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Students Participation and Facilitation in PBL Tutorial Session

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Abstract

Students' participation in the PBL group discussions has always been associated with the role of facilitator, who is responsible for the effectiveness of tutorial sessions. This paper examines the participation of first-year polytechnic students in PBL group discussions and proposes a method of facilitation. The PBL was implemented for ten weeks according to the fourteen-step PBL procedures. Students solved five problems in a two-week block period. Students' participation was observed and videotaped. Students also responded using a fixed reflective journal while attending all the tutorial sessions held in the 10-week period. At the beginning of the discussion session, students felt awkward to communicate with other members of the groups. They liked to chat with their partners, and the groups generally lacked discussion skills. A serious discussion session only lasted for less than 10 minutes; as a result, no clear decision was made at the end of the discussion session. Therefore, several suggestions were proposed to develop a facilitation technique: to create an environment conducive to discussions and carry out monitoring every 10 to 15 minutes.

Keywords: Problem-based learning, facilitation, participation, tutorial session, engagement with PBL, electrical engineering

1. Introduction

A facilitator's prescriptive tasks in a Problem Based Learning (PBL) environment require a long list of actions to be identified. Facilitators should apply their knowledge and skills of a subject matter expert or procedural expert in the tutorial class, especially in group discussion sessions (Wee, 2004). Among the important tasks, a facilitator is to guide students throughout the process of learning in order to fulfil the course learning outcomes. In addition, a facilitator has to deal with group dynamics, fostering a suitable climate for collaborative learning (Wee, 2004). In particular circumstances, a facilitator is responsible for resolving team conflicts through diplomatic and negotiation skills (Savin-Baden, 2003; Sabburg, Fahey and Brodie, 2006). One major responsibility of a facilitator is to ensure appropriate level of participation and the use of resources in order to increase group effectiveness (Justice and Jamieson, 2012).

Determination of students' levels of participation in a PBL group discussion has been very subjective. Previous studies agreed that measuring participation can be done as a group property but not as an individual count (Paletz and Schunn, 2011). Some studies have examined individual participation rates in relation to communication of influence or persuasion of members of a team (Burgoon and Hale, 1987). In fact, some researches propose a matrix for measuring an individual's participation (Paletz and Schunn, 2011): rubric, questionnaire, and informal self-assessment (Knight, 2011). It is argued that the level of participation can be observed from the pattern of interaction and contribution of members in a group, which are actions indicating an individual's behaviour (active-passive), oral ability (silent-talkative), group skills (excellent-poor), and confidence (high-low).

Previous authors pointed out that behaviour, oral ability, confidence level and group skills are associated with one another; the combined effects of these four factors influence an individual's participation in the group discussion (Remedios et al., 2008). A student's active or passive behaviour in participating in group discussion has been explained in the Model of Learning and Teaching Styles (Kolb, 1984). When a student actively participates in a discussion session, the student talks, moves, and reflects on the subject matter; when a student switches to passive mode, the student watches and listens. However, a student's actions of talking, moving, and reflecting within a group might end up in disaster without proper group skills. An appointed leader must function as an individual who coordinates a discussion orderly and effectively according to procedures. In order for everyone to attain success of learning, a group should comprise members with understanding of content matter and good communication skills; they should also demonstrate a high level of confidence in presenting views and opinions in the discussion session.

In this context, an ideal facilitator should have two sets of skills (Wee, 2004). Firstly, the facilitator must possess skills relating to PBL process and procedures, such as dealing with group dynamics and fostering suitable climate for collaborative learning. Secondly, the facilitator must be equipped with skills to stimulate students' meta-cognitive ability, such as probing, questioning, provoking, and any other methods that can encourage students to think creatively. In certain circumstances, the facilitator must be capable of resolving team conflicts through diplomatic and negotiation skills (Savin-Baden, 2003; Sabburg, Fahey and Brodie, 2006).

Using PBL as a platform, a facilitator is the most important person who can influence students' participation in a group discussion. Hung (2009) proposed a facilitation method based on students' capability: minimal, moderate, or aggressive guidance

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is provided for students depending on maturity levels of students. However, it is difficult to prescriptively define a set of procedures for effective facilitation and stimulation of active participation to ensure effective learning. Existing models of facilitation such as the pyramid model of facilitation (Hunter et al., 2009) are sometimes difficult to be applied in practical group environment, especially in educational context. In addition, specific methods of facilitating PBL group discussion sessions are dependent on individual skills of a facilitator. Therefore, this paper investigates the pattern of students' participation and proposes a facilitation technique for effective learning in the PBL group discussion sessions. The findings reveal a pattern of participation and behaviour of the first-year students in the PBL group discussions.

2. Methodology

The data reported in this paper were a subset drawn from an experimental study among engineering students to compare the effects of PBL and Traditional Learning Approach in terms of knowledge acquisition, critical thinking ability and intrinsic motivation. While the comparative study provided a major finding from quantitative data, the combination of several qualitative data provided another significant finding. The qualitative data of the study consisted of an observation by the third author, video data, reflective journal, and field notes.

Participants comprised 27 first-year undergraduate students from the electrical engineering course in one of the polytechnics in Malaysia; 24 of them were male and the remaining 3 were female. These students had undergone ten weeks of PBL tutorial sessions in one of the compulsory modules, namely Electrical Technology. Data field notes were collected by a facilitator (the third author) during the PBL group discussion sessions according to descriptive and reflective methods (Emerson et al., 2011). In descriptive method, the observer records the natural setting, actions and conversation taking place in the tutorial session. In reflective method, the observer records ideas, thoughts and concerns based on observation or reflection of events taking place in the tutorial session.

At the end of the 10-week tutorial sessions, field notes of 20 sessions as well as 135 pages of fixed-reflective journals were analysed. Data from field notes and students' fixed-reflective journal were transcribed digitally into a matrix form. The data from videotapes were repeatedly watched and used to double check students' behaviour and participation during the discussion sessions.

2.1. Brief notes on PBL tutorial session

The instruction was based on the 14 steps of PBL procedures (Masek and Yamin, 2012). Briefly, during the first meeting, students were divided into groups according to previous test results such that higher-score and lower-score students were evenly distributed (heterogeneous group). A total of seven groups were formed: six groups each with four members and one group with three members. They were then asked to appoint a leader for each group and were briefed on the PBL procedures.

Students were given five PBL subject-focused problems (subject-centric) during the 10-week PBL tutorial sessions. One problem required a two-week block of time to complete one cycle of PBL procedures. In the two-week block, it was compulsory for students to attend two tutorial sessions. The first session was dedicated to problem delivery and group brainstorming, while the second session was devoted to group discussions (decision- making) and presentation.

Both sessions of group discussions were videotaped and recorded in field notes (by the third author). The video data were used to validate the data from the field notes jotted down by an observer regarding students' participation during the PBL group discussions. The writing of reflective journal was implemented for each student at the end of the second session (one complete cycle of PBL procedures). The purpose of the reflective journal was to capture students' participation in the PBL group discussions; the journal contained fixed questions such as "what is the most motivating thing in PBL session" and "what is the most frustrating thing in PBL session".

3. Findings and discussions

Several repeated patterns of interaction were identified in order to understand students' participation during the discussion sessions. These patterns were set up as a base for critical comments and discussions regarding students' participation during PBL group discussion sessions. These patterns include the students' behaviour (active-passive), oral ability (silent-talkative), group skills (excellent-poor), and confidence (high-low) as described in Table 1:

Table 1: Themes from data matrix of extracted field notes and fixed reflective questions

TYPE	DESCRIPTIONS
Behaviour *Active-passive*	• Some group members actively participated in the discussion activities. They moved, talked and reflected on one another's responses. • Some group members passively participated in the discussion activities. They moved less, did minimal talking and did not reflect at all (during the first and second PBL cases).

Oral *Silent-talkative*	• Some group members were talkative persons. They talked about relevant and irrelevant topics of discussion. • Some group members were quiet for at least 10 to 15 minutes during the discussion session.
Group skills *Excellent-poor*	• Group skills were excellent for some groups. Procedural discussion was observed: chairman, secretary and contributors. • Group skill was poor for some groups. No procedural discussion was observed.
Confidence *High-low*	• Some group members have high levels of confidence in action, behaviour, communication, contributing ideas and proposing solutions. • Some group members have low levels of confidence in action, behaviour, communication, contributing ideas and proposing solutions.

Table 1 indicates the pattern classifications of students' behaviour, oral ability, group skills, and confidence level during discussion times in the PBL group tutorial sessions. These classifications can produce several combinations as listed below:

Active and talkative group: A number of groups were active during the discussion sessions (on topic or off topic); the members of these groups were talkative persons. Students who were talkative persons were involved in the discussion sessions and got along well with other members. Particularly, the PBL problem was discussed rigorously from many possible aspects, and several possible solutions were also identified. These active participation and spontaneous responses were reflected in excellent presentations with good contents and proposals having minimal errors. Interestingly, there were some students who were identified as quiet persons, but they appeared to be contributors of ideas for these particular groups.

Passive and quiet groups: This category usually has two distinct types of groups exhibiting different characteristics. Firstly, a successful group with passive members; the group was led by quiet but brilliant or hardworking members. Secondly, a failure group; some members did not cooperate and some other members were quiet participators who seldom talked (Remedios et al., 2008). Two occurrences can be observed in the successful group (first case): first, some students kept silent and only talked when they were prompted by other members; second, some students kept silent and only listened to others for the first 10 to 15 minutes. In the first PBL group discussion, it could be observed in both types of groups that several students were shy and felt awkward to participate in discussions, especially when there were female members in the group.

High confidence and poor group skills: Several groups were observed to have high levels of confidence in conducting group discussions. However, members lacked group skills in order to have an effective discussion session. Members contributed ideas and the discussions appeared organised and procedural, but no one took down notes.

Low confidence but excellent group skills: Several groups were observed to have low levels of confidence but they had good ideas and skills in problem solving. A member of the group was actually brilliant and creative, but members were hesitant to start the discussion of the topic given. The group wasted quite some time at the beginning before some members kick-started the discussion session.

4. Discussions and recommendations

Literature suggests that skills of facilitators are one of the three main input variables that influence tutorial group process, which in turn determines cognitive and motivational outcomes (Arts, Gijselaers and Segers, 2002). It is believed that by improving group process, individual participation will also increase; the key is that facilitators must play their roles appropriately according to the nature of individual groups. In considering these constructs, one might argue that variables such as student characteristics will substantially affect the amount of self-study and the level of students' participation in learning. However, it must be noted that without a facilitator's guidance, it is doubtful that group discussion can be effective since individual participation is minimal or perhaps none at all.

Premised on these findings, four constructs were derived based on the dynamics and variety of group nature and action in the PBL group discussion sessions as well as existing literature. Basically, several possible combinations can be created based on the four constructs, but four major combinations are highlighted for discussion in this paper. Therefore, several recommendations for facilitation techniques are proposed especially for those practising the concept of floating facilitator, which is mainly based on group nature.

Generally, for the active and talkative groups, the identified quiet individuals can be put together with those who are more talkative to encourage communication and effective discussion sessions. The quiet individuals appear to be good critical thinkers because they are capable of debating ideas proposed by other members as well as facilitators. This does not always happen because the quiet individuals sometimes are not in the same groups as talkative members. However, in order to maintain the level of control, autonomy as well as the inclusion of social aspects of students' learning (Arts et al., 2002), facilitation techniques are proposed to deal with participants according to the identified group nature as defined above.

Active and talkative group: The top priority job is for the facilitator to frequently monitor discussion sessions and guide participants to move along the right path. Naturally, the purpose of facilitator intervention is to improve the way participants identify and solve problems (Schwarz, 2002); the actions of facilitators must serve to trigger students' meta-cognitive ability, such as probing, questioning, provoking, and any other methods that may stimulate students' thinking process (Wee, 2004).

However, it is suggested that the level of facilitator intervention be kept to the minimum to avoid disrupting the momentum of group discussions.

***Passive and silent group*:** The facilitator should provide aggressive guidance to excite members so that the groups can take off with warm and lively discussions. In this context, aggressive guidance means to encourage collaborative learning among members within a group, inside and outside of the tutorial class (Arts et al., 2002). In the tutorial class, the facilitator promotes warm and lively discussions amongst group members by injecting a hot topic, a controversial issue, or a particular concern relevant to the problem in hand. Another role of the facilitator is to monitor participation of individual students in brainstorming sessions. Outside the tutorial class, the facilitator encourages students to have independent group discussions and self-study sessions; this will provide opportunity for group members to speak and contribute ideas.

High confidence and poor group skills: The group requires less help from the facilitator to start on discussions. The facilitator's role is limited to suggesting members of the group to be chairman, secretary, and contributors in the discussion session. The facilitator has to monitor the discussion at the beginning before leading the group to work independently. Justice and Jamieson (2012) highlighted the necessity of group members' function at appropriate levels of participation and the proper use of resources in order to have an effective group discussion. Minimal guidance from the facilitator is needed for this type of PBL group.

Low confidence but excellent group skills: The group members require some ideas from the facilitator to start on discussions. Everyone is hesitant to contribute ideas although they have been thinking so much about the topic given. The main issue is that students are less confident to speak up. According to Schwarz (2002), group effectiveness can be increased by creating a discussion environment that is substantively neutral. It is suggested that the facilitator acts as a fellow learner within the group to create an informal discussion environment. The discussion in this case should be continuous similar to normal conversations and chats with friends.

5. Conclusion

Generally, in PBL tutorial sessions, it is facilitators' responsibility to promote effective group discussions and to stimulate effectiveness of participants according to dynamic group nature. By increasing participation of individuals in the discussion session, one group might effectively operate under the facilitator's supervision. Several steps are essential for smooth group functioning, such as allowing the group to appoint a leader that rotates for every single project and letting students decide who the first leader is. Facilitators are also responsible for monitoring groups every 10 to 15 minutes; the aim is to create a friendly environment, impart group skills, and update discussion progress every 10 to 15 minutes. Facilitators must also emphasise clear findings to increase effectiveness of group discussions.

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