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EXPLORATION OF RECITATION PROGRAM FOR IMPROVING STUDENT'S PHYSICS CONCEPT: STUDY LITERATURE

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ABSTRACT

The main goal of learning physics is to help students master concepts. Students must possess a strong mastery of concepts, particularly fundamental ones in physics, to effectively solve problems. However, many students struggle with understanding physics concepts. A recitation program can enhance students' mastery of physics concepts. Using the recitation program increases students' concept mastery. This article examines how the program was developed. This research employs a literature review method. Vosviewer processed the data collected from Google Scholar, Scopus, Microsoft Academies, and Harzing's Publish or Perish. The results of the article synthesis show that the recitation program can improve students' mastery of physics concepts, and various kinds of recitation programs have been developed using Wondershare Quiz Creator, Microsoft PowerPoint, and the web. Based on the results of the article synthesis, it can be concluded that the recitation program can improve students' mastery of concepts, and the recitation program that has been developed is getting better and more modern.

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INTRODUCTION

The main goal of learning physics is to help students master concepts. Good concept mastery is useful in helping students to solve problems based on the right concepts (Andanawarih et al., 2019; Docktor & Mestre, 2014; Johan et al., 2018). Students must possess a strong mastery of concepts, particularly fundamental ones, to effectively solve problems (Amanda et al., 2022). A thorough understanding of fundamental concepts will support learning the next more complex physics concepts (Karagiorgi et al., 2022; Turányi & Tóth, 2013). Good concept mastery skills will also be useful for students to use when solving problems in everyday life. Students are considered to have mastered concepts if they can understand ideas that are considered essential in physics and are able to apply them to solve problems (Docktor & Mestre, 2014; Kustusch, 2016) or to explain physical phenomena, both naturally occurring and by human engineering (Li & Singh, 2018). However, adequate mastery of concepts is difficult for students because it is possible for students to build incorrect concepts at the previous level and even experience misconceptions, namely a mismatch between the concepts possessed by students and scientific knowledge (Docktor et al., 2015).

Students' fragmented knowledge also contributes to the difficulty in understanding the concept of physics (Park & Liu, 2021; Xie et al., 2021). According to the piece of knowledge theory view, or resource view, it states that student knowledge consists of pieces or items that are not necessarily compiled into a larger concept (Brown, 2014; diSessa, 2018; Pereira & Bamel, 2021). When students use pieces of their knowledge in solving a problem, they may not be able to solve similar problems presented in different formats (Docktor & Mestre, 2014). This can happen because students have too much material to master compared to the available learning time. Limited time in the learning process resulted in students lacking practice questions (Hofer et al., 2018).

To fix this requires a learning process that takes a long time to be able to convey physics concepts to students. Limited time in conveying physics concepts is an obstacle in achieving learning objectives. A recitation method is necessary to convey a broad concept within a limited time frame (Geller et al., 2019; Klein et al., 2021; Yusmaridi et al., 2012). After lectures, recitation serves as a deepening process (Kohl et al., 2007). Recitation is a learning approach in which the teacher provides a little information, asks questions, gets student responses, and then offers feedback by praising or correcting students' mastery of certain concepts (Diyana et al., 2020a; Klein et al., 2021; Sundari & Dewi, 2021).

Regarding the importance of recitation in increasing students' mastery of concepts, this study will examine various studies related to recitation of students' mastery of physics concepts. This article formulates the problem as follows: 1) Which recitation program have previous researchers developed? 2) Can the recitation program improve students' mastery of concepts?

METHOD

This study uses a research method based on a literature study. A literature study is a technique for gathering information and verifying facts by seeking sources from libraries, including archives, books, bulletins, journals, and historical records. Literature study: Using this method, researchers collect data by collecting data in the library by reading, recording, and processing these sources as research material with a strategy in the form of a methodology (Melfianora, 2017; Paré & Kitsiou, 2017; Ridley, 2012).

The goal of this study is to understand the development process of the current recitation program and its potential to enhance student concepts. The type of research used is a review article. We conduct article reviews by summarizing and analyzing research data from various previous research results. We collected the research data by browsing articles in online journals, Google Scholar, Scopus, Microsoft Academics, Harzing's Publish or Parish, and Crossref. The keywords used by researchers in searching for articles are "understanding concepts," "recitation programs," and "physics students." Researchers then process the obtained articles using VosViewer to identify those that meet the criteria. Articles that meet the criteria are then analyzed in a comparative method to find out how to increase mastery of concepts and how the recitation program has been developed. The development software consists of different types, specifically Wondershare Quiz Creator, Microsoft Office PowerPoint, and Moodle, presented in Figure 1.

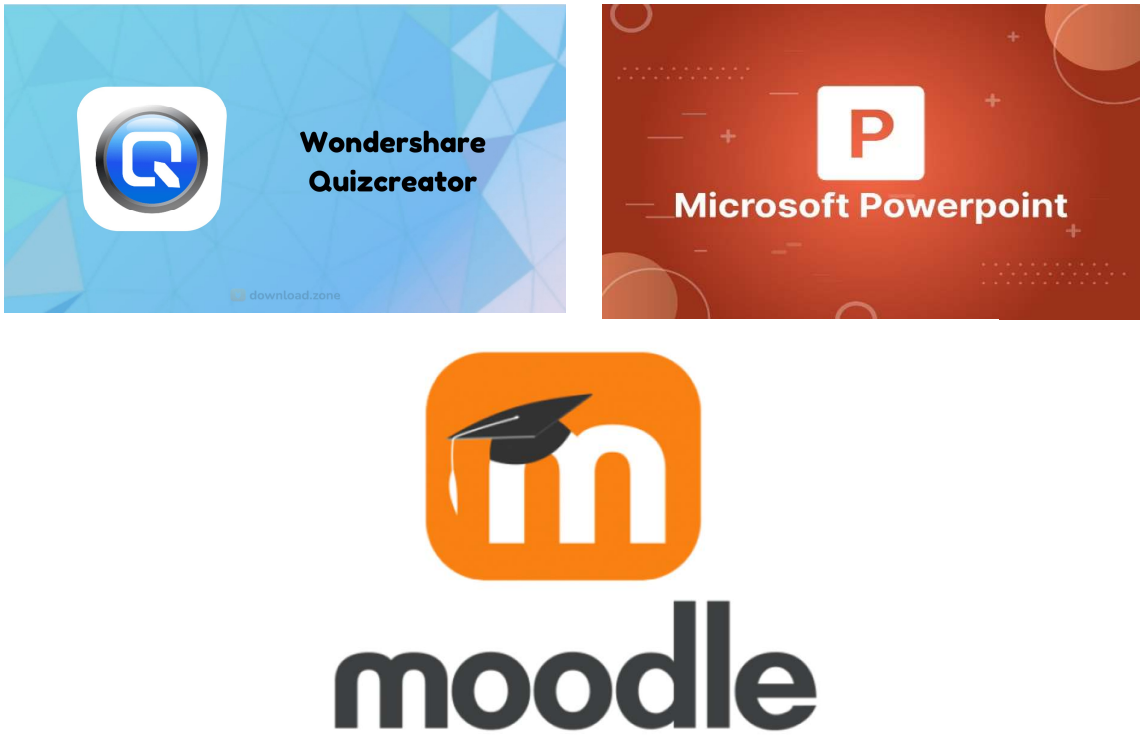

Figure 1. Wondershare Quiz Creator, Microsoft Office PowerPoint, and Moodle

RESULTS AND DISCUSSION

Results

The results yielded 12 articles that met the specified criteria. We process the article data by summarizing and identifying the key findings from the research. We then report back the data using both qualitative and quantitative descriptions. Data from the recitation program analysis can be seen in Table 1.

Table 1. The Recitation Program Analysis Had 12 Articles

No	Writer	Year	Development	Topic	Result
1	(Sutopo et al., 2016)	2016	Wondershare Quiz Creator	Force and Motion	Effectively helping students improve their mastery of

No	Writer	Year	Development	Topic	Result
					concepts about motion and force with a d-effect size of 1.46 and a normalized gain (N-gain) of 0.31
2	(Ghozali et al., 2017)	2017	Microsoft Powerpoint	Simple harmonic motion	There are differences in students' conceptual mastery between before and after using learning with a computer-based recitation program. from 47.2% to 80.6% and p = 0.00 with a d-effect size of 1.46 (strong) and an N-gain of 0.7 (strong)
3	(Reyza et al., 2013)	2017	Microsoft Powerpoint	Particle Dynamics	The recitation program which contains conceptual practice questions, and their feedback has the effect of improving students' understanding in building FBDs
4	(Pebriana et al., 2018)	2018	Microsoft Powerpoint	Dynamic Fluid	Students' understanding of concepts on dynamic fluid topics increased significantly with N-gain 0.29 after using the recitation program
5	(Pratidhina et al., 2019)	2019	Adobe Flash CS4	Gas Law	There is a moderate increase in student achievement after using a computer program as a learning resource.
6	(Zulfa et al., 2020)	2020	Microsoft Powerpoint	15 Physics Topics	Media validation is 83.33% while material validation is 84.33%.
7	(Pratama, 2020)	2020	Web	Equilibrium and Rotational Dynamics	The results of the other pair test show that the results of the ed sample t-test using web-based assessments have a very large influence on students' mastery of concepts as indicated by the difference in pretest and posttest scores.
8	(Diyana et al., 2020b)	2020	Web	Fluid Mechanics	The Web-Based Study Program that has been developed is effective in helping students to improve their mastery of fluid mechanics concepts.
9	(Amalina et al., 2021)	2021	Microsoft Powerpoint	Static Fluid	Produce a product in the form of a computer-aided recitation program to improve the mastery of physics students' concepts on static fluid material with a proper category
10	(Febryanti & Taqwa, 2021)	2021	Web	Kinematics	Web-based recitation program with multiple representations on kinematics material
11	(Hermawati & Hidayat, 2021)	2021	Microsoft Powerpoint	Static electricity	Produce static electricity material recitation program products for high school

No	Writer	Year	Development	Topic	Result
					students. The feasibility of the content of the recitation program is 95%, (2) the feasibility aspect of presenting the recitation program is 87.50%, and (3) the readability aspect of the recitation program is 86.86%
12	(Sundari et al., 2021)	2021	Web	Kinematics	Physics teacher competence in the development of interactive tajwid programs increased, around 32.4%

Discussion

Based on the results of the article analysis, a synthesis is obtained that provides an overview of the research on the recitation program used in learning. The re-station program used in learning is developed from various software. The software used in development consists of various kinds, namely Wondershare Quiz Creator, Microsoft Office PowerPoint, and Moodle. Of the various types of software used, it was found that the use of Microsoft Office PowerPoint software was most widely used, namely that used by (Amalina et al., 2021) regarding static fluid, by (Hermawati & Hidayat, 2021) regarding static electricity, by (Pebriana et al., 2018) regarding fluid dynamics, and by (Reyza et al., 2013) regarding particle dynamics. This study shows that Microsoft Office PowerPoint is easy to use in making recitation programs. The ease of using Microsoft Office PowerPoint in making recitation programs is presumably because the program makers are familiar with Microsoft Office PowerPoint.

There is more recitation programs developed using Microsoft Office PowerPoint, but their use is less than optimal because they can only be run using a laptop. A web-based recitation program, such as Moodle, is a more user-friendly option for students. A web-based recitation program was developed by (Diyana et al., 2020a) regarding fluid mechanics, by (Pratama, 2020) regarding equilibrium and rotational dynamics, and by (Sundari & Dewi, 2021) regarding kinematics. The recitation program developed on a web basis (Moodle) is easier to use because it can be accessed using a laptop or smartphone. However, the widespread development of web-based recitation programs remains limited due to their greater complexity compared to Microsoft Office PowerPoint. Therefore, we need to further develop web-based recitation programs on various physics topics to enhance student accessibility.

The analysis revealed that kinematics and fluids were the most widely developed physics topics. Without putting aside other physics topics, the development of the recitation program should be able to develop various other physics topics (Docktor et al., 2015; Docktor & Mestre, 2014; Etkina et al., 2010). This is because, of the various recitation programs used to improve mastery of physics concepts, all studies claim that recitation programs can improve mastery of physics concepts (Adila et al., 2019; Shodiqin et al., 2024). However, the distribution of recitation programs developed in various physics topics is still lacking (Pollock & Finkelstein, 2008). As with even more abstract topics, such as the topic of electricity or the topic of magnetism. The development of recitation programs on various other topics is needed to support the learning process even more optimally.

CONCLUSION

From the results of the analysis of the articles that have been carried out, it can be concluded that the recitation program developed in various physics topics can improve students' mastery of physics concepts. We developed the recitation program using a variety of software, including Wondershare Quiz Creator, Microsoft Office PowerPoint, and the web platform Moodle. The results of the analysis show that the physics topics used in the recitation program have not varied. The topics that are widely used are kinematics and fluids, so it is still possible to develop other physics topics. Researchers also found that the web (Moodle) proved to be an effective and user-friendly recitation program for students. Therefore, the development of a web-based recitation program (Moodle) with other physics topics is needed because it can increase students' mastery of physics concepts.

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AUTHOR CONTRIBUTIONS

The article's idea, design, data collecting, analysis, interpretation, writing, and revision were all contributions of the writers. The final manuscript was approved by all writers.

CONFLICT OF INTEREST STATEMENT

The author asserts that the publication of this paper does not include any conflicts of interest. No personal, financial, or other affiliations affected the study, or the results presented in this work; supervisors' guidance and support were sufficient to meet their professional obligations. We have taken every precaution to ensure that the research is carried out and presented in an honest and open manner.

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