBL to some extents. It is not the researcher did not want to approach those against PBL but that they refused to be interviewed. The reasons are politically, socially and culturally bonded and will be included in the discussion chapter. As to personal values, the researcher considers it is a bias but also a strength to this research. If it is not for the researcher's personal belief about the reform, there will not be this research in the first place. Furthermore, it is the same belief that helps this research done.

4. Results

4.1 Introduction

In the previous chapters, the literature on medical education and reform has been analyzed; theories in PBL are carefully examined too. There are four research questions identified, and the methodology on how to do the research and uncover answers is described in the methodology chapter. This chapter is the result of the data collected and categorization from the interviews. There are eight themes identified to answer the four research questions raised and will be briefly described here.

Theme 1 uncovers how TMAC and MOE are trying to control/change medical schools out of good intentions. Both students and teachers show their discontent especially toward liberal education. Other than school curriculum, TMAC and MOE are proposing some policy changes too. Theme 2 identifies some of them that related to FJU. Findings in the first two themes help in answering the first research question:

- ***What are the goals for medical education reform in Taiwan and what are the forces behind it?***

Next two themes are about what ought to be for good doctoring. Theme 3 identifies how medical schools influence medical students' values and how they grow to get used to the system. Theme 4 identifies some characters the educators think a competent doctor should possess. These data help one to answer the second research question:

- ***What are the key characteristics of medical education and how is medical professionalism taught in medical schools?***

Then the data move from some general issues to students' experience in PBL. Theme 5 explores how students worried about their deficiencies in basic science at first but then became confident because they know there was no boundary in knowledge acquisition. Theme 6 is some characteristics found that are related to PBL, including communication skills, willing to cooperate

and so on. Both will lead to answers to the third research question:

- ***What is PBL and how will it relate to medical students' future practice as competent doctors?***

Finally, Theme 7 raises some curriculum issues related to PBL in FJU, showing that FJU was not well prepared for PBL. Theme 8 focuses on the management dimension of the curriculum change that how other schools might learn the lesson. Both of them lead to the fourth research question, which is

- ***What are the lessons learned from FJU and what is the implication of it?***

In summary, this research centred on PBL which was related to medical education reform in Taiwan. Evidence showed that there existed disparities between why and how of the reform. People have different perceptions about what PBL is. The definition of competent doctors needs reinforcement too. Moreover, it shows that power was exercised in the decision making process and PBL seems to offer a possibility for students to be emancipated.

4.2 Medical education reform in Taiwan

As pointed out in section 1.1 that medical schools in Taiwan started to review their curriculum under the pressure from TMAC (Taiwan Medical Accreditation Council). TMAC came to function in 2000 and aimed to improve the quality of medical education in Taiwan. Curriculum change was the first thing most medical schools did in response to TMAC's request for improvement.

Theme 1 shows that the reason why medical schools had to reconcile themselves to TMAC's request comes mainly from the accreditation power held by this semi governmental organization. The teachers/educators interviewed showed complex feelings toward TMAC. On one hand, they respect TMAC's noble ideals in helping Taiwan's medical schools make progress, but on the other, they criticize TMAC's examiners for being familiar with the system in the United States but not Taiwan.

Both MOE's (Education) Whitepaper and TMAC's statement show that the responsibility of a medical school lies in 'careful selection of its students' (Huang 2003; TMAC 2006), and in the hope that the students will become competent physicians. Such objective-centred approach is accepted by all medical schools and by almost all educators and teachers interviewed.

In theme 2, the educators interviewed talked about students' selection, about how to change the training in hospitals, about how to do PBL. They believe that if only they select the '**right**' students in the beginning and teach them properly, they will become '**competent**' doctors in the future.

4.2.1 Theme 1—the reform made by the power groups

The Whitepaper released by the Ministry of Education profoundly reviewed some major issues in medical education, from the deficiencies in teaching faculties to the residence training in hospitals, from the admission system to the tuition policy (Huang 2003). Most of the problems they pinpoint are, however, unable to be solved by any individual school. For instance, they propose to raise the tuition fee but it is regulated by the government.

Those who wrote the Whitepaper are also examiners of TMAC; they are seen as the most powerful persons in affecting the medical schools in Taiwan nowadays. The accreditation made by TMAC is not only about reputation, but is related to the budget and subsidies each school can get from the government. And it will affect their teaching hospitals' rating too which is again correlated to the reimbursement the hospitals can get.

TMAC started the accreditation in 2000. Usually, a group of examiners will spend five days in the school being accredited. The examiners talk with school members and students to see if they have followed the proposed curriculum, developed its faculties and attracted good human resources. Being the youngest medical school, FJU is required to be accredited yearly by 2007 when they have its first year of graduates.

1-1 The examiners think they know what the problems are

TMAC is anxious to raise the quality of medical education in Taiwan to an internationally recognized standard, and they indeed reached the goal in 2004. (TMAC 2006) The examiner committee of TMAC is composed of doctors from different specialties, none of them experts in education but are confident about 'what should be' in medical education. They are experienced medical doctors and thus say that they know how to educate one, without question.

We all take this job seriously. You know everyone is so busy these days, but we spend almost a whole week in one school. We talk with teachers, have lunch with students and walk around schools freely. I know they have told students to behave if they see some 'old men' walking around and asking questions. (Laugh) We can just walk into any classroom if we like. I think this is how we get to know a school. (E1-1-1-1)

E1 is an examiner and he considers the five-day observation period being long enough to pinpoint the underlying problems, but the director of FJU (T1) says that TMAC does not know the difficulties they face.

The examiners are not very responsible, different people gives us different comments and different suggestions. It makes us hard to follow. For instance, they ask why we set the proportion of oral test at 40%. I know they want it to be higher. I told them several times that Taiwan is different from the US, but they just cannot understand. (T1-1-1-2)

The examiners think 'having lunch with students' is an opportunity to hear the voices of students and uncover the problems. But student S1 doesn't think so. He says that school purposefully chooses students who won't say bad things about school and thus there is no way to uncover any problem during the visit.

I had lunch with them several times. You know school likes to choose certain 'nice' students to attend. ...Well, for instance, I remember once there were five girls and one boy (me) sitting around the lunch table with them. Have you noticed the problem? We have only 12 girls in our class (48), why 5 of them there? The proportion is not right. But they (the school) think girls are nicer and more obedient, girls can just smile if they are being asked some questions but unable to answer. I am quite outspoken but maybe they think I am safe. I won't say something unexpectedly, something inappropriate. (S1-1-1-3)

Maybe because of the opportunity to have lunch with the examiners, S1 expresses his observations about those important persons and concludes that they take only the opinions that agree with theirs. Here S1 shows his ability to question the power group.

Those professors are all the same. They already decided in their minds what we ought to do; they will not ask you about things not in that category. I mean, they will not discuss things with you, they just ask things that interest them and want you to support their ideas. I tried to express my opinions at the first time but gave up later; I realized they are not really listening.

They are all the same. They did not think for us and just ask us do whatever they told us to do. However, is that really good for us? They did not take into consideration about our background, our society and our need. (S1-1-1-4)

When both T1 and S1's opinions were mentioned to E1, he replied that 'she (T1) doesn't understand' and 'that's why they (students) need to be taught.' To E1 and other examiners from TMAC, they are trying to help medical schools in Taiwan to reach a higher standard comply with the US's. To medical schools and medical students, they are the dominant group in Taiwan's medical reform.

1-2 Liberal education stage is not as expected

TMAC suggests schools focus on liberal education in the first two years. It is unclear why some schools set the first two years as the liberal education stage even though they are unable to offer students versatile courses. Even the examiner E1 admitted that it turned out to be a waste of time. The main problem he thought was the lack of good teachers, which related to the budget restraint.

Our medical students, even those in public universities with good resources, are not well-educated. The general courses are not designed for medical students. And it turned out that most of them have wasted the first two years. For instance, they should have Philosophy in the first two years. But I am afraid we don't have good teachers. And you can imagine the private schools must be even worse. (E1-1-2-1)

TMAC tries to let medical students become doctors with humanity thus asks all schools to set their first two years as liberal education stage. But they question that the faculties in medical schools are incapable of doing this job.

What our higher education should offer? Our medical students are only high schools graduates. Many schooled in the single discipline university which is unable to offer a comprehensive education for them. The width and depth of humanistic courses the school can offer are limited. Some students told me that many teachers are worse than high schools'. It's our responsibility to offer a better learning environment. (E1-1-2-2)

E3 is the only examiner in TMAC interviewed who is not a medical doctor. Being a professor in medical ethics, he questions the effect of giving humanistic courses but strengthens the importance of inspiring the students' abilities to think.

We are now trying to give them more courses on humanity. But I think the effect is quite limited. There are always problems between theory and reality. You can tell them what they should do, but it is useless because it contradicts what they see. I would say teach them how to think is the most important. Most of our students don't understand themselves. But it is not just for medical students, I think our education system made it, all students are alike. (E3-1-2-3)

It seems too arbitrary to say that students don't know what they want, but the education system in Taiwan is so technocratic oriented that the students have only to get good grade in the tests to get into medical schools. They don't have to know what medicine is when they are being admitted. It is thus important for the medical school to be sure about what to teach.

From this aspect, FJU is trying hard. For instance, the liberal education stage in FJU is different from other medical universities. S2 who transferred from another school said he had taken more courses in FJU. S3 clearly identified the differences between FJU and other schools.

FJU indeed is much more diversified. When I was in Y school at year 1, the class I could attend was very limited. But when I transferred to FJU, I took many courses at year 2, such as History, Computer. I cannot have those in Y school. (S2-1-2-4)

We have fewer teachers in Basic Medicine such as Physiology. But we have a lot of teachers in Humanities. For instance, we have professors from Department of Chinese Literature, Mathematics or English. I think it is impossible in other medical universities. (S3-1-2-5)

But not all students think humanistic education is important at the early stage of their medical training. S1 thinks it is a matter of priority. He says that what they need now is not communication skills but basic knowledge about human body.

If I have a lot of knowledge already, of course I can say caring or communicating with patients are important. I know ethic is important too but ethic alone cannot make you a good doctor. Can you see my point? The examiners are all equipped with profound knowledge, but we are only students, we have different priorities. At this stage, I think we should try to build up some basic things but not on the communication skill or things like that. (S1-1-2-6)

While educators concern about what and how to teach in the humanistic courses, not all students think it is important for them at this stage. The importance of liberal education is perceived differently by the examiners from TMAC and the students.

Other than liberal education stage, TMAC urges medical schools to have

curriculum change. Theoretically, a good liberal education stage serves as a better foundation for the application of PBL. But TMAC seems to have difficulties with FJU on this issue.

1-3 TMAC's attitude toward PBL

There is a paragraph in the Whitepaper talking about PBL. It said

If students in Taiwan can be benefited from PBL needs more evidence. Medical school has to improve teaching so that students will change their learning styles. Otherwise, the implementation of PBL will only get half the result with twice the efforts (Huang 2003). P.12

It clearly states TMAC's attitude toward PBL and shows its technocratic rationality. Without knowing TMAC's policy, student S1 think TMAC loves PBL which is not true.

Of course I said something sometimes, but what I said is not important, because TMAC think PBL is excellent so they will not look for its shortcomings. They already have a specific blueprint in their minds and think it is heaven. I think they never think of finding drawbacks in heaven and thus they can never see the real problem. (S1-1-3-1)

While S1 thought TMAC love PBL, a teacher from FJU concluded that TMAC hate it. T4 is the one who decided to do PBL in FJU. At the age of 72, he teaches and demonstrates what the *real* PBL is every year. The following quote shows his anger toward TMAC which is rarely known.

TMAC hate PBL, yes, that's true. The president of TMAC is against it. Yes he did, he said so several times in public. The reason sounds ridiculous to me. ...It is because he met a medical student from Tuft University in the airplane five years ago (2000), and that students told him that he hated PBL. He then asked that students write him a letter stating his reasons and later he gave all medical schools a copy...now you can see how we handle things in Taiwan, very irrational. The problem that student mentioned could happen in any medical school, what we can know from his experience is Tuft did not do it right, but how can you condemn PBL because of one student's experience? He even wrote several articles on newspaper to criticize us (FJU) for 'pursuing fashion'. I cannot understand what he opts to... But I have no interest to know anyway. (T4-1-3-2)

Discrepancies indeed exist because of some prior experiences about PBL. E1 the examiner has seen some other school doing PBL and concludes that FJU must be quite the same.

Once I saw a so-called PBL in one school. The student was presenting a paper he found in internet. He himself did not understand it very well. His team-mates were unable to know more than he did. The tutor was not familiar with the topic either. So you can imagine how the discussion must be going nowhere. I think what happens in FJU should be no different. (E1-1-3-3)

TMAC wants medical schools to change their curriculum, but does not encourage PBL because the examiners generally think Taiwan is not ready for this kind of teaching. And it is an opinion shared by several educators interviewed.

TMAC never asked any school to use PBL but did ask them to change the curriculum. Also TMAC asked school to improve the quality of faculties. I think it is right. As to the curriculum, the philosophy of PBL is right too, you cannot teach them everything, you can only teach them how to fish, not to fish for them. But I don't know if our students are ready. (E3-1-3-4)

From how E1 and E3 perceive FJU and its PBL, it is evident that both of them think FJU is unable to do well out of their supposition. TMAC's attitude toward PBL which is clearly written in the Whitepaper coincides with the above quotes. It signifies that TMAC is imposing its value on medical schools to make the changes happen.

1-4 Summary

This theme tries to explore the role of TMAC. It is evident that examiners from TMAC are confident that they know about the problems and have prescribed the solutions too. They want all schools to set a liberal education stage but at the same time, they think schools are unable to meet their expectations.

TMAC is an organization to make decisions and announcements only. They do not communicate with teachers or students on what liberal education is and

what are their attitude toward PBL. They just write it down in the Whitepaper and expect others to follow. It is without question that TMAC represents the hegemony in Taiwan's medical education reform.

4.2.2 Theme 2—other changes have to be made

TMAC proposed several suggestions and tried to reform medical education in Taiwan. Some of them are easier to achieve in individual school, but most of them are correlated with different departments of the government. For instance, the tuition fee is regulated by the Ministry of Education and the Board Exam is under the jurisdiction of Department of Examination (Huang 2003).

There are various changes TMAC wants to make, but only issues related to students in FJU will be discussed here.

2-1 Select student through interview

The pragmatic view of education is prevalent in Taiwan. As medical schools have to produce good doctors for the society, many educators think medical school should find the 'right' students in the first place. E6 is enthusiastic in promoting education reform ever since he returned from the US in 1990s.

We ought to change the system. We should not let grade keep on kidnapping our medical students. What our society needs is medical student with good heart, not with good grade. Do you remember the crisis of SARS in 2004? There were so many doctors that refused to take care of SARS patients. Our system is sick, we have to change it, and we have to find the right persons to become doctors. (E6-2-1-1)

E3 expresses his opinion with similar viewpoint that one doesn't have to be very smart to become a doctor. But speaking from a non-physician's stance, he implies that many doctors practice medicine only to make money.

We don't need so many clever doctors. You know in western countries, doctors used to be priests because doctors have to be caring. The intelligent ones, well, maybe they should go to business to make money. (E3-2-1-2)

Besides choose the 'right' student, TMAC tries to postpone the age of entrance from 18 to 22 when they graduate from general universities. (Huang 2003) It is assumed that mature youngsters would know better if they want to be doctors. Furthermore, they will contribute more during PBL because they are better educated.

Our medical students are too inexperienced. Especially under current educational system, they know nothing when graduate from high schools. What we see in the US, their medical students are already engineers or sometimes PhD in Biology or Chemistry. They have something to contribute during a PBL discussion. We are different. (E1-2-1-3)

But how can medical school choose the 'right' students? TMAC suggests abandon the entrance exam completely and adopt the American way: through application and interview.

We can learn from other countries. You know almost all medical schools choose their students through records, recommendation letters and interviews. The test results are the basic requirement but other things are important too. They will check your service records. The interview methods are quite versatile and you can hardly cheat on it. All the efforts are trying to know if they suitable to become doctors. (E6-2-1-4)

However, T3 questions the fairness of the interview; she is doubtful if she is capable of telling the phoney documents prepared by students. The 'fair' myth is constructed upon a value system that people rely on test result only.

I am not sure if we can depend on interviews only. Students have their ways of handling it. My experience is you cannot tell if he is cheating within 5 or 10 minutes. But time may not be the prime issue, I am not sure if the interview time being prolonged, then I can identify the phoney document. (T3-2-1-5)

T3's worry may arise from her personal experience. T4, who is an experienced professor from FJU, supports that the admission policy should be as diverse as possible. Both E6 and T4 think they are able to pick the right ones.

You can always find ways to tell if they are telling the truth. I think an experienced teacher can do it. If we always count on exams to select students, the exams then will lead learning and teaching, and then nothing will ever change. (T4-2-1-6)

It is not clear if select the right students then all problems will be solved. But it is obvious that not all teachers agree on selecting through interviews. If there is disagreement among teachers, the objection from other parties must be stronger. And it makes the selection method difficult to change.

2-2 Not enough teaching in teaching hospitals

Almost all major hospitals in Taiwan are teaching hospitals. Not that they love to teach, but it is how to get higher reimbursement from the Bureau of National Health Insurance (BNHI). And in order to cut down the cost, some teaching hospitals are paying salaries to medical students training there. Students pay tuition and get salary at the same time.

I have seen many hospitals asked interns or even clerks (Year 5 or 6 medical students) doing the works that are supposed to do by residents, it is not right. If hospitals think they are students, they should not have the badge with the title of 'doctor'. It is cheating. They pay these clerks salary too, and that is why some interns would ask me why they have to pay the tuition. It is completely wrong. (E1-2-2-1)

Students are not happy about their clerkship. They complain that hospitals are not teaching. S1 noticed the difference between public and private hospitals and wondered if it is the reason that doctors won't teach.

I feel no one ever pay attention to our clerkship. People say that T school has the best teaching program. They are well prepared; I mean all the doctors know who will come and what they should teach. I do not know if it has something to do with the hospitals. You know our teaching hospitals are all profit-oriented. T is public... I am not sure if it is the reason. (S1-2-2-2)

All the residents are extremely busy...sometime they don't even have time to eat. Under such circumstances, how can you keep on asking questions? How can you expect them to teach you anything? (S1-2-2-3, abstract from S1-3-4-1)

Instead of waiting to be assigned a patient to work on, S2 finds his way to reach patients. After all, they have to find ways to learn by themselves, just like in PBL.

Patients are afraid of doctors, even doctors like us. We should approach patients but they will get tired too if we keep on asking them questions. I put my focus on the patient hospitalized through the emergency; it is the time easier to approach them... It is difficult at first, but you have to start anyway. We have to find our ways to learn, no one is waiting there for us, and everyone is so busy you know. (S2-2-2-4)

In general, hospitals do not take seriously their responsibility in teaching. Service is far more important. However, some educators consider students are not so motivated and have to share the responsibilities. E6 for instance, thinks that students today are not motivated.

In terms of residents training, I am sure it is different from what I had thirty years ago. The medical knowledge today is quite different. But when I was a resident, I had the passion, motivation and sincerity to learn. I worked over-time in hospital and thought it was good for me. But I cannot find these on young residents now. Some patients complain that they can hardly find any doctor in the ward after 6pm. I think it is the question of attitude. (E6-2-2-5)

E5 is not a member of TMAC but works on curriculum change from 1990s. He has noticed that students' motivation for learning is deteriorating too. He is trying to do PGY (Post graduate year), a system TMAC does not support.

Our training is too specialized. I am working toward a PGY system that every medical student has to spend his/her first residence year in General Medicine instead of going into a specialty. Maybe it will change our medical students learning behaviour too. Now I know some year 7 students are spending their time in cram schools, they rarely show up in hospital to take care for the patients. (E5-2-2-6)

Hospitals are important places for medical students. From the above quotes one can see that both teachers and students agree on that students benefit little from teaching hospitals unless they are highly motivated.

2-3 Cram schools and the Board Exam

Cram school (Bu-Shi-Ban) is popular in Taiwan's culture. There are different Bu-Shi-Bans for different licensures. Many medical students attend cram schools for the Board Exam. Among the five student interviewees, two are in.

And they think going there has made them confident in passing the Board Exam.

I am in Bu-Shi-Ban. They are very advanced; we can either watch videos or attend lectures. Well, it is quite expensive all right, more than NTD 100000 (approximately 2000 pounds), but there is no time limit; you can go whenever you want until you pass the exam. I am planning to go more frequently this summer. This is the last summer I have, next year I have to practice in hospital. (S3-2-3-1)

I started Bu-Shi-Ban last summer. I became more confident after I went there. They play videos and have highlights for us, tell you what will come out in the Board Exam. I am surprised how well organized they are. (S4-2-3-2)

S5 did not go but she was impressed by how they run the business, including helping students with school works. She noticed that some cram schools even prepare materials for PBL and concluded that the spirit of PBL is lost.

I did not go, but I know many did, I think 80 to 90 % of my classmates. Year 3 and 4 are even higher. Taiwan's education system teaches us to take all the exams. But you have to admit that Bu-Shi-Ban is good at doing business. You know their teachers will collect and summarize everything. Students sometimes just bring it into PBL. Really, I think PBL now is already different from what we had two years ago. (S5-2-3-3)

Students worry about if they can pass the exam; teachers on the other hand, consider the format has to change. Just like T4 has said (2-1-6), the exam will lead teaching and learning. Both T4 and T1 are teachers from FJU; they think the traditional testing method is unable to encourage students to think.

If we think teaching them how to think is a right direction, then the exam has to change too. If you still use the old testing method, the students and parents will criticize us and say, see, you have not taught them well. ...Yes it is because the exam still focuses on if you can remember some details. (T1-2-3-4)

T3 is a PBL teacher from another medical school. She is concerned about the ideology behind the exam. She feels that the purpose of the Board Exam is only to fail students. E5 agrees with her on this point.

If the national exam still focuses on trivial things, students will not change their

learning. We know now that they are trying to modify but still cannot see the differences yet. ...The test now is multiple choices and teachers from different schools responsible for it. Sometimes even I feel it is not appropriate. ...Yes you can feel that they just want to fail you, it is too difficult. (T3-2-3-5)

Exam system is a big problem. We are going to change that too. If both teaching and testing modify toward encouraging students to think but not to memorize, then the students will change. The exams in other countries are changing too, the US now test three times, preclinical, clinical and in general practice. But we are still focus on memorizing details, it is not right. (E5-2-3-6)

TMAC is trying to change the exam and the new method has been proposed too. Though not a member of TMAC, T5 is clear about it and thinks students under PBL will be benefit from this new testing method.

I know they are changing the exam. For instance, you will receive a case summary telling 'a 68 years old male, working in a coal mine who has shortness of breath. What questions you should ask and what tests you should make? ' I think PBL experience will be helpful for such an exam. (T5-2-3-7)

Other than the test itself, there are things related to how to produce competent doctors such as the training after they got the licence. But they are governed by different departments. TMAC tries to change the system completely.

We have three different government organizations are connecting with doctors now. First it is the MOE (Ministry of Education) responsible for education, and there is another MOE (Ministry of Examination) responsible for the Board Exams. After they past the exam, it is the MOH (Ministry of Health) giving they licence and governing their training and practice. We are now trying to put these three things together, let one organization takes charge. It is a major change and we are on the way. (E1-2-3-8)

Students will modify their learning style according to the testing method. The healthcare system will influence their perception of good doctoring too. TMAC is aware of all the problems and tries to change them. They draw a picture of 'what should be' in education and healthcare system, and are heading toward it.

2-4 Summary

Except for the curriculum change discussed in the Theme 1, TMAC tries to do some other changes. Issues raised here are: how to select the 'right' medical students, how to improve teaching in hospitals and how to change the current Board Exam.

The evidence shows that while some want to select medical students through interviews, not all agree with it. And from students' experience in hospitals, it is clear that what the students want from hospital is different from hospital can offer. How to enhance the teaching in hospitals is a complex issue. Some examiners attribute it to students' motivation and think that select the motivated students will solve the problem, however, has downplayed the complexity of the issue.

Finally it is about how to change the format of the Board Exam, the training and practicing environment. The examiners from TMAC have a clear picture about 'what ought to be'. But since the accreditation power TMAC holds work on medical schools only, it is hard to tell if hospitals have the incentives for any change.

4.3 Medical school cultures and ethics

Quite often, medical doctors in Taiwan are not only physicians that treat diseases, but also local leaders (Ido 1994). Medical students are clear about their future roles when entering medical schools. They are generally well protected from very young. From the following quotes one can see that basically, they resemble each other.

It in part explains why the education reform in medical schools has not caused major objections. The reform in other fields and levels of education system in Taiwan has caused a lot of disputes among teachers, parents and students. In contrast, medical students and especially their parents don't question how and what to teach in medical schools as long as the students become doctors after graduation. They are clear about the purpose of medical education and thus care less about the process.

In this section, the evidence shows how students form a special culture of their own (Theme 3) and how they see their future roles (Theme 4). One can see the cultural capital students generally hold and how they are influenced by the hidden curriculum.

4.3.1 Theme 3—Medical students are different

Medical school is a place carrying special cultures. Because of conducting PBL, FJU bears some characteristics very different from other medical schools. In this theme, some characteristics that are held by most medical students will be discussed too.

Historically, medical doctors in Taiwan were not only physicians but politically involved (Ido 1994). Things have changed now but basically practice medicine is still a respected profession. Government policy on restricting the number of physicians has made the admission of medical schools highly competitive. Generally, only those 'good' and 'clever' students are able to get in.

In theme 3 there are evidence of how medical students are brought up and how they see themselves as different from others. How medical schools form a

culture that only grade counts, how students think they are better than others and how hospitals interact with school culture are being discussed.

3-1 It's a family business

Students interviewed know they are carefully planned by their parents to finally get into medical schools. Three of the five students come from teacher families that emphasize children education and the other two from government officials. It coincides with previous study on medical students' background in Taiwan that they general come from high socioeconomic families (Chang 2005).

In the following quote, S1 says that even his mother tries to select friend for him, he still have some from different social class. There is clear evidence of cultural capital.

I used to have neighbours doing small business and they are my friends even after I became a medical student. ...Most of medical students are being over-protected; their friends are usually being selected. My mother selects friend for me too, but still I have some friends from different background. (S1-3-1-1)

Physician is one of the professions in Taiwan that shows family clustered tendency. Though none of the five students interviewed came from doctor families, one can find this tendency in the teachers and educators interviewees. As pointed out earlier, ten out of twelve interviewees are medical doctors, and among the ten, seven have children who are studying medicine now, either in the US or in Taiwan.

Thus one can see that becoming a doctor is considered as a pride symbol for the whole family. And it is a tradition for doctors' families. If one performs well in school, he usually will be expected to become a doctor.

My parents have not told me to become a doctor, but I know they are pleased I will become one. They are both teachers. So you see I come from a very typical and ordinary family. (S1-3-1-2)

There are many high school graduates retake the entrance exam year after year just to get into medical schools. Sometimes they don't want to be doctors

at first, but as they get into one, usually they follow the route.

I retook the exam. I was admitted to the Department of Pharmacology and everyone advised me to try again. I was not so determined then but if you ask me now I would say it was a right decision. (S5-3-1-3)

S2 was in FJU from a different route. He transferred from Dentistry in another medical school. Here he mentions practicing medicine and making money without being asked. People quite often would connect these two things together, including students themselves.

I transferred from the Department of Dentistry. It is difficult to tell which is better; you know if I stay there, I will practice dentistry next year, and am preparing to make money... (Laugh).... but I still have a long way to go now. It is a matter of choice; I have no complaint on it. (S2-3-1-4)

Becoming a doctor is the parent's expectation and very often it is not the student's. They are in medical schools just because they are good enough to pass all the exams. And here S3 correlated being a doctor with doesn't have to find another job. Similar to S2's above quote.

I do not have any specific goal for my life; I do not have a strong will to become a doctor. I think I just happened to be here. Being a doctor seems not so good now but at least I do not have to worry about where to find a job. (S3-3-1-5)

The above evidence validates worries the examiners express in Theme 2-1 that students in Taiwan are too young to know the meaning of becoming doctors. Furthermore, medical students possess cultural capital and are not aware of it.

In Taiwan, one has to work hard from very young if he wants to become a medical student. Usually family plays a significant role in supporting him financially, psychologically and socially. In the following section is evidence on how medical students consider they belong to one special group.

3-2 Medical students are clever

Overall, medical students know they are clever and are considered as clever too. This 'cleverness' is a symbol of being different from non-medical students and can be seen as part of the cultural capital shared by all medical students, not just for students from FJU.

We are all very clever and no one wants to feel inferior to others. Therefore, I will work harder next time. This is a strong force to push us work harder. (S5-3-2-1, Abstract from S5-6-2-7)

S5 in the above quote takes their cleverness in a positive way in pushing them to work harder. S4 on the other hand shows her identity to medical students as a whole.

Actually, I don't think we would be better than others (students from other medical schools). I mean the abilities to find references. They are clever too; it is impossible for them to just sitting there (in the classroom) listening. They must have learned something too. (S4-3-2-2)

Not only students recognize their cleverness, teachers too, show their confidence on this. But one has to note that most of them come from a similar background just like the students. They are also medical doctors.

They are very clever, we try our best to inspire them and usually during the process, we are inspired by them. I think it is the biggest enjoyment for being a teacher. After we reorganized the curriculum, I could see they become more competent. They are better at looking for references and making presentations... We teach them to think, to solve problems, to approach patients, to search for information. I am happy to know people do feel they are different now. (T3-3-2-3)

I would say no matter which medical school, medical students should have about the same abilities, in intelligence I mean. So if they cannot achieve something in the future, it is us to blame. We must help them to reach their best. (T5-3-2-4)

The following quote signifies how medical doctors see themselves as very different, and usually better than other professions. Doctors today are largely

controlled by lawyers and managers, but E4 does not withhold his contempt on them.

I would say medical education is the best educational system in Taiwan. Structured and organized and owned the best students. I think medical schools are much better than other universities. For instance, I think Law is bad. Management is not good either. However, they turn out to control doctors now. How can you say about it? (E4-3-2-5)

It is not surprising that during medical school years, the concept of 'you are the best of all' will be strengthened over and over again. Medical schools are the places that make medical students become an isolated group and distant from the society and the public. This is how the term 'ivory tower' is used to describe medical society.

3-3 We want to get good grade

E6 once wrote an article on newspaper describing his experience in one medical school.

When I just came back from the US, I still had the habit of leaving 5 to 10 minutes for students to ask questions. But no one ever asked. With the intention to encourage them to ask, I told them once that if no one asked questions that day, the class would go on forever. Finally, there was one raising his hand, 'What you have said today will be in the mid-term exam?' I was so disappointed. (E6, Liberty Times, 2002/03/07)

Medical students are no different from other students in Taiwan that care about grades only. But to tell the truth, if they were not, they will not be able to get into medical schools at all. The following example is given by S1.

My brother is under huge pressures...He is being compared with me all the time. My father kept on telling him that 'you are clever, if only you work harder, you can become no.1'. You see no mother would think her son is stupid, but there is only one no.1 in every class. Why every adult considers it is important? If everyone wants to be no.1, then who will be no.2, 3 or the last one? (S1-3-3-1)

When everyone wants to be the Number One, learning will be distorted. Getting high marks is extremely important for medical students because it

connects directly to their future practice, on the hospital and the specialty one can choose to go into.

Therefore, it is not surprising that there were a lot of disputes on how to grade in PBL.

At first, T4 suggested not to use the traditional grading and have only pass or fail. But his idea was not accepted. FJU came out with a complex system to make it 'fair'.

If we grade according to their performance during the discussion, they cannot learn from the process. We have to take the spirit of PBL into assessment too. I do not think Pass and Fail system is good either. We have to assess them constantly during the term time; we cannot just fail him without doing anything. If you find anyone left behind, you have to help right away, not to wait until the end.

Unfortunately, Ministry of Education (MOE) disagreed with our design. They insisted that we must have exact marks for each student. Moreover, we must have lectures so that students will earn credits. That is why we still have several lectures today; it is only to satisfy MOE. (T4-3-3-2)

But T1 from FJU admits that teachers usually are too kind to fail students. Thus they add test to PBL, then if one fails in the test, school knows what to do.

It is very difficult for a PBL tutor to fail his student. It he did not talk at all during the discussion, theoretically, he should be failed. But our tutors are always too kind to do such a thing. It is the reason we give paper test a higher proportion of the final grades. (T1-3-3-3)

T5 from another medical school has been very careful in giving marks. Here is how he keeps on tracking. He wants to be fair too.

I used to take note during the class to prevent me from confusing or forgetting. You know even though they are less than ten, sometimes I still get confused. I try my best to be fair, so the grade for each section is separate. I mark and give it to my secretary; I do not keep a copy so I will no be affected by general impressions. (T5-3-3-4)

Students show their concerns about grades too. They think grade is necessary

and there should be no exception for PBL. This concern leads to their pursuit for 'correct answer' in PBL. S5 describes how some strive for higher marks in PBL.

We Chinese really know how to survive, even in PBL. You can say we the first year are the genuine, but later on, they are modifying. They get cases from us, and they act according to tutors' preference. I would say sometimes they 'fake'.

What do I mean by this? Well, they know how to do even if they have not studied. They just know how to get good grade. I can give you an example. I may just skim read all the sections that required to study. Then I search for a journal paper and thoroughly read it. When in the class, I will present it as an extra after everyone has finished. Can you imagine how the teacher will be impressed? I can easily get high marks.

Yes, of course we will despise such person. But those who do this won't care. I think you have to be very clever to find out their tricks. (S5-3-3-5)

S1 has noticed the problem too. They basically like PBL but worry that it is being modified. Both of them say that even in FJU, PBL is different from what they had two years ago. The spirit of PBL is lost.

PBL is very complicated. I think you cannot find a way to study it scientifically. Just as you mentioned, the students show great deal of compassions. However, have you ever thought what if they are just pretending? They have to be very aggressive and active or they may fail. Their compassions are confined to the classroom only. I think it is not the spirit of PBL. (S1-3-3-6)

We must have grades. If they do not grade us, then we will be more indifferent to PBL. The reality is we need grades to decide our practicing hospitals, you must have high grade if you want a good hospital. The Board Exam too, you have to pass this before you can do anything.

I know many year 3 and year 4 just copy the way we did. They no longer search for references and just ask us which textbook they should read. For instance, if someone suggests Chapter 19 of Harrison's, then everyone read only that chapter. Have you seen the problem? The variety of PBL is lost. (S5-3-3-7)

Except for competing for higher marks, medical students have a shared value

that things are either 'right' or 'wrong'. They want correct answers for almost everything. T4 has noticed it and considers it one of the benefits of PBL.

I remember when we gave a PBL-like session in the entrance oral tests several years ago, a student told me that he liked the format but better not use it next time, because there was no 'correct' answers for all the issues discussed. He thought it was unfair for selection. But when he become a doctor someday, he will know that usually there is no 'correct' answer. They have to know this as early as possible. (T4-3-3-8)

In medical schools, students are encouraged to search for the right answers. It coincides with pragmatic medical society's general beliefs that competent doctors will make correct diagnosis and solve patients' problems. It explains the worry of pretending or faking in PBL. They are competing for grades too.

3-4 Hospital has different culture

To medical students, hospitals are the other medical schools; they have to spend almost three out of their seven years in hospitals, and perhaps the rest of their life. But hospitals are not places friendly to them.

We have three teaching hospitals, but all are profit-oriented. The doctors there are told to make more money, not to teach... all the residents are extremely busy, each one has to care for up to twenty beds. They don't even have time to eat and have to find time for a nap. Under such conditions, how can you keep on asking them questions? How can you expect them to teach you anything? And you dare not to have any complaints too, because they are those who will grade you. You cannot say anything bad. (S1-3-4-1)

Hospital is the best place for student to learn the realities. They obtain early patient contact from hospitals, but there is something more. For instance, the hierarchy in a hospital is more obvious than in the school. The students soon learn how to survive within the system. HereT3 talks of one of her student's experience.

I had a student last year almost kicked out of school just because he wrote something on the teaching chart that he was not clear why the director make such orders. The hospital considered it is a serious offensive conduct. I think it is not right. Hospital has different culture from school, which I know. But as a teaching hospital, we should not

against the principle of education. (T3-3-4-2)

The hierarchy in hospitals is clear. After passing the Board Exam, students are qualified as doctors. But they are first-year Residents, at the bottom of the tree. Usually they have to spend 4 to 5 years in the residency and longer for subspecialty. Only after that are they able to practice independently. The future looks dim to S3.

When I read in the newspaper that doctors now have to see 100 patients in one morning, I feel tired already. Because in this case even if you want to be a good doctor it is almost impossible. Maybe I will not go to clinical; I don't like the tense relationship between doctors and patients. (S3-3-4-3)

Hospitals are places that shower 'culture shock' on students. Students learn how to take care of patients, but what they have seen in hospital usually contradict what they have learned in school. E3 is not a medical doctor, he teaches medical ethics to medical students. But he feels pessimistic about the future.

What can you expect from them? They don't have mentors, what they see are doctors trying to make money, what do you think they can learn? No matter how you teach them in medical schools, it is useless, because in reality what they saw are different from what you have taught them. It is not just in medical education, I think every sector in our society should be responsible for this. (E3-3-4-4)

Hospitals play an important part in educating medical students. From what have shown, students seem difficult to learn things there, at least not the things on how to be good doctors who really listen and care.

3-5 Summary

In this theme, a picture of medical student in Taiwan has been drawn. They come from doctor, teacher or government official's families. They hold cultural capital that makes them different from others. They may not aware of it, but they do know that they are clever.

This trait is evident since they were still young. They have to outperform most

of their classmates in order to get admitted to medical schools. And they are always trying to be better. Medical students show strong identity toward medical society and though not yet familiar with hospital culture, they will get used to it. In other words, they will be reproduced during the school years. And once they enter hospitals, they will be influenced by the hidden curriculum and become doctors no different from others.

It is evident from the data that students in FJU basically are no different from other medical schools. They are under PBL that encourage critical thinking instead of searching for right answers, but as S1 and S5 have described, students are modifying PBL into a local version. Will it turn out to be, like E3 says, no different no matter how you teach them?

4.3.2 Theme 4—How to become a competent doctor?

Producing good doctors is the basic goal the teachers want to accomplish, but do not know exactly how to do it. There is no consensus on the definition of good doctors, but some basic principles should remain unchanged. The answers can be found in things other than the knowledge taught.

From Theme 3-1 one can see that not all medical students are devoted to be doctors. Thus the characteristics good doctors should possess become mainly the educators' expectations. They consider the following characteristics are important for good doctoring.

4-1 Integrity and courage

Medical doctor is a profession requiring passion and devotion. Just like E1's worry, medical students in Taiwan generally are not devoted to it.

Our students are too young. They have not thought it over why they want to be doctors. It is dangerous and difficult for them. If you want to make money, it is the last place you should come. They are general very clever, with such intelligence, I think doing other things will make them happier, if money can make them happy. ...But as I told you earlier, they are too young to make such decisions. (E1-4-1-1)

Integrity and courage seem to belong to scope of moral education instead of medical education. But many educators interviewed feel that all students should be taught more on these. It is not to say that medical students are comparably less moral, but considering they will enter a profession where high moral standard is required, many agree that the more the better. However, both E1 and E3 think it could be already too late.

I have no intention to give moral education at this stage because it is already too late. We have a lot more to do in medical schools. (E1-4-1-2)

I agree that you are unable to change the students' moral or ethic in the university; still you have to teach them the principles. Who knows, maybe one or two I can influence and that is enough. (E3-4-1-3)

PBL emphasizes the discussion and exchanging of ideas. There is feedback time at the end of each discussion that encourages students to say things about themselves and others. Self reflection or criticism is welcomed. It is quite unusual in Taiwan's education system. Speaking frankly about a person or an issue is somewhat against oriental cultures. S1 says that he has become better at communication.

It is hard to say if I have learnt anything from feedback time. Maybe more like latency effect that I cannot feel it myself. Some relatives say I have become mature. And I feel I am good at dealing with people now. (S1-4-1-4)

S4 on the other hand feels that she is able to say something that people usually don't want to hear. It is training important for doctors. You have to tell patients the bad news.

Usually I will point out who should work harder in the feedback time, especially when I am the chair. I know some people think I should not say so, but it is for his sake and I think I have made some improvements now. I mean I will say it in a way that he will not get angry at me. (S4-4-1-5)

S3 understands that PBL helps in communication skills, but still he doesn't like the feedback time when someone speaks too frankly. To him, it is 'mean'.

PBL helps me to have better communication with others. However, I do not like the

feedback time, some people speak so harsh on others, and I feel it is not necessary, you do not have to be so mean. (S3-4-1-6)

Telling the truth sometimes will be seen as 'mean' in Taiwan's culture. And there is another phenomenon connected with cultural differences: students' participation. For instance, E3 says students don't talk because in Taiwan they don't have to. They have got used to the passive learning.

Students here do not like to talk, especially in the classroom. Why? I would say it is cultural differences. We are more introspective in general. Of course, it related to one's personality too. Another reason I would say is our teachers always give students the 'right' answers; they do not have to talk or think. Just sitting there listening, this is the way of learning they used to; they are brought up this way. (E3-4-1-7)

T3 agrees that students here rarely ask why. And she refers it to lack of 'justice for truth'.

I feel we are less able in searching for truth. It is nothing to do with ability but the passion. We are too used to multiple choices; it is very competitive but only to get the right number. Not many of us would seek for the truth. I mean we do not have the habit of trying to know why; we don't have 'the justice for truth'. (T3-4-1-8)

Integrity and courage are characters important for a good doctor. The evidence here supports that PBL has helped students to tell the truth, especially in telling something people don't want to know or hear. It may help later when they have to tell the patients bad news. And 'do the right thing' usually takes courage too.

4-2 Social justice and responsibility

A school is built within the society and influenced by it. One should not expect to have a good school out of a bad neighbourhood, and vice versa. Mentors are considered important for young medical students when constructing their own values. In Taiwan, it is getting harder to find one.E6 thinks that the current healthcare system is the one to blame.

Our education system puts too much effort on how to obtain more knowledge but ignore the cultivation of attitude. Attitude is very important to the practice of medicine. I

think it is the result of the healthcare system. We have to change it. (E6-4-2-1)

S1 express his concerns regarding people's value. But he attributes it to the influence of mass media and the commercials. He is not yet a doctor but speaking from a doctor's standpoint.

There is a commercial of Cash Card recently; it encourages youngsters to borrow money and make dreams come true when they are still young. I think youngsters should work from the bottom, but now everyone is encouraging you to skip all the efforts and become success at the top. I feel unhappy about such distortions of values. People see right as wrong and wrong as right, and who knows, maybe all our efforts will be destroyed by missiles from China. (S1-4-2-2)

I feel all the social value is distorted. Do you remember last year there were doctors demonstrating? They tried to raise public awareness of some unfairness in present payment system. And did you see the result? People think doctors are rich and thus they must be wrong. Such value is abnormal. I think the way media covered it should be responsible too. (S1-4-2-3)

E3 has made several comments from the angle of cultural difference to explain how people interpret responsibility differently. Politically he thinks that Taiwan should seek for independence or else people will always afraid to make decisions and won't take responsibilities.

In western religion, we talk about responsibility. We strengthen the importance of us to the community, to the society, but you cannot see the counter parts in our culture. We only consider ourselves, family maybe, but no more. I think it is a very important element but people don't want to touch this part. We think it is a part unable to change so we just assume it does not exist. (E3-4-2-4)

It has something to do with the religion. You know in Buddhism they do good things for themselves; they want a better next life. It is selfish in a way.

What Taiwanese expect for their life? Making more money I would say. But there are many things money cannot buy, for instance, a good night sleep. I think in our education system, we never talk about this, we should do more. (E3-4-2-5)

Taiwan is not a recognized nation and it influences our value too. Some people always

say we should stay what we are, don't have to fight with China. But I would say it is the worst part of Taiwanese culture. We don't make decisions, we think it is destiny; we call it peace-loving. But we should either unify with China or be an independent Taiwan, we must decide....No I don't think it is only a political issue. It is an important value judgment and we should not avoid it. (E3-4-2-6)

E6 says the healthcare system in Taiwan has to be responsible if medical students do not have the right attitude about the practice of medicine. ***(E6-4-2-1)*** He implies that in a profit-oriented system, it is difficult to teach students about values. E3 on the other hand, considers it is politically, religiously and culturally interrelated. There is no right or wrong here but only to show that in terms of the teaching of good doctoring, it is more complicated than one can think of.

4-3 Understanding and mutual respect

It is important for one to think. Teachers consider medical students in Taiwan unequipped with some abilities, including thinking. Also, some teachers say they don't respect people, including patients.

E3 still teaches in Canada, preparation beforehand is how he takes as respect. But he cannot see such students in his medical ethics class in Taiwan.

Our education is teacher-oriented, not student-oriented. If you cannot understand what the teacher says, that is your business. You can say we do not respect students' rights. But on the other hand, students do not respect teachers' either. Do you know what will make a teacher feel he is being respected? I teach in Canada every summer, the students there respect me; they always well prepared to the classroom and always ask a lot of questions. I think it is the best feedback a teacher can have. I call it respect. I have been in Taiwan for eight years; I cannot see any hope here. (E3-4-3-1)

E1 and E6 have been practicing in the US for many years. Both of them have some words about what good doctors should be. They think caring for patients is the most important factor.

There are four Cs required for a doctor, character, common sense, creativity and courage. So you see it is not required to be smart. I have seen one report from Australia that when they change the composition of medical students, there are some interesting

findings.

In Australia the medical students generally come from top 2%, but there were two years they purposely make it different, one is 10% and the other 0.4%. It turned out that those from 0.4% performed poorer than usual. So we know that it is not necessary for medical students to be very brilliant. But they need to have some special characters. (E1-4-3-2)

I hope our students can follow what Dr. Francis More had said, a doctor should help his patient in three ways, his words, his medication and his hands. He is the former director of the Department of Surgery in Harvard Medical School. We have to use words patients can understand, use medication can help patients, and the hands are not just on surgery, they should always be there to comfort patients. (E6-4-3-3)

Indeed knowledge and skills are not what a doctor needs most. T3 recalls what she witnessed in a hospital ward. The issue is not about if the young doctor is skilful, but on that he does not respect that patient at all.

I have seen one young doctor doing endoscope to a dying patient. I was sorry that we didn't teach him how to respect life. We shall at least try to treat the patients just like they are our families. (T3-4-3-4)

In terms of skill, S1 questions on if it is the most important thing for a surgeon. And it is a question he has to find out by himself.

I don't know what kind of doctor I shall become. I know other medical schools train their students' surgery skills. But will it make them better doctors? I really don't know. (S1-4-3-5 Abstract from S1-8-3-8)

A good doctor-patient relationship should be built on mutual respect and understanding, and this could be the most difficult part for students to learn. The ideal of patient-centred care will remain an ideal if things taught in school won't change.

Intellectuals in Taiwan are spoiled. Doctors are likewise, they are high in the hierarchy structure. It is also true in other countries but I would say not as serious as in Taiwan. China too, is very serious. Both are depending on Qwian-Xi (relationship) to do many things. You have to know somebody to have things done.

We would do anything to reach the goal, I mean anything. The respect between human beings is disappearing. We are too ego-centered. Everyone considers he is the most important. (E3-4-3-6)

Patient-centred care is what we should strive for. Our medical education should keep on reminding our students all the time. Everything we do, patients should be our first priority. If keep this in mind, I think we will not get stray in what to teach in medical schools. (E1-4-3-7)

What E1 has said, patient-centred care, is not related to most people's experience. Most of teaching hospitals are unable to teach this part either because they are not offering this service to patients. Thus just like E3 said earlier in 3-4-4, no matter how they are taught in medical schools, students will become similar products once they become doctors.

4.4 Summary

Medical education is unique in that both medical schools and hospitals are responsible for the teaching. However, not only there is rarely any teaching in hospitals, the culture of medical schools and hospitals is deteriorating students' perception of good doctoring.

In Theme 4 there are characteristics suggested by several educators about the components of a good doctor. However, it is difficult for students to find one in the current healthcare system. The schooling process only made them resemble each other and kept them distant to patients. How to communicate with patients is something taught in the classroom, they will become too busy to practice it when become doctors.

So far the questions about the goals of medical reform and the characteristic of medical education in Taiwan have been identified. In the following sections, PBL will be the focus to see if it offers a possibility of change.

4.4 Detriment in basic science and the effectiveness of PBL

Fu-Jen University (FJU) established its medical school in 2000 adopting a completely different curriculum called PBL (Problem-based learning). Although there are some other schools that also claim to conduct PBL, those are mainly traditional lectures with small group discussions. Students from FJU use '**cosmetic PBL**' to describe other school's PBL.

PBL is not the only format of a reformed curriculum. But from the interview data one can see that there are misunderstandings about it. The main concern of PBL is about the learning of basic science. In Theme 5 all teachers being interviewed admitted that it was their major concern. But not all consider it an issue worth the worry. The issue used to be the researcher's major concern too when beginning the research. But in the end, after have reviewed the related papers and data collected from the interviewees, it became trivial.

In Theme 6 there are explorations of the effectiveness of PBL. Some characteristics have been identified including communication skills, English proficiency, cooperation and active learning. But under the current system, they will not reflect on the test result.

4.4.1 Theme 5--PBL and debate on the basic science

Students entering this research are FJU's first class, admitted in the year 2000 and are expected to graduate in 2007. They can be seen as the pilot of PBL in Taiwan and the memory of their first contact with PBL was still vivid when being interviewed in 2005.

They knew nothing about PBL when entering FJU. It is understandable because many teachers knew no more either. The biggest worry is on basic science learning at first, but the data shows that students turn out to be confident on this teaching philosophy.

5-1 Mixed feelings toward PBL

When being interviewed, the students interviewed were at their fifth year and spent most of their time in teaching hospitals. Their practice time is one year earlier than other schools because of the design of PBL. All of them have only 'heard of' PBL when being admitted in 2000.

I heard of PBL at the reception party held by the school. Even by then, PBL was just a term to us. We did not know how it is different from the system we knew. (S1-5-1-1)

I consider it as my destiny. It is impossible for me to know this when I was in high school. I am in FJU because my grade just fit in. That is all. (S3-5-1-2)

However, even if they knew PBL, the result could still be the same. S5 says it is because PBL is something you know only after you really do it.

We heard of PBL at the first two years. School did give us many introductions. We know that there will be a case, and then we have to make hypothesis from it. After some studying and reading by ourselves, we then have to present what we have studied and have discussions within our group. It sounds easy but when you sit in the PBL room, it is very different. You have to run it once then you know what it is like. (S5-5-1-3)

Almost everyone have a vivid memory of PBL. Like PBL or not, they all have their reasons and it is interesting to know. For instance, S5 still remembered her first PBL.

We know nothing when in year 3. I still remember we have a case about a patient has fever. And you know the first thing in PBL is to make hypothesis. Then one of us say 'common cold' and then it is silence. (Laugh) Six of us just sitting there and did not know what to say next. (S5-5-1-4)

S3 is pessimistic and always worry. S4 is optimistic and considers PBL a challenge. She worries too, about basic science.

In the adapting stage I was very frustrated. You know we have PBL on every Monday, Wednesday and Friday mornings. I was tired and confused, because usually I did not have a clear concept about the topic but still I had to talk about it. I always worry about

if I can survive tomorrow. (S3-5-1-5)

PBL basically is very challenging. If you want to be better, you can. But if you give up, then it is easy to fool around too. I think I benefited from PBL, especially in that I can speak in public now. But I am not so good in basic science. (S4-5-1-6)

The worries toward PBL have become something S2 is proud of now. PBL makes them different from other medical schools' students. And above all, he knows now that he is competent.

I was so afraid of PBL that I could not fall asleep the night before our first PBL. And the first case was a nightmare. I remember we ought to read four or five topics, but I could not finish even one. That was really scaring. ...Now? I am proud of us you know. Even some year 6 students from other schools think we are tough. Because they always carry some notes with them but we have nothing. 'You have no teachers and can go this far, amazing.' It is what they have told me. (Laugh) (S2-5-1-7)

The confidence shown on these students is evident. But the confidence seems to occur after they go to hospitals and have the chance to work with year 6 students from other medical schools. During school days, they felt insecure about PBL too. It is a point worth further study.

5-2 They are doing cosmetic PBL

Cosmetic PBL is a term invented by FJU students in describing some other schools that have only a few courses using PBL.

I have asked other schools' students. They told me that their PBL is easy to manage. They usually have only one course use small group discussion. And it will not affect their grade very much so no one really pay attention to it. ...Yes, they told me they just have to 'In-Fu' it. (In-Fu in Chinese means to handle or manage.) (S3-5-2-1)

Someone told me he doesn't like PBL. But it is OK in their school; PBL is only cosmetic for them. They will not be graded on PBL, so they have only to 'In-Fu' it. (S5-5-2-2)

Students from FJU are pretty aware of the status of PBL in other schools. They are clear about it thus say they are just doing cosmetic PBL. Schools need to

do PBL to show they are reforming.

However, T5 who in charge of another medical school's curriculum change is sensitive about the term. He wants to know the definition of cosmetic.

I think we should clarify what cosmetic PBL is. Is the proportion or the process our major concern? I think it is not fair just by looking at how many courses in the syllabus and decides that it is only cosmetic....Yes, we have now only one course, Pathological Physiology on year 4, uses the format of PBL. There is another two on year 2 and 5, Communication and Ethic; they have combined lectures and PBL. (T5-5-2-3)

Basically all medical schools have similar strategy to T5's school, starting with one or two courses using PBL. For them, PBL is small class teaching with case studies. But students still depend on teachers to 'feed' them; PBL is not the main course. The spirit of PBL is not there.

5-3 The fear has disappeared

PBL is a different learning experience and students worry. The major worry is on if they will be able to pass the Board Exam. And just as S4 said in 5-1-6, their major concern is in basic science.

Basic science refers to some basic human knowledge required for making clinical judgment. Here it narrows down to some subjects taught in schools such as Anatomy, Physiology, and Pharmacology and so on.

Here is how S1 compare lectures and self learning. He says that in lectures, teachers just mention some terms, but if he reads he usually finds more from books.

During lectures, teachers can teach us general things. They will summarize for us, but still it is impossible for them to teach us ALL the materials. In addition, I find out that things they give us are fragmental, not in depth. Most of the time, they just mention the names, and usually when I look up in the books I can learn more. I feel I can have more during the same time by self-learning. (S1-5-3-1)

S5 admits that she used to worry about not good enough because of PBL.

After she practices in hospitals, she finds out that others have learned it before but forgotten already. It is a relief to many of them.

I used to feel that we are deficient in basic science, because you know we do not have teachers to give us the whole picture. However, the fear disappeared after I went to hospital and had chances to compare with others. They have learned it all but they have forgotten most of it already. It is really a relief to me. Even though they have all the lectures, they are not better than us. (S5-5-3-2)

S3 and S4 both give examples to show the difference between traditional lecture and PBL. Both know all the pros and cons of PBL but just not sure if it is true. Medical students generally don't want to be left behind, thus they suggest extending the PBL year from two to three.

When we see a patient with sputum, we can make all kinds of hypothesis. We are good at this you know. However, other school students have criteria; they use it to make differential diagnosis, get the answer right away and we are still guessing. Moreover, they know many diseases; know epidemiology and mechanism, things like that.

I know they get all these from the teachers. They just memorize it and we spend our time on the process. But I feel very tired and am not sure if we are going to be better. I know the theory of PBL but am not so sure....Maybe we should do PBL from year 3 to 5 and go to hospital on year 6, maybe it will be more relax for us. (S3-5-3-3)

I think I can have more basic knowledge at this stage if we were not PBL. For instance, if I have a list of disease indicators or diagnosis criteria, I will feel more comfortable. Others have it from their lecture notes but we do not have such things.

I know the habit of life-long learning is more important and it is the spirit of PBL. I agree with this. But if you give traditional curriculum two years then we PBL should have more time. With longer time, I think we will be equally good in basic science but better at communication. We are limited by the time now. (S4-5-3-4)

S5 too, suggests learning more so that when seeing something in the future, they will know what it is because they have already learned it before.

I still think we should learn more in basic science. Well, like in Microbiology, if we have studied more 'worms' in school, we will have better diagnosis skill now. Sometimes the

resident was showing off by saying that he saw a patient last year and reached the diagnosis before he got the test results. Because he knew the route of infection of certain bacteria and it was related to clinical symptoms. ...Yes, if we have studied more, we can use them to make better and faster diagnosis.

We have to know some classical diseases too. For instance, we have to tell from a chest X ray and know what is normal, what is being operated, what is Tuberculosis etc. I may not have chance to see one such patient in my whole life, but once you see it, you have to know. You cannot tell the patient that let me check the book first. You see, we have a lot to learn. (S5-5-3-5)

It is impressive from the above data that all the students want to learn more. To the researcher, they have already shown the characteristic of life-long learning which is considered as one of the benefit of PBL. Because just as West has said forty years ago that part of what is taught in medical school is wrong and much is quickly forgotten (West 1966), there should be no 'learned enough' in medicine.

5-4 There is no 'enough' in basic knowledge

Teachers' opinions on students' requests of learning more are complicated, depending on their standpoints. T1 puts her efforts on curriculum design and feels discouraged because of the feedback. She says that there is no enough in basic knowledge.

All the studies show that students like PBL, but our students lack confidence. Perhaps it is because we don't have graduates, we haven't got a chance to compare with others, and so they feel what they have learned is not enough. ...But there is no 'enough' in basic knowledge. Under the traditional lectures, students will get back to their notes to recall. In PBL we don't have such notes. But they cannot say PBL is no good because of this. I think we should not say so...If years later, they find themselves are better at presentation, will they attribute it to PBL and appreciate us? (T1-5-4-1)

T4 on the contrary shows confidence on students. He says once FJU has more graduates and people will know they are better and that is because of PBL.

According to others' experience, I think we don't have to worry about their test results

at all. We are using PPI (Personal Progress Index) to monitor their performance; they will have experience on multiple choice questions from PPI. We don't have to worry about the basic science. There is no cultural difference... Yes, other studies already give us evidence. (T4-5-4-3)

T6 is the basic science teacher in FJU. He suggests that some modifications should be made. It shows that teachers in FJU have different opinions on what and how to teach in PBL. It reflects the conflict between basic and clinical teachers too.

Our students don't have knowledge on Physiology. I think it is the most deficient part. For instance, Pharmacology should be taught after Physiology, I think learn a little bit here and a little bit there, students cannot have a whole picture. Maybe we should teach them Physiology in the first semester and then start PBL. (T6-5-4-2)

But not only students at FJU show their anxiety, another school with a smaller degree of PBL has similar situation among students. The teacher thinks it is normal and she says it is because of the Board Exam.

Our students show their worries too. They think the teachers do not teach as much as they used to be. But actually we have done a lot of integration. What we give is not less.

It is normal for them to worry. I think both teachers and students will worry. The main reason is the Board Exam. If the exam still uses the traditional way, we have to give students all the materials so that they can 'soak in'. If they cannot pass the exam, it is their fault for not working hard. However, if we have not dumped everything on them, they will blame us for not doing our job.

We all know that we cannot remember everything. We have been through these before; we know there is only a certain percentage memorized can stay with us. (T3-5-4-4)

If there are students clearly not learning enough, can one say it is because of PBL? Both E2 and T1 agree that there are always good and bad students in every class; it should have nothing to do with the teaching method used.

Some of them have not even heard of several basic terms. These are things a year 5 student should know. I think it perhaps is because of PBL, they have learned only a few cases. But not everyone, some still are quite good. However, there are a few really being

left behind. But I don't know if it is because of PBL. (E2-5-4-5)

We can always find good students and bad students in one class. The bad students may play all the way down until one day they become doctors and perhaps, only when they being sued will they regret. There is really not much we can do; such students are always there, in the traditional lectures or PBL. (T1-5-4-6)

Some teachers believe that only lectures can help students learn. T6 is a typical basic teacher. He wants to give students lecture after PBL, to make sure students have learned.

If we let students have PBL only and don't give them lectures afterward, I think it is dangerous. They could miss something that is important. I think test is important for us and students to know how much they have learned. But in PBL we are difficult to assess. ...I mean to give them lectures after PBL, we can summarize for them. (T6-5-4-7)

The above quote validates that the pressure of the implementation of PBL usually comes from faculties in the basic science departments. It shows that T6 still holds the banking concept in education which contradicts the spirit of PBL.

5-5 Prior knowledge is not required

From reviewing papers in PBL, 'prior knowledge' is not necessary for discussion to go on. It is interesting that those who have been doing PBL agree with it, but those who are not familiar with PBL argue that without some understanding of the topic, the discussion will be superficial.

E1 has a bad experience during his on-site examination thus questions about the prior knowledge the student ought to have. But he says that if the teacher has prepared, the process will be different. It shows the expertise required in PBL is very often being underestimated. And T4 echoes E1 on this point.

Once I saw a student presenting a paper he found in internet. He himself did not understand it very well. His team-mates were unable to know more than he was. The tutor I think was a gynaecologist and was not familiar with the topic either. So you can imagine how the discussion must be going nowhere. I remember it was something

about the mechanism of a pain killer. If I were the tutor, I would have some preparation; in that case I can give students some hints or directions. It is what teachers should do.

So maybe the problem is not on PBL is good or not. It is on whether one is prepared. If the teacher had done his homework, I think the process would be different. (E1-5-5-1)

The main reason is on tutors. If you have real good tutors, they will know how to induce people to talk. It needs training. Actually, we have tried on nurses and they have no problem in having real discussions. It is not what they have 'before', PBL focus on what they can get 'after' discussion. (T4-5-5-2)

E3 on the other hand refers prior knowledge as general reasoning skills.

PBL is unsystematic. Students have to know how to do reasoning, have to know how to learn. It starts in one question but maybe ends up with one hundred questions. So you have to know how to walk before you run.

I think in PBL, it assumes you have all these already. However, medical students in Taiwan are different from other countries. They are not ready for discussions. (E3-5-5-3)

Being a basic science teacher, T6 emphasizes on the hierarchical structure of knowledge that one has to learn; for instance, Physiology before anything else. He thinks it is important in medicine, a 'brick-by-brick' sequence.

Medical students in the US or UK, most of them already have a Bachelor Degree. But our students are only high school graduates. Their background is not enough to have any in-depth discussions. That is why I recommend letting them have Physiology first. (T6-5-5-4)

Clinical teachers say prior knowledge is not required in PBL and S4 says too.

It seems unnecessary for the students to have specific knowledge when they start a case. If you are familiar with scenes in PBL, you will know that it is generally daily life things in the first and second scenes. I usually tell them to refer to if it happens on their families. It is possible to make mistakes, but it is a way of learning and it is rare for the whole group to make the same mistake. Even in such case, we can still correct them in the end. (T2-5-5-5)

In PBL you don't need much basic science. Usually we have some general questions and start to look for answers. You will find a lot of information during the process, some are meaningful some are not and you have to make judgment. It has nothing to do with if you have such knowledge before. (S4-5-5-6)

One can see from the above evidence that they have different definitions of 'prior knowledge'. For E1, the knowledge he refers to is the specific topic under discussion. E3 focuses on the reasoning ability and general knowledge one should posses during the discussion. T6 cares more about the foundation knowledge medical students should have. S4 knows that she doesn't have to learn Anatomy before identifying the issues or making the hypotheses.

5-6 Summary

There are several issues discussed in this theme. Students talk about their worries in basic science, if they have learned enough and so on. Teachers too, express their confidence or discontent about this teaching method. Students interviewed generally feel confident about PBL, especially after they have worked with others.

But is there a limit of knowledge acquiring? Some suggest to teach more or to extend the time of learning. Students are aware of active learning but still rely on schools to do more teaching. This is a sign that they are not fully liberated from the current education system.

One can see from the above data too that not all teachers understand and agree with the philosophy of PBL. They still have the concept of teacher is the giver and student is the receiver. From this viewpoint, students seem to be benefited more from PBL, and it is what the next theme will show.

4.4.2 Theme 6—PBL does make a difference

Not all five students have a positive feeling toward PBL, but compared to those who refuse to talk about it, their attitude is more neutral. This is a pre-existing bias the researcher perceived, but was unable to solve. However, the researcher did try to pry students' opinion in general and thus asked questions

such as 'Do you know how others think about it?'

The following items are characteristics the researcher has observed and it is the result of personal judgement.

6-1 Better at communication

The ability to communicate is clearly identified in every student interviewed. It is the characteristic important for their future practice. It is also the ability difficult to teach through the traditional lectures.

I learn how to say one thing differently. For instance, when during the discussion I know for sure that he is wrong, instead of saying 'you are wrong', I will say 'but according to what I have read, the book says.....'

I use the same strategy dealing with my brother you know. When he failed in school, usually I would blame him for not working hard. But now I would say, 'What's happened? Was the teacher difficult to deal with?' And then he would reply that 'Well, my fault too, I did not work hard enough.' You see, it is useful even outside the classroom. The relationship between me and my brother is much better now. (S5-6-1-1)

We have to learn how to talk, especially when in front of others. I think I am now better at making myself understood. It is very helpful when I make presentations. (S3-6-1-2)

I feel myself improved in communication, because I talk more and thus know what the shortcomings are. (S4-6-1-3)

However, not everyone attributes this ability to PBL. For instance, S1 says he has always been good at communication. S2 considers he has improved a lot because of experiences with real patients.

Personally I don't think communication skill is what I have learned most from PBL. I have confidence in communicating with people. It involves a lot of skills. Say different words to different people is a way of communicating too. In PBL, one has to work with different members and different tutors; you have to modify yourself all the time. I know how to do something under certain context, how to have good performance. (S1-6-1-4)

I used to be afraid of patients very much. You know on the day before I came to practice in hospital, I was so nervous that I started to have diarrhoea. (Laugh) I don't know what to talk to them. I am afraid that I cannot find topics to chat with them. ...Now? No problem. (S2-6-1-5)

S3 raises a special viewpoint on how to handle conflicts during the feedback in PBL. He thinks it is ability for his future role as a doctor.

You know there is always this kind of person. He likes to show how good he is and you are wrong. He will say something during feedback that doesn't have to. I mean he will say 'who did not read thoroughly' or things like that. Sometimes we have conflicts. I think it is good for interpersonal relationship though. Conflicts arise when people become familiar with each other. We have to face it in the end. For instance, we have to work with others to take care of one patient. It is a good training for me. (S3-6-1-6)

But the gains in PBL seem to diminish when they enter hospitals. According to E4, hospitals are doing PBL all the time, but S1 doesn't agree.

Teaching in hospitals is PBL. For instance, an 18 years old mother gave birth to a child with deformities. There are a lot to learn, from Anatomy, Histology to how to feed the baby. Socially what kind of problems will the mother face? How to help them? And how can a surgery help? There are so many things we can teach, but I don't know if teachers in basic science are able to teach them all these. (E4-6-1-7)

I have confidence on PBL. And this is why I accept your interview. (Laugh) ...But I don't feel like it very much now. Because I think the hospitals cannot support our learning. You can say that what we have built up in the previous two years has been cancelled out....Well I mean like our communication skills or how to express our ideas. In hospital, a student like me is unable to say anything....Yes, not even ask questions. (S1-6-1-8)

What E4 has described is the things that ought to happen in hospitals. He also questions the abilities of basic teachers. But what S1 has seen in hospital is not the same. And that is why he says that the gain from PBL has gone when they go to hospitals. It echoes what have already shown in theme 2-2 that the quality and quantity of teaching in hospitals.

6-2 Cooperate, not compete

The education system is highly competitive. Students have to be good at taking exams and getting high marks. They still consider grade is important, but on the other hand, all of them mention friendship and cooperation, and consider it is because of PBL.

We 48 have a special connection; you can call it 'revolutionary emotion' if you like. My friends tell me that it is difficult for them to imagine how we can become so close. It is very unusual in university. They usually don't know each other or rarely talk. (S5-6-2-1)

There is always someone left behind. However, when I am the chairperson, I would try my best to give him a hand, to help him out, to serve him the ball so he can show too. I hope everyone can be benefited from this process. (S2-6-2-2)

Yes, we will try to help each other. If we know any special part he is good at, even if I have read it, I will let him talk. He will then have some points...They are not bad students, sometimes they are just not good at talking in public, or maybe they have wrong ways of studying. Anyway, we as a group will help everyone make it. (S4-6-2-3)

Teachers consider it is the advantage of PBL. Even in other schools with a few PBL courses, students behave differently.

They left message on the website saying that the interactions among classmates improved immensely. They used to be distant and the frequent contact in PBL is a new experience for them. (T3-6-2-4)

Students know how to get a good grade during the discussion. The atmosphere of cooperation encourages them to work together instead of competing with each other, because competition is not valued in PBL.

It is important to have teamwork in group discussion. For those like to interrupt, talk too much or pretend to know everything, they cannot get high grades. How do we know? Sometimes the tutors will tell us, sometimes we just know. (S5-6-2-5)

But others consider PBL as very competitive too, but it seems to merge nicely in pushing them to work harder.

In PBL it is competitive and cooperative. When you have something to contribute, people will see it as cooperative, but if you have nothing to say, others will be watching, the tutor is watching too, it is a very competitive situation. (S4-6-2-6)

We have competitions during the discussion. For instance, we may have the same reference at home. Why he knew something that I did not see? Can you see what I mean? We are all very clever and no one wants to feel inferior to others. Therefore, I will work harder next time. This is a strong force to push us work harder. (S5-6-2-7)

One can see from the lines that students cherish the PBL experience. They are strongly connected with each other. This is important for their future practice where peer support is crucial.

6-3 Become active learners

Students complain about extra workload mainly because they have to 'look for' things to learn. In the beginning, it is a disaster:

We were told to 'go home and study'. However, no one knew what to do. We chatted on the computer discussing what to study and everyone felt panic. ..... We had three PBL each week on year 3 and everyday was a nightmare. When the first month finally passed, we were so tired and thought there was no way to survive that semester, and at the end of that semester, we told ourselves that we were half way there. ...When looking back at the end of year 3, we told ourselves, well, we knew what PBL was. ...And it was easy for us in year 4. (S5-6-3-1)

However, the habit of active learning seems to surface years later, at least when they start to practice in hospitals. Generally, they feel there is lot more to learn after going to hospitals, and they show more confidence on PBL.

Hospital is the place you have to learn by yourself. Doctors are all very busy; you have to find questions to ask them; you cannot expect they to be there for you. I am better at asking questions than students from other schools. Well, maybe they are too good to have any questions. I don't know. We have no teachers 'supervising' us now but we still keep on working hard, I think it is the effect of our previous training in PBL. (S4-6-3-2)

I like to know more about the patient. For instance, I will check the report in details, to find out what the figure means and how to interpret those numbers. The questioning ability I think stems from what I have learned in PBL... Compare to other schools, they are one year older than us you know, I think I am better at approaching patients. ...Yes, I think I have to spend more time on skills, no, not communication skill. I mean some standard procedure you have to do when care patients. If I am familiar with it, I have more time to do other things. I won't miss major things and I can learn more. (S2-6-3-3)

We are better at how to approach a question. Perhaps it is from PBL. I think we are one year earlier than others in contact with real patient, but the experience could be even earlier when we were studying cases. (S3-6-3-4)

E2 who works in one teaching hospital and supervises students from different schools shows positive attitude toward FJU students, especially about their clinical abilities.

They maybe one year younger but you really cannot tell from their performance, especially in clinical, they dare to ask all kinds of questions. Some students are not good at basic knowledge but I think it is personal problems. I have seen students from different schools including from Philippines. I would say FJU students in general are quite competent. (E2-6-3-5)

One of the benefits of PBL is the habit of active learning. The question is not on if the students are better than others, but on if they show the motivation to learn. To the researcher, they have proved themselves on it.

6-4 Improvement in English

The PBL case in FJU is written in English but the discussion made in Mandarin. T1 says that school tried to improve the students' English and the outcome is satisfactory.

We don't know if our students are better than other medical schools'. But we ask them to take English Proficiency Test before graduation. ...Language is something will be with you all your life. (T1-6-4-1)

Students are not used to it at first, but two years later, they find themselves

have progressed unexpectedly.

We were quite uncomfortable at first. The school told us that English is the universal language so we must become more acquainted to it. In addition, we have to write charts in English later, and all the papers will be written in English too. Anyway, I just followed and it looked to be a good policy. I feel I have progressed a lot now. (S3-6-4-2)

Now I can finish one page within two or three minutes. You know when I was studying Biochemistry two years ago, I could only read five or six pages in one hour. Not only the speed, I can easily grasp the main point now. I know now that you don't have to look up dictionary all the time. Sometimes you will get lost after you know all the vocabularies; the most important thing is to know what it is. (S5-6-4-3)

S3 recommends that schools give more courses in English. He thinks it is what school can do, and can make FJU different from other medical schools.

We do not have a systemic English education. If the school considers English important, they should give us more on it. Yes, we did have some but they were not good enough. FJU is a huge university; we should have no problem having more tutors in English...I am auditing some English courses at Arts School; it is helpful for my writing, reading and listening. The tutors there are much better. (S3-6-4-4)

English may not be the important issue in PBL. But for students in Taiwan, it is a good way for them to learn clinical cases and English at the same time. This is, of course, a characteristic has not shown in other countries.

6-5 Summary

From the students' response, one can feel they have strong identity toward FJU and PBL. They have shown improvement in communication skills, in English proficiency, in cooperation and in active lifelong learning. All are important for their future practice as medical doctors.

However, these characteristics are not assessed in the current Board Exam and it could explain partly why some students and teachers in FJU are doubt of PBL. Furthermore, how FJU did it affect their attitude toward PBL too. The following evidence will help in clarifying it.

4.5 The PBL experience in FJU

When FJU decided on PBL, faculties didn't know what PBL was, and students didn't know it either.

To faculties in FJU, PBL is just a different method of teaching; it is just a new syllabus. When they realize later that it is not, the students are already there, they have to start anyway, no matter if they are ready. In UK too, there is another medical school facing similar problems (Burton and McDonald 2001). In the following two themes are mainly experiences learned from FJU, the research target of this thesis.

4.5.1 Theme 7--Curriculum, what is it?

Medical teachers in Taiwan, without exception, equate curriculum to content. Under the positivist view of medical education, the teachers are trying to equip their students with all the knowledge necessary to become competent doctors.

There are teachers from other medical schools that having hybrid curriculum being interviewed too. They talk about things that happened during the planning and implementation stage. Their major concern centred on teaching materials.

7-1 Curriculum as content and syllabus

During the interview, there is no one questioning the researcher about the definition of curriculum. Such phenomenon in a way reflects their presumption that curriculum is something that everyone has agreed on, while it is not. The following quotes show how teachers equate curriculum with content or syllabus.

We put some curriculum at fourth year. Year 2 students don't know it, and thus worry that they will be unable to learn enough and go around complaining. It is understandable but they are maybe just too anxious. (T1-7-1-1)

The newest curriculum will ask year 5 and year 6 students to stay in hospitals all the time. (T2-7-1-2)

Such interrelated use of curriculum with subjects, courses and syllabus can be attributed to language use and cultural difference. Curriculum is translated to **'Kier-Chen'** in Mandarin. This word has its special theoretical implication, but it is used by the general public as syllabus in schools.

The main reason lies in people's technocratic tradition toward education that education is always with a specific purpose and the subjects taught in schools become the most convenient things to measure. And it explains why TMAC wants all medical schools start with curriculum change and schools responded to it with a liberal education stage mainly on syllabus rearrangement.

7-2 PBL is just a different teaching method

So what is the teachers' perception of PBL? Among those interviewed, only one (T5) clarified his understanding of PBL. Others all said that they had seen it before so knew about it 'pretty well', but not all of them actually did. For instance, what E1 has seen is not PBL.

The PBL I know is more classical. It means that part of the content I want to teach is defined by students themselves. We will design a clinical case and give it to students for discussion. They will try to find the terms they don't know and look up in the textbooks. And they will try to find the learning issues from the clinical situation we give them. In the next session, students will present what they have found to others. The teacher will audit the whole process. This is the PBL I know of. (T5-7-2-1)

Once I saw a student presenting a paper he found in internet... you can imagine how the discussion must be going nowhere...So maybe the problem is on whether one is prepared. (E1-7-2-2, abstracted from5-5-1)

If one tries to approach PBL from the methodological side, it is very likely his PBL will be no more than pedagogy. But in the medical society, the pragmatic consideration is quite common. E4 is the president of a medical school and shows great interest in medical education. It is very likely that they will start to 'produce' their own manpower in this field, just like how they decided to have

their own medical school and produce their own doctors.

We are trying to set up our own PBL now. Our teachers try to go to different workshops to learn how to do it, how to assess students in particular. We will modify it so it can be applied in our school. I am thinking about offering a medical education degree to physicians in our hospital. I think it is easy; you can spend one year or two to get a Master's degree. In less than five years, we can build our department on medical education. (E4-7-2-3)

Regardless of using PBL or not, medical teachers are trying to teach more effectively, in traditional lectures too.

Once I was in a lecture of Microbiology in Missouri, the tutor impressed me a lot. They gave Virology three hours only; I was so surprised how anyone can cover Virology within three hours. The teacher gave us only three viruses, Influenza virus, AIDS virus and HPV. They are all very common and very important. The teacher had his handout posted on the website and asked students to review it first. The lecture was very interesting, impressive and easy to understand. From that time on, I know lectures can be very different from what we used to know. (T2-7-2-4)

We kept on asking our teachers to cut down their materials. Finally, a model came to life. He is a Cardiologist. He used only 50 slides during an hour's lecture. Many students left message on the website express their gratitude; they said they understand completely about the teacher's lecturing. Later we set 50 slides as a criterion and ask all other doctors to follow. Some are still unable to meet. Actually, 50 is already too many, I use about 65 slides for a two hours session. (T2-7-2-5)

Other than the teaching method, one school had devised a systematic way to assess PBL students. One can see that they plan carefully before the change. They take teaching seriously.

I use the test as the weapon for PBL. I was worried what if PBL failed. I spent about two years in communicating with teachers. They opposed to it very much but finally agreed. Among 240 faculties, 50 participated and only 10 really engaged. We had seven cases for the module. I asked the basic science teacher give five questions from each case, and then I let clinical teacher pick two from it. Therefore, there will be 14 questions in total. The students had to answer only seven questions. I told them not to memorize those trivial details and they were happy about it. They had higher grades and felt the

learning meaningful. (T5-7-2-6)

Meaningful learning experience is something many medical doctors lack. And that is why they think it is important.

7-3 Meaningful learning experience

Learning experience for many medical students is not very pleasant. E5 who initiated the curriculum reform as early as 1992 in another school talked about why he wanted to change the curriculum.

I was unhappy when studying in medical school. The experience was very bad. So when I had the chance to do something, I wanted to make it different. I have two sons; I don't want them go through the same thing like me. (E5-7-3-1)

Indeed many have the same memories of their medical school years.
T5 recalled during the interview that one of his classmates decided to quit medicine in the third year thirty years ago, because he could not endure all the memorizing tasks. PBL seems to help students to solve this problem. The clinical context helps students to remember.

In PBL, we use clinical cases to explain to students the purpose of leaning basic science. You have to let them know the connection between the two. In the past, year 3 medical students might not know why they have to learn this and that, but now we have cases for them, they know it will be useful in the future and they will not feel boring. (T2-7-3-2)

The main thing we did in PBL is to integrate. For instance, in Physiology you have to learn the functions of many Ions. I admit it is difficult to memorize. However, when the ions appear in clinical cases, students will be easier to identify and remember them. The workload is the same but the feeling will be very different. They become touchable. (T3-7-3-3)

T4 is the real believer of PBL. He raises many concepts in PBL and tries to convince as many as he can. T1 on the other hand, does not have the similar confidence. She thinks that some students may take advantage of PBL and spend time on other things.

You have to learn basic medicine through patients, and then you can think from different perspectives later when become a doctor. The traditional way to teach Anatomy, Physiology or Biochemistry separately is not right.

1950s in the US, Case Western University had system-based teaching to solve this problem. Take cardiovascular diseases for instance, they had teachers in Anatomy, Histology, Embryology and Pharmacology to teach related topics from different fields. Perhaps Microbiology too can join to explain the connection between tonsil infection and valves of heart. Clinical doctors will introduce their specialties later. Such knowledge still offered under the format of lectures but the ideas are changing.

PBL is one-step further. You have to learn all these by yourself, going to classroom just give you the opportunity to share and discuss what you have learned and know how other people think and thus perhaps you will think differently. (T4-7-3-4)

We have noticed our students become bipolar, either working hard and benefited from PBL, or making the best of group but does not do his share of study. I would say they have learned only the skin-deep of PBL; the attitude of learning has not changed. I think we need time, we should teach them something different, something they can carry all the way to their practice. (T1-7-3-5)

The above data shows that teachers want to make learning interesting and meaningful. It is how PBL built on. But FJU was not doing well at first.

7-4 FJU was not prepared

Public medical schools in Taiwan are doing better in curriculum reform; the teachers actually are using their private time to reconstruct the curriculum. For them, enthusiasm seems to be the driving force. FJU on the contrary, seems have decided to do PBL overnight. T5 and T2 both work in public medical schools.

We spend several years in collecting data and training teachers. We know if we are not well prepared, the outcome could be serious. And the main reason I started with Pathological Physiology was that I knew even if I failed, the students could still be taught later when they went to Internal Medicine or Surgery later. (T5-7-4-1)

Our first move in 1999 was on year 4 students. Two modules were chosen, Clinical Diagnosis and Experimental Diagnosis. ...These two modules used to be quite relaxed for the students. ...We chose these two as our starting point because we thought even if we failed there was not much to lose. (T2-7-4-2)

E5 who had reformed their curriculum recalls how the students stood out to fight against the reform. He is somewhat proud of what he has accomplished.

I had a pilot on year 4 students in 1992, divided the students into two groups, 32 in small groups teaching and 90 in traditional lectures...they liked it and felt it was a stimulating teaching method. But do you know the other group's reaction? Yes, we all thought they would like to be included in the experiment too, but no, they told me that such teaching could not survive in Taiwan, and thus we had to stop immediately...I determined to show them it is doable, the reform started next semester. (E5-7-4-3)

It is important to point out again that all the schools heading for curriculum change are public schools. FJU is a private Catholic University; obviously they did not have time to go through the experiment but jumped into PBL directly.

In the beginning, we want this new school be different from others. What comes to everyone's mind is the curriculum. You know FJU is the second largest university in Taiwan. We can offer much more versatile courses to our students than most of other medical schools, public or private. ...All the other medical schools are basically located within Medical Universities and the resources are quite limited. Teachers in FJU can support us with a multi-dimensional curriculum. It is our strength.

The other element is the teaching method. T4 has experience and he is interest in PBL too. If FJU wants to have PBL, he insists on doing it comprehensively. We had debate then and finally agreed on it. I thought hybrid would be safer but reconciled in the end. (T1-7-4-4)

Yes, it was all because of me. I was told to do one or two subjects at first but I insisted that if we want to do PBL, we have to do all. If there are still lectures, students will spend their time memorizing things and will not focus on the discussions. We have to put all basic sciences together and teach them through the patient's symptoms. They then know how to think from different aspects when they really see one in the future. You cannot teach them Anatomy, Physiology and Biochemistry separately. They cannot

learn real things that way. (T4-7-4-5)

However, no one expected it to be so difficult. Most of them are medical doctors; they think PBL is just a different method of teaching, no big deal. But it turned out to be a completely different story.

All of us had little knowledge about PBL. We invited experts coming here to give us lectures and held several workshops. We thought Ok we got it, but when we really started, we knew there was a big difference. It was completely different from what we used to know as teaching. (T1-7-4-6)

The above data show that when starting PBL, FJU was not prepared at all. One can say that the school was 'learning by teaching'. However, one has to admit that a whole scale curriculum reform is impossible in an existing school. FJU is able to do it is mainly because it is a new school.

7-5 Summary

Medical people generally confuse curriculum with syllabus and PBL with a teaching method. To them, education is much easier than operation or making diagnosis. The ideology is consistent in that medical doctors think what they do is much more complex and difficult than the other professions.

Data from this theme shows that medical society generally underestimates the difficulties in education. They think PBL is just a different teaching method and it can be easily learned overnight. That is what they have tried on FJU. In the final theme is about what have learned from FJU.

4.5.2 Theme 8—How to do it right?

All medical schools are heading for curriculum change recently. But the main reason FJU can have whole scale PBL is due to their 'freshness.' Being a new school without many senior teachers from the department of basic science, the counterforce is weaker.

Teachers interviewed made suggestions for those who want to reform their

curriculum in the future.

8-1 No time for teaching

Organizing and coordinating departmental affairs is time consuming. And in PBL one needs many cases in advance and prepares detailed tutor's guide. Almost all interviewees suggest that someone ought to take charge of this job.

However, there is no such job-description in any school now. The director of FJU felt herself exhausted, in that she has to be the administrator and course coordinator at the same time.

I try to show tutors and students what is a real discussion. I have tried to do demos in different classes. But I have so many administrative works; I need someone who can focus on curriculum design and research. It is the biggest problem now. .....Yes, we are trying to modify our PBL. But I need people who can work with us and has expertise on this field. I cannot do them all, my time is limited. (T1-8-1-1)

What she has done was not appreciated. For instance, T6 complains about his workload, especially on the time spent in PBL.

I have three mornings doing PBL. It is very time consuming. In traditional lectures, I don't have to spend so much time with students. I just teach. And we are required to do research too. I know that she (T1) video taped some PBL sessions for us to watch. But really, I don't have time to watch it. I think the time problem could be worse for the clinical teachers; they have patients to take care of. ...Yes, time is my biggest problem. (T6-8-1-2)

This is not only applies to teachers in FJU, all university teachers have the similar complaints. They have to do research, to apply for fund, to write papers. They don't want teaching taking too much of their time. Their major task is on research or clinical service, not teaching, and especially not on the time-consuming PBL. As to other schools not doing the same PBL as FJU, they too think someone should be assigned as the course coordinator.

We need some course designers to spend their time on it for sure. I have been to Hong Kong University and I was surprised on the money they spent on the research of PBL.

They have a huge team just do the research. We have nothing, all of us are just part-timer, and it is not the right way to do things right. (T5-8-1-3)

It is evidence shows that teaching is the least important objectives for medical teachers. Course coordinators may share some workload but it is doubtful that the problems will be solved.

8-2 No more guinea pigs

Almost all students interviewed consider themselves the guinea pigs of PBL. FJU did not have sufficient preparation before they started PBL; the students have every reason to say so.

They always told us that you are the first year so you have to tolerate their inexperience. It is not fair for us. We are no different from the second or third year students; we can have our medical school years once only. (S1-8-2-1)

But things are not changing; students don't know what is ahead of them. They don't know about what will happen in year six and seven. And maybe school doesn't know either.

I do not know how school is going to arrange for us next year. I think no one knows, maybe the director herself does not know either. We have so many uncertainties; I think I can only blame myself for being the first year. (S3-8-2-2)

Not everyone feels bad about being a guinea pig. S5 feels that she is precious by school and not many students have the same luck. It is perhaps because of the uncertainty that they have formed a strong bond. And just as T6 says, many first year students show strong identity toward FJU, which is unable to see in the students he teaches now.

I think both school and us are having difficult times. On one hand, we have to go through many trials and errors. On the other, school seems precious you very much. Sometimes we benefit from this situation you know, because they don't know how to do with us. (S5-8-2-3)

I joined FJU lately so didn't have a chance to teach the first year students. But some

colleagues told me that they had strong identity towards FJU, they felt they had some obligation to FJU. It is very different from the students I teach now. The incentive for learning will be different too. (T6-8-2-4)

The above data shows that what has happened to the first year students is unable to change. While there are ethical guidelines for medical experiments, schools should set their own protocols when trying to have some innovations. Or there will be more guinea pigs in education.

8-3 Devoted teachers and a teaching hospital

There are many discussions on the role and the expertise of teachers in PBL. Students have their own observations. Their expectations on teachers are quite different, in terms of giving answers or not.

Teacher is very important in PBL. I think he doesn't have to be the expert. I still remember we had a module in cardiac disease when in year 3. It was about cardiac output. We had the numbers but didn't know the meaning of it.

It was crucial for us before further discussion to go on, but we had no ideas and thus stuck in. If he could just give us a quick answer, it would be easier for us to go ahead. He doesn't have to be an expert on Cardiology, besides, he has tutor guide as his reference.

Oh, I know they cannot give answers, but it is not the answer. It is just the direction. For example, sometimes the patient just returned from a tour but we might not know the significance of it, and if he could just hint that, you should take care of this point, and then we would know. I know school tried not to let specialty doctors be our tutors, (Laugh) yes they are afraid that he starts to give us lectures during PBL. (S5-8-3-1)

Even though S5 says that she knows teachers cannot give answers and she doesn't want answers, but unconsciously, she is still looking for the 'correct' answers. It is evident here again that the 'right answer' culture is rooted. S3 knows what can and cannot for PBL teachers too, and he implies some teachers are not good but still, they are coming back.

I know they cannot give us answers or even directions. They can only lead us. You

know only when we get lost or cannot reach an agreement. We also have to assess tutors but I don't know the outcome. I think they still come back even if I say something bad on them. We have the problem of tutor shortage. (S3-8-3-2)

Indeed, tutor shortage is the biggest problem for FJU. T1 admits it and she says that students in Taiwan are different. It is connected with what have previously been discussed in theme3.

It is important whether we have competent teachers; they are much more in PBL than in traditional curriculum. A good tutor can lead the discussion, it is not just the question of giving answer or not. Of course if we just let students to lead the discussions, the teachers will be easier. But once they start to lead and they are wrong, we have to spend more time to pull them back.

But our students are very different. They argue about grades, about 'correct' answers and even about if the discussion time is too long. I know in other countries, students would ask for extra lessons, but our students grow up in an over-protected environment; they always think it is others' faults.... There are so many cultural differences you never know. If I choose hybrid curriculum at first, I would not have to face all these now. (T1-8-3-3)

E1 has some comments on what PBL teachers ought to be which may not correct. But what he says about FJU being unprepared is agreed with E3's.

I feel that maybe we should ask tutors to be more directing. The tutor can induce them to think, why we come to this conclusion, if we come to the other one, what kind of evidence will I need?

FJU is too audacious. They do not have enough faculties and decide to go. You can say they are totally unequipped. When Harvard had their New Pathway, the teacher students ratio was ten times compare with other medical schools. FJU should ask them what they have. (E1-8-3-4)

I want to have reform in our medical school, and I have visited many schools in different countries in the past few years. I would say FJU is the last one should do PBL. We have more resources but still we are hesitating on if we should do it or not and how to do it right. (E4-8-3-5)

The above criticism may be not fair for FJU because the quality of teaching is unable to quantify. The characteristic of a good teacher is hard to answer.

Before starting PBL, we are thinking about what a good lecture should look like. We cut the lecture time into half, from two hours into one. But you know what happened? The teachers still carry the same materials, they either postpone the dismiss time or speed up. They think it is their responsibility to show all they know. (T2-8-3-6)

Some schools let students to assess teachers. The assessment made by students is not credible either.

Our school started assessment a few years ago. Not only teachers evaluate students, students can evaluate teachers too. Unfortunately, those who seldom show up in the classroom write harsh feedback to their teachers. You can imagine how disappointed those teachers would be about teaching. (E6-8-3-7)

S1, however, gives another viewpoint about what one should expect from his teacher.

I don't know what kind of doctor I shall become. I used to have a teacher in high school who graduated from a famous university. He told us that he felt his teachers did not teach him anything, but still he turned out to be 'not bad'. I am thinking about it recently, exactly what should I expect from my teachers? I know other medical schools train students on surgery skills, but will it make them better doctors? I really don't know.

I am confused too about what is a good teacher. Some have knowledge; have a lot of patients too. But you don't know what they are talking about. Some can express their ideas well, but you may feel they are very superficial. Some have really good relationship with you, but in the end you may suddenly realized that you haven't learned anything from them. It is a very complicate problem. (S1-8-3-8)

Trying to solve the tutor shortage problem, FJU constantly recruits tutors from several nearby hospitals. Doctors need teaching positions for promotions, and FJU exchange their inputs as tutors in PBL. Theoretically, it is a supply and demand relationship to let both sides feel happy.

Teaching position could be an incentive. They come to school once a week but there is no extra time that can be spent on teaching. And the workload in

hospital makes their regular teaching difficult. It makes S1 feel he is wasting his time.

I used to like PBL very much but no longer now. I think the school puts too much effort in year 3 and 4 and does not have a good plan for year 5 and 6. We are now here, but hospitals are not prepared to teach us. The school gave us a lot of training on how to communicate and how to express ourselves but all in vain. We just walk around the wards and see whatever happens to see, I think it is not education. Sometimes there is no one knows we are coming, and when we show up, the nurses will tell us to do whatever we like. Can you understand my feeling? It is not well organized and I feel I am wasting my time.

I think no one can change this. The director writes the clinical tutors notes on what to teach us, but I think only less than half ever read them. Among those read, how many will understand and how many of them really practice it, I really doubt about it. I think the only solution is having our own teaching hospital and training our own teachers. (S1-8-3-9)

Teaching hospital may solve some of the problems but not all. There are many good medical schools without their own teaching hospitals. The main problem then still rests on the faculties; they have to be experienced and motivated.

8-4 Summary

This section focuses on things related to FJU's PBL experience which may be helpful for those wanting to have similar changes in their schools.

It is clear that FJU did not expect PBL to be something so different from the traditional teaching. Under the current budget and structure constraints, FJU is struggling to do its best.

But the main problem could still be rested on the ideology medical people generally hold. As long as they still think that education is for the production of competent doctors, the teaching will focus on the skills and knowledge required during medical practice. A teaching hospital then will serve as the money making place again instead of a hospital that really do the teaching.

4.6 conclusion

In this chapter the interview data is categorized into eight themes. In Theme 1 both students and teachers in FJU expressed their discontent about the examiners from TMAC. The educators interviewed, some of them are examiners, talked about their ideals of the proposed reform. It is clear that the students, the teachers from FJU and the examiners are having different expectations about education. The effectiveness of liberal education stage is raised to show that TMAC is not only culturally incompatible with Taiwan, but also exercising power towards medical schools.

In Theme 2 there are some solid suggestions for the reform, including selecting medical student differently, improving clinical teaching and changing the Board Exam. All these are considered as feasible and are underway.

The above two themes are able to answer the first research question which is about the goals of medical reform in Taiwan and the role of TMAC. From the data, one can see some points that need closer examination. First is about the power relationship between TMAC and the schools/students from FJU. The misunderstanding seems not just the result of lack of communication, but is connected with the ideologies some people hold.

Second is on the measures TMAC is about to take (student pre-selection) and already taken (liberal education stage). It is questionable if these will help to reach the goal of reform on producing competent doctors, but many already question the feasibility and effectiveness of these measures.

In Theme 3 some characteristics of medical students are clearly identified. Students usually come from families that value education and want their children into this profession. Such cultural capital is recognized and considered by some as the tradition of medical society. Furthermore, the hidden curriculum in medical schools (for instance, grade-centred) and in hospitals (for instance, profit-oriented) both influence students' value judgement greatly. All these contribute to medical students' future behaviour when they become medical doctors. They do not only resemble each other day by day, but will be remote from the other social classes.

In Theme 4 several educators express their perceptions of good doctoring including integrity, courage, justice, respect and responsibility which are seen as shared values. However, how these characteristics can be taught is largely unresolved, especially when it is difficult to find mentors in the current profit oriented healthcare system.

Both themes help in answering the second research question in this thesis regarding the characteristics of medical education and the components of medical professionalism. It seems that good doctoring is hard to find, let alone how to teach. What's worse, what have found in Theme 3 basically contradict the characteristics identified in Theme 4.

Theme 5 consists of mainly students' feelings toward PBL, and how they started from not knowing what it was to becoming quite confident about this learning method. They know that there is no 'limit' of any knowledge and learning is possible at any stage and that no 'prior knowledge' is required for PBL. It is a triumph the students have shown over the educators and teachers. Some theoretical arguments about the hierarchy of knowledge and the structure of the PBL in literature are validated in this theme.

Theme 6 shows some characteristics observed of the students interviewed. They are better at communication, notice the importance of cooperation and become active learners. All are important characteristics but are unable to be taught through the traditional subject-based teaching. FJU did not strengthen these either, but the students became different unconsciously.

Theme 5 and 6 are answers to the third research question on the effectiveness of PBL. The evidence is clear when they start to practice in hospitals and have the chance to compare with students from the traditional curriculum. However, whether the effects will sustain after they work in hospitals is questionable.

Finally is about the last question on the implication of FJU. In Theme 7 there is evidence of people's mix-use about curriculum, syllabus and content etc. Also there is evidence of misconception about PBL, even for tutors in FJU. Such misconception is not alone for Taiwan. It implies that the problems occurring in the teaching sites share some similarities worldwide.

Theme 8 offers some suggestions on how to do it right next time. From the

FJU experience, it is identified that good planning (including time, people and money), better management, and a hospital that supports teaching are required. But under the current environment in which medicine has become highly profit oriented, both teachers and educators show a great degree of despair about the future of education.

What can be done to change it? What is the role the students can play during the process? Is there a future for medical education? Will medical students become competent doctors as expected? Will PBL be the answer? In the following chapter, the researcher will try to make her deduction based on the data collected from FJU and this research.

5. Discussions

5.1 Introduction

Traditionally, medicine was a prestigious profession in Taiwan. Doctors cure people's physical ailments and psychological suffering, they were also leaders of the community, had high social status and were much respected (Ido 1994).

Things became different after the commercialization of healthcare system. And it worsened when the National Health Insurance Program was launched in 1995 (Huang 2003). The image of doctors came to a historical low when some of them refused to go to hospitals during the outbreak of SARS in Taiwan in 2004. The public now wants to know what's wrong with medical education. Is there not enough teaching of ethics? And if medical students were educated differently, will they become different from now?

These are questions that cannot be easily answered. Moreover, what is the impact of the changes in healthcare services to medical education? To what extent will it change medical students' attitudes? Will the reformed curriculum make students better prepared for future practice? The educators want to know the answers and it reflects on their urge for the reform.

The researcher tries to answer some issues related to PBL through in-depth interviews with students in FJU and teachers from different medical schools. Some surfacing phenomena indicated that the curriculum could not be treated independently from the social, cultural and political context in which it resides. The reform cannot be isolated from the hierarchical structure within medical society either.

This chapter starts with the researcher's reflections on the limit of this study. Although the researcher has tried to discover as many different opinions as possible, there will always be some voices unheard. But procedures were taken to ensure that the opinions of the interviewed were correctly captured and expressed.

The main body of the discussion will be divided into five issues. They are

based on the researcher's personal perceptions and from the policy angle in relation to current issues of concern in Taiwanese medical education. They derive in part from the research interviews but are also informed by the wider reading undertaken into the Taiwan medical education system. The data from the eight themes are used to address the five issues and constitute, in a sense, a meta-analysis. The observations and suggestions which follow are, therefore, rooted in the data gained from the interview and are clearly identified

It begins with the medical profession in Taiwan. Under its specific cultural, political and historical background, doctors have been a hegemonic group in the healthcare system. People are generally unaware of that and take it for granted. The hegemony exists in the healthcare system between doctors and patients, as well as between doctors and paramedical professionals. It is evident within the hierarchical medical system too, and TMAC is exercising it toward medical schools.

Then the discussion is about issues related to PBL, the major interesting point that encouraged the researcher to pursue this topic. One can see that everyone has his own definition of PBL, and PBL is evolving into a Taiwanese version in FJU. Some people worry about if students in Taiwan are capable of adjusting to this western learning method, but the evidence shows that they have obtained some qualities that are impossible to quantify under the current Board Exams. Teachers in FJU may not know much about emancipation or liberation, but through the practice of PBL tutoring, students show abilities of independent thinking. And it constituted the second and third part of the discussion.

Fourth is on the medical education reform in Taiwan. TMAC has been actively involved in the reforming process. With the accrediting power, TMAC has been the hegemonic party to medical schools in Taiwan. The examiners are mainly medical doctors returned from the US and want to raise Taiwan's medical education to a US standard. The role of TMAC will be examined closely here.

Finally there will reflections on the future of medical education based on FJU's experience. As the healthcare system has become more technology-centred and profit-oriented, medical education has to re-examine their objectives. If medical education should be redirected to fit for a profit-oriented healthcare system, or should serve as a medium that more and more medical students

are able to become emancipated through the process, is an unavoidable task that all medical educators should take.

5.2 Limits of the research

There have been debates among medical education scholars since mid-1990s that refer to the forms and roles that researches should take and play. The definition of medical education research, as some put it, is 'the critical, systematic study of teaching and learning in medicine that includes scholarly analysis of the context, processes and outcomes of all phases of medical educations' (Bligh and Parsell 1999). The researcher agrees with this view.

However, the researcher personally questions Bligh's comment that all the medical education should be patient oriented, because such view reflects the pragmatic view that medical education should be focused on patient related issues. It is without doubt that healthcare service ought to be patient centred, but if medical education confines itself to being patient oriented, some aspects will be left unnoticed. The researcher holds the belief that medical education should aim to educate medical student, whether they want to become doctors in the future or not.

Basically, educational research should be a field available for researchers from both qualitative and quantitative angles, but the ideology of medical people still focuses on the importance of double-blind and randomly controlled trials (Norman 1998; Cribb and Bignold 1999; Albert 2004). The researcher started with a quantitative intention but ended with a qualitatively oriented method. When looking back, the researcher valued the process of learning and inquiring, however, there were some limitations the researcher was unable to resolve.

First is the problem of sampling. Randomized sampling is fundamentally difficult for most educational researchers because the students are always already pre-selected at the school level. Even for research performed at the course level, the randomization is questionable and Harvard's New Pathway is seen as a rare exception (Murray 2002).

The researcher had a similar difficulty when picking FJU as the research target. Students admitted to FJU shared certain characteristics, and school culture may have strengthened it. Though medical students usually are seen as an isolated group, the researcher is cautious not to over-generalize the findings

from FJU. However, on the other hand, what has occurred in FJU is seen in other schools and is validated from the data. Therefore, findings from FJU can be carefully drawn to a bigger picture that medical schools would generally possess.

Second is the problem of negative samples. As the researcher already mentioned in the chapter 3 on research methodology, the students with negative attitudes toward PBL and who refused to be interviewed represent the biggest defect of this research. The researcher tried to get to know their opinions through others but data were quite limited. The negative samples however, show that FJU is the epitome of the medical society because lack of altruism is a general criticism people hold towards this profession. What observed in FJU thus is very likely to happen in other medical schools.

The educators/teachers chosen as key informants are mainly well known scholars and long time medical education advocates. Most of them are recommended as 'the best person to talk on the topic'. All have certain understandings of PBL; either they are doing it or are familiar with PBL. However, even under such circumstances, most of them know little about what others are doing. And that explains why their perception of PBL in FJU is not always correct.

With the above shortcomings, the researcher had to decode the message from the interview data critically. Triangulation became an important task during the process. However, this is subject to the researcher's personal value judgment during the decoding process, which can be referred to as researcher bias that was already mentioned in section 3.4.3.

Last but not least is about the lessons learned in classroom observation. The researcher tried to know how FJU doing PBL and arranged four sessions observation. They may be different from what happened in the interviewees' classrooms but constitute the researcher's prior knowledge. This experience became the guide when making inference or deciding who to interview, which question to ask and how the themes are constructed.

5.3 Medical doctors, the dominant class

To know medical society in Taiwan, one has to start with the history of this island.

Before being colonized by Japan for fifty years from 1895 to 1945, Taiwan had been ruled by Holland, Spain, the Ming and the Manchu Dynasty. During Japan's colonization, practicing medicine was one of the best occupations a Taiwanese could have. It thus became a tradition that all youngsters would strive to go to medical school because it would bring them fame and prosperity when they are saving people's lives. And pretty often, they would become involved in local affairs and become important figures politically (Ido 1994).

Such traditions were overthrown when the autocratic KMT party came from China. During the massacre of February 28 of 1947, many local leaders were killed and many of them were medical doctors. This accident had silenced many of them and helped to make the medical society an isolated group.

5.3.1 Medical students belong to a special class

Doctors represent a special class of the society. Becoming a doctor implies not only having certain social status, but ensures an above average income. Medical students are aware of that (**Theme 3-1**).

Bourdieu's description about student inequality, cultural capital and social class are validated by the students interviewed (**Theme 3-2**). They were well-protected and carefully raised that even friends have to be chosen by their parents. When they finally get into medical schools, the sense of 'we are different' is likely to become stronger. They know they are clever, they are different than general university students, and they are medical students that belong to a special group.

Medical students in Taiwan mainly came from three kinds of families: doctors, teachers and governmental officials (Hsieh 2002; Chang 2005). The three occupations belong to the Bourgeois in Taiwan; they are able and willing to invest in education. As stated earlier that while general universities are

worrying about students' cognitive abilities, medical schools are thinking about how to select students 'not so clever' (**Theme 2-1**). It shows that the educators have already noticed the conformity of medical students and are trying to recruit students from different backgrounds.

However, even if the different recruiting system was conducted fairly and correctly, there is little hope that future doctors will differ from those now being produced. **Theme 3-3** is descriptions on how students compete for good grades and pursuit the correct answers. **Theme 3-4** shows how hospitals are profit-oriented. The effect of hidden curriculum will make medical students resemble each other.

Theoretically, it is not surprise to see medical school having reform but without any changes. However, the researchers discovered some different traits in the students interviewed.

5.3.2 Students from FJU seem to be different

According to E3's experience, it is difficult to make his students talk in the classroom (***E3-4-1-7, 4-3-1***). But what the researcher has observed in FJU's PBL is quite another story. The students are having spontaneous discussions and are well prepared. Of course it can be seen as their strategies to get high grades just as some interviewees mentioned in **Theme 3-2**, but their behaviour are indeed different.

E2 is the Chief Resident in one teaching hospital and has the opportunity to supervise students from various medical schools. He says that students from FJU are good at asking questions (***E2-6-3-5***). S1 feels that he cannot keep on asking question because doctors are too busy (***S1-3-4-1***). S4 says that she is good at asking questions (***S4-6-3-2***). Both imply that they have become a special group in the teaching hospitals.

In **Theme 6** there is more evidence on how students see themselves. They have noticed they are different from students under lectures. Students consider early patient contact as beneficial (**Theme 6-3**). They know they can learn more in hospitals but complain that teaching hospitals are not prepared for teaching (**Theme 3-3**). All these show their abilities of self reflection and critical

thinking. Unconsciously, they are transforming the knowledge learned in the cognitive domain into an analytical level. Or more precisely, their intelligence has shifted from analytical to practical aspect according to Sternberg.

But will these different characteristics be carried with them to their practice? From the previous discussion in 5.3.1, the researcher would say the chances are low. They will very likely to adapt to the new hospital culture and become doctors no different from others. And it is because of the hegemonic nature of this profession.

5.3.3 Doctors are the hegemonic group in a healthcare system

Medical people generally consider them clever and take pride in this trait (**Theme 3-2**). They are not only aware of it; they also try to show it off. And it becomes a pressure for other professions in healthcare systems.

Healthcare requires teamwork from different specialities including doctors, nurses, technicians, social workers and many others. But medical doctors are always the most decisive characters. It is not the question of if they are right or wrong in some situations, but is about their hegemonic roles during the process. E3, the only non-physician educator mentioned that doctors are high in the hierarchy (***E3-4-3-6***).

And this phenomenon can be traced back to their medical school years. In Taiwan, medical schools basically consist of different departments such as pharmacology, dentistry, nursing and the like. But the department of medicine always have the most resources. And once they enter hospitals, quite often medical doctors are the directors of almost every department within a hospital. They can be the director of Accounting, Information, Medical Records and even Nutrition. The so-called teamwork means doctors must be the leader and others are the team members. It is already a very common phenomenon that most people in Taiwan working in the hospitals take for granted.

If one takes the definition of professionalism in section 2.3.2, it is clear that nursing, pharmacology and other paramedical personnel all fall into this category too. But it always is the medical doctor to make decisions. It is what Gramsci refers to that a **common sense** or '**doxa**' has established within

healthcare systems.

Furthermore, when speaking of medical education, all teachers/educators know it is only doctor education referred to. E1 said that with the limited resources, the current medical education reform can only focus on doctors. Other professions can participate later if permitted. It again, shows the doctor's hegemonic role in the healthcare service.

But when it comes to the doctor-patient relationship, when doctors have to work with patients who come from 'the outside world', the problems arise. Doctors and patients could be using the same language but are unable to communicate. It is thus the skill of communication that is gaining more attention in medical schools. However, real communication is not merely based on the language used, and it is thus difficult for doctors to understand patients if being pain, poor or hungry are states that are unknown to them.

Ironically, the situation is coming to a possible solution because of the worsening prospects of the medical profession. If going to medical schools is not as selective at 2% as now, it is anticipated that there will be students from more diversified backgrounds. And they are able to understand the language of disadvantaged patients.

However, according to the theory on culture capital and hidden curriculum, it is very likely that once such a new class is formed within medical schools, it will soon become stereotyped and tries to resemble the existing dominated class. The Ivory Tower then, will keep on producing similar doctors over and over again.

5.4 The story of PBL in Taiwan

At the onset of the study, when it was finally decided on PBL, the researcher equated curriculum with PBL. Starting with a positivist view, not much different from the medical people under study, the researcher considered the curriculum as content and thus put almost all the efforts on uncovering all the details of PBL.

This reflects most people's perception of education. First, education should be content-centred and with a particular objective. Second, a teacher's job is to transmit the pre-selected knowledge to students and thus the content is of utmost importance. Therefore, after a profound literature study about PBL, almost all the interviews were centered on the objectives, the procedure and the effectiveness of PBL. PBL was researched as a tool, the content and a teaching method.

5.4.1 Everyone worries about basic science

When the research began and the researcher started with literature reviews on PBL, issues related to basic science learning were being discussed most often. There are explanations for this.

First, the related papers are generally written by medical professionals and published in journals such as Medical Education or Academic Medicine. What interests their readers is related to the detriment of certain subjects in medicine. It is seen as the most important element in education.

Second, the researcher herself grew up in a society that considers basic science the fundamental element for becoming a competent doctor. Thus it is taken as the indicator for the effectiveness of PBL. If the evidence indeed shows that students haven't learned 'enough' basic science, then the research question is solved, and PBL failed.

However, in **Theme 5-3** and **Theme 5-4** there are students' reflections on how they realized that indeed they don't have to worry about it. 'Not enough learning' thus is no longer an issue in PBL.

If one looks into the reason why basic science learning would become an issue in the first place, then one can see that both teachers and students are taking the content view of the curriculum (PBL) and consider education as merely the transmission of knowledge (Kelly 1989).

It is not only for Taiwan. A survey on medical staffs and medical students shows that the majority view curriculum as synonymous to syllabus (Burton and McDonald 2001). Unconsciously, the medical teachers are approaching curriculum issues from a technocratic tradition. With a pragmatic mind, they see the curriculum as 'materials' to deposit.

5.4.2 Not many know the philosophy of PBL...

PBL has become a popular term in Taiwan because of the educational reform in medical schools. Even though almost everyone interviewed said they know exactly what PBL is, it is however questionable if they really know and which PBL they refer to.

According to the data shown, teachers in FJU have different understandings and opinions about their PBL. T1, T4 and T6 are all PBL tutors in FJU, but their attitudes toward PBL are different. For instance, T6 think students should be lectured first and then start PBL (***T6-5-4-2***, ***T6-5-5-4***), but T4 think if there is still lectures, students won't concentrate on discussions (***T4-7-4-5***).

It shows that the tutors themselves do not agree on the philosophy of PBL. As the literature shows, PBL is not about the format, but about students taking charge of their own learning. They set their own pace and their own learning issues. It must really interest them so they will actively participate. And the best part of it is on clinical transfer, because if the entire scenario is a real case, students will recall it easier years later when in practice.

If tutors in FJU show this discrepancy, there must be more disputes in other schools that have different forms of PBL. According to the researcher's impressions, the students interviewed showed a better consistency than teachers. In **theme 5** there are plenty of their feelings toward PBL. Most of them vividly reflect the spirit of PBL. The emotions come from people who

really live with PBL. As to the teachers, PBL is just their alternative teaching method. They did not benefit from PBL.

5.4.3 ...but claim they do

If tutors from FJU are unable to reach a consensus on PBL, it is even harder for teachers from other schools. But almost all interviewed say they know exactly what PBL is. And the more powerful he is, the more affirmative his tone is.

Under the reform pressure from TMAC, many medical schools pick one or two courses within traditional curricula and label them as PBL. What they do is small group discussion. For them, doing PBL represent their determination and achievement in curriculum reform.

Therefore, when the researcher heard of the term 'cosmetic PBL' for the first time from one of the student interviewed, no further explanation was needed to clarify the term. Indeed one should not judge any school's degree of PBLness just by the number of course under PBL. The question is, when those interviewed comment on the strength or shortcomings of PBL, do they know which PBL are they talking about?

From the literature review on PBL, one can see that knowledge acquisition is still considered as the most important component. Most of the studies and discussions are centred on the basic knowledge and its relationship to reasoning skills. The clinical cases, the problems, are seen as a medium to obtain basic knowledge. Problem solving skills are not the main purpose because the knowledge gained during the process is more important.

However, one can see that if problems are seen as tools to find the missing knowledge, solving problems will unavoidably become the most important goal during the learning process. It is then not much different from the traditional lectures in that both focus on knowledge acquired. From this view, PBL is no more than a teaching methodology that uses a clinical context for students to aid better memorization. But that is not the spirit of PBL, at least not the PBL in this thesis.

5.4.4 Prior knowledge needs clear definition

'Is prior knowledge necessary for PBL?' It was one of the researcher's major concerns when starting the research. It is evident in the data that everyone has his own perception of prior knowledge, and again, a clear definition on prior knowledge is required for further discussions.

For most of the discussions in PBL, people are concerned about only content knowledge or subject knowledge. For instance, T6 considered Physiology as the prior knowledge. But not all take prior knowledge as a specific subject. Some consider it as more general living experiences; thus there is no need to know the chemistry of pain transmission to start a PBL case on toothache. Students can learn it during the process, but not in the beginning.

It is possible that when E1 contended that prior knowledge is a must for discussion (***E1-5-5-1***), he was referring to basic science (cognitive domain) and reasoning abilities (cognitive and affective domains) , not the specific subject to be learned. But if one views this issue from another angle, is there anyone without any prior knowledge? Except for the newborns, everyone has certain prior knowledge. Even according to the pragmatic view that knowledge is being put into an empty room, i.e. human's mind, medical students are not without any prior knowledge, no matter which form of knowledge is referred to.

Medical people have their own culture; they consider knowledge of the human body and disease as more important than others. It reflects in their curriculum that basic science is the most important subject that every medical student should learn. It is not only prior knowledge; it is also 'back to basics', basic science is the fundamental thing.

Thus it is not about if prior knowledge is required for doing PBL, but on who has the power to decide what to teach in FJU. And how PBL is constructed upon clinical cases in order to make learning more efficient basically coincides with the pragmatic nature of medical society. It explains too why PBL is widely adopted by medical schools worldwide.

5.4.5 Cultural shock of PBL

Evidence shows that medical students in Taiwan are very different from other countries. For instance, they are not well-educated ***(E1-1-2-2) (E1-4-1-1)***, rarely participate in classroom discussion ***(E3-4-1-7) (E3-4-3-1)***, don't have the justice for truth ***(T3-4-1-8)***, argue for grades ***(T1-8-3-3)*** and so on. Thus it is questionable if they are able to really enjoy the learning of PBL.

Though teachers consider students will have difficulties in adjusting to this challenging teaching method, students are acting unexpectedly. They show great anxieties at first **(theme 5-1)**, but get used to it pretty soon and even find themselves benefit from it **(Theme 5-3)**.

It implies that when students are said to be reluctant to speak, it is not because they are unable to express their ideas or don't have opinions. The problem could be context related. When there are more than one hundred students in the classroom, when the outcome is assessed through tests that are focus on memorizing trivial details, why would students bother to talk?

When the educators accusing students from Taiwan are not well-educated ***(E1-1-2-1)*** or don't respect teachers ***(E3-4-3-1)***, it is not cultural difference but context issues. When students are put in a small class environment, they will talk. And since grades still valued in the current system, it explains the emergence of 'faking' during discussion and the so-called Taiwan version of PBL **(Theme 3-3)**.

When comparing medical students in Taiwan with other countries, the educators tend to downgrade them without considering the backgrounds. It shows their hegemonic status and will be discussed in the following section. But let's examine what have happened in FJU first.

5.5 All that happened in the teaching site

Being a new school that wanted to be different from all the others, FJU successfully set up its characteristics and made itself known in the medical society of Taiwan.

However, many things that should not happen did happen. In **Theme 7-4** one can see that FJU was planning to conservatively do one or two PBL at first, but because of the insistence of one person, it expanded into what they have today. It could be imagined that tutor training is insufficient. The number of tutors is far below what is required, and the quality is not as expected ***(E1-8-3-4, E4-8-3-5).***

Such decision making process is not unusual in Taiwan. But the management issues will not be covered in details here. Instead, teachers' and students' roles in FJU will be reviewed. The teachers' role in PBL will be discussed first, from the tutors in FJU and be expanded to other schools, trying to identify the characteristics of a good teacher. The possibility of student-centred education will be examined and followed by the benefits observed on FJU's students.

5.5.1 Teaching in PBL is challenging

Influenced by Confucianism, students in Taiwan have an inborn respect for teachers. Children are told to be obedient to school teachers when they entered kindergarten usually at age 4 to 6, and teachers are seen as morally good persons in the society. Today's youngsters may not posses the same respect toward their teachers, even though the profession of teaching is still considered as a good career choice.

How people see teaching and teachers' role are not very different between east and west. Freire in his article uses the concept of banking in describing teachers as depositors and the students as the repositories. He says that

...the more he fills the receptacles, the better a teacher he is. The more meekly the receptacles permit themselves to be filled, the better students they are (Freire 2003, p.57).

The banking concept is evident in all the teachers interviewed. In **Theme 7-4** both T2 and T5 said that even if they failed to teach students properly, there are still chances for students to be taught when they practice in hospitals. It is a widely accepted ideology that students are passively waiting to be taught, and without teachers' deposit, students will stay ignorant. It explains why some teachers don't want to cut down their teaching material (***T2-7-2-5***).

The students interviewed know about the teachers' role in PBL (***S5-8-3-1***), that they should lead the discussion but not give answers or even worse, give lectures. But while knowing the limit of tutors, they still expect them to say more. Unconsciously they are still waiting for the 'correct' answers even under PBL.

Such habits already established in students' as well as in teachers' minds are difficult to break just because of the practice of PBL. Thus when there are discussions on how to prevent one from doing 'just' problem solving in PBL, in reality it is hard to avoid.

Various papers have been showing that PBL teachers don't have to be experts in the topic (Albanese and Mitchell 1993; Johnstone and Biggs 1998; Hamilton 2005). It means that when the problem is about heart failure, the tutor doesn't have to be a cardiologist. A lecturer in Anatomy or a gynaecologist will do too if only they know the principles in PBL. However, it doesn't mean he can be exempted from preparation. What E1 had observed is perfectly true.

So maybe the problem is not on PBL. It is on whether one is prepared. (E1-5-5-1)

It is understandable that medical teachers are overloaded because of the necessity of research and service delivery. It is the same for medical schools everywhere that medical teachers have to teach students, do research and treat patients. There is some criticism about PBL that 'teachers don't teach'. However, both T1 and T6 said in **Theme 8-1** that tutoring in PBL is far more difficult than 'just lecture' in a traditional curriculum.

There are no easy ways of teaching if only one considers teaching seriously. It is not a question of applying PBL or not. There are schools that start to ask students to teach themselves and that change the teacher-student relationship into a dialogue format (Solomon and Crowe 2001; Cate 2004). All these efforts

should shed light on the positivist view of teaching. That teaching is not about if one talks or not during the classroom, but is about putting students at the centre of the teaching and doing things for their best interests.

The practice of PBL influenced medical teachers too. Basic science teachers are forced to learn clinical issues and clinical doctors walk into classrooms for different purposes such as teaching positions in schools. T3 is a clinical teacher. Her experience in teaching is worth looking into.

We try our best to inspire them and usually during the process, we are inspired by them too. I think it is the biggest enjoyment for being a teacher. (T3-3-2-3)

Inspire and being inspired, instead of deposit and withdraw of the banking concept in education, could be a new way of teaching that both teachers and students will benefit from as a result of the learning process.

5.5.2 Student-centred education

Curriculum design should be the fundamental work when starting a new school, but obviously FJU did not take it seriously.

Almost every student said that they did not know FJU was going to use PBL, let alone what PBL was. Teachers also did not know what PBL was at first **(Theme 7-4)**.

There are several possible explanations for this. First, teaching is not a medical school's first priority. Among research, service delivery and teaching, basic science teachers prefer research, and clinical teachers would choose service delivery. Theories of education or pedagogy are not their major concerns.

On the other hand, they think PBL is just a different teaching methodology; it can easily be learned in a few days workshop. Medical doctors indeed have all kinds of short term workshops. They spend the weekend in some resorts and some skills can be easily learned. PBL cannot be more complex than laparoscopy, education is easy. It is validated from E4's quote.

I am thinking about offering a medical education degree to physicians in our hospital. I think it is easy; you can spend one year or two to get a Master's degree. (E4-7-2-3)

The third and most important reason is that a students' right is never an issue in Taiwan. Especially in medical schools, students are the teaching hospitals' future employees and the power relationship is obvious.

Every school would say student-centred education is what they are after. But it is only lip service; schools rarely take students' opinion into account. Teachers and administrators are the dominant class in exercising power toward students under the name of teaching and educating.

From ***Theme 2-2*** there is evidence of how hospitals take medical students as their employees and ignore their responsibilities in teaching. Students question about the phenomenon but are unable to do anything. In the profit centred healthcare system, hospitals are sacrificing students' to earn more profit; the student-centred education is out of the question.

5.5.3 Effectiveness observed

Previous researches have shown that the learning experience in PBL usually is pleasant and enjoyable. Students in FJU express uncertainty about their future, but the pressure comes mainly from the Board Exam and their future practice **(Theme 5-1)**. The characteristics identified in **Theme 6** are almost impossible to quantify using current scientific tools.

Active learning and critical reasoning abilities are considered as the two major benefits of PBL. While the life-long learning habit is clearly identified in **Theme 6-3**, the critical reasoning ability is difficult to find. S1 dares to challenge the powerful persons and expresses his opinions on various social issues. Others have shown the abilities of reflection and self awareness. Here are some examples.

The examiners are all equipped with profound knowledge, but we...have different priorities. (S1-1-2-6)

Conflicts arise when people become familiar with each other. We have to face it in the

end. (S3-6-1-6)

I used to feel that we are deficient in basic science...but the fear disappeared after I went to hospital. (S5-5-3-2)

These are the most significant effectiveness and evidence of PBL the researcher has seen that students are empowered with the ability of critical thinking. It is such self awareness and thinking ability that make everyone unique. Only through the constant dialogue can one grow. But is this ability the result of PBL? There is no evidence of cause-effect relationship here but the training in PBL and habit of thinking independently should be the main reason, and that is related to PBL.

However, only the outcome of the Board Exam is taken into account as the effectiveness of PBL. And it contradicts the purpose of education and the philosophy of PBL. From this point of view, though having whole scale PBL, FJU is not different from other schools.

In summary, there is no real PBL based education in Taiwan because the society does not recognize it, the teachers do not appreciate it, and the system does not allow it.

5.6 The visible hand—TMAC

TMAC is one of the most powerful organizations in medical society in Taiwan. Medical schools seriously follow all the recommendations made by TMAC even though they are not under the jurisdiction of it.

The power of TMAC originates from accreditation, which is connected with every school's reputation and its teaching hospital's reimbursements from health insurance. Some schools may not agree with the standards TMAC takes, but hardly anyone dare to say it bluntly.

The relationship between TMAC and all the medical schools is thus subtle. TMAC is taking a technocratic rationality according to Giroux, but when the examiners are having lunch with students, they are trying to move towards an interpretive rationality that permits dialogue. However, it is not communication **(Theme 1-1)**. The role of TMAC thus requires close examination.

5.6.1 Liberal education stage did not help

Medical students in Taiwan spend seven years in school. Recommended by TMAC, all medical schools now appoint the first two years as liberal education stage that no basic science course is allowed. The next two years are mainly for some required courses in basic science. And in the following three years students have to go to hospitals for clinical training.

Because of the load of basic science subjects during the third and fourth year, some schools used to put Anatomy or Embryology teaching in the students' first two years. TMAC is strongly against it and considers it as a criterion for accreditation.

From the literature review one can see that there are various definitions for liberal education. TMAC and MOE want medical students to be immersed in different forms of knowledge so to become holistic doctors in the future. But the data shows most schools are unable to do it well and some examiners know pretty well too **(Theme 1-2)**. Students in FJU generally benefit from this regulation but most medical universities don't have the resources to support

versatile humanistic courses.

Considering the power that TMAC has and how that is related to the funding, it is understandable that schools have no other way but to follow. TMAC is the hegemonic party to Taiwan's medical society.

Furthermore, it is worth noting that the policy of liberal education first and medical science next basically reflects an ideology of medical people. They consider History, Literature and social sciences that classified as liberal education subjects are in a lower knowledge hierarchy and less important compared to the basic medical sciences such as Microbiology or Anatomy. This however, needs further discussion.

5.6.2 Which knowledge is more important?

Bloom's taxonomy of educational objectives is widely used in curriculum design now (Popham 1972). But the evidence from this research shows that medical people still consider the knowledge in the cognitive domain more important than the other two, affective and psychomotor domain.

TMAC asks schools to have more teaching on ethics and Literature, History and the like before the basic medical knowledge. They think the knowledge of human body or biochemistry should be based on the humanistic subjects. But from Bloom's taxonomy one can see they should be interrelated, not sequential. Learning something categorized in different domain can make the learning more meaningful, easier to transfer and to apply in real life.

Our education system puts too much effort on how to obtain more knowledge but ignore the cultivation of attitude. Attitude is very important to the practice of medicine. (E6-4-2-1)

The 'attitude' mentioned in the above quote, for instance, where should one put that in? It does not belong to any discipline in the liberal education stage; it does not fall into any subject in the basic science stage either. It is difficult for a school to have a course on 'attitude', because then you don't know what to teach, or how to grade it. E6 is a professor on Medical Ethics, he teaches students attitudes, but students think it is a non-important, unnecessary

course.

I know ethic is important too but ethic alone cannot make you a good doctor... (S1-1-2-6)

It is not students who are undermining the importance of ethics or humanistic cultivation that the TMAC wants them to have. Other than the reason that the school is unable to teach it well, the students don't see a need for it to learn. They have different priorities. And this is the result of the technocratic society in which they grow up. They think learning basic medical knowledge will contribute most to their future career as a doctor. In other words, they are trying to become experts, and not general practitioners. Why bother to learn other less important things?

Which knowledge is more important? TMAC tries to set the priority for medical students. It might work in most schools, but in FJU where students are asked to think, they think differently.

5.6.3 Student selection is controversial

TMAC wants to expand the current system of admission in order to have medical students from more diversified backgrounds. Theoretically it should work, but in the highly competitive environment, people are questioning the fairness of this method **(Theme 2-1)**.

With regards to the interview, teachers have different opinions on how they can discover cheatings. But except for the question of fairness, can a different selection method make students more versatile? It depends on the method used and on the purpose of the selection, and most important, on if the person knows what he aims at.

For instance, here follows how one medical school selects its students. Other than the existing tests results, they give the students another test to measure their abilities in doing laboratory experiments. The purpose of the double selection then is not trying to decrease class inequality; on the contrary, it has increased the inequality because only those financially better are able to go to cram schools know how to pass the test.

It is thus dangerous to believe that a different selection method will lead to a different input. Very often it will make the student more highly selected and the original idea of diversity is lost.

But again, the power TMAC holds may decide the future of admittance policy. TMAC is influencing all medical schools through their power in accreditation.

5.7 Some basics in medical education

Up to this point, it is time to ask this question again. What is the purpose of the medical education reform?

Officially written, it is for the students to become competent doctors, and for the patients to have better relationships with their doctors. Eventually, it is hoped that people's health will improve out of the better doctor-patient relationship.

From the above discussions one can see what has already been done. First, all medical schools now forbid student to learn basic medical science in the first two years. Hopefully, according to TMAC, that will help them become more humanistic oriented. But in the present environment, most of the medical schools are unable to make meaningful contributions. They don't have enough faculties to do this; the feedback from students is not good either **(Theme1-1)**.

Secondly, TMAC is trying to change the admission system so that the test results will not be the only consideration during the selecting process. However, even if the worry of fairness can be excluded, there are different ways of doing this. The outcome of it is not clear now as discussed in section 5-6-3.

In this section, some 'what should be done' will be discussed. If the goal of the reform is set as above, then there are a few things that have to be made clear. First, medical schools may have to rethink their missions. Second, the changing healthcare system has to be included, because it is one of the most important factors affecting the basics of medical education. Third, just as patients should be put at the centre of health services, education should be student-centred.

5.7.1 Re-examine the nature of medical education

Medical schools in the US have seen medical education as their 'minor activity' for some time. Other goals such as research and patient care are much more important (Bloom 1988). Medical schools in Taiwan have similar problems too.

...we are required to do research too...the time problem could be worse for the clinical

teachers; they have patients to take care of ... (T6-8-1-2)

In Whitepaper there are discussions on how to increase the quality of teaching through budget and training. However, the neglect of teaching is within the constraint of current system and if it were left unrecognized, the problem will always be there.

Then it is about the missions of medical schools. Different schools may have different wordings but the main and the only objective for medical schools is quite the same: 'to produce competent doctors'.

Doctors in Taiwan are representing a dominant class to the general public. And if hegemony is seen as the ability of dominant groups to establish the 'common sense' of a society, medical doctors have been playing this role successfully in the health service system.

Scholars in higher education argue that education should not focus on training but put more efforts on indoctrination (Margetson 1994). For medical schools in Taiwan, it has never been an issue for two reasons. First, teachers in medical schools generally are medical doctors too. They come from similar social class and hold the same cultural capital. They have the same ideology that medical schools are to produce competent doctors. One of the interviewee E3 agrees on this point and says he is often being questioned on if he is able to teach medical ethics, just because he is not a medical doctor. Second, medical people generally think that education is easy if compare with medicine, E4 says that physicians can easily become expert medical teachers within one or two years.

When medical schools are comprised of the 'like-minded' teachers, there is hardly anyone who would question the 'product' view on objectives. Likewise, it is even harder for them to reflect on the reality that teaching has become the least important work for medical teachers.

From the literature one can see that some countries have already noticed this problem and some programs are being taken (Irby, Cooke et al. 2004). In Taiwan, the problem has not yet been identified. Medical schools keep on producing doctors with their own methods, and expect to have better doctors through curriculum change.

5.7.2 Reform the healthcare system

Medical schools have close relationship with the healthcare delivery system. In the US, the ties had become stronger after the Medicare and Medicaid legislation in 1965. It resulted from the financial incentives of the marketplace and from doctors enjoying much higher salaries and benefits (Ludmerer 2000). In Taiwan, it was quite the same when the Labour Health Insurance Program was launched in 1970s, and things became worse after the 1995's National Health Insurance Program.

From **Theme 3-1** it is evident that medical students connect their future job with making money. Market forces pose a tremendous threat to medical professionalism. Doctors are asked to control cost or maximize profit, and it sometimes violates their commitment to quality of healthcare. Faculty mentoring, internal culture changing and a less commercial hospital could be the solutions. (Ludmerer 1999) But from the data in **Theme 2-2** and **Theme 3-4**, the outlook is dim.

The reason is mainly economical. Doctors, hospitals and the industry of medical technology have formed a vicious cycle that is impossible to break. After taking the political factors and consumers into consideration, the situation is even more complicated.

The demand for healthcare service is the result of the political revolution that advocates a view that health care is a natural right (Bloom 1988). This concept has caused a dramatic change in public attitude and has resulted in an unprecedented demand for medical services. The change is partly because of the increased general affluence; it partly reflects the effectiveness of modern medicine too. The cost of healthcare is getting out of control regardless of people's ability or willingness to pay.

Many of the interviewed perceived the problems but none felt they can be changed. According to E1, E3 and E6, it has something to do with people generally lacking some basic values such as integrity, courage, responsibility and social justice **(Theme 4)**. Under the highly profit-oriented healthcare system, the traditional curriculum seems to be more desirable. Almost every student mentioned that some summarizing materials are helpful in reaching a

quick diagnosis. It is efficient when one has to examine 100 patients in three hours ***(S3-3-4-3, S5-5-3-2, S2-5-1-7).***

It is evident that memorizing some criteria will be helpful if you have only one minute to make the decision. With the concept of deposit in banking education, teachers help to prepare the materials and students try hard to memorize it. When the environment suggests that memorizing is the most effective method of learning, of course both teacher and student would see PBL as inefficient.

The curriculum chosen usually reflects a complex social, cultural, economical and political background. It is clear that students' anxiety toward PBL came from the wider medical environment, not because they are not familiar with this teaching method. If the threat of the Board Exam could be taken away and the practice environment could be improved, PBL could become a pleasant learning experience for them.

5.7.3 Students are partners in the education process

Very often the curriculum reform is made by educational authorities who try to make things better (Macdonald 2003). But the previous discussions have already shown that if the agenda set by TMAC is followed, the reform seems to be facing a dim future.

The data shows that FJU chose to use PBL for two major reasons. FJU wanted to be different from other schools and they consider PBL a better teaching philosophy **(Theme 5-3, 5-4, 7-3, 7-4)**. It is clear that the voices of students have not been considered even though PBL is said to be student-centred.

As to the liberal education stage, medical schools see the curriculum as something they can control. For them, curriculum design is about which subjects to teach and by whom. School administrators care for the power they possess during the process but not on if students have learned.

Schooling used to be a highly regulated behaviour, but it has moved towards an open system with interactive and holistic learning. The introduction of the internet has changed the traditional concept of the school completely. The role of students has evolved from the earlier knowledge receiver to now being the

knowledge-producer (Macdonald 2003).

Schools in Taiwan are not prepared to take students as their partners in the education process, but more are realizing that the school is no longer the main place where people gain information or are getting educated. The computer and the internet are taking part now and the teacher-student relationship is coming into a new era.

Students from FJU worry about the Board Exam, they attend cram schools, they are concerned about grades, they complain about being neglected in hospitals. These anxieties can be found in other medical schools' students too.

However, they have shown some other interesting characteristics. In **theme 6** one can see how they talk about friendship, how they help classmates. They are much better at presenting their ideas and listening to others. These are the positive results that are impossible to show in any multiple-choice test.

During the interview the teachers talked about how to change the exam so that the students can be more properly assessed, but students are far ahead in developing their own ways to survive and in gaining support from external cram schools. They are liberating themselves from the traditional constraints, but that is not the outcome FJU is expecting.

It is thus clear that neither the school nor the teachers are the key persons in the education reform. It is all on the students. But they cannot wait to be told or taught either; it is up to them to find out by themselves. When FJU started PBL, they had not imagined reaching this far, but the philosophy of PBL that encourages critical thinking and active learning, has brought the students to a different world.

6. Conclusion

PBL provides students and teachers in FJU with a different educational experience. To most people in Taiwan, the holistic approach to education (that knowledge and practice are developed as an integrated web) is challenging. Some even considered FJU's brave attempt as a 'silent revolution'.

In the western world, PBL started from a few medical schools more than three decades ago. In Taiwan, it is the medical school too that took the first step. The evidence from this research shows that students in FJU benefited from PBL. The outcome is in accordance with other countries' results.

The benefits here refer to abilities in communication, willingness to cooperate and the habit of life-long learning. However, these are not the characteristics FJU expects. What matters to the institution is the result of the Board Exam. It is understandable for FJU to take such a technocratic view, because the goal of medical schools is to produce competent doctors, and one needs to become a doctor in the first place. Passing the Exam thus is a must.

But if one puts FJU's PBL on a wider platform of medical society, and examines the origin of medical education reform critically, just like the researcher has done, then it is questionable if PBL or any curriculum change will or could make a difference. If medical schools keep on taking 'producing competent doctors' as their prime objective, the 'products' they get will remain quite the same no matter what they do.

Curriculum alone, or more broadly, school only, tends to reproduce students and make them resemble each other. The cultural capital effect is far more prevalent in medical schools than in other educational organizations. And collectively the hegemonic medical society so formed can hardly respond to the society's request for Tomorrow's Doctors.

The objectives of medical education are the basic questions left for all the medical schools to think about. It is not to say that the goal of making a competent doctor is not important. But if medical schools can step back to the fundamentals of education, then the goal of 'competent doctor' will be fulfilled. Curriculum innovations are important, but unless medical people recognize the

inwardness of education, changing the way of teaching alone is not likely to make any difference.

TMAC is composed of a group of brilliant medical doctors who want to give Taiwan's medical education a new look. The intention could be good and the ideals could be noble, but both students and teachers have complaints about such interference. What TMAC wants to do can be seen as a moral and intellectual reform (Simon and Gramsci 1982), in which the whole medical society is trying to build a system of alliance to sustain its hegemony.

As to the doctor patient relationship that TMAC aims to reach, Gramsci suggests that the relation can be seen as one of power and control (Simon and Gramsci 1982). Such a view though, has been neglected due to a fear of Marxism which has been propagandized for more than sixty years in Taiwan. Doctors and patients unavoidably fall into a power relationship and the consent from the patients group has made this relationship justified (Steiner 2000).

Such a relationship is obvious between teachers and students. What PBL wants to strengthen is to facilitate the migration between educators and learners. According to the Freirean conception of education, authority is not bad, but authoritarianism is (Steiner 2000). Both Freire and Gramsci focus on the emancipation of the dominated groups from hegemonic domination and from FJU's PBL, indeed there is a possibility emerging.

However, under the current healthcare system, transformation in the education sites alone seems unable to make real change happen. However, an education system that aims at liberating students, that empowers them with the ability of critical thinking, will help for a better healthcare environment. And it is the value of education to have dreams and offer possibilities.

Several interesting questions arising from this research, including how to foster a more humanistic clinical teaching and learning environment, how to inform the general public of it's rights and responsibilities in terms of doctor patient relationship and how decision makers can come to recognize the inconvenient truth of hegemony etc. Medical society is a territory full of possibilities, double blind controlled test should not be the best option, only after the ideology has been identified will the liberation become possible.

Finally, the researcher has to say that it is she who benefits most from the research. First, the hegemony in medical society is clearly identified during the

process, which answered the researcher's long-time curiosities about various things existed in healthcare system. Second, the purpose of education is self-evident during the process. The researcher used to take the pragmatic view of education that people get educated so they can utilize what they have learned. It is understood now that learning itself is the purpose, and only after the realization of it, learning becomes a joyful experience.

Reference

AAMC. (2004, 2008/05/18). "Educating doctors to provide high quality medical care: A vision for medical education in the US." Retrieved 10/20, 2006.

Albanese, M. (2000). "Problem-based learning: Why curricula are likely to show little effect on knowledge and clinical skills." Medical Education **34**: 729-738.

Albanese, M. and S. Mitchell (1993). "Problem-based learning: A review of literature on its outcomes and implementation issues." Academic Medicine **68**(1): 52-81.

Albert, M. (2004). "Understanding the debate on medical education research: A sociological perspective." Academic Medicine **79**(10): 948-954.

Armstrong, E. G. (1998). A hybrid model of problem-based learning. The challenge of problem-based learning. D. Boud and G. Feletti (ed). London, Kogan Page: 344p.

Ausubel, D. P., J. D. Novak, et al. (1978). Educational psychology : a cognitive view. New York ; London, Holt, Rinehart and Winston.

Barrows, H. S. (1986). "A taxonomy of problem-based learning methods." Medical Education **20**: 482-486.

Barrows, H. S. and R. M. Tamblyn (1980). Problem-Based Learning. An approach to medical education New York, Springer publishing com. inc.

Becker, H. S. (1961). Boys in white : student culture in medical school. Chicago, University of Chicago Press.

Berkson, L. (1993). "Problem-based learning: Have the expectations been met?" Academic Medicine **68**(10): S79-88.

Bligh, J. and G. Parsell (1999). "Research in medical education: finding its place." Medical Education **33**: 162-164.

Bloom, S. W. (1988). "Structure and ideology in medical education: An analysis of resistance to change." Journal of Health and Social Behaviour **29**(4): 294-306.

Boelen, C. (1992). "Medical education reform: the need for global action." Academic Medicine **67**(11): 745-749.

Bordage, G. (1987). "The curriculum: Overload and too general?" Medical Education **18**: 183-188.

Boud, D. and G. Feletti (1998). The challenge of problem-based learning.

London, Kogan Page.
Bourdieu, P. (1976). The school as a conservative force: scholastic and cultural inequalities. Schooling and capitalism : a sociological reader. R. Dale, G. Esland and M. MacDonald (ed). London, Routledge and Kegan Paul [for] the Open University Press: vii,232p.
Bourdieu, P. (1998). Practical reason : on the theory of action. Cambridge, Policy Press.
Burger, W. (2001). "The relation between medical education and the medical profession's world view." Medicine, Health Care and Philosophy **4**: 79-84.
Burton, J. L. and S. McDonald (2001). "Curriculum or syllabus: Which are we reforming?" Medical Teacher **23**(2): 187-191.
Cate, O. T., Snell, L., Mann, K., Vermunt, J. (2004). "Orienting teaching toward the learning process." Academic Medicine **79**(3): 219-228.
Chang, C. (2005). The study of motivation of medical students to be doctors and its influential factors. Taiwan, Tzu Chi University. Master.
Cockerham, W. C. (1995). Medical sociology, New Jersey, Prentice Hall.
Cohen, L., L. Manion, et al. (2003). Research methods in education. London ; New York, Routledge Falmer.
Colliver, J. A. (2000). "Effectiveness of problem-based learning curricula: Research and theory." Academic Medicine **75**(3): 259-266.
Colliver, J. A. (2002). "Educational theory and medical education in practice: A cautionary note for medical school faculty." Academic Medicine **77**(12): 1217-1220.
Colombotos, J. (1988). "Continuities in the sociology of medical education: An introduction." Journal of Health and Social Behaviour **29**: 271-278.
Creswell, J. W. (1998). Qualitative inquiry and research design : choosing among five traditions. Thousand Oaks, Calif. ; London, Sage Publications.
Cribb, A. and S. Bignold (1999). "Towards the reflexive medical school: the hidden curriculum and medical education research." Studies in Higher Education **24**(2): 195-209.
Cruess, R. L. and S. R. Cruess (2006). "Teaching professionalism: general principles." Medical Teacher **28**(3): 205-208.
Curry, L. (2002). Achieving large-scale change in medical education. Kluwer international handbooks of education. G. R. Norman, C. v. d. Vleuten and D. Newble (ed). Dordrecht, Kluwer Academic: 2 v. (xi, 1106 p).
Custers, E. and H. Boshuizen (2000). The psychology of learning. Clinical

reasoning in the health professions. J. Higgs and M. A. Jones (ed). Oxford, Butterworth-Heinemann: xiv, 322 p.

Davis, M. H. and C. B. White (2002). Managing the curriculum and managing change. International handbook of research in medical education. G. R. Norman, C. v. d. Vleuten and D. Newble (ed). Dordrecht, Kluwer Academic: 2 v. (xi, 1106 p).

Distlehorst, L. H., E. Dawson, et al. (2005). "Problem-Based learning outcomes: The glass half-full." Academic Medicine **80**(3): 294-299.

Dochy, F. J. R. C. (1996). Assessment of domain-specific and domain-transcending prior knowledge: entry assessment and the use of profile analysis. Alternatives in assessment of achievements, learning processes and prior knowledge. M. Birenbaum and F. J. R. C. Dochy (ed). Boston ; London, Kluwer Academic: xv,395p.

Donner, R. and H. Bickley (1993). "Problem-based learning in American medical education: an overview." Bulletin of the Medical Library Association **81**(3): 294-298.

Education, M. o. (2006). Accreditation Report 2005. Taipei, Higher Education Evaluation and Accreditation Council of Taiwan. **2007**.

Ehrich, L. C. (2003). Phenomenology: The quest for meaning. Qualitative educational research in action : doing and reflecting. T. A. O'Donoghue and K. Punch (ed). London ; New York, Routledge Falmer: 209 p.

Elstein, A. S., N. Kagan, et al. (1972). "Methods and theory in the study of medical inquiry." Journal of Medical Education **47**(2): 85-92.

Entwistle, N. J. and P. Ramsden (1983). Understanding student learning. London, Croom Helm.

Eva, K. W., A. J. Neville, et al. (1998). "Exploring the etiology of content specificity influencing analogic transfer and problem solving." Academic Medicine **73**(10): S1-S5.

Farrow, R. and G. R. Norman (2003). "The effectiveness of PBL: the debate continue. Is meta-analysis helpful?" Medical Education **37**: 1131-1132.

Flexner, A. (1910). Medical education in the United States and Canada., Carnegie Foundation for the advancement of teaching.

Fraser, S. P. and A. M. Bosanquet (2006). "The curriculum? That's just a unit outline, isn't it?" Studies in Higher Education **31**(3): 269-284.

Freire, P. (2003). From pedagogy of the oppressed. The critical pedagogy reader. A. Darder, M. Batodano and R. D. Torres (ed). New York, Routledge: 524 p.

Gijbels, D., Dochy, F.,Van den Bossche, P., Segers, M. (2005). "Effects of

problem-based learning: A meta-analysis from the angle of assessment." Review of Educational Research **75**(1): 27-61.

Giroux, H. A. (1981). Ideology, culture and the process of schooling. London, Falmer.

Giroux, H. A. (2003). Critical theory and educational practice. The critical pedagogy reader. A. Darder, M. Batodano and R. D. Torres (ed). New York, Routledge: 524 p.

Giroux, H. A. and P. McLaren (1989). Critical pedagogy, the state and cultural struggle. Albany, State University of New York Press.

GMC (2003) "Tomorrow's doctor." DOI: http://www.gmc-uk.org/

Golafshani, N. (2003). "Understanding reliability and validity in qualitative research." The Qualitative Research **8**(4): 597-607.

Goulding, C. (2002). Grounded theory : a practical guide for management, business and market researchers. London, SAGE.

Greckhamer, T. and M. Koro-Ljungberg (2005). "The erosion of a method: examples from grounded theory." International Journal of Qualitative Studies in Education **18**(6): 729-750.

Hafferty, F. W. (1998). "Beyond curriculum reform: Confronting medicine's hidden curriculum." Academic Medicine **73**(4): 403-407.

Hamilton, J. D. (2005). "Problem-based learning: From where to where?" The Clinical Teacher **2**(1): 45-48.

Hammersley, M. (1990). Reading ethnographic research : a critical guide. London, Longman.

Harden, R. M. (1998). "Medical teacher." Medical Teacher **20**(6): 501-502.

Hart, I. (1999). "Best evidence medical education (BEME)." Medical Teacher **21**(5): 453-454.

Hemker, H. C. (1998). "Critical perceptions on problem-based learning." Advances in Health Sciences Education **3**: 71-76.

Hirst, P. H. (1974). Knowledge and the curriculum : a collection of philosophical papers. London, Routledge and Kegan Paul.

Hirst, P. H. and R. S. Peters (1970). The logic of education. London, Routledge & K. Paul.

Hmelo, C. E., Gotterer, G.S., Bransford, J.D. (1997). "A theory-driven approach to assessing the cognitive effects of PBL." Instructional Science **25**: 387-408.

Hsieh, P. S. (2002). Medical education in Taiwan. Taipei, National Taiwan University.

Huang, A. T. (2002). Use you heart, at the right place. Taipei, Common

Wealth.
Huang, C. Y. (2003). Whitepaper for Medical Education. M. O. Education. Taipei, Committee on Medical Education.
Huang, J. T. (2003). The Current Development and Challenges of Higher Education in Taiwan. T. M. Ministry of Education.
Ido, k. (1994). Four hundred years of Taiwan, history and prospect 台灣四百年的歷史與展望 伊藤潔. Taipei, New far east 新遠東.
Irby, D. M., M. Cooke, et al. (2004). "The academy movement: A structural approach to reinvigorating the educational mission." Academic Medicine **79**(8): 729-736.
Johnstone, K. M. and S. F. Biggs (1998). "Problem-based learning: Introduction, analysis and accounting curricula implications." Journal of Accounting Education **16**: 407-427.
Kaufman, D. R. (2000). "Problem-based learning-time to step back?" Medical Education **34**: 510-511.
Kelly, A. V. (1989). The curriculum: theory and practice. London, Paul Chapman.
Khoo, H. E. (2003). "Implementation of problem-based learning in Asian medical schools and students' perceptions of their experience." Medical Education **37**: 401-409.
Kincheloe, J. L. (2005). Critical pedagogy primer. New York, P. Lang.
Knowles, M. S. (1990). The adult learner : a neglected species. Houston, Gulf Publishing.
Leung, K. K. and C. Y. Chen (2003). "Evaluation of the present status of academic family medicine in Taiwan." Asia Pacific Family Medicine **2**: 114-119.
Leung, W. C. (2002). "Why is evidence from ethnographic and discourse research needed in medical education: the case of problem-based learning." Medical Teacher **24**(2): 169-172.
Levine, S. and M. Nanavi. (2004). "Review of education for critical consciousness." Reviews of Paulo Freire's books Retrieved 2007/05/14, from http://www.wier.ca/~daniel_schugurens/freire/slmn.html.
Lin, C. S. (2005). "Medical students' perception of good PBL tutors in Taiwan." Teaching and Learning in Medicine **17**(2): 179-183.
Lin, T. L. (2003). Malpractice and social control, a sociological analysis. Institute of interdisciplinary studies for social sciences. Kaoshung, Taiwan, National Sun Yat-Sen University. PhD.

Lincoln, Y. S. and E. G. Guba (1985). Naturalistic inquiry. Newbury Park, Sage.

Ludmerer, K. M. (1999). "Instilling professionalism in medical education." Journal of American Medical Association **282**(9): 881-882.

Ludmerer, K. M. (2000). Curriculum reform 2000: An analysis, Milbank Memorial Fund.

Macdonald, D. (2003). "Curriculum change and the post-modern world: is the school curriculum-reform movement an anachronism?" Journal of Curriculum Studies **35**(2): 139-149.

Margetson, D. B. (1994). "Current educational reform and the significance of problem-based learning." Studies in Higher Education **19**(1): 5-19.

Margetson, D. B. (1998). Why is problem-based learning a challenge? The challenge of problem-based learning. D. Boud and G. Feletti (ed). London, Kogan Page: 344p.

Margetson, D. B. (1999). "The relation between understanding and practice in problem-based medical education." Medical Education **33**: 359-364.

Margetson, D. B. (2000). "Depth of understanding and excellence of practice: the question of wholeness and problem-based learning." Journal of Evaluation in Clinical Practice **6**(3): 293-303.

Mathison, S. (1988). "Why triangulate?" Educational Researcher **17**(2): 13-17.

Maudsley, G. (1999). "Do we all mean the same thing by 'problem-based learning'? A review of the concepts and a formulation of the ground rules." Academic Medicine **74**(2): 178-185.

Mays, N. and C. Pope (1995). "Qualitative research, rigour and qualitative research." British Medical Journal **311**: 109-112.

McCrorie, P. (2000). "The place of the basic sciences in medical curricula." Medical Education **34**: 594-595.

McLaren, P. (2003). Critical pedagogy: A look at the major concepts. The critical pedagogy reader A. Darder, M. Batodano and R. D. Torres (ed). New York, Routledge: 524 p.

Miflin, B. (2004). "Adult learning, self-directed learning and problem-based learning: deconstructing the connections." Teaching in Higher Education **9**(1): 43-54.

MOE. (2006, 2008/05/18). "Accreditation Report 2005." 2007, from http://www.heeact.org.tw/Medicine/MedicineNews.aspx?F=1.

Moore, G. T., Block, S.D., Style, C.B., Mitchell, R. (1994). "The influence of the New Pathway curriculum on Harvard medical students." Academic Medicine **69**: 983-989.

Moustakas, C. E. (1994). Phenomenological research methods. Thousand Oaks, Calif., Sage.

Murray, E. (2002). "Challenges in educational research." Medical Education **36**: 110-112.

Neufeld, V. R., R. F. Maudsley, et al. (1998). "Educating future physicians for Ontario." Academic Medicine **73**(11): 1133-1148.

Newman, M. (2003). "A pilot systematic review and meta-analysis on the effectiveness of problem-based learning." Retrieved 11/07, 2006, from http://www.ltsn-01.ac.uk/resources/features/pbl.

Norman, G. R. (1988). "Problem-solving skills, solving problems and problem-based learning." Medical Education **22**: 279-286.

Norman, G. R. (1998). Assessment in problem-based learning. The challenge of problem-based learning. D. Boud and G. Feletti (ed). London, Kogan Page: 344p.

Norman, G. R. (1998). "On science, stories, quality and quantity." Advances in Health Science Education **3**: 77-80.

Norman, G. R. (2005). "Research in clinical reasoning: past history and current trends." Medical Education **39**: 418-427.

Norman, G. R. and H. G. Schmidt (1992). "The psychological basis of problem-based learning: A review of the evidence." Academic Medicine **67**: 557-565.

Norman, G. R. and H. G. Schmidt (2000). "Effectiveness of problem-based learning curricula: Theory, practice and paper darts." Medical Education **34**: 721-728.

Papa, F. J. and P. H. Harasym (1999). "Medical curriculum reform in North America, 1765 to the present: A cognitive science perspective." Academic Medicine **74**(2): 154-164.

Patel, V. L., Groen, G.J., Norman, G.R. (1991). "Effects of conventional and problem-based medical curricula on problem solving." Academic Medicine **66**(7): 380-389.

Patton, M. Q. (2002). Qualitative research & evaluation methods. Thousand Oaks, Calif., Sage.

Peters, A. S., R. Greenberger-Rosovsky, et al. (2000). "Long-term outcomes of the New Pathway Program at Harvard Medical School: A randomized controlled trial." Academic Medicine **75**(5): 470-479.

Petersen, S. (1999). "Time for evidence based medical education." British Medical Journal **318**: 1223-1224.

Phenix, P. H. (1975). realms of meaning. Curriculum design. M. Golby, J.

Greenwald and R. West. London, Croom Helm [for] the Open University Press: [6],529,ix p.

Popham, W. J. (1972). An evaluation guidebook: A set of practical guidelines for the educational evaluator. Los Angles, The instructional objective exchange.

Prideaux, D. and J. Bligh (2002). "Research in medical education: Asking the right questions." Medical Education **36**: 1114-1115.

Rees, C., C. Sheard, et al. (2002). "The development of a scale to measure medical students' attitude towards communication skill learning: the communication skill attitude scale(CSAS)." Medical Education **36**: 141-147.

Rees, L. H. (2000). " Medical education in the new millennium. ." Journal of Internal Medicine **248**: 95-101.

Rosinski, E. F. (1971). "The new medical schools and curriculum innovation." Journal of American Medical Association **216**(2): 322-323.

Sargent, L. T. (1969). Contemporary political ideologies : a comparative analysis. Homewood, Ill., Dorsey Press.

Schon, D. A. (1988). From technical rationality to reflection-in-action. Professional judgment : a reader in clinical decision making. J. Dowie and A. Elstein (ed). Cambridge, Cambridge University Press: 565 p.

Silverman, D. (2001). Interpreting qualitative data : methods for analysing talk, text and interaction. London, Sage Publications.

Sleeter, C. and J. Stillman (2005). "Standardizing knowledge in a multicultural society." Curriculum Inquiry **35**(1): 27-46.

Small, P. A. J. and E. Suter (2002). Transitions in basic medical science teaching. International handbook of research in medical education. N. G.R., v. d. V. C. and N. D.I (ed). Dordrecht, Kluwer Academic Publishers.

Solomon, P. and J. Crowe (2001). "Perceptions of student peer tutors in a problem-based learning programme." Medical Teacher **23**(2): 181-186.

Stephenson, A., Higgs, R., Sugarman, J. (2001). "Teaching professional development in medical schools." Lancet **357**: 867-870.

Sternberg, R. J. (1999). "Intelligence as developing expertise." Contemporary Educational Psychology **24**: 359-375.

Strauss, A. L. and J. M. Corbin (1990). Basics of qualitative research : grounded theory procedures and techniques. Newbury Park, Sage.

Tesch, R. (1990). Qualitative research : analysis types and software tools. London, Routledge Falmer.

TMAC. (2006, 2008/05/18). Retrieved Oct.2, 2006, from http://www.nhri.org.tw/nhri_org/mc/main1.html.

University, N. T. (2004). Family, society and medicine. Taipei, Department of social medicine, NTU.

Vernon, D. T. and R. L. Blake (1993). "Does problem-based learning work? A meta-analysis of evaluative research." Academic Medicine **68**(7): 550-563.

Watkins, D. and J. B. Biggs (1996). The Chinese learner : cultural, psychological, and contextual influences. Hong Kong Camberwell, Melbourne, Vic., CERC ; ACER.

Watson, R. T. (2003). "Rediscovering the medical school." Academic Medicine **78**(7): 659-665.

Wear, D. and M. G. Kuczewski (2004). "The professionalism movement: Can we pause?" The American Journal of Bioethics **4**(2): 1-10.

West, K. M. (1966). "The case against teaching." Journal of Medical Education **41**(8): 766-771.

West, N. (1992). Classroom observation in the context of appraisal : a training manual for primary schools. Harlow, Longman.

WFME (1998). "International standards in medical education: assessment and accreditation of medical schools' education programmes. A WFME position paper." Medical Education **32**: 549-558.

Whitfield, R. C. (1971). Disciplines of the curriculum. Maidenhead, McGraw-Hill.

Wong, F., W. M. Lee, et al. (2001). "Educating Nurses to Care for the Dying in Hong Kong: A problem-based learning approach." Cancer Nursing **24**(2): 112-121.

Woodward, C. (1998). What can we learn from programme evaluation studies in medical education? The challenge of problem-based learning. D. Boud and G. Feletti (ed). London, Kogan Page: 344p.

Yin, R. K. (2003). Case study research : design and methods. Thousand Oaks, Calif., Sage Publications.