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STUDENTS' PERCEPTIONS OF THE NEED FOR A COMBINED SCIENCE LEARNING MODEL OF FCL, PBL, AND 7ELC IN HIGHER EDUCATION

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Abstract

One of the subjects that prospective elementary school teachers are required to understand is science. The exploration was led to determine the requirements of instructors and understudies for the advancement of learning models. Information sources in the review included 3 teachers and 188 understudies. Interviews and questionnaire sheets served as the instruments. The consequences of the examination found issues that happen, for example, absence of movement in learning, absence of time accessible to comprehend ideas, absence of understudy capacity to apply ideas, and not augmenting the utilization of web learning. Active learning at every stage, including problem-solving activities, providing an overview of the material prior to learning, discussing concepts with peers, and maximizing the use of learning time, is essential for lecturers and students alike. Subsequently, the improvement of a learning model is required. The recommended learning model is a mix of flipped classroom, problem-based learning, and the 7E learning cycle. It is believed that the mix of the three models can figure out the possibility of dynamic and captivating understanding, so students might, at any point, even more successfully appreciate and apply material thoughts concerning science learning.

Keywords: Learning Model; Flipped Classroom; Problem-Based Learning; 7E Learning Cycle.

INTRODUCTION

Science is one of the subjects taught at the elementary school level. Science is taught so that students can understand the natural environment around them and be able to act wisely in dealing with natural phenomena encountered in everyday life. Science can lead to the emergence of love and care for the environment (Suryawati & Osman, 2018; You, 2017). Seeing the importance of science learning in elementary schools, prospective elementary school teachers should participate in learning and understanding science materials in elementary schools.

Initial observations at the elementary school teacher education program, Universitas Islam Riau, found that prospective elementary school teachers learn science material in the course "Science Learning in Elementary School". However, the findings show that the lecture activities carried out have not been able to accommodate the needs of students in understanding the material taught. Many students are still less skilled in identifying the problems given, less able to explore information, and less able to apply the concepts that have been learned (Mustika et al., 2023). Lecture activities are dominated by conventional learning models in the form of presentations from students (Mustika et al., 2022). The use of the right learning model can change the way learning becomes more effective and efficient (Coman et al., 2020; Gomez & Valdes, 2019). The learning model helps develop students' ability to understand and apply the knowledge learned (Changwong et al., 2018). Students can develop better learning abilities by thinking critically and creatively, so that the quality of learning increases (Seng Tan, 2021; Yew & Goh, 2016). However, the application of inappropriate learning models can cause problems with learning. In theory, there is no one learning model that can accommodate the needs of all subjects (Andrini et al., 2019; Macdonald, 2017; Singh et al., 2021). The learning model ought to be created by the necessities and qualities of the subject. In order to make learning interactions more enjoyable, an appropriate learning model can foster a positive relationship between lecturers and students.

After surveying these issues, the learning models that are reasonable to be utilized are the flipped classroom, problem-based learning, and the 7E learning cycle. The findings demonstrate that the flipped classroom model can be utilized in education because it can extend the limited time allotted for learning (Al-Samarraie et al., 2020; Cabı, 2018; Diana et al., 2023; Sergis et al., 2018). In the flipped classroom, the traditional learning sequence is reversed by starting independent learning at home first before moving into classroom learning (Rasheed et al., 2020).

According to the findings of other studies, the problem-based learning model helps students understand concepts by making learning easier through problem-solving (Aksela & Haatainen, 2018; Ali, 2019; Phungsuk et al., 2017; Rohmah et al., 2020; Sholihah & Lastariwati, 2020). Problem-based learning can be applied to individual or group learning and can be applied to in-class or out-of-class (online) learning (Arwidiyarti et al., 2022). Moreover, the consequences of exploration on the 7E learning cycle model presumed that the model can make understudies effectively engaged with learning exercises by investigating data and applying the ideas learned (Fatimah & Anggrisia, 2019; Istuningsih et al., 2018; Mustafa & Suyanta, 2019a; Parno et al., 2019).

Each learning model has advantages and disadvantages, so it is necessary to conduct a needs analysis to find out more about the learning needs that lecturers and students need to achieve course objectives. Needs analysis is a continuous cycle of program development, implementation, and evaluation (Powell et al., 2017). Conducting a needs analysis before designing a learning model allows the design results to be utilized more optimally. The research question is: How do students perceive the need for a combined learning model of FCL, PBL, and 7ELC?

METHODS

The examination was directed at the primary teacher education (PGSD) concentration program at Universitas Islam Riau. The information sources in this study were 3 speakers and 188 understudies of the PGSD concentrate on program who took the course "Science Learning in Elementary School". This research is qualitative with a descriptive design. Qualitative research focuses on in-depth observation with the aim of understanding and interpreting a phenomenon in a natural setting [48]. Qualitative research in this study is used to analyze and interpret data obtained from interviews and questionnaires. The instruments utilized in this study were survey sheets and interview guide sheets. The poll sheet was addressed to understudies and appropriated with the assistance of Google Forms. The poll for understudies comprised three principal parts, to be specific: 1) section A to figure out the issues in learning; 2) section B to figure out the utilization of the learning model that has been utilized; and 3) section C to figure out the understudies' requirements for the improvement of learning models. The scale used is a Likert scale, with answers ranging from "strongly disagree" (1) to "strongly agree" (4). The interview guideline sheet was aimed at lecturers with the intention of finding out the needs of learning models that are in accordance with their characteristics and learning objectives. Before being used, both instruments were validated by three experts with an average validity score of 0.88. In addition, the questionnaire was also distributed to the trial sample (n = 20) and the validity of each statement item was sought using statistical calculations. The results of statistical data processing for instrument validity can be seen in Table 1.

Table 1: Calculation of the validity and reliability of the questionnaire

Indicators	Items	Result			
		r_{count}	r_{tabel}	Alpha Cronbach	Category
Problem in learnings	1	0.56	0.44	0.83	Valid
	2	0.47			Valid
	3	0.39			Invalid
	4	0.54			Valid
	5	0.55			Valid
	6	0.65			Valid
Application of learning models	1	0.49			Valid
	2	0.65			Valid
	3	0.60			Valid
Learning model needs	1	0.54			Valid
	2	0.50			Valid
	3	0.42			Valid
	4	0.22			Invalid
	5	0.45			Valid
	6	0.51			Valid
	7	0.47			Valid

Based on Table 1, the questionnaire was distributed to 20 respondents who acted as a trial sample. The results of the data processing of 20 respondents found two invalid questions because the value was < r table 0.44. Invalid statement items were discarded and not used. In addition, the Alpha Cronbach coefficient data is 0.83, which shows the questionnaire statement is reliable because it is > 0.60. Thus, from the initial number of 15 statement items used, there are valid and reliable statement items, for a total of 13 statement items. The information investigation utilized is a Miles and Huberman information examination with 3 phases, specifically information decrease, information show, and end drawing (Hennink et al., 2020). Information decrease is finished by choosing the fundamental exploration information, searching for designs, and disposing of pointless information. This is done to get a clear picture of learning issues and why good learning models are needed. The information show is finished with brief depictions, tables, and charts. At long last, the end drawing is finished by including proof obtained during the information assortment process.

RESULTS AND DISCUSSION

Questionnaires were distributed to investigate the perceptions of PGSD study program students on the need for a learning model. The intended learning model is a combination of FCL, PBL, and 7ELC models with indicators related to problems in learning, application of learning models, and learning model needs.

Table 2: Questionnaire results - student perceptions of the need for a combination learning model

Indicators	Statements	Percentage (n=188)	
Problems in learning	I understand the material studied in the course "Science Learning in Elementary School".	Strongly agree	19 %
		Agree	23 %
		Disagree	43 %
		Strongly disagree	15 %
	I can answer questions related to science material.	Strongly agree	11 %
		Agree	7 %
		Disagree	57 %
		Strongly disagree	25 %
	I am able to apply the science concepts that I have learned.	Strongly agree	7 %
		Agree	6 %
		Disagree	53 %
		Strongly disagree	34 %
	I am given enough time to understand the science material.	Strongly agree	6 %
		Agree	15 %
		Disagree	41 %
		Strongly disagree	38 %
	Science learning is done by maximizing the use of web learning.	Strongly agree	5 %
		Agree	12 %
		Disagree	55 %
		Strongly disagree	28 %
Application of learning models	I know the problem-based learning model.	Strongly agree	40%
		Agree	52%
		Disagree	7 %
		Strongly disagree	1 %
	I know the 7E learning cycle model.	Strongly agree	12 %
		Agree	7 %
		Disagree	47 %
		Strongly disagree	34 %
	I know about the flipped classroom model.	Strongly agree	14 %
		Agree	10 %
		Disagree	33 %
		Strongly disagree	43 %
Learning model needs	I need learning that begins with the presentation of real phenomena related to the material to be learned.	Strongly agree	21 %
		Agree	76 %
		Disagree	2 %
		Strongly disagree	1 %
	I need learning that gives me the opportunity to examine the concepts to be learned on my own.	Strongly agree	26 %
		Agree	68 %
		Disagree	5 %
		Strongly disagree	1 %
	I need learning that facilitates discussion among students for investigation.	Strongly agree	28 %
		Agree	70 %
		Disagree	2 %
		Strongly disagree	0 %
	I need learning that gives me the opportunity to prove things for myself.	Strongly agree	19 %
		Agree	76 %
		Disagree	3 %
		Strongly disagree	2 %
	I need learning outside the classroom that can help me understand the concepts I have learned.	Strongly agree	31 %
		Agree	67 %
		Disagree	0 %
		Strongly disagree	2 %

In Table 2, it is known that the largest average percentage of student responses for the indicator of problems in learning is in the answers "disagree" (43%), and "strongly disagree" (15%). This response shows that most students stated that there were problems in the science learning process.Based on these responses, it is known that the problems that occur in the learning process are: 1) students do not understand science materials; 2) students are unable to answer science questions; 3) students are unable to apply science concepts; 4) students feel they do not have enough time to complete the learning; and 5) less optimal utilization of web learning in learning.

Based on Table 2, it is also known that most students know about the problem-based learning model (strongly agree = 40% and agree = 52%). However, for the 7E learning cycle model, more students are less or do not know (disagree = 47% and disagree = 34%). Likewise, with the flipped classroom model, fewer students knew or did not know (disagree = 33% and disagree = 43%). In this manner, one might say that of the three learning models asked, most understudies just know about the problem-based learning model. Overall, it is known that of the three learning models, specifically problem-based learning, the 7E learning cycle, and the flipped classroom, more understudies are familiar with the problem-based learning model. It is likewise realized that most understudies feel blissful when teachers utilize specific learning models in their growing experience. This is evidenced by student responses obtained through additional questions. A total of 60% of students gave the answer "strongly agree" and 37% gave the answer "agree". Thus, it is known that 97% of students feel happy if the lecturer applies learning by using a particular learning model. A summary of student responses can be seen in Figure 1.

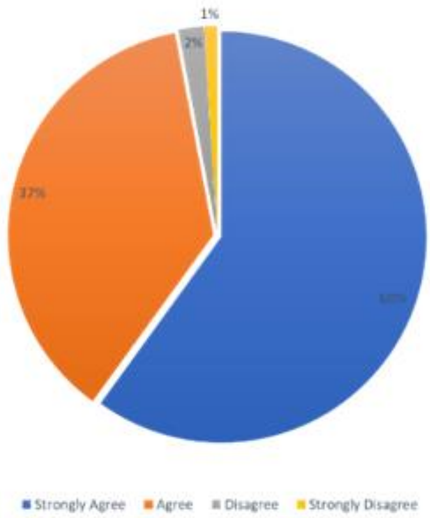

Figure 1: Student responses to the use of learning models

Moreover, in light of Table 2, it is realized that the biggest normal level of understudy reactions for the learning model requirements marker is in the responses "concur" and "emphatically concur". The aftereffects of the investigation of understudy reactions are : 1) students need the presentation of real phenomena at the beginning of learning (97%); 2) students need the opportunity to examine their own learning first (94%); 3) students need the opportunity to discuss and investigate the material being studied (98%); 4) students need the opportunity to prove their own concepts learned (95%); and 5) students need learning outside the classroom to deepen their understanding of the material that has been learned (98%). Finally, the researcher also asked for

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student responses about the need to develop a learning model that suits the needs and characteristics of the "Science Learning in Elementary School" course. An overview of student responses can be seen in Figure 2.

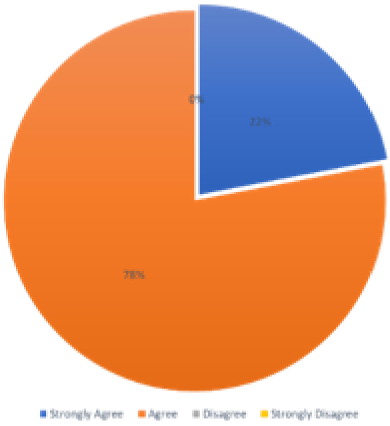

Figure 2: Student responses to the development of the learning model

There are no students who responded "strongly disagree" or "disagree," as shown in Figure 2. This indicates that all students concur that a learning model that meets the requirements and characteristics of the "Science Learning in Elementary School" course is required. Generally speaking, it tends to be reasoned that what understudies need is discovering that can support dynamic association in each learning action so understudies can all the more effectively comprehend the science ideas learned and have the option to apply these ideas to taking care of regular issues.

It is known from the presentation of the research results that learning science can be challenging. This depends on the discoveries of a survey that was given to the understudies, who reasoned that there were issues, for example, an absence of understudy contribution in the educational experience, an absence of dominance of the material covered, an absence of time for understudies to learn and understand the material, and an absence of capacity for understudies to try what they have realized. The findings of this problem are not in accordance with the principles of learning put forward by (Nair, 2019) that learning should be able to accommodate the needs of students in learning. Especially science learning, which requires special consideration in its implementation. Research results (Alsalhi, 2023; Öztürk et al., 2022; van Alten et al., 2019) shows that effective learning can produce learning outcomes according to the objectives.

Contemplations that can be given to assist with taking care of the issue are to foster a learning model that is as per the qualities and necessities of science learning. Misconceptions in learning can be minimized if learning is carried out at the right stages of the learning model (Kumar Shah, 2019). Fundamentally, the utilization of learning models is a work that instructors can do to assist with actuating understudies so they are easier to follow and grasp learning materials. This is evident from the responses provided by 97% of students, who stated that they were pleased when lecturers utilized particular learning models to apply learning.

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The mix of the flipped classroom model, the problem based learning model, and the 7E learning cycle model can assist with understanding the idea of dynamic learning. Because learning begins before students enter the classroom, the flipped classroom model helps to maximize learning time (Bravo et al., 2019; Prieto Martín et al., 2021). The use of flipped study halls in learning can assist with further developing science learning results essentially contrasted with conventional learning (Cabı, 2018; Sergis et al., 2018; van Alten et al., 2019). The flipped classroom also has advantages in the long run, especially in terms of learning outcomes and time efficiency. Regardless, the flipped study hall model similarly has detriments, which will generally be based on data development, ignoring decisive reasoning and thought application (Díaz et al., 2021; Shnai, 2017; Vogelsang et al., 2019). Problem-based learning and the 7E learning cycle can make up for the drawbacks of the flipped classroom model.

According to the findings of research on problem-based learning models (Ali, 2019; Ulger, 2018) these models have the potential to boost student motivation and engagement in science instruction. Problem-based learning provides understudies with a higher comprehension of ideas and critical thinking abilities. Through a problem-based learning model, understudies are confronted with an issue that can sharpen their decisive reasoning, cooperation, and relational abilities (Alias et al., 2015; Hussin et al., 2018; Saputra et al., 2019). Different discoveries likewise show that the problem-based learning model can be applied with regards to online classes in science learning, despite the fact that it encounters difficulties concerning parts of connection and cooperation (Mudhofir, 2021; Paristiowati et al., 2019).

Furthermore, the 7E learning cycle model is also considered to create a more interactive and interesting learning environment. The 7E learning cycle model effectively improves conceptual understanding and develops higher-order thinking, especially in science learning concepts (Mustafa & Suyanta, 2019b; Parno et al., 2019). Each stage in the 7E learning cycle model also leads students to make connections between past learning experiences and current learning experiences (Alsalhi, 2023).

The study above shows that the three learning models are in accordance with the characteristics of science learning. However, each model has its own shortcomings. The shortcomings of each model can be covered with the advantages of other models. In addition, the successful development of learning models is inseparable from the needs analysis activities, which are the basis for identifying problems and formulating answers to help solve them.

A learning model that is really in accordance with the qualities and prerequisites of learning should be created in view of the portrayal of the outcomes and the conversation that has been introduced. Skills are the objective of acquiring exercises for understudies. The blend of the flipped classroom model, problem-based learning, and the 7E learning cycle is seen as fitting as a response to vanquish the issues that lectures and students have investigated during learning.

CONCLUSION

It is possible to draw the conclusion that elementary science learning courses face learning difficulties on the basis of the needs analysis that was conducted. The absence of a learning model that is compatible with the requirements and characteristics of elementary science learning courses is the root cause of the issues that teachers and students face. As per the consequences of the requirements examination, it is prescribed to foster a learning model that joins the phases of the flipped classroom model, problem-based learning, and the 7E learning cycle. It is trusted that the blend of the three learning models can be an elective answer for learning models that are appropriate for execution in science learning in advanced education.

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