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THE PROBLEM OF PROBLEM IN PROBLEM-BASED LEARNING: A CLOSER LOOK AT THE BASICS

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Abstract

Problem-based learning (PBL) is one of the commonly used learning methods in the European Higher Education Institutes (HEIs). The aim of the study is to review the basics of PBL method by focusing on the most fundamental aspect of it – ‘the problem’. This study proposes that the term ‘problem’ in PBL should not be conceived as a ‘problem’ in its lexical meaning, that is an unwelcome or harmful situation demanding a solution. Rather, the term ‘problem’ in PBL should be understood and addressed as an ‘irregularity’ that may produce negative or positive outcome. This study supports the proposition that PBL is indeed problem focused and that learning is stimulated by the problem, nonetheless this study proposes that in PBL methods, the learning is not necessarily dependent on finding solutions, rather that learning about the ‘irregularity’ in question. What we know and do not know about the ‘irregularity’. This study follows a quantitative research design and is supported by empirical evidence consisting of a sample of 40 students from a Bachelor of Business Administration (BBA) degree program in a Finnish HEI. This study explores the PBL method in terms of students’ engagement in the tutorials and sheds light on the effectiveness of this method to achieve desired results. The analysis of the results shows that almost all the respondents considered to be familiar with the steps of PBL tutorial session. Majority of the students assessed that they have received sufficient information about PBL method. However, about a quarter of the students were unsure or did not consider the information to be sufficient. During the PBL tutorials, over half of the respondents took a specific role as a discussion leader, a recorder or an observer. Videos and news articles were used as triggers during the opening sessions by most of the respondents. Presentations and pictures were used the least. Majority considered the triggers to be an unstructured representation of the real world. Even though many respondents considered the triggers to be easy to understand. Noticeably, only a few considered it very easy to identify the main problem and few to formulate the learning objectives. This study shows that those respondents, who found it easy to identify a main problem, considered themselves being able to formulate the learning objectives related to the main problem. Analysis shows that respondents selected ‘thinking’ and ‘group discussion’ as two main variables that are triggered by a PBL trigger. Interestingly, none of the respondents chose time management. This study contributes in providing insights related to PBL method in the European HEIs. Hence, this study is directly connected with the current body of knowledge related to student engagement and learning in the HEIs.

Keywords: Problem-based learning, irregularity, tutorials, problem-centered learning, higher education institutes.

1 INTRODUCTION

The history of ‘Problem-based learning’ (PBL) method has its roots in medical education setting [1]. Its formal application dates back to 1950s and 1960s in various undergraduate courses [2], where this method was used to explore medical knowledge base as well as to encourage students pay a visit to an integrated, multidisciplinary knowledge base [3]. At present, PBL has proven to be one of the most common learning methods in higher education institutes (HEIs) around the world [4]. According to Dochy et al. [5], PBL has a positive effect on student learning in terms of retaining acquired knowledge in comparison to more traditional methods. Students acquire flexible knowledge, which can be applied to numerous problems [6]. According to Boud and Feletti [7, p.6], *‘the definition of PBL is now international property rather than the publicized impressions of any one profession or institution’*. As a learning method, PBL is an instructional and curricular model that possesses a learner-centered approach, which enables students to conduct research, integrate theory and practice, as well as apply knowledge and skills to establish a possible solution to a defined problem [8].

The aim of the study is to review the basics of this method by focusing on the most fundamental aspect of it – ‘the problem’. In prevailing research, the difficulty of potential problem is measured using variables

like complexity and structuredness [9]. Researchers have further dissected the complexity into rational complexity, attainment level, breadth of knowledge and intricacy of procedures [9]. This study proposes that a 'problem' in PBL should not be conceived as a 'problem' in its literal meaning. That is, according to Oxford English language dictionary, 'a matter or situation as unwelcome or harmful and needing to be dealt with and overcome'. As soon as a matter or situation is labelled as a 'problem'; instinctively, we start to find a solution. Rather, a 'problem' in PBL should be understood and addressed as an 'irregularity'. That is, a matter, situation, or something with the quality of not being regular. In the context of business education, an 'irregularity' could produce negative or positive outcome.

Furthermore, while viewing the intended goals of PBL, one that is most apparent is to develop and enhance learners' application of knowledge to solve problems in addition to problem solving and self-directed learning skills [9]. According to researchers, PBL method is problem focused that is student learning is driven by the problem to be applied back to the problem – again to find a viable solution. This study supports the proposition that PBL is indeed problem focused and that learning is stimulated by the problem, nonetheless it proposes that in PBL methods, the learning is not necessarily dependent on finding solutions, rather that learning about the 'irregularity'. What we know and do not know about the 'irregularity'.

According to Hmelo-Silver [10], other goals of PBL are i) constructing a flexible and an extensive knowledge base; ii) developing effective problem-solving skills; iii) developing lifelong and self-directed learning skills; iv) becoming effective collaborators; and v) becoming intrinsically motivated to learn. Research also highlights some of the challenges of PBL including are important role of administrative leadership, value of effective communication, recognition of students' need, anxiety by faculty and necessity of assessment method [11]. In general, PBL process includes setting the environment/climate; 1) reading the trigger/problem; 2) defining the kernel of the trigger/problem; 3) brainstorming; 4) discussing and synthesizing; 5) formulating learning objectives/issues; 6) studying/researching independently; 7) co-constructing knowledge and professional action [12]. During PBL students take a larger amount of responsibility of their own learning, however studies show that students struggle with PBL method and try to adhere to fixed structures and minimize their effort when dealing with unfamiliar ill-defined problems [13].

The remaining study is structured as follows. The research design and the context of the research and are presented in the next section, as part of research methodology. Later, the analysis of empirical data and its results are presented. Finally, conclusion of the research is presented in the later part the with limitations and recommendations for further research.

2 METHODOLOGY

A brief description of the research design and the context of the study are presented as follows. The aim of the study is to review the basics of PBL method by focusing on its most fundamental aspect. The present research explores international business students' perception of PBL as part of their degree curriculum. The context of this study is a 5 ECTS course as part of a Bachelor of Business Administration (BBA) degree program in one of the higher education institutes in Finland.

This research follows a quantitative research design. The primary data for the research was collected via a survey questionnaire during Spring semesters of year 2021. A questionnaire was created using Webropol 3.0 survey tool for this specific research purpose. The participation in the data collection was voluntary and all responses were anonymous. This study uses a sample of 40 international business students belonging to BBA degree program. As part of the data sample, respondent students were asked about their own experience and perception of PBL during their course. The questions and variables used in the above-mentioned data collection survey questionnaire were based on the literature review of the study.

Keeping in view the process of PBL, students were asked about receiving sufficient information about the PBL method in the beginning of the process. Students were also asked about the type of the triggers used in the PBL opening sessions during the course. Respondents were asked about their own perception of the nature of PBL triggers. In addition to the above, students were asked about their own perception of the main problem and intended learning objectives. Finally, students were asked about their perception of the aim of the PBL trigger or problem.

The students anonymously submitted their responses through electronic platform by the end of PBL sessions. The authors of this study carefully reviewed the submitted questionnaire and included the

responses in the data analysis. Participants were clearly informed in the beginning that their participation in the research was voluntary and that their answers shall remain anonymous and confidential.

The authors analyzed the data sample with the help of IBM-SPSS software. The empirical data was entered into IBM SPSS statistical tool for the analysis. The data analysis includes Spearman's correlation coefficient method to one of the survey questions with respect to the correlation between identifying the main problem with coming up with the learning outcomes. The results of the empirical analysis are presented in the following section.

3 RESULTS

The survey was sent to 55 students. Total of 40 responses were received and therefore, the response rate of the survey is more than 72%.

All the respondents have participated in PBL sessions during the course. Majority of the students assessed that they have received sufficient information about PBL method to effectively take part in it. However, about a quarter of the students were unsure or did not consider the information to be sufficient. (Figure 1.)

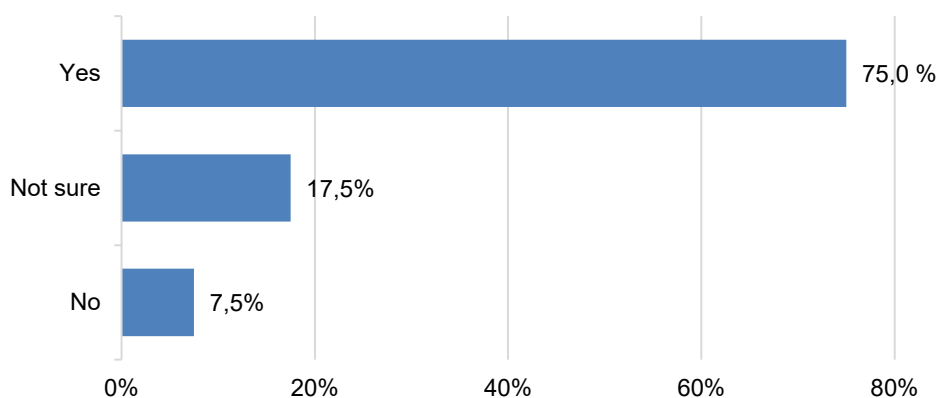


Figure 1. Receiving sufficient information about the PBL method

Over 90% of the respondents considered to be familiar with the steps of PBL tutorial session. None of the respondents disagreed with this, however, 8% were somewhat unsure about the steps. During the PBL tutorials, over 70% of the respondents took a specific role as a discussion leader, a recorder or an observer.

The respondents were asked to select all types of triggers that they have used during the PBL opening sessions. Videos and news articles were used the most, by about 80% of the respondents. Presentations and pictures were used the least, by less than 10% of the respondents. (Figure 2.)

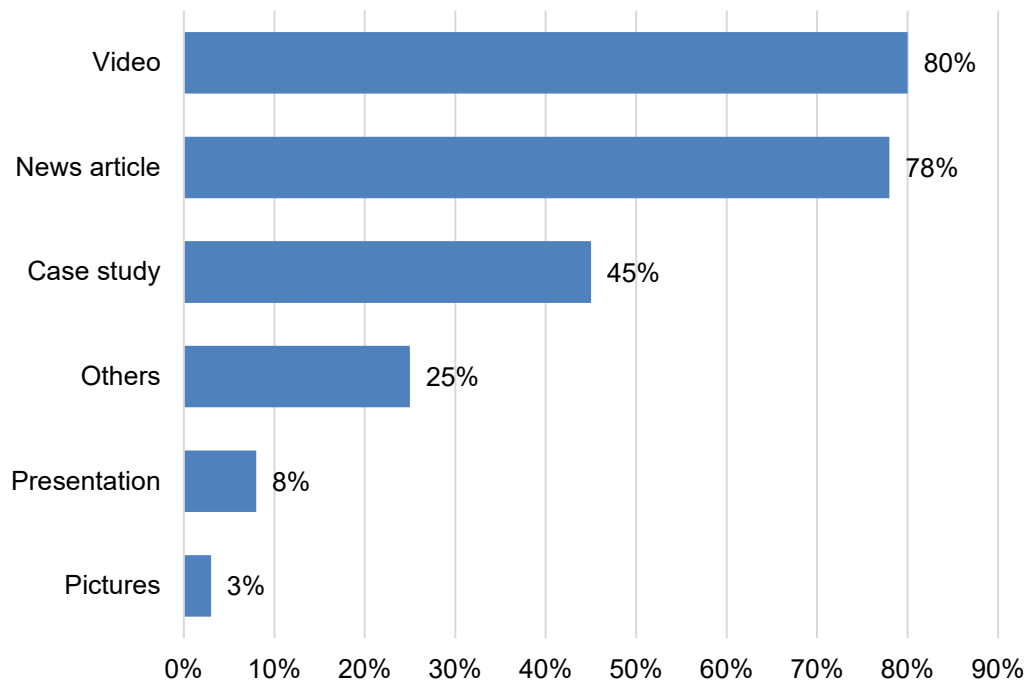


Figure 2. Types of triggers used during PBL opening sessions

Majority of the respondents considered the triggers to be understandable as well as an unstructured representation of the real world. However, about a quarter assessed to be unsure and some respondents disagreed with the statements.

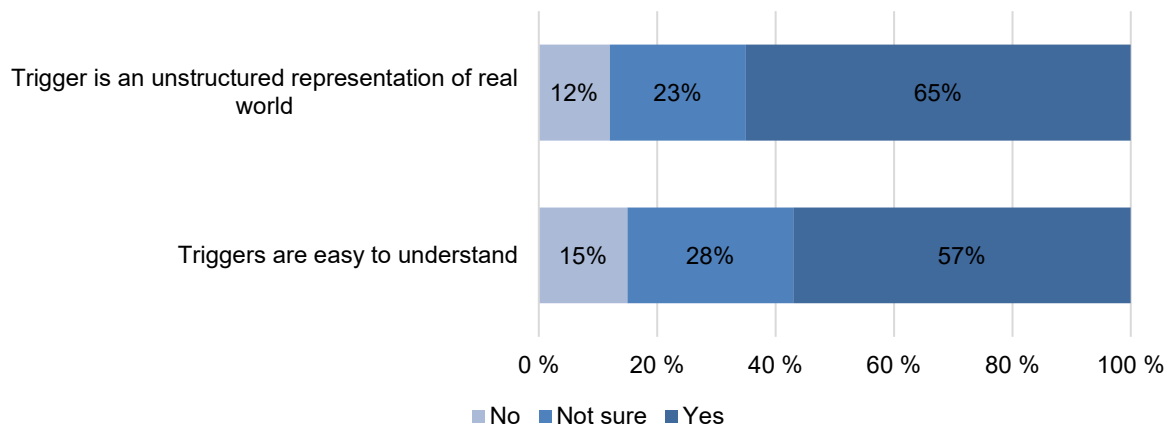


Figure 3. Respondents' views about the triggers

Even though over half of respondents considered the triggers to be easy to understand, about half of the respondents did not find it easy to identify the main problem or to come up with the learning objectives (Figure 4). Noticeably, only 2 % considered it very easy to identify the main problem and 5 % to formulate the learning objectives related to the main problem.

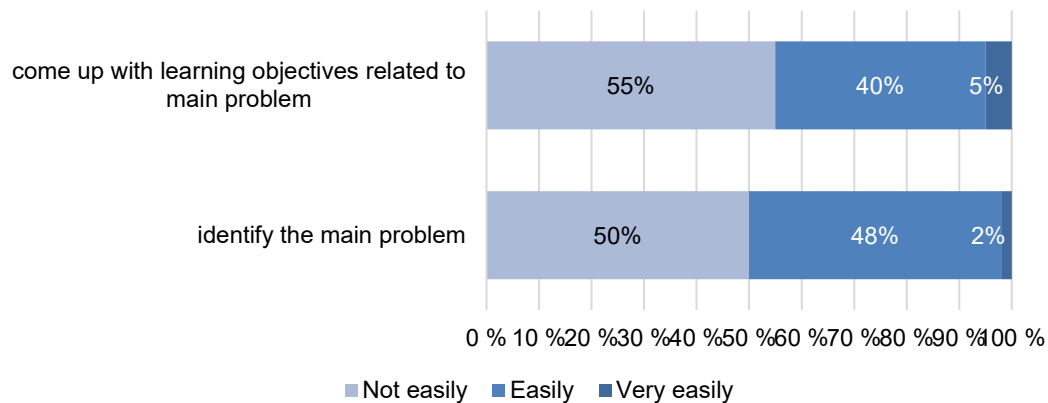


Figure 4. Respondents' assessment of being able to identify main problem and the learning objectives

The respondents that found it easy to identify the main problem, considered themselves being able to formulate the learning objectives related to the main problem ($r=0.386$, $p=0.014$, Table 1).

Table 1. Spearman's correlation coefficient

		Were you able to come up with learning objectives related to main problem?
Were you able to identify a main problem?	Correlation Coefficient	0,386
	Sig. (2-tailed)	0,014
	N	40

The respondents were asked to select one out of three factors that on their opinion the PBL trigger means to trigger. The factors were 'Group discussion', 'Thinking' and 'Time management'. The responses were divided rather evenly between thinking (53%) and group discussion (47%). Interestingly, none of the respondents chose time management. (Figure 5.)

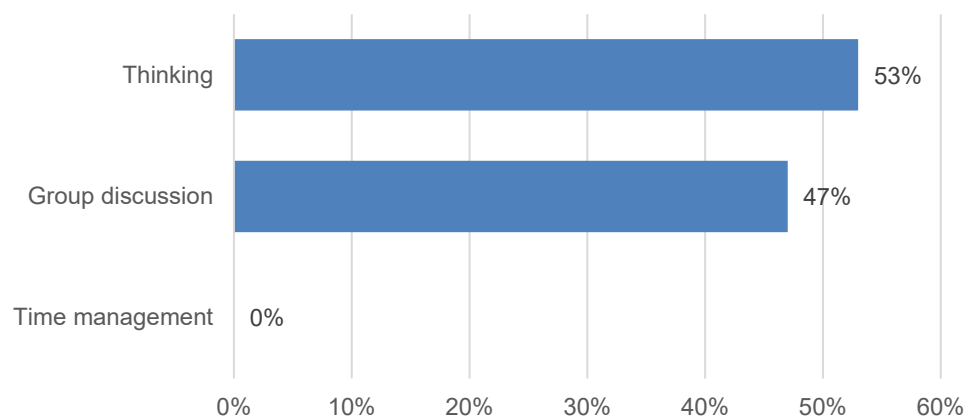


Figure 5. Respondents' views about 'what does a PBL trigger aim to trigger'

The conclusion of the research is presented in the following section.

4 CONCLUSIONS

Problem-based learning (PBL) is one of the most commonly used learning methods in the European Higher Education Institutes (HEIs). The aim of the study is to review the basics of PBL method by focusing on the most fundamental aspect of it – ‘the problem’. This study proposes that the term ‘problem’ in PBL should not be conceived as a ‘problem’ in its lexical meaning, that is an unwelcome or harmful situation demanding a solution. Rather, the term ‘problem’ in PBL should be understood and addressed as an ‘irregularity’ that may produce negative or positive outcome. This study supports the proposition that PBL is indeed problem focused and that learning is stimulated by the problem, nonetheless this study proposes that in PBL methods, the learning is not necessarily dependent on finding solutions, rather that learning about the ‘irregularity’ in question. What we know and do not know about the ‘irregularity’.

This study is supported by empirical evidence consisting of a sample of 40 students from a Bachelor of Business Administration (BBA) degree program in a Finnish HEI. This study explores the PBL method in terms of students’ engagement in the tutorials and sheds light on the effectiveness of this method to achieve desired results. A survey was developed for the purpose of data collection. The participation was voluntarily. This study follows a quantitative research methodology. The analysis of the results shows that a large number of participating students were familiar with the structure of the PBL tutorials. All the respondents have participated in PBL sessions during the course. Majority of the students assessed that they have received sufficient information about PBL method to effectively take part in it. However, about a quarter of the students were unsure or did not consider the information to be sufficient. Almost all the respondents considered to be familiar with the steps of PBL tutorial session. None of the respondents disagreed with this, however, a very small portion of students were somewhat unsure about the steps. During the PBL tutorials, over half of the respondents took a specific role as a discussion leader, a recorder or an observer. The respondents actively took part either as discussion leader, session recorder, session observer or session member in the tutorials. The students used a variety of PBL triggers. The respondents were asked to select all types of triggers that they have used during the PBL opening sessions. Videos and news articles were used the most, by about three quarters of the respondents. Presentations and pictures were used the least, by the respondents. Most of the students received sufficient information to actively participate in the opening and closing sessions. Majority of the respondents considered the triggers to be understandable as well as an unstructured representation of the real world. However, about a quarter assessed to be unsure and some respondents disagreed with the statements. Even though over half of respondents considered the triggers to be easy to understand, about half of the respondents did not find it easy to identify the main problem or to come up with the learning objectives. Noticeably, only a few considered it very easy to identify the main problem and few to formulate the learning objectives related to the main problem. The respondents that found it easy to identify the main problem, considered themselves being able to formulate the learning objectives related to the main problem. The respondents were asked to select one out of three factors that on their opinion the PBL trigger means to trigger. The factors were ‘Group discussion’, ‘Thinking’ and ‘Time management’. The responses were divided rather evenly between thinking and group discussion. Interestingly, none of the respondents chose time management.

With the help of empirical analysis, this study reviews basics of PBL method by focusing on the most fundamental aspect of it. It sheds light on international business students’ perception of the process of PBL as part of their curriculum. This study contributes in providing insights related to PBL method in the European HEIs. Hence, this study is directly connected with the current body of knowledge related to student engagement and learning in the higher education. This study uses limited empirical data sample. As a research limitation, care should be taken in generalizing the findings of study. A larger data sample as a potential future direction of this research could be conducted.

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