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A PROBLEM-BASED LEARNING APPROACH IN MANAGEMENT
CONTROL SYSTEMS COURSES: PERCEPTIONS FROM ACCOUNTING
STUDENTS IN INDONESIA

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Abstract

This paper aims to describe the implementation of a problem-based learning (PBL) method in non-technical accounting courses with students in an Indonesian learning environment. Non-technical courses such as Management Control Systems are not precise disciplines. They require students to probe for possible solutions from their own approaches by considering divergent views. Accounting students might find it challenging to learn in the manner the course requires as they tend to focus on accounting technical skills and expect an exact answer. The situation is more exigent in the Indonesian learning context, as students in Indonesia have the habit of obeying and learning by rote from lecturers. Therefore, it is pertinent to apply a PBL method in this course to support students in constructing their thoughts. The second objective of this paper is to determine students' perceptions of the implementation of PBL in a Management Control Systems course. The findings of this paper are that overall, students perceive PBL positively. The factors contributing to their favorable response are group discussions, self-study, and improved communication skills. Hence, PBL is an effective teaching approach in a quiet and passive learning environment. PBL is also suitable to be implemented in non-technical Accounting courses, such as Management Control Systems.

INTRODUCTION

Accounting education has been subject to criticism. One of the criticisms addressed to Accounting educators is to break off from the practice of solely lecturing and not just focusing on knowledge but also on skills and abilities (Albrecht & Sack, 2000). Correspondingly, the International Federation of Accountants (IFAC) released International Education Standards (IES) 3

which place emphasis on the development of professional skills. A professional accountant is expected to be intellectually, technically, and functionally equipped. They are also expected to have personal, interpersonal, and communication skills, as well as organizational and business management skills. Continuously, a change in the nature of the labor market also implies a transfer to new educational standards, hence affecting all higher education systems; (Abdrahman, Joldassova, Amandosova, Kenzhebayeva, & Sanay, 2017) including Accounting education.

To meet the above expectations, Accounting educators are trying to modify their teaching practices. Prior research shows that the problem-based learning (PBL) approach is put into practice in Accounting classrooms to fulfill the required process and skill focus. Research began more than a decade ago when an experiment was conducted comparing the traditional teaching method and the PBL approach (Breton, 1999). His study found that students who are taught with the PBL approach have significantly higher marks, as well as better and longer-lasting knowledge compared to those in the traditional lecturing style group. A few years later another study suggested putting more emphasis on the PBL approach in Accounting curricula (Milne & McConnell, 2001). They recommended the usage of PBL in Accounting courses so that Accounting students could experience the rigors of professional life. They also stated that case studies are suitable to be used as 'problems' in PBL. In 2012, a PBL method was employed in an Accounting classroom to confirm the effectiveness of the method in encouraging questioning, problem solving, communication, and teamwork skills (Stanley & Marsden, 2012).

These studies, however, focus on the application of PBL methods in technical Accounting courses. To the authors' knowledge, the application of PBL in non-technical courses, such as Management Control Systems has not been widespread. Although Breton (1999) study was in an Accounting theory course, the aims of the authors and Breton's studies are different.

Management Control Systems is not an exact science. What is considered pertinent in one situation might not work in other circumstances. Management Control Systems courses require students to make judgments and to ensure the benefits derived from a certain decision will overrule the costs. To accomplish this, students do not rely on a set of rules, regulations, or information (Merchant & Van der Stede, 2007). Instead, they need to establish their own range of approaches and thoughts. This situation resembles the real working environment that accountants face. However, this can be challenging for Accounting students where they get used to single-answer problems (McCarthy, 2010). Therefore, providing a supportive learning environment through PBL enables them to construct their thoughts and broaden their views. Additionally, by allowing students to encounter problems first without any prior lectures, there will be a knowledge deficiency which will ignite their self-directed learning process (Hmelo-Silver, 2004). This serves as the initial phase of lifelong learning, an essential skill that is required by professional accountants.

This study uses Accounting students in Indonesia as its source of data. The learning environment in Indonesia is heavily teacher-centered. As an expression of respect to higher authorities- including teachers - students are expected to listen to, and obey their teachers (Novera, 2004). This learning

environment along with the Accounting students 'converger' learning style (Boyce, Williams, Kelly, & Yee, 2001) makes the process of teaching courses such as Management Control Systems even more complex for lecturers.

This study aims to describe the implementation of PBL in Management Control Systems courses. Second, it also intends to determine how Accounting students in the Indonesian learning environment perceive PBL. By transcribing the students' feelings and thoughts, it is hoped this will provide feedback to Accounting educators on the application of PBL in non-technical Accounting courses. To achieve the second objective, this study used a qualitative method which analyzed Accounting students' reflection journals. To enhance the data quality, several interviews with selected students were also conducted.

The next section of this paper will discuss PBL research, the application of PBL in Management Control Systems courses, and students' perceptions of PBL methods.

LITERATURE REVIEW

PBL and Its Characteristics

Barrows & Tamblyn (1980) define PBL as follows:

"Problem-based learning is the learning that results from the process of working toward the understanding or resolution of a problem."

Problem-based learning is built on the theory of constructivism. Proponents of constructivism, such as John Dewey, believe that 'meaning-making' happens when people construct their own knowledge through interpretation and experience based on their previous knowledge. Therefore, in a PBL approach, students are encouraged to decide what they need to learn and how to acquire that knowledge (Hmelo-Silver, 2004; Milne & McConnell, 2001).

Prior literature has recorded many advantages of employing PBL methods. Among the many advantages, scholars recognized that PBL promotes an engaging and stimulating learning environment (Hmelo-Silver, 2004; Milne & McConnell, 2001; Stanley & Marsden, 2012; Walsh, 2005). Hmelo-Silver (2004) elaborated on this by stating that PBL can assist students in constructing extensive and flexible knowledge, developing effective problem-solving skills, increasing self-directed and life-long learning skills, becoming effective collaborators, and becoming intrinsically motivated to learn.

The implementation of PBL differs for each scholar. For example, Walsh (2005) identified seven steps in the PBL process. Milne and McConnell (2001) presented a longer process that consists of nine stages. Stanley and Marsden (2012) simplified the PBL process by developing the abbreviation 'FIRDE', which stands for 'facts, ideas, research, decide, [and] execute'. Hmelo-Silver (2004) provided a problem-based learning cycle that allows iteration. The implementation of PBL can be varied owing to the following factors: the nature of the problem; the roles of facilitators; self-directed learning; effective collaboration; and students' reviews of their learning experiences and processes.

Research Context

The university.

The university where the authors conducted the study is located in South Jakarta, Indonesia. The university is private. Several programs are available and one of them is the Accounting & Finance program. The university also engages in double degree programs and study-abroad programs with partner universities around the globe. The university employs English as the medium of communication for teaching and learning. Students who are admitted to the university are expected to demonstrate English proficiency.

In 2015, its Accounting & Finance program was granted EPAS accreditation. Since then more pedagogies have been introduced to diversify students' learning experiences. One of the pedagogies that has been implemented is the problem-based learning approach.

Management control systems course.

The Management Control Systems course is one of the core Accounting courses offered in the sixth semester. Students who take the course are supposed to have passed Cost Accounting, Management Accounting, Financial Accounting 1, and Financial Accounting 2. The course is counted as a four-credit class. There are two meetings every week, with each meeting lasting 100 minutes.

The course uses the third edition textbook of Merchant and Van der Stede as its main point of reference. It focuses on the implementation of companies' strategies and plans, primarily on result control (Merchant & Van der Stede, 2012). Every topic is supported with case studies that bring students real, complex, and multi-dimensional examples of Management Control Systems paradigms.

Student participants of this study.

The initial total number of students who enrolled in the Management Control Systems course was 36 students. However, due to personal reasons, three students withdrew from the course, leaving 33 students. Among those 33 students, four of them retook the course due to failure in the previous semester. None of them had previously been exposed to PBL methodology. The class consisted of 18 male and 15 female students.

The university has a small class size policy. Therefore, the students were divided into two parallel classes. Students were free to choose their own schedules. The results of the enrollment were that there were 15 students in one class, and 18 students in the other. One author - who was a lecturer of both classes - requested these classes to be scheduled back-to-back. To ensure uniformity, both classes were taught by the same lecturer and run at an identical pattern and pace.

Implementation of the PBL Method in a Management Control Systems Course

Before the PBL approach started, students formed groups of 3 to 4 students. They were free to choose their group members and were obliged to stay with their members throughout the 13-week course. This was done to ensure that each student was comfortable with their team. Azer (2009) asserted that a contented environment fosters the participation of each member in group work. Additionally, constant meetings and contact with each member enhances students' motivation in self-learning by means of peer pressure (Schmidt, Rotgans, & Yew, 2011).

The course lecturer used case studies available in the text of Merchant and Van der Stede, 3rd edition (2012) as the ‘problems’. The authors agree with Hmelo-Silver (2004) in Milne and McConnell (2001) that case studies are loosely-structured enough to give room for students to analyze them from diverse angles. Additionally, Management Control Systems courses involve complex and multi-dimensional situations. A simple exercise will not be sufficient to represent the complicated environment that Management Control Systems engender (Merchant & Van der Stede, 2012).

To enhance the usage of case studies in the context of PBL, the lecturer did not give out the suggested questions provided in the teaching notes. Instead, the students took the role of consultants determining the problems and what needed to be done to solve them. To assist the students, the lecturer provided six steps of a PBL process for the students to follow. Each case study was covered within 3-4 sessions, depending on the level of difficulty of the case and the topic being discussed.

Furthermore, prior to the commencement of a class meeting (approximately 5 days earlier), the assigned case was given to the students. This was because cases are lengthy and class sessions did not provide enough time for students to read and discuss them in-depth. Also, by assuring students that they had enough time to read, they could immerse themselves in the situation presented in the case. Reading was to be done individually and outside the class schedule. The lecturer did not deliver any course content in the class. To provide basic knowledge about the topic being discussed, the lecturer used an online forum to ask conceptual questions from the assigned chapter. Students’ online answers were addressed individually to ensure students got the proper feedback and knowledge.

The adopted PBL process was designed by the lecturer with reference to a number of sources (Breton, 1999; Hmelo-Silver, 2004; Massa, Audet, Donnelly, Hanes, & Kehrhahn, 2007; Milne & McConnell, 2001) to fit the needs of the students and the nature of the case studies. The process consisted of acquaintance, problem identification, self-directed learning, brainstorming, decision making, and communication (see Table 1).

Table 1.
PBL Process in Management Control Systems Class

PBL step	Description
Step 1 - Acquaintance	Identify what is given, unclear terms, and correct any misinterpretation
Step 2 – Problem identification	Define the objective, determine the possible problem, and identify the information needed and whether it is provided
Step 3 – Self-directed learning	Determine the self-learning need, how, where and when to study, and measure its success
Step 4 - Brainstorming	Identify several possible solutions by considering their advantages and disadvantages
Step 5 - Execution	Apply decision making with deep analysis and reasoning
Step 6 - Communication	Present the proposed solution with an open mind

At each stage, students recorded their evolving ideas on a whiteboard. The purpose of keeping their ideas on a whiteboard was to keep students' problem-solving process focused and to aid them in constructing knowledge (Hmelo-Silver, 2004).

In the first step (the acquaintance phase) the students identified what had been presented in the case study. It also served as an opportunity for students to address any unclear terms or misinterpretations from reading the case study. Finally, a synopsis of the case was drawn to keep students from being lost in details and narrow everything down from 'the big picture'. This initial step was similar to Breton's (1999) PBL first phase.

Table 2.
Step 1 – Acquaintance

Are there any..?		What are the main facts presented in the case?	
Unclear terms?	Main characters (persons) presented in the case?		
What is the case all about (the synopsis of the case)?			

The second step involved problem identification. This is where the problem-solving phase started. Students needed to decide whether a problem existed and identify what they believed to be the problem (Milne & McConnell, 2001). It was also necessary for students to clearly identify their objective in the problem-solving process. At this stage, students determined what information was needed, and identified whether it was provided or not.

Table 3.
Step 2 – Problem identification

What are we trying to accomplish?			
What are the possible problems?	What do we need to know (information) to solve the possible problems?	For the information that we need know, is it provided by the case?	If, no, ...
		If yes, is it sufficient to solve the problem?	Where can we find the information? Do we need to make any assumptions?

After the second stage, it was expected that students could identify their learning needs. Thus, the third step was for students to embark on their self-directed learning. Students held themselves responsible for attaining the necessary knowledge and skills to solve the problem (Massa, Dischino, Donnelly, & Hanes, 2009). This activity was conducted individually outside the class schedule. Each student filled in the following table before beginning the self-study process. It also served as a tool in aiding students' self-study success.

Table 4.
Step 3 – Self-directed study

What are my learning goals?			
Specifically, what do I need to learn?	What resources will I use?	How will I budget my time?	How will I know when I have achieved my learning objectives?

After the self-directed study, students returned to their respective groups and conducted step four - brainstorming. Students were expected to apply the knowledge and skills that they obtained through self-directed learning (Hmelo-Silver, 2004; Massa et al, 2009). Students were expected to examine and respond to each proposed idea by considering the advantages and disadvantages of them. Each idea was ranked according to its feasibility/viability. For each proposed idea, students laid down their next plan.

Table 5.
Step 4 – Brainstorming

Let's hear some ideas....				
Ideas	Pros	Cons	Ranking	Next step

The fifth step was where the students generated a group consensus. Similar to a real-life work setting, students were required to analyze their recommendation(s) in detail. Milne and McConnell (2001) called this 'analyzing a solution, information gathering and reasoning'.

Table 6.
Step 6 – Execution

Our decision is

Consideration	Advantages	Disadvantages	Justification
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The last phase in the PBL process was to present their ideas to the class. Students were encouraged to be open-minded and take note of any valuable input. The goal of the presentation was to listen to other groups' perspectives. Likewise, when another group was presenting, those who listened were encouraged to compare and write down any important points.

Table 7.
Step 6 – Communicate

During our team's presentation	During another team's presentation: Another team's information that gives insight to our problem-solving
The feedback	Our response

The above steps needed to be followed sequentially. Each step served as a prerequisite for the next one. The lecturer handed out written guidance and explained each step to the students at the beginning of the semester. Additionally, the PBL process allowed for several iterations. The loop was concluded by a group report which included each member's self-reflections. As asserted by Barrows (1986) only the iterative PBL approach can fully capitalize upon the objectives of the teaching method. In the same way, one study recommends the usage of self-reflection to enhance students' learning strategies and evaluate their learning outcomes (Adler & Milne, 1995). Additionally, the authors believe a periodic assessment of one's own self-learning strategies and outcomes will improve his/her SDL skills. During the process, the lecturer served as the facilitator. The lecturer tried to avoid giving answers to the students. The lecturer tried to trigger their thoughts and curiosity through scaffolding instead. The lecturer also adopted a wandering facilitation model, whereby the facilitator rotated from one group to another (Hmelo-Silver, 2004). The time spent on each group varied, depending on the needs of each group.

CONCLUSIONS

There were two objectives that this paper tried to achieve. The first was to describe the development and implementation of the PBL method in a non-technical Accounting course such as Management Control Systems. Because of the wide remit of the course, case studies were used as the 'problems' of PBL. The development of the PBL method is with reference to several studies (Stanley & Marsden, 2012; Hmelo-Silver, 2004; Massa et al, 2009; Breton, 1999). As a result, there were six steps of PBL produced in this study – acquaintance, problem solving, self-directed learning, brainstorming, execution, and communication.

Overall, students perceived PBL positively. There were three factors that caused students to prefer the PBL method. First was the dynamic group discussion; second was the self-directed learning, and the last was improved communication skills.

- *Most of the students are used to learning through traditional educational methods assuming their teacher as the main source of knowledge rather than a facilitator and mentor. Because of this understanding towards the subject matter, students may confuse it with problem-based learning. However, we like it because the PBL process can improve our teamwork skills, self-learning skills, and critical analysis skills through group discussions. In the PBL process, we as students are required to be active in the learning process and able to solve a problem by ourselves.*(Student#23)
- *Honestly, my team members and I do not like the PBL process since it is very challenging. The only thing that we liked from the PBL process is the teamwork that allowed us to discuss and learn from others.* (Student#22)
- *Throughout the semester, I like Management Control Systems the best because it uses PBL. It made the learning process easier, fun, and also gave me a chance to get closer with my friends. It is far from boring because it allows me to stay active and talk in the discussion. I find it hard to keep track of the time, because in the PBL process, the clock seems to move twice as fast as it usually does.* (Student#30)
- *Honestly, I prefer this PBL process rather than the conservative one. I think it is because this Management Control Systems class is suitable with this learning process as every chapter is related to the case study, so we can discuss the case study with our group members.* (Student#23)
- *What I like most about PBL is it makes the class much more entertaining and interesting. I can actually be productive by talking to my friends instead of only listening to the lecturer.* (Student#2)
- *This PBL process creates a fun learning environment which makes almost all students in the class enjoy their time by discussing the case without feeling bored.* (Student#17)
- *I like this subject because I enjoy having discussions with my team members.* (Student#21)
- *Through the PBL method, everyone is more enthusiastic in learning. This is because we are allowed to give input to one another. Also, everyone becomes keen to debate and give his/her opinion. That is why I like this method where everyone has active participation.* [Translated] (Student#26)

Students' perceptions demonstrated that PBL is relevant to be applied in non-technical Accounting courses. Specifically, in a silent and passive learning environment, the PBL method encourages more engagement and participation of the students. In the same way, for non-technical courses, PBL gives more opportunities for students to explore possible solutions by conducting more self-study and by listening to others' ideas. This is an important skill as accountants are required to have open minds. The self-directed learning activity in PBL enhances students' responsibilities, which in turn prepares them as life-long learners. Similarly, the PBL method assists Accounting students in their learning process by enhancing their understanding and knowledge retention. PBL can also serve as a platform to

improve Accounting students' communication skills and communication apprehension.

However, several discomforts also arose from the implementation of PBL. In the authors' view, the uneasiness should and could be overcome by lecturers. Overall, echoing Stanley & Marsden (2012), regardless of the difficulties and challenges of applying PBL, it is worth applying it in the Accounting curriculum, including in non-technical courses and in a passive learning environment, as the rewards are greater than the trouble it could potentially cause.

Since this was a preliminary study in an Indonesian learning context, further research should be conducted to enhance the findings. First, future researchers could carry out a longitudinal study to confirm the findings. Second, to have a richer understanding of student perception, a more thorough interview method for all students should be considered.

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