

THE ROLE OF PROBLEM-BASED LEARNING APPROACH IN PROFESSIONAL IDENTITY DEVELOPMENT OF MEDICAL UNDERGRADUATE STUDENTS IN UNIVERSITI SAINS MALAYSIA

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Abstract: Problem Based-Learning (PBL) is a popular approach in teaching and learning process and has been receiving great attention especially for the medical sciences world-wide. This phenomenological qualitative study aimed at exploring the role of PBL in professional identity development of medical undergraduate students in Universiti Sains Malaysia (USM). Specific, the research objectives were (i) to understand the students' perception towards the role of PBL in professional identity development and (ii) to seek PBL contribution in professional identity development. Maximum variation type of purposive sampling technique was applied to justify the participants of the study. A total of 9 students participated in the study. They were 5 males and 4 females who were undertaking houseman ship in hospitals in Peninsular of Malaysia. Face to face interviews were applied to collect the data and later analysed manually based on the N-Vivo procedure. These interviews were conducted in two locations (i) in the hospital the participants practise and (ii) in the nearby hotel of the hospitals. The data collection process was ended since the saturated point was achieved. Open coding, axial coding and selective coding that used in grounded theory data analysis techniques were applied in data analysis. The results show that four themes emerged; (i) problem solving skills, (ii) leadership skills, (iii) communication skills and (iv) team work. In order to seek trustworthiness, participants check, peer checker and Cohen's kappa index techniques were applied. Impact of the study and recommendations that relate to the issues also discussed.

Keywords: Problem Based Learning (PBL), Professional identity development and teaching and learning.

Introduction

Teaching and learning process is a crucial part to ensure quality of students in educational institutions especially in higher education. Therefore, many techniques and innovations have been initiated in order to enhance not only the students' academic performance but also to soar upwards their soft skills. One of its approaches is Problem Based-Learning (PB). In medical school, PBL is a prominent approach and has been receiving great attention from medical teachers since it was first introduced in McMaster University in 1969. Over the next 20 years, 50 medical schools adopted the PBL based format of the curriculum (Ahmed Yaqinuddin, 2013). Philosophical, It is based on principles of adult learning theory, including student's motivation,

encouragement to set goals, and think critically about decision making in day-to-day operations (Bajaj Preeti, Ahuja Ashish, & Gosavi Shriram, ' 2013). The main objectives as described by Burrows are to deliver knowledge in clinical context, use clinical reasoning skills, use self-directed learning skills and excite intrinsic motivation and enquiry.

Universiti Sains Malaysia (USM) has been introducing this approach since the school of medical sciences established in 1979. Unique, USM is practising PBL not as separated way, yet integrated with others relevant components of curriculum that combined in terminology of SPICES means; S- Student oriented, P-Problem-Based, I-Integrated, C-Community oriented, E- Electives and S-Spiral and systematic. Based on this curriculum design, USM intended to produce graduates who should be able to:

- (i) Understand the scientific basis of medicine and its application to patient care
- (ii) Acquire a satisfactory standard of clinical competence related to the following parameters:
 - Interview a patient and obtain a relevant case history
 - Perform physical examination and basic clinical procedures
 - Diagnose common diseases and acute emergencies and formulate their solution, which entails institution of first line management before referral for specialist treatment whenever necessary.
 - Acquire satisfactory behavioural and communication skills necessary for establishing rapport with patients and planning their care.
- (iii) Understand and appreciate the social and cultural background of the patients and his/her environment in formulating a plan of management including follow-up and long term management
- (iv) Understand and broader role and responsibilities of doctors in society and play a leadership role in a health care team and in the community.
- (v) Utilize the knowledge acquired to pursue continuing medical education. (USM)

This study focuses on the role of PBL in Professional Identity Development (PID) of the medical doctors. The USM Medical Sciences has introduced the approach since its establishment in 1979. Generally, PBL is conducted in a classroom whereby lecturers as facilitators leading the discussions. A PBL session consists of three components (i) lecturer, (ii) a group of students and (iii) trigger. The role of lecturers are facilitating and monitoring the group discussions and assess the students' performance based on specific criteria provided by its committee at the end of the sessions. In order to ensure the discussion well organised, lecturer is guided by a protocol that prepared by committee earlier. Students are responsible to read, discuss issues that posted early to them. They need to assign a class monitor and note taker, while the others are responsible to take part actively in the discussions. Trigger is a tool for the discussion. It consists of case scenario that describes health issues that was given to the students earlier.

Literature review shows that PBL has much strength such as to enhance students' self-esteem, communication skills and leadership. Besides this, PBL is also able to produce students who manage to practice positive thinking and be a problem solver. These features are needed in order to help them being to be a professional doctor in the future.

Concept of the professional identity

Professional identity development refers to the gradual process by which students assume the identity of physician over the course of their undergraduate medical training . According to Stets

JE & Burke PJ, 2000). Identity may be characterized in terms of (1) personal identity, comprised of factors such as an individual's history, experience, personalities, feelings, goals, and values; (2) role identity, which refers to one's assumed social or professional functions, activities, and responsibility; and (3) social identity, understood as the commitment to the values and goals specific groups.

In medical education, professional identity development is informed by a variety of factors that includes academic course-work, clinical activities, and receipt of feedback and mentoring. These experiences are integrated with each individual's extracurricular activities, prior experience, personality, values, and aspirations to give rise to notions of professional identity and highly subjective (Mary, Nicole, Susan 2010).

In the literature, many issues related to identity development are discussed. These discussions can be divided into two categories, namely identity development for doctors in training and in service. Identity Development for Doctors in Training Weaver et al (2011) conducted a research related to the identity development among the doctors, entitled Part of The team: professional identity and social exclusivity in medical students. The purpose of the study was to explore the elements that contribute to medical students sense of professional identity and to investigate the concept of social exclusivity and how this might relate to student's development of their identity as medical professional is using a fully qualitative approach, they interviewed 13 first and third year student at an undergraduate medical school at a university in Australia. The questions were open-ended and asked students about their experiences in medical school, sense of identity and social connections. This research showed that there are two main components which contributed to a strong sense of professional identity in medical students namely professional inclusivity and social inclusivity.

Elhimney and Rowens (2008) conducted a grounded theory study which aimed to examine the impact of the clinical psychology flexible training scheme on the development of professional identity. Studies involving clinical psychology trainees have mainly focused on their psychological adaptation to the challenges of training. A longitudinal study of the 2003 cohort of the University of Edinburgh Clinical Psychology Training Programme was conducted to identify factors that facilitate and impede professional identity development. Six main categories were identified: Perceived Competence, Formal Status, and Comparisons of Self with Others, Expectations of Others, Role Conflict and Role Ambiguity. The results suggest that professional identity development involves attaining an equilibrium between the formal status of the role and the individual's perceived competence in that role.

A Similar study was conducted by Helmich, et al (2010) to assess the influence of very early nursing attachments on the professional development and identity construction of medical students. A questionnaire containing open questions concerning student's perceptions of nurses, doctors and their own future roles as doctors was administered to all year 1 medical students (n=347) before and directly after a 4-week nursing attachment in hospitals and nursing homes. The result has shown that doctors were seen as interested and reliable. Students also maintained positive views of their own future roles as doctors.

Meanwhile Madill and Latchford, (2005), conducted research related to the Identity change and the human dissection experience over the first year of medical training. The aim of this study was to explore identity change in medical students over their first year of medical training particularly in relation to their experience of human dissection. Their identity constructs involved three common themes: dedication, competence, and responsibility. However, the data also revealed negative reactions to the demands of training, such as feeling driven and stressed.

Three major themes were apparent in their experience of human dissection: involvement, emotional coping, and ability.

Identity professional development for doctors in service

Identity professional development is also focused to doctors in service. In this context the term used is Continuing Professional Development (CPD). CPD is a process that includes continuing medical education. Many countries are now moving from a 'knowledge and skills base', towards a system that seeks to promote the 'the wide-ranging competencies needed to practice high quality medicine' that CPD entails (Thomas, Z. 2005). The Academic Unit of Primary Medical Care, University of Sheffield, in collaboration with Capital Health (2012) conducted a research to assess the impact of CPD on doctors' performance and patients or service outcomes. This project focused on four objectives as follows; (1) the role of CPD for doctors and its impact on the wider environment, (2) the broad implications of CPD and the benefits it may have for individual doctors, the wider team, colleagues and multi-professional teams, patients, employers and organisations, (3) the impact on doctors' confidence and competence in their day to day work and ability to deliver high quality care, and (4) how CPD may help doctors stay engaged and strive towards excellence. The researchers identified seven key themes as follows; (1) the impact and benefits of CPD, (2) barriers to CPD, (3) barriers to the implementation of learning from CPD, (4) Facilitators of the implementation of learning, (5) Overall Barriers / Lessons learnt, (6) Trust and Royal College Perspectives of CPD, and (7) Cultural differences between Primary and Secondary Care with regard to CPD.

Research in PBL

[Bajaj Preeti](#), [Ahuja Ashish](#), and [Gosavi Shriram](#) (2013) conducted a study entitled Problem Based Learning (PBL) - An Effective Approach to Improve Learning Outcomes in Medical Teaching. The aim of the study is to measure the effectiveness of the "Problem Based Learning" as compared to conventional theory/didactic lectures based learning. A total of 72 medical students from Dayanand Medical College and Hospital, Ludhiana were involved in this study. Two modules of problem based sessions designed and delivered. Pre & Post-test score's scientific statistical analysis was done. Student feed-back received based on questionnaire in the five-point Likert scale format. Results have shown that PBL ensures better practical learning, ability to create interest and subject understanding. Majority were agree that "Problem-based learning" helped them create interest (88.8 %), better understanding (86%) and promotes self-directed subject learning (91.6 %). Substantial improvement in the post-test scores clearly reveals acceptance of PBL over conventional learning.

Nor Hasniza, and Mahani Mokhtar (2013) carried out a study entitled the effect of PBL in teaching and learning in higher education institutions. This mixed methods study aims to identify the strategies the level of students' satisfaction towards the use of PBL in their learning. The instrument consists of a set of questionnaires and semi-structured interviews. The questionnaire was administered to 226 undergraduates in an institution of higher education who were chosen randomly. Interview sessions were carried out on eight selected respondents. Quantitative data were analysed using descriptive statistics while content analysis was adopted to analyse qualitative data. The results show that students were able to solve the problems presented using lecture approach, group activities, lecturer guidance and independent learning. Besides, PBL also could enhance soft skills particularly on students' motivation, communication skills,

collaboration and independent learning. Students also found to have positive perceptions towards the implementation of PBL in their learning process.

Based on the above discussions, it is clear that PBL is the main component in teaching process. Although no study conducted on role of PBL on PID, the researches discussed are useful in order to understanding the role of PBL in PID.

Problem statement and research aims

Although PBL approach has been receiving an intensive focus in medical curriculum, no specific study has been done specially for examining the role of PBL in professional identity of the undergraduate medical students in USM. Thus, this study is conducted in order to explore its contribution in producing the professional physicians in future. Consistent with this statement, this study aimed at exploring the role of PBL in professional identity development of medical undergraduate students in Universiti Sains Malaysia (USM). Specific, the research objectives are (i) to understand the students' perception towards the role of PBL in professional identity development and (ii) to seek PBL contribution in professional identity development.

Methodology and Procedures

This study applies phenomenological qualitative study as its method. A phenomenology focuses on the process and experience one goes through. Literally, phenomenology is the study of "phenomena" or the things we experience and the ways we experience such things. Experience is a complex concept and not directly observable by an external observer. It may be difficult to answer research questions in a concrete way because it is subjective. However, "intersubjectivity" is often used as a mechanism for understanding how people give meaning or interpret their experiences (Ben, & Newman). The purpose of a phenomenological study is to explore and understand the essence of a phenomenon (Creswell, 1998). The phenomenological approach involves "a return to experience in order to obtain comprehensive descriptions that provide the basic for a reflective structural analysis that portrays the essence of the experience" (Moustakas, 1994, p.13). The phenomenological method is appropriate for this study because the goal of the study is to explore the experience means for developing a professional identity. Phenomenological method was chosen since the suitability of the method in order to gain perceptions and experiences which are unable to be measured by quantitative approach.

Participants and location of the study

The research term used for qualitative sampling is purposive sampling. In purposive sampling, researchers intentionally select individuals and sites to learn or understand the central phenomenon (Creswell, 2012). The standard used in choosing participants and sites is whether they provide "useful" information (Patton, 1990). According to the Gay and Airsian (2000), since qualitative researchers seek quality from participants and not quantity, participant selection is "designed" to identify participants who can provide information about the particular topic and setting being studied.. In this research, maximal variation sampling is used. Maximal variation sampling is a purposive sampling strategy in which the researcher samples cases or individuals that differ on some characteristic or trait. This strategy is parallel to the purpose of the study in exploring how PBL experience contributes towards the professional identity development among the graduates doctors.. Participants in this study must meet the following criteria; (1) have completed an undergraduate programme from USM and (2) undergoing housemanship in government hospitals.

A total of 9 housemanship who are practising in hospitals in Peninsular of Malaysia are participating in the study. Maximum variation type of sampling is utilized in order to justify the participants of the study. They are 5 males and 4 females. In term of location of practice, they are practising in the different hospitals such as Pahang, Kelantan, Sabah and Kuala Lumpur. Archive from the academic office was benefited to find out the potential participants of the study. Secondly, they are contacted to confirm of their willing their participate in the study. They officially received official letter that offer them to be participants. Then a specific meeting was arranged to conduct in-depth interview in hospital or in the near hotel of the practice.

Data collection procedure

In-depth interviews or face to face interviews were applied in the data collection process. This method was chosen due to its strengths to collect in-depth data on the participants' perceptions and experiences of PBL implementation during period of their study in USM. In order to standardize the interviews format and professional ethic for conducting interviews, it was conducted based on the interview protocols that were developed beforehand. The interview protocols consist of three components; (i) introduction, (ii) main questions and (iii) conclusion. The first component functioned as warming up questions before starting the further conversation. The second component focuses on the research objectives. Besides the main questions, probing questions also addressed in this component. The third component is conclusion part, in which participants were requested to share their inputs that were not including in the conversation.

Through the sessions, tape recorder, as permitted by those participants was used to ensure the information gained from the interviews was not missing. The interviews were continuously done until saturated point achieved. The data collection process took place in the duration of 3 months from September 2015 to November 2015. This process produces 9 scripts of interviews that was later analysed manually based on the N-Vivo programme procedure.

Data analysis procedure

Data analysis process started since the first interview exercise finished. Three steps involved in the data analysis procedure; (i) management of data, (ii) understanding of data and (iii) interpretation of data.

Management of data

The first step started with transcribing the interview transcripts. Data from the tape recorders were transcribed into verbatims. Each transcript was given code index as follow; P(1)/2/9/2015, P(2)/5/9/2015, P(3)/12/9/2015, P(4)/2/10/2015, P(5)/7/10/2015, P(6)/12/10/2015, P(7)/12/11/2015, P(8)/12/11/2015 and P(9)/22/11/2015; means; P(1)=participant number 1, 2/9/2015 refers to the date interview conducted, on the 2nd September 2015, P(2)=participant number 2, 5/9/2015 refers to the date interview conducted, on the 5th September 2015, P(3)= participant number 3, 12/9/2015 refers to the date interview conducted, on the 3th September 2015, P(4)=participant number 4, 2/10/2015 refers to the date interview conducted, on the 2nd October 2015, P(5)=participant number 5, 7/10/2015 refers to the date interview conducted, on the 7th October 2015, P(6)= participant number 6, 12/10/2015 refers to the date interview conducted on the 12th October 2015, P(7)=participant number 7, 12/11/2015 refers to the date interview conducted, on 12th November 2015, P(8)= participant number 8, 12/11/2015 refers to the date interview conducted, on 12th November 2015 and P(9)=participant number 9, 22/11/2015 refers to the interview conducted, on 22nd November 2015.

Understanding of data

Upon completing the data code indexing process, the next step was understanding the data. Researcher read verbatim texts line by line and sentence by sentence in order to find out the concepts, ideas and terminologies that relate to the research objectives. Researcher will then choose relevant information that can assist him to answer the research objectives.

Interpretation of data.

Data interpretation is an on-going process to group the data gained from the second step. This process is known as coding process by using open coding, axial coding and selective coding technique that applied in grounded theory method. During open coding, the data will be sorted into emerging themes and re-grouped them for similarities and differences. From there, categories of information to search for the phenomenon being studied are developed.

At this step researcher will read the verbatim transcripts actively in order to identify the similarities and differences of the concepts, ideas and terminologies identified at the second step. Research objectives acted as a controller to help researcher focuses on the specific concepts, ideas and terminologies that can potentially lead to answering the research objectives. These concepts, ideas and terminologies were grouped in specific themes and categories. These actions were continuously done until all the concepts, ideas and terminologies grouped in themes and categories that relate to the research objectives identified. In axial coding, similar concepts or themes are linked together to identify a single category based on their homogeneous conditions within similar contexts. Axial coding consists of the researcher breaking one category into subcategories and comparing the interrelationship of that category. In this phase, researcher asked questions about the meaning of the data and emerging concepts and continuously made comparisons to differentiate data and concepts throughout the study (Strauss & Corbin, 1998)

The last phase in the coding process consists of identifying specific core categories from the categories discovered in the axial coding phase. Selective coding is the phase of selecting the core category, systematically comparing it to other categories, and conforming those connections (Strauss & Corbin, 1990). During selective coding, a story that connects the subcategories and categories around the core category is built. So those relationships against the collected data are validated.

Reliability and validity

Patton (2002) states that validity and reliability are two factors which any qualitative researcher should be concerned about while designing a study, analysing results and judging the quality of the study. This corresponds to the question that "How can an inquirer persuade his or her audiences that the research findings of an inquiry are worth paying attention to? According to Guba (1985), in qualitative paradigms the terms Credibility, Transferability, Dependability and Conformability are to be the essential criteria for quality. The idea of discovering truth through measures of reliability and validity is replaced by the idea of trustworthiness (Mishler, 2000), which is "defensible" (Johnson 1997) and establishing confidence in the findings (Lincoln & Guba, 1985)

Credibility

One of the key criteria addressed by positivist researchers is that of internal validity, in which they seek to ensure that their study measures or tests what is actually intended. According to Merriam,

the qualitative investigator's equivalent concept, credibility, deals with the question, "How congruent are the findings with reality?". Lincoln and Guba argue that ensuring credibility is one of the most important factors in establishing trustworthiness. This study will use triangulation and member checking as tools to ensure the credibility.

Triangulation

Gay and Airasian (2000) described triangulation as a form of cross-validation that examines similarities in data by comparing different participants, settings, and methods to identify recurring results. In this study, data is collected through different participants and settings. Variation of participants and setting in this study enable to validate the data obtained. Besides this, researchers also utilized member checks and bracketed the subjectivity.

Member checks

Member checks are the most important way to establish credibility (Creswell, 1998). Member checks also assist qualitative researchers by allowing participants to review and clarify the interview transcripts and interpretations to validate the accuracy of the participants' ideas (Lincoln & Guba 1985). Maykut and Morehouse (1994) found that members' feedback is very valuable and sometimes helps researchers see or emphasize something missed. In this study, researcher sought the feedback from participants about the findings as they emerged throughout the data collection and data analysis. A member check is used to clarify the interpretations of the participant's interviews. Participants are requested to check and verify interview content as soon as interview is finished. Feedbacks from participants are considered to correct the data. This practice will improve credibility of the data.

Bracketing researcher subjectivity

In qualitative inquiry, the researcher's biases, assumptions, and role as researcher should not be written out of the text (Creswell, 1998). This relates to the development of the research question and it permeates all parts of the qualitative research process. The qualitative researcher is inextricably immersed in the research; thus qualitative research requires a high level of 'reflexivity' or self-reflection about one's part in the phenomenon under study (Darlington & Scott, 2002). It is critical for qualitative researchers to become cognizant of their subjectivity in order to analyse the research findings more objectively. This can be accomplished by researchers bracketing their subjective influences (Sherman & Webb, 2001). Thus researchers pay attention to the biases aspect. Researchers as a lecturer in USM "enter" scope of study with minimum belief on the experience of the curriculum orientation aspect. This is important that the researchers do not influence the analysis and data collection.

Besides biases elements may exit from researchers which influence interview questions, coding process and themes development. To minimise these issues, researchers will apply three members for checking and verifying obtained data.

Transferability

According to Darlington and Scott (2002), one of the issues for qualitative research is the degree of generalizability of findings across settings. Generalizability is defined as the results of a study transferring to another setting (Creswell, 1998). Therefore, it is important for the researcher to acknowledge the limitation of the study's findings in terms of the context in which they were obtained and give the reader sufficient information about this context. The reader needs to be

aware of this so that they can make allowances when extrapolating the findings to other settings (Darlington & Scott, 2002).

To achieve the transferability researchers will use, thick description of the contexts, processes, participants, and findings from the current study and allows readers to transfer the collected and analysed information to similar settings.

The transferability and generalizability of the data will also be expanded by having participants in this study from different participants and different cultural backgrounds Also, by using an array of data collection methods, a variety of tests for validity, the review of the literature, and the research findings generalizability is supported.

Dependability

In addressing the issue of reliability, the positivist employs techniques to show that, if the work were repeated, in the same context, with the same methods and with the same participants, similar results would be obtained. However, as Fidel and Marshall and Rossman note, the changing nature of the phenomena scrutinised by qualitative researchers renders such provisions problematic in their work. Florio-Ruane highlights how the investigator's observations are tied to the situation of the study, arguing that the "published descriptions are static and frozen in the 'ethnographic present' ". Lincoln and Guba stress the close ties between credibility and dependability, arguing that, in practice, a demonstration of the former goes some distance in ensuring the latter. This may be achieved through the use of "overlapping methods", such as the focus group and individual interview In order to address the dependability issue more directly, the processes within the study should be reported in detail, thereby enabling a future researcher to repeat the work, if not necessarily to gain the same results. Thus, the research design may be viewed as a "prototype model". Such in-depth coverage also allows the reader to assess the extent to which proper research practices have been followed. So as to enable readers of this research report to develop a thorough understanding of the methods and their effectiveness, researchers have included the following sections:

- a) The research design and its implementation, describing what was planned and executed on a strategic level;
- b) The operational detail of data gathering of what was done in the field;

In order to achieve the highly dependability, audit trail and member checking is used.

Conformability

The concept of conformability is the qualitative investigator's comparable concern to objectivity. Here steps must be taken to help ensure as far as possible that the work's findings are the result of the experiences and ideas of the informants, rather than the characteristics and preferences of the researcher.

The role of triangulation in promoting such conformability again be emphasised, in this context to reduce the effect of investigator bias. Miles and Huberman consider that a key criterion for conformability is the extent to which the researcher admits his or her own predispositions. To this end, beliefs underpinning decisions made and methods adopted be acknowledged within the research report, the reasons for favouring one approach when others have been taken explained and weaknesses in the techniques actually employed admitted. In terms of results, preliminary theories that ultimately were not borne out by the data should also

be discussed. Much of the content in relation to these areas may be derived from the ongoing “reflective commentary”.

Audit trail

Once more, detailed methodological description enables the reader to determine how far the data and constructs emerging from it may be accepted. This process is called as “audit trail”, which allows any observer to trace the course of the research step-by-step via the decisions made and procedures described

Results

This part displays the results in answering the research objectives on (i) to understand the students’ perception towards the role of PBL in professional identity development. The Result has shown that there are four themes of students’ perception towards role of PBL in professional identity development which are; (i) problem solving skills, (ii) leadership skills (iii) communication skills and (iv) team work.

Theme 1: Problem solving skill

Generally, students especially those who are studying in higher education setting need various knowledge and skills to promote their holistic performance including problem solving. Problem solving is considered as a skill and knowledge acquired by someone in performing his/hertasks. In medicine profession, this skill is crucial in order to create a professional physician who are not just having competencies of knowledge but also able to cater issues professionally. Data from interview has shown that problem solving skills is one of the benefits obtained from the PBL sessions. This statement has been supported by participant 4,5 and 7 as follow;

{...} I felt that after joining few sessions of PBL, it enables me to seek a best answer for some problems that I face, my mind became more creative and help me to answer the problems in my study {...} P(4)/2/10/2015, translated by the researcher based on the actual evidence in Malay language)

{...} PBL helps to nurture my skills; it educates me to be a strong man in term of how to solve problems in the life. P(5)/7/10/2015, translated by the researcher based on the actual evidence in Malay language)

Data from the interview of participant 7 has confirmed the result. This can be seen after the researcher reviews his transcript as below;

{...} yes... quite obvious, after one year joining PBL, its effect is clear... I feel more confident in finding more options to overcome my problems {...} P(7)/12/11/2015, translated by the researcher based on the actual evidence in Malay language)

Besides, the participants describe that through the problem analysis in PBL, they able to determine what aspects they already know and need to know. Thus, students must know on how to analyse and solve the problems. For instance participant no 1 expressed his idea as follow;

{...} in reality, the most challenging part in PBL is problems analysis...I personally felt that I must think and think again to get answers for the problems...so in long term it will be a useful skill on how to face the problems properly {...} P(1)/2/9/2015*translated by the researcher based on the actual evidence in Malay language)*

{...} Normally, when we want to apply this problem-based learning in our career, it will be more systematic. We will know the exact step-by-step that we should take to find a solution of this problem because we have the experience due to the problem-based learning; differential diagnosis, professional diagnosis; so how can we exclude differential etc {...} P(1)/2/9/2015 *translated by the researcher based on the actual evidence in Malay language)*

Theme 2: Leadership skills

Leadership skill is vital in order to promote highly competent doctors in the future. It should be cultivated in their studying period. This theme is revealed as an important item for doctors as they are do not just involved in clinical but also in management at workplaces. The participants which were interviewed admitted that this characteristic is really needed. This statement was supported by interview analysis data of participants 1,6 and 9.as follows;

{...} as we all knew, in organising PBL, one of the student is assigned as a chairman of the discussion, the task is to facilitate and lead the discussion...and it is not an easy task, in which we have to acquire skills such as asking and entailed the group members to manage the discussion otherwise the session will fail... to me it is golden opportunity to polish skill of management and lead people. This skill is very important at workplace {...} P(1)/2/9/2015*translated by the researcher based on the actual evidence in Malay language)*

This statement has been supported by interview data of participant 6 as follow;

{...} appreciation, politeness and openness are the positive attitude that the students adopt from PBL sessions, these elements are important for a leader...besides, skill on how to convince people is also skill.. to be a good leader {...}. P(6)/12/10/2015*translated by the researcher based on the actual evidence in Malay language)*

{...} Usually, in the profession as a doctor, we cannot be alone. At least there should be consultation or a discussion with colleagues since we cannot remember everything; there must be some kind of blank space in our minds. So when we have this problem-based, when we discussed on the same problem, there will be a trigger. Why not this, why not this? {...} P(9)/22/11/2015 *translated by the researcher based on the actual evidence in Malay language)*

Theme 3: Communication skill

Communication skills is also significant in shaping the future career of doctors. Data from interviews has shown that this statement is true. Almost all the participants admitted that communication skills they receive from PBL contribute to their professional development. For instance participants 1, 8 and 10 stated as follow;

{...} in my PBL session, all members are interact each other, we discuss, give and receive ideas and inputs in order to answer the problems studied, usually the group members are consists of various background in...males, female, Malay, Chines and Indian event Bajau and Kadazanas well {...} P(1)/2/9/2015 *translated by the researcher based on the actual evidence in Malay language*)

Furthermore, interview data of participant 8 addressed the below statement;

{...} the varieties of member in PBL contribute to its strength...like me as a non-Malay, try to understand on how the best communicate to the difference ethnic group such as Malay and Chiness....so here...I learnt the ways to communicate well with my group members {...} P(8)/12/11/2015 *translated by the researcher based on the actual evidence in Malay language*)

{...} Yes, it is very important. When we have problem-based learning that we have learned in USM, I learned on how to respect other's opinion but I can say No to that opinion as well ...Yes. For example, this problem-based learning can also be applied when I deal with patients because sometimes, patients nowadays are educated; so they will ask their problems and then I will discuss them with my colleagues on how to explain to the patients to make sure they understand. P(8)/12/11/2015 {...} *translated by the researcher based on the actual evidence in Malay language*)

Theme 4: Team work

Team work plays an important role at workplaces including in health professions. The important of this element is proven by the data gained from participants 5 and 7 as bellow;

{...} one of the greatest PBL contribution is promoting team work to us. I mean...emm...emamong the group members...we discuss various ideas and inputs so that spirit of team building is developed...besides this, we all connect each other even after PBL sessions. So, this is PBL advantage {...} P(5)/7/10/2015 *translated by the researcher based on the actual evidence in Malay language*)

{...} we learnt lot of things from PBL class....including spirit of cooperation among the members...one thing is...our friendship was becoming closed after PBL sessions...not just PBL {...} P(7)/12/11/2015, *translated by the researcher based on the actual evidence in Malay language*)

Discussions

The research aimed at exploring the role of PBL in professional identity of medical doctors. The findings show that four themes have emerged; (i) problem solving skills, (ii) leadership skills, (iii) communication skills and (iv) teamwork skills. It is shown that PBL is a vital component in shaping physicians in the future. By practicing the skills in performing their services, they become good healthcare service providers to the society, so that the profession will be highly respected by the public. It is parallel with the government policy which is to provide first class healthcare service in the country.

Problem solving skills

In medical profession, problem solving skills are applied in many situations such as doctors-patient's interaction, doctors-managements interaction, doctors -families of patient interaction and doctors-publics interaction. In order to ensure the interactions are properly managed, doctors need a set of soft skills components including problem solving skills. Physicians who are having highly competent skills in problem solving will be able to make right decisions on the clinical problem. These skills are useful for novice, competent and expert physicians.

Leadership Skills

As required by the job nature, medical officers need to take responsibility for all clinical outcomes. Thus, leadership skills is important to enhance doctors' competencies in management and leaderships as they are not just health care providers, but also managers and leaders at workplace. The doctors' involvements are obvious in leading of a proper meeting, handling specific programmes and delivering consultation services. So they need skills in influencing their sub-unit effectively. So, this result is significant in the context to promote the competencies of doctors. Doctors' competencies must be cultivated as early as possible. This is parallel with Australian Medical Association (AMA), doctors are uniquely placed to take on leadership roles, including management and leadership of health services, and in the wider management and leadership of the organisations that they work in (Australian Medical Association)

Communication skill

Since the medicine profession is a patient oriented service, the style of communication has been becoming important at workplace. Thus, practising highly competency in communication skills is required for medical doctors as the communication across multiple units, physicians, nurses, and others become vital to ensuring that accurate and complete information is available, properly exchanged, and regularly updated (Salas, 2003). This is consistent with findings of research titled the effects of problem-based learning during medical school on physician competency: a systematic review conducted by [Gerald et al \(2008\)](#). [Finding shows that communication skills are among the components of the soft skills that](#) the doctors need. They conclude that, Problem-based learning during medical school has positive effects on physician competency after graduation, mainly in social and cognitive dimensions.

Teamwork

High quality products are resulted from various factors including teamwork spirit among the group members of an organisation. In medical profession, team work is a prerequisite in order to perform a task. Teamwork theme as emerged in this research is a proof that it is really needed by

doctors. This research findings consistent with Salas' statement; every day, team of medical professional make important decisions and actions regarding diverse and complicated treatments that affect the lives and well-being of patients (Salas, 2013)

Conclusion

Based on the above discussions, the following ideas are recommended;

- (i) the similar study on PBL can be expanded to examine its impact on the others aspect such
- (ii) a quantitative study is recommended in order to validate the findings

Besides, it is hoped that the school of medical sciences focuses on the efforts to enhance the effectiveness of PBL sessions. It is needed to seriously organise development of programme regularly for the lectures especially for the new one. PBL syllabus should be revised to ensure the soft skill components among the prioritised agenda. A pool of experts of PBL could be considered consultantsto continuously enhance the quality of PBL.

After getting the recognition as a prominent approach world-wide, PBL is continuously significant in teaching process in higher education including for medical setting. Thus, it should be recognised as a special entity in medical school.By doing so, PBL becomes well structured so that the aims to produce competent doctors will be achieved.

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