






Effectiveness of Case-based Learning: View of Educational Technology Students

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Abstract. Case-based learning is a pedagogical approach that encourages students to think critically and solve real-world problem. This study aims to evaluate educational technology students perceived impact of case-based learning on critical thinking and problem solving. Based on a questionnaire survey and focus group discussions, the perception of educational technology students on case-based learning in enhancing critical thinking and problem solving were evaluated. A total of 64 undergraduate students at the State University of Surabaya participated in this study. A survey approach was employed. Results revealed that students perceive case-based learning as effective in enhancing professional knowledge, motivation, self-directed learning, group collaboration and problem-solving skills. Overall, the findings encourage an active case-based learning to use in educational technology curricula and to promote 21st century skills.

Keywords: Case-based Learning, Critical Thinking, Problem-Solving.

1 Introduction

1.1 Nature of the problem

Less opportunities for group cooperation are offered to students by lecturers, who are thought of as one-way communicators. Case-based learning (CBL) and problem-based learning (PBL), two active learning methodologies that have been the subject of several research, are thought to be more effective in preparing students for real-world situations than standard lecture-based learning. [1]. In fact, lectures continue to be the principal form of instruction in many institutions of higher learning[2]. The learning activity is not optimal since [2] demonstrated that lecturer-based learning gives students little opportunity to engage in active learning, restricting their capacity to address real-world problems, inhibiting self-directed learning, and making it difficult for groups to collaborate.

The reason for the occurrence of learning activities that are not optimal can be seen from the learning process. According to [3] the learning process is not optimal because of two things, namely (1) the learning process is informative, has not been directed to the active process of students to build their own knowledge, and (2) the

learning process is centered on the teachers, has not been directed to learning that is centered on students.

Based on early observation with several teachers on public higher education institutions in Surabaya, the researchers found that the learning process in higher education is currently less attractive. The learning process is less interesting because of this: first, the learning process does not stimulate students' curiosity to dissect problems around the social environment. Second, students are seen as a blank paper or individuals who passively receive student presentations. However, Students are individuals who have enough initial knowledge because they have interacted with the environment and have the right to construct their own knowledge. Third, teachers position himself as a person who patronized students. Using genuine, real-world scenarios, case-based learning (CBL) is an active learning strategy that aims to prepare students for professional activity [4]. CBL connects theory to practice by providing contextualized questions based on "real life" issues and employing inquiry-based learning to apply knowledge to the instances [5]. CBL is a form of student-centered learning in which teachers frequently act as facilitators to help students solve problems cooperatively from a variety of viewpoints. The collective Therefore, lectures and prior experience are crucial in order to successfully complete CBL. Participatory CBL helps students develop their problem-solving and critical thinking skills as well as their ability to manage group dynamics. CBL has also been found to be successful at promoting critical reflection and fostering the development of learning abilities [4].

This study analyzed the efficacy of employing CBL by starting with the shortcomings of the process and learning outcomes as indicated above and addressing this research gap based on the views of educational technology undergraduate students. The study's major goal is to determine whether CBL improves 21st century competencies like problem-solving abilities, self-directed learning, teamwork, and motivation.

CBL is a learning strategy that is based on student learning activities (student centered) and a constructivist learning paradigm in which students choose, construct, and make decisions based on their newly acquired and old knowledge [6]. According to [7] cases or problems in the CBL strategy are in the form of factual news, complex problems written to stimulate class discussion and collaborative analysis. In the CBL learning strategy, there are principles that need to be considered, namely a learning process that is student-centered and activity-based that encourages problem-solving skills [8], [9], and [10].

2 Method

2.1 Design

This study used a survey approach [11] to investigate a CBL model through students' perceptions in a half-semester long course. Quantitative data were collected at the end of the course and students' perception of the pedagogical approach were obtained through questionnaire. The quantitative data in the questionnaire were analyzed using SPSS software.

2.2 Participants

The study was conducted at the public university in Surabaya. Participants were undergraduate students (N=64) who took the Education technology course. All participants were majoring in Educational Technology department.

2.3 Instruments

The purpose of the questionnaire survey was to learn about and gauge students' perceptions on their CBL model learning experiences. The questionnaire comprised five parts. The first is about educational technology of professional knowledge consisted of 4 questions, the second is about developing of problem-solving skills consisted of 4 questions, the third is about developing of self-directed learning consisted of 4 questions, and improvement of motivation consisted of 4 questions as well as promotion of effective group collaboration consisted of 4 questions that were adopted from [5]. The questionnaire consists of 20 items with 5-point Likert scale (1=strongly disagree to 5 strongly agree). Regarding reliability, the Cronbach's alpha for the scale was 0.925 which shows a high internal consistency.

2.4 Data Analysis

The quantitative data from Likert-scale questions and the scoring questions in the questionnaire were computed and analysed using SPSS. Descriptive statistics were run for students' opinion of the implementation a CBL model through percentages, mean, and standard deviation.

3 Result And Discussion

According to students' self-report of students' opinion subscale, the mean of the item revealed overall student perceived high agreement with the CBL model. The questionnaire result of the CBL illustrated in table 1 revealed that students perceived CBL to be significantly effective to cultivate various skills in the learning process. In regard to educational technology of professional knowledge, many agreed that learning activities in the CBL model beneficial for the future career (mean=4.54, SD= 1.25) and furthered their in-depth understanding of knowledge in educational technology (mean=4.27, SD= 0.80).

In regard to development of problem-solving skills, many agree that learning activities in the CBL model enhance students' capacity to address real-word problems (mean=4.50, SD=0.94), enabled students to think alternatives when solving a problem (mean=4.37, SD=1.03), the cases in the CBL model were challenging but appealing (mean=4.31, SD=0.89), and help students to make reasonable inferences and conclusions to address real-word problem (mean=4.02, SD=1.23).

In regard to development of self-directed learning, many agree that learning activities in the CBL model enabled students to think independently (mean=4.82, SD=1.04), helped students to recognize gap in their knowledge (mean=4.11, SD=0.92), and encouraged students to study and work independently (4.10, SD=0.72).

Table 1. Students' Opinion of A CBL Model.

Item	Mean	SD
Educational technology of professional knowledge		
1) The case studies enabled me to use previous experience and knowledge	4.17	0.80
	4.05	0.67
2) The case studies helped me to interpret, analyze and apply key concepts precisely and rationally	4.27	0.80
	4.36	1.25
3) The case studies furthered my in-depth understanding of knowledge in educational technology		
4) The case studies were beneficial for my future career		
Development of problem-solving skills		
5) The case studies were challenging but appealing	4.31	0.89
6) The case studies enhanced my capacity to address real-word problems	4.50	0.94
	4.37	1.03
7) The case studies enabled me to think alternatives when solving a problem	4.02	1.23
8) The case studies helped me to make reasonable inferences and conclusions to address real-word problems		
Development of self-directed learning		
9) Case studies encouraged me to study and work independently	4.10	0.72
10) The case studies helped me to recognize gaps in my knowledge	4.11	0.92
11) The case studies helped me improve my ability to find a variety of resources to meet my own learning needs	4.00	0.88
12) The case studies enabled me to think independently	4.82	1.04
Improvement of motivation		
13) The case studies inspired me to be active in own learning	3.04	0.93
14) The case studies encouraged me to learn more	4.19	0.77
15) The case studies stimulated my interest in learning	4.10	0.95
16) The case studies provided incentives for participation through the discussion of problem	4.61	1.02
Promotion of effective group collaboration		
17) The case studies stimulated me to involve in group discussion	4.73	0.77
18) The case studies enabled open discussion of differing opinions	4.18	0.82
19) The case studies enhanced my ability to work efficiently on a team	4.06	1.03
20) The case studies helped me to share my knowledge with the entire group	4.75	1.32

In regard to improvement of motivation, many agree that learning activities in the CBL model provided incentives for participation through the discussion of problem (mean=4.61, SD=1.02), encouraged students to learn more (mean=4.19, SD=0.77), and stimulated students interest in learning (mean=4.10, SD=0.95).

In regard to promotion of effective group collaboration, many agree that learning activities in the CBL model helped students to share their knowledge with entire group (mean=4.74, SD= 1.32), stimulated students to involve in group discussion (mean=4.73, SD=0.77), and enabled open discussion of differing opinions (mean=4.18, SD= 0.82) as well as enhanced students' ability to work efficiently on a team (mean=4.06, SD=1.03).

This study assessed how a group of educational technology students perceived the value of CBL in developing their problem-solving skills, motivation, knowledge, and ability to work in groups. The findings demonstrated that students believed the CBL might improve group collaboration, motivation, and knowledge in addition to problem-solving skills. These outcomes support the conclusions of [12]. The purpose of the study was to examine how CBL affects motivation for learning, problem-solving, and communication. According to the findings, CBL students had higher levels of communication, problem-solving aptitude, and learning motivation than their counterparts in the lecture-based learning group. According to the outcomes, [13] demonstrated how a CBL approach could help students be better problem solvers. This study also shown that when CBL was put in place, students' perceptions of self-directed learning improved. The outcome was in line with [14]. They showed that following the CBL intervention, pupils' self-directed learning increased after the intervention of CBL.

The results were also validated by other earlier investigations. For instance, how CBL affects students' ability to learn through complex thinking, such as critical analysis and problem-solving. The other example, [12] completed a study to investigate how CBL affects motivation for learning, problem-solving skills, and communication. The findings demonstrated that the CBL group possessed noticeably better communication abilities, problem-solving capabilities, and learning drive. Other advantages cited by [4] include the development of intrinsic and extrinsic motivation, enabling customized learning, encouraging self-evaluation and critical reflection, and the development of learning skills like HOTS. A quasi experimental study conducted by [15] aimed to assess the effect of case-based learning on student's critical thinking and academic self-efficacy. The results of the study showed that comparing the average scores of post-test analysis of groups, both critical thinking and academic self-efficacy increased significantly for the students who used case-based learning approach.

4 Conclusions

The finding suggest that the majority of educational technology students held positive perception of the CBL, especially CBL could enhance students' professional knowledge, problem-solving ability, motivation, self-directed learning and group collaboration. Given the limitation of this study, future studies should be conducted in experimental design. An analysis of the teachers' perspectives on experiences of the CBL model also merits future investigation.

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