

Students' Academic Experience in Medical Problem-Based Learning Tutorials

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Abstract

In recent years, in medical education, problem-based learning (PBL) has increasingly been adopted as the preferred pedagogy. In the context of the increasing use of PBL methods, there is a need to investigate how students and tutors manage their participation in the tutorials. The purpose of this paper is to investigate the factors influencing student participation in the tutorials. In the present study, three PBL groups were selected, which consisted of local and international students, and stimulated recall interviews were conducted with the students. This research provides a general picture of how the participants discuss the clinical theme. In particular, introspective data provided insights into the students' academic experiences and perceptions of their own participation in the PBL tutorials in relation to students' content knowledge, English communication, perceptions of tutor roles and social relationship with peers. Based on these findings, further research on students' learning strategies should be undertaken for the development of the PBL curriculum which aims to foster autonomous learners.

近年、医学教育では問題基盤型テュートリアル（PBL）が注目されるべき教育方法として新しく取り入れられてきている。こうした状況においてPBLでの学生やテュータの授業活動の実態を調査する必要がある。本稿は、留学生とオーストラリア人の学生で構成するPBLグループを対象とし、再生刺激法で得たデータを基に学生の授業参加に影響を与える要因を調査した。特に、学生の背景知識やコミュニケーション能力、テュータの役割に対する認識、学生間の社会的関係等がPBL教室内外での学習経験と密接に関係していることが明らかになった。本稿は、この調査結果を基に、今後、学生の学習ストラテジー分析がPBLカリキュラムのさらなる開発につながることを提言する。

Introduction

The concern over the use of a / the problem-based learning (PBL) approach in not only medical education programmes but also several other disciplines has been growing around the world, particularly at the Australian university which served as the context for this study. The PBL method aims to foster students' decision-making strategies, reasoning skills and self-directed learning skills through small group discussion (see Institute for International Medical Education, 2006). However, the implementation of a PBL curriculum is an interesting pedagogical issue in that the major objectives for medical students are different from those of a traditional classroom. Participants in the PBL curriculum need to understand the roles and types of contributions that it will be appropriate for them to make in interactions in PBL situations. This research was undertaken in order to investigate students' participation in three PBL tutorials by analysing stimulated recall interview data. Specifically, this paper will address one principal research question: which factors affects students' oral participation in these medical PBL tutorials.

Problem-based Learning and the Tutorial System

The structure of the PBL curriculum at this Australian university is that one clinical theme is usually covered over two PBL tutorials. Firstly, students need to consolidate basic clinical knowledge in a lecture. After that, in the first tutorial, they brainstorm a clinical case scenario and identify their learning objectives, and then, in the second tutorial, they report back on their individual research related to their learning objectives, and discuss them. Each PBL tutorial runs for approximately 30-60 minutes.

Figure 1: PBL Curriculum and Participants' Roles

Student roles	Tutor roles
Lecture: obtaining basic knowledge	Lecture: teaching a basic clinical theme
First tutorial: brainstorming clinical scenario; discussing what they need to know in the theme, namely setting learning objectives	First tutorial: facilitating student learning, promoting critical thinking and promoting effective group functioning
Interim: studying learning objectives outside classroom by group or individual work	
Second tutorial: reporting back on their assigned tasks and discussing the theme further	Second tutorial: giving feedback and providing further clinical information

As Figure 1 above illustrates, what is to be noted in the/this PBL curriculum is the characteristics of student and tutor educational activities. The PBL tutor concentrates not on teaching a clinical theme but facilitating student learning, while students are basically to understand the case scenario, to identify their lack of knowledge and what needs to be known, to specify their learning objectives and to analyse the clinical issues by themselves. That is, the PBL curriculum enables students not only to autonomously learn a clinical theme but also to 'teach' it to their peers.

Issue of Participation in Problem-Based Learning Tutorials for International Students

It has been claimed that a range of factors affect student participation in small group discussions including those that take place within a PBL curriculum (Renshaw & Volet, 1995; Duek, 2000; Treloar *et al.*, 2000; Lycke, 2002; Hendry, Ryan & Harris, 2003; Khoo, 2003; Remedios, 2005). Because PBL is a recently developed pedagogical approach, it is important for participants to understand the characteristics of the PBL curriculum. Through analysis of the discourse produced during PBL tutorials, differences in the PBL processes between actual student participation and the pedagogical prescription of institutions, as well as differing tutor roles have been

observed (Legg, 2005; Imafuku, 2007). For instance, Lycke (2002) indicates that a dysfunctional PBL group may arise when a tutor dominates the interactions or when some students have insufficient skills to activate their prior knowledge. As for student participation, Hendry *et al.* (2003) argue that managing the balance between quiet and dominant students is important in a successful tutorial.

In a group consisting of students from different cultural backgrounds, such problems related to participation in the PBL curriculum may be more complex. Duek's (2000) study, which investigated the proportion of student participation in PBL tutorials, indicates that students' gender and ethnicity influence their active contribution in the discussion. Moreover, Remedios (2005) has established that classroom culture and the linguistic demands of the PBL curriculum, with intense group dynamics and frequent topic shifts, are factors which can cause international students to have lower participation rates in the classroom. International students' lack of progress in PBL tutorials is attributed not only to their weaker proficiency of English as a second language, but also to the difficulties they experience in coping with alienation while studying in a different environment, such as adjusting to different learning styles from their home country and getting academic support from local peers (Treloar, *et al.*, 2000).

With regard to Asian students' learning preferences from a cultural perspective, some studies argue that when compared with local students' participation, international students present passive participation patterns caused by fear of mistakes, peer pressures and reluctance to interrupt other speakers (Kim, 1999; Watson, 1999; Benwell and Stokoe, 2002). Interactive teaching methods, such as a PBL approach, employed in the West would not fit with Confucian academic contexts (Chan, 1999; Berrell, *et al.*, 2001). For example, as the Asian students have been socialised to respect lecturers and older students as a part of Confucian culture, these students are reluctant to argue with teachers and older peers (Chan, 1999; Huang, 2005). Some studies stated that Asian students' consciousness of face-loss may increase in situations where it is possible to make mistakes, such as when using English to ask questions in class, or to approach their tutor or classmates to discuss assignments (Watson, 1999; Berrell, *et al.*, 2001). However, there are several studies that have analysed the nature of Asian learner and teacher participation from various points of view, such as cultural and linguistic aspects, conceptions of learning and educational contexts (Tsui, 1996; Benson and Lor, 1999; MacKinnon, 1999; Khoo, 2003; Huang, 2005; Kivela and Kivela, 2005; Legg, 2005; Hussain, Mamat, Salleh, Saat & Harland, 2007). Kivela and Kivela (2005) showed that, contrary to the stereotype of the passive learner, the students they studied in Hong Kong valued communicative and interactive learning activities, which highlight student-centred learning, more than the conventional lecture-based methods of learning.

Methodology

Participants

This study involved three PBL groups which consisted of local and international medical students and their tutors at an Australian university. All PBL tutors in this paper are experienced doctors as well as medical educators. The medical students in these groups were in their third year of the course and were aged between 20 to 24 years. The students were categorised into two groups, local (L) and international (I) students, following Elder's (2000) classification. The term 'local student' is defined as students who have completed their pre-tertiary education in Australia (Elder, 2000: 94). Although some students have different ethnic backgrounds or are first generation immigrants in Australia, 'local students' were identified based on their secondary education and language proficiency rather than their cultural background or home language. Furthermore, on the basis of Eggins and Slade's (1997) theory, this study identified

each student's frequency of their contributions in the tutorials by counting a 'move'¹ which is a speech functional unit (see appendix). Table 1 below outlines the student participants and their backgrounds.

Table 1: Student Participants in Group 1

Group 1 Clinical theme: HIV infection				
Participants	Place of birth	Year of arrival in Australia	Place in previous education	Frequency of contribution
L1	Australia		Australia	High
L2	Vietnam	1985	Australia	Low
L3	Vietnam	1989	Australia	Medium
L4	Australia	Parents from Hong Kong	Australia	Medium
I1	Malaysia	2002	Brunei	Low
I2	Malaysia	2002	Malaysia	Low

Table 2: Student Participants in Group 2

Group 2 Clinical theme: headaches				
Participants	Place of birth	Year of arrival in Australia	Place in previous education	Frequency of contribution
L5	Australia		Australia	High
I3	Malaysia	2002	Malaysia	Medium
I4	Malaysia	2002	Malaysia	Medium
I5	Malaysia	2002	Malaysia	Low
I6	Malaysia	2001	Malaysia	High
I7	Malaysia	2001	Malaysia	Medium

¹ According to Eggins and Slade (1997, p. 186), the move is defined as a 'functional-semantic reinterpretation of the turn-construction unit of conversation analysis'.

Table 3: Student Participants in Group 3

Group 3 Clinical theme: seizure and epilepsy				
Participants	Place of birth	Year of arrival in Australia	Place in previous education	Frequency of contribution
L6	Taiwan	1989	Australia	Medium
I8	Malaysia	2002	Malaysia	High
I9	Malaysia	2002	Malaysia	High
I10	Malaysia	2002	Malaysia	High
I11	Malaysia	2002	Malaysia	High

Data Collection Procedures

This study was conducted in semester two, 2005. Different approaches of data collection were employed, including classroom observations, video-recordings of the tutorials and stimulated recall interviews. Information about the students' perceptions of their participation was obtained through stimulated recall interviews which were conducted immediately after the recorded PBL tutorials. Four local (L1, 3, 4 and 5) and five international students (I1, 4, 9, 10 and 11) volunteered to participate in the interviews. The participants were asked to try and recall what they did during the PBL tutorial. In other words, while watching the DVD-recorded PBL tutorial on a computer screen, informants answered questions about their thinking processes and evaluations of other participants' contributions at specific points in the tutorials.

Findings

Content Knowledge and Tutorial Preparation

The analysis of the interview data clearly illustrates that lack of content knowledge of the subject area influences the students' participation in the PBL tutorials. In Excerpt 1 below, I1 claims that the clinical topic, including a variety of information related to it, is an influential factor on his participation, and he was conscious himself that he was a quiet participant in this particular tutorial. I1 stated:

Excerpt 1

I1: I think some clinical knowledge is very thorough. If you talk about non-clinical things, I tend to get fuzzy, especially biology. Like, today was a lot of topics, epidemiology and mycology. So, these things I don't remember any more. I was quite rather quiet today.

This problem (of getting 'fuzzy' in relation to some topics) did not only apply to non-clinical topics. I10 claims that she has difficulty in coping with new clinical topics which they have not previously studied.

Excerpt 2

Int: Was the topic of the PBL tutorial, that was on seizures, was that one of your confident topics?

I10: Um, not really, because generally we don't really like neurology topic. We were not given a chance to have the topic. So, we were not very sure of what we would do about.

This issue, which is related to clinical content knowledge, also affected I10's participation pattern. When they were not confident about the topic, both I1 and I10. could only participate to the extent of clarifying others' contributions in their discussion. On the other hand, I9 actively participated, and commented that she was confident of the clinical topic because of her basic content knowledge built up during the preparation for the tutorial. I9 even researched the topics which the other group members were assigned in addition to completing her own task. As Excerpt 3 below shows, by reading more books about the clinical theme, I9 tended to obtain a better understanding of it:

Excerpt 3

I9: Because I'm not only prepared for my objective, I will still read about the other objectives which I wasn't s'posed to do, and if I don't understand, I will ask the person who are s'posed to do the objectives. Just to clarify some stuff.

Overall, as Excerpt 1 shows above, unfamiliarity with non-clinical topics, including biology, epidemiology, and mycology, resulted in I1's lack of participation, because he did not know how to deal with the various themes relevant to this clinical topic. In the same way, I10 having not previously had the opportunity to learn the vocabulary of neurology was unsure in class (though in general she was one of the most active participants). On the other hand, Excerpt 3 above indicates that the I9's preparation for the tutorials had a great influence on her participation. Comments like these imply that better preparation may reflect the development of student-directed learning skills.

English Communication

International students may have some difficulties in using English in the tutorial where they interact with local students at the university. In this study, some international students commented about their participation in PBL tutorials in relation to their language proficiency. For example, even though I9 is recognised as an active participant in Group 3, she mentioned that it is sometimes hard for her to explain her clinical knowledge in the discussion due to her thinking process in which she translates her first language (Malay) into English. I9's claim can be seen in the following extract:

Excerpt 4

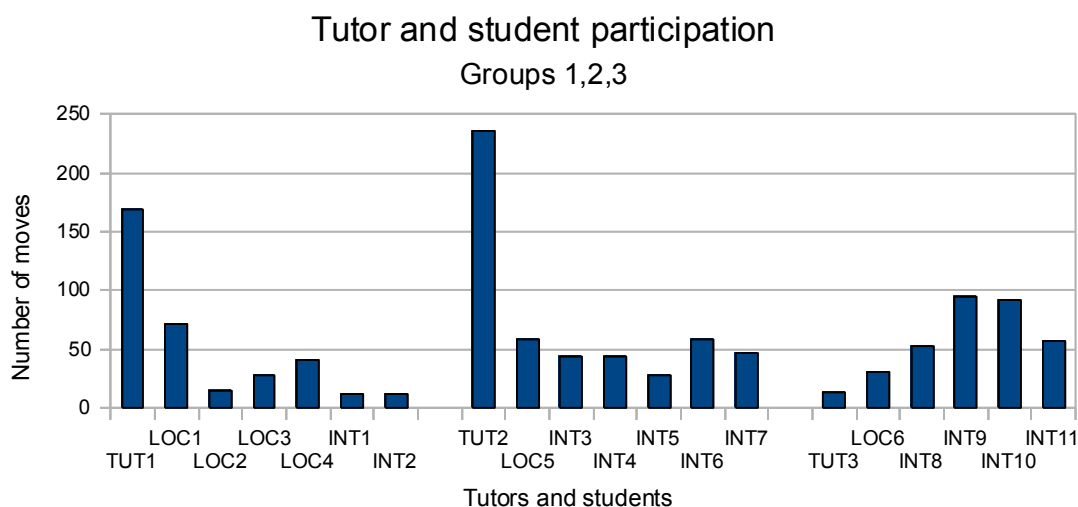
Int: In terms of your English as a second language, do you have any difficulties?

I9: Just sometimes, if I don't know what to say, and then, I'm not very good at explaining stuff. It's hard. At first, I think in Malay, but express the word in English, and to explain it in the right sentence. It's sometimes quite hard. I need help from my friends [from Malaysia], and then, we explain them in Malay each other. They kind of translate for me.

In fact, as Figure 2 illustrates, one important factor in determining participation by international students seems to have been the balance between local and international students in each group. The international students in group 1, who were only two

students out of 6, participated least of all, while those in Groups 2 and 3, with only a single local student in each group, participated far more.

Figure 2: Tutor and Student Participation in Tutorial, Measured in Terms of Number of Conversational Moves



I4 also commented on her use of English as a second language. Excerpt 5 below shows that her limited lexicon sometimes influences her oral participation, in particular, when talking with local students. Like I9, who feels that she can obtain academic support from peers who have the same ethnic background when she encounters language difficulties, I4 too claims that she feels more comfortable participating in the discussion when communicating with other international students in non-standard English:

Excerpt 5

I4: E-especially, I think, because in my group, most of us are all from non-English-speaking background, and only L5 is the one who's [from Australia]. If I want to talk to friends who are English as a first language, I'm not really confident to talk with them.

Int: Do you know why you are not confident?

I4: Maybe because I think... my vocab. is not really good. So, sometimes I find I'm struggling to find a correct word to talk with them, but with people who is not English-speaking-background, I think it's okay. One more thing that makes me more comfortable to speak with other international students in English, compared to local students, is because among international student, we all speak in 'Broken English'. It's okay, compared to when speaking to Aussie people.

Given these language difficulties experienced by some international students, the fact that the majority of members in Groups 2 and 3 were international students seems to have promoted their participation. That is to say, certain learning strategies, such as obtaining help from their peers and concentrating on listening to others' contributions, may allow them to overcome or compensate for such difficulties.

Tutor Roles and Students' Perceptions of These Roles

Tutor roles and students' perceptions of these roles may have a great impact on students' participation in the discussion. This study found that there is a difference between the actual tutors' contribution and the 'ideal' participation of PBL tutors as prescribed by the university. Specifically, the tutors in Groups 1 and 2 took the initiative in the discussion. Therefore, actual tutor participation, which can vary depending on the educational contexts, may be considered as an influential factor on student participation in the PBL tutorials.

In the interviews, the students commented on the two main tutor roles: asking questions and providing and clarifying clinical information. Firstly, some students stress the importance of the tutors' questions in the discussion, whereby such questions facilitate the group dynamics. In Excerpt 6 below, L1 considers that by asking questions to the whole group, the tutor provides the chance for all group members to respond to his question:

Excerpt 6

L1: Usually when tutor asks questions like that, he's sort of addressing the question to the whole group, and it's up to one of us who knows something about it to say something.

L1's claim above indicates that T1 tries to balance the students' participation in the tutorial. Hendry *et al.* (2004) also suggest that the tutor needs to use appropriate strategies for managing quiet students, such as asking them questions individually.

Secondly, some students claimed that the tutors' role as a provider of clinical information is important in the tutorial. L1 mentioned in Excerpt 7 below that the tutor's contribution is helpful for developing the discussion when the students are struggling to deal with the topic:

Excerpt 7

L1: Usually a tutor generally tends to give us some input when we're struggling. He is giving us his knowledge or framework for thinking about a theme. I think it's good... Moreover, T1 summarised a lot of things which are important, because we tend to have a lot of information. If we don't know whether it is important or not, he gives us a correct direction.

In discussing the clinical topic without the tutor's help, it is sometimes hard for the students to identify the main point from a wide range of clinical information. Most students expect their tutor to clarify the information in the tutorial.

The stimulated recall interviews revealed that the students acknowledge certain roles for the tutor. In other words, the tutors' questions facilitate the group dynamics, while the tutors' input reinforces the students' clinical knowledge. However, it seems to be important for tutors to balance the role of providing clinical information with the role of facilitating group dynamics.

Social Relationships with Peers

The learning atmosphere and relations between peers in the groups may also have an impact on their participation. Social relationships can influence the students' learning activities not only inside the tutorial but also outside the classroom, such as getting academic support from peers. In this study, Groups 2 and 3 contained a majority of members who were from Malaysia and thus these international students were able to establish comfortable learning environments. For example, as discussed above, I9 can obtain academic support from her Malay friends by using their first language. As a result, I9 feels comfortable in participating in the tutorial. Furthermore, I10 pointed out that in Group 3, the 'small size of the group' (a smaller number of

members than in the other groups) can promote discussion, allowing everyone to get an opportunity to make a contribution.

Contrastively, the issue of the social relationship with group members was raised as a negative factor by some students in Group 1. In Excerpt 8 below, when compared with other tutorials' members, I1 did not report on good relationships between his peers in Group 1, and he considered that this relationship affected the group dynamics of the tutorial:

Excerpt 8

I1: My pathology tutorial have almost all local, and we get along very well, and participation is very great, and we can discuss a lot of things, but this particular group has a bit of probably we don't have a best group in terms of, it doesn't bring up best each other...and not all of us are friends outside of the works [this tutorial], so it seems like affect group dynamics....Personally I don't mind if I'm working with people who aren't my friends, but some people in the group might feel that they don't feel comfortable or...productive.

Group composition can be one of the elements that may promote the establishment of positive social relationships between peers. Learning environments like Groups 2 and 3 in which a majority of members are international students allow the international students to obtain support from peers. Renshaw and Volet (1995) argue that an equivalent proportion of the international and local students in groups helps them to establish a learning environment in which they feel comfortable, in conjunction with the social relationships between them.

Conclusion

This study has explored a number of factors influencing the students' participation in the PBL tutorials: content knowledge and tutorial participation, English communication, tutor roles and students' perceptions of these roles and social relationships between peers. The findings suggest that the above factors were interrelated and often occurred in conjunction with each other, both inside and outside the PBL tutorial.

The PBL curriculum has been designed to promote students' autonomous learning. In fact, this study recognised that some students actively participated outside as well as inside the classroom, such as by researching their learning objectives and seeing the patients with related clinical theme of the tutorial. However, despite the pedagogical intention of a PBL tutorial which aims to facilitate students' independent learning skills, there were some unsuccessful participants, for instance, who just listened to others' contributions in the discussion. The poor participation of some students in the tutorials seems to be attributable to these four main factors: content knowledge, English proficiency, tutor roles and students' perceptions of these roles, and social relationships between group members. Further research on the learning strategies used by students to overcome the difficulties caused by these factors should be conducted for PBL curriculum development, as well as to promote student use of autonomous learning skills.

The Author

Rintaro Imafuku completed his MA at Monash University, and has taught Japanese as a second/foreign language in Australia and Japan. Currently, he is a PhD candidate in Education at the University of Hong Kong. His research interest is in looking at students' discourse socialisation into a problem-based learning (PBL) approach in Japanese higher education in terms of self-directed learning.

Appendix

Students' and Tutors' Participation Pattern

Student and tutor participation in Group 1

	T1	L1	L2	L3	L4	I1	I2
▣ Moves	169	71	14	28	41	12	11

Student and tutor participation in Group 2

	T2	L5	I3	I4	I5	I6	I7
▣ Moves	236	58	44	43	28	58	47

Student and tutor participation in Group 3

	T3	L6	I8	I9	I10	I11
▣ Moves	13	31	53	95	92	57

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