



PROFILE OF STUDENT SCIENTIFIC PERFORMANCE IN COMPUTER-BASED LEARNING MEDIA COURSES THROUGH IMPLEMENTATION OF TEAM BASED PROJECT LEARNING METHODS

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Abstract: Technological advances in the world of education can be used as a means of creating learning media that functions as an innovative and meaningful learning resource for students. This is in line with Kepmendikbud No. 3 of 2021 which mentions the application of learning methods in accordance with IKU Point 7 regarding the application of project-based group learning methods (Team Based Project). This study aims to describe the scientific performance profile of students in computer-based learning media courses through the application of the project-based team learning method. This research method uses descriptive research methods. Research respondents were students taking computer-based learning media courses in the even semester of 2020/2021. Data collection techniques use project assessment sheets (scientific performance), observation and documentation. Data analysis techniques use the percentage of the Likert scale used. The results showed that 85.71% of students were able to plan, implement projects and prepare reports. This means that students are able to provide substantively correct interpretations of the project products produced, complete project products using existing procedures, complete projects on time, product results are in accordance with established indicators and are able to present project results substantively correctly. Thus, the teambased project learning method can act as an alternative learning method in order to support the implementation of the OBE (Outcome based Education) curriculum in physics learning.

Keywords: Learning Media, Scientific Performance, Team Based Project

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Introduction

The development of global technology has had a major influence on all aspects of life such as the economy, culture, arts, social and of course in the field of education. Technological advances that are happening today are something that cannot be avoided, because technological advances will go hand in hand with advances in science. Therefore, in an effort to improve the quality of education in Indonesia, the development of technology and information has been widely used. Even in facing the 21st century, UNESCO (1996) through the journal "The International Commission on Education for the Twenty First Century" recommends the 4 pillars of the learning process in continuing (lifelong) education efforts, namely: Learning to know (learning to master knowledge), Learning to do (learn to know skills), Learning to be (learn to develop yourself) and learning live together (learn to live in society). Therefore, the role of the teacher as a learning agent is very important to master and apply Information and Communication Technology in learning (Jamun, 2018).

The rapid development of technology has had many positive impacts on education. The development of technology and information also plays a role in changes to the learning process in Indonesia (Cholik, 2017). Technological developments support the availability of various learning resources that can be accessed anytime and anywhere, thereby improving the quality of education. Mustadi et al (2020) argued that learning media is a means or container of material used by teachers to assist in the process of delivering material. Learning media is also an interesting and fun learning resource, so that the use of appropriate learning media can improve the quality of teaching and learning and accelerate student understanding.

Quality education can also be realized by measuring how students learn in a lesson. One good way of working is working using scientific concepts or what is commonly called scientific work. Scientific work can be interpreted as an activity carried out by people who have a scientific attitude. Aji and Hudha (2015) argue that scientific work is an activity that refers to the way scientists study the world and provides explanations based on scientific facts. Scientific work consists of hands-on skills and minds-on or mental processes, so that scientific work is not something that occurs systematically but requires training in the process (Hudha et al, 2017). Therefore, a scientific attitude needs to be trained in students so that students can do scientific work. Students who have a scientific attitude will have a high curiosity, be able to make decisions, develop their desire to solve problems with an open, objective, honest mind, conscientious and able to work well together (Retno and Yuhana, 2018)

This scientific performance is in line with Kepmendikbud No. 3 of 2021 which mentions the application of learning methods in accordance with IKU Point 7 regarding the application of project-based group learning methods (Team-Based Project). Working in a team is an important work skill, but students generally have a negative perception of group work (Christensen et al, 2018). Through the Team-Based Project learning method, the class will be divided into groups (> 1 student) to work on assignments together for a long period of time, then the group will be given a complex problem or question to solve in space and form a work plan and collaboration model. In the last stage each group will prepare a presentation/final work which will later be shown to the lecturer, class or other participants who can provide constructive feedback.

The teacher's Team-Based Project learning method can assess several aspects including: an assessment of students' interpretation of the substantive truth of the project product to be produced, an assessment of the ability of students to make/complete project products using all existing procedures, an assessment of the ability of participants students in completing projects with good results and in accordance with the desired time, assessment of product results in accordance with predetermined indicators/standards both in the form of physical or innovation, and the last is an assessment of the ability of students to present project results

correctly in an effective way. substantive by using language that is easy to understand and delivered with confidence.

The results of this study are relevant to research by Swanson et al (2019) which obtained the results that implementing a Team-Based Project could make learning more effective because it was able to increase the final grades of the course and students' test performance. In addition, by implementing team-based learning students can be actively involved in learning so that they are more interested in learning and able to prepare more effectively for assessment and course performance. In addition, this research is also relevant to research by Burges et al (2017) which obtained the result that very many students choose PBL as an optimal teaching strategy. This is because students can find that the Team-Based Project has a structure and format that is more conducive to learning. Although the Team-Based Project approach requires an instructional approach, guidance from the tutor and remains student-centered, TBP is able to produce positive results and self-confidence in students. Therefore, TBP is an effective and appropriate learning model for use in project-based courses.

Reimschisel et al (2017) stated that as many as 118 articles that used Team-Based Projects in learning met the inclusion criteria. In fact, the number of articles published annually in Team-Based Projects continues to increase, more than tripling in 2011 and 2016. This shows that learning with Team-Based Projects is an effective learning method and is capable of producing effective learning products or projects. in accordance with standard indicators/standards that have been set either in the form of physical or innovation. The stages of the Team-Based Project learning method are suitable when applied to courses that require products to be produced so that students are able to apply and create media as an interactive learning resource.

One of the courses that aims to enable students to be able to apply and create media as an interactive learning resource is the Computer based learning media course. Computer-based learning media courses have graduate learning outcomes in the category of special skills that students must master, namely students are able to create innovative and creative physics learning practices in accordance with 21st century life skills, based on local potential and wisdom, and future-oriented with take advantage of the progress of science and technology in learning physics in schools. In addition, this computer-based learning media course is a physics learning instrumentation research group course which aims to contribute to the preparation of student final assignments. Computer-based learning media courses are also able to improve students' understanding of concepts so as to improve student learning outcomes (Kurniawati and Nita, 2018). Based on the description of the rapid progress of technology and its use in the field of education, but the lack of use of technology-based media as a source of learning, the role of implementing team-based project learning methods in physics learning, this research aimed to describe the profile of scientific performance of students in learning media courses computer based.

Method

This research method uses a qualitative descriptive research method (Fraenkel and Wallen, 2009). Respondents to this study were 28 students taking computer-based learning media courses in the even semester of 2020/2021 at the Physics Education Study Program, Faculty of Teacher Training and Education, University of Jember. The number of respondents was taken 28 students because it was appropriate to the class size. Data collection techniques used with project assessment sheets (aspects of scientific performance), observation and documentation. The data analysis technique uses percentages and is then analyzed descriptively.

Results and Discussion

The application of student scientific performance in computer-based learning media courses through the application of the Team Based Project learning method has been implemented for students of the physics education study program research group 1 physics learning instrumentation who are taking computer-based learning media courses in odd semesters of the 2021/2022 school year. Learning begins with the delivery of concepts about computer-based learning media and then continues with the division of groups of 28 students into 7 teams, so that each team consists of 4 students. After that students hold discussions about teaching materials for computer-based learning media courses, and finally students are assigned to prepare a project design that they will make in quite a long time so that results/projects are obtained in accordance with established indicators/standards both in physical form or innovation. The challenge faced by students during the project work was adapting to the use of technology in the form of software that was new for them.

The theme that will be prepared by students departs from the problem of the lack of learning media in conveying physics material. The theme includes Dynamic Electricity material by group one, Heat temperature and its transfer by group two, Mechanical waves by group three, GLB and GLBB material media by group four, Static fluid material media by group five, Newton's Laws of Motion by group six and media matter of work and energy by groups of seven. Students are given the freedom to choose what application/software will be used in developing a physics learning media project. The results of the work show that students use articulate storyline and macromedia flash software.

In the project planning process, students will be assessed through three aspects, namely: preparing designs properly and according to assignments, preparing equipment and materials properly and preparing steps/time schedules that are logical. In the next stage, namely the project implementation process, there are also three aspects of assessment, namely: activeness in carrying out all project-making activities, discipline in complying with the timetable and provisions that have been prepared and cooperating in implementing activities. Finally, in the reporting process students will also be assessed through three aspects, namely: making progress reports according to a predetermined schedule, compiling results and receiving input for improvements and implementing improvements after receiving input.

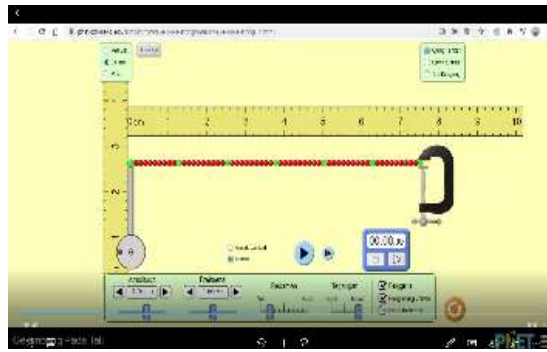
The components listed in the media include core competencies (KI), basic competencies (KD), and learning objectives; collection of material discussed; analysis of application in everyday life, media supporting animations, sample questions and quizzes. This is because the most important component that must be included in a learning media is the learning objectives to be achieved. (Hamid et al, 2020: 44). Furthermore, the results/projects of each group in the computer-based learning media course are shown in Figure 1 below.



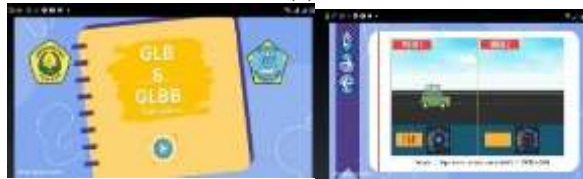
(a)



(b)



(c)



(d)



(e)



(f)



(g)

- (a) Dynamic Electric Media, (b) Temperature, heat and displacement Media, (c) Mechanical Wave Media, (d) GLB and GLBB Media, (e) Static Fluid Media, (f) Newton's Laws of Motion Media, and (g) Work and Energy Material Media

Figure 1. The results of the media project work

The results of the assessment of the three components of the scientific performance assessment showed that students' project planning abilities were 86.90%, scientific performance skills in project implementation were 85.71%, and reporting was 84.52%. The average ability of scientific performance activities is 85.71%. This means that students are able to provide substantively correct interpretations of the project products produced which are demonstrated by the ability to understand problem solving, the lack of physics learning media for abstract physics content. Apart from that, this is also able to realize the active involvement of students in the learning process (Pujaningsih et al, 2022). The ability to complete project products using existing procedures, which is demonstrated by the ability to use application software for making learning media. Previous study Suryawati & Osman

(2017) describe that CTL has contribute significant implications for the enhancement of scientific thinking skills among various students' capabilities and different categories of school. In addition, using appropriate instruments to measure student performance is crucial. Student performance in science can be reliably assessed using instruments that demonstrate good generalization coefficients (Hild et al, 2019)

The ability to complete projects with results in accordance with a predetermined time or on time. This is shown by the timeliness of submitting student project assignments even with several assessment notes. Ability to present product results in accordance with established indicators and be able to present substantively true project results, use language that is easy to understand and deliver with confidence. This is shown that students have good confidence in delivering project assignments that have been completed. This can be a solution in solving problems regarding students' lack of confidence in presenting assignments (Rezkillah and Haryanto, 2020).

The results of working on the learning media project are in accordance with the results of research by Efendi et al (2021) which stated that using learning media can make students enthusiastic and motivated in the teaching and learning process, so that it can eliminate students' boredom in participating in learning. Midroro et al (2021) also conducted the same research regarding instructional media and found that 81.60% of students' responses on a small scale were very positive about learning media and 83.86% of students' responses on a large scale were very positive about learning media. Learning media can certainly have a good impact if used properly too, based on their functions and benefits (Nurfadillah, 2021).

The results of research by Swanson et al (2019) put forward the results that through TBP students can be actively involved in learning, so that through the TBP learning model they are able to improve the final results of students. This is also in line with research by Siyam (2021) and Tekad and Pebriana (2021) which obtained results that TBP can increase student activity so that student understanding and learning outcomes also increase. The TBP learning model also has a structure and format that is more conducive to learning so it is very effective for use in project-based learning (Burgess et al, 2017). Therefore, the use of media in learning is able to provide convenience and a true picture of a particular form or process. Thus, users can be facilitated in the learning process that is centered on students/students (Nuraini and Supriadi, 2018).

Conclusion

Based on the research results, it can be concluded that 85.71% of students are able to plan, implement projects and compile reports. This means that students are able to provide substantively correct interpretations of the project products produced, complete project products using existing procedures, complete projects on time, product results are in accordance with established indicators and are able to present project results substantively correctly. This research provides a practical contribution to the development of learning strategies in higher education, particularly in computer-based learning media courses, by demonstrating that the application of team-based project learning methods can significantly improve students' scientific performance. The results of this study can be used by lecturers as a reference in designing more effective collaborative learning activities and encouraging students to be more active, creative, and responsible in producing technology-based products.

The suggestions from this research are: 1) it is necessary to develop variants of media projects for other subjects so that the lack of technology-based learning media can be properly addressed, 2) the team-based project learning method can be an alternative learning method in order to support the implementation of the OBE (Outcome) curriculum. based Education)

in learning physics in different subjects, and 3) Better time management is needed in implementing the team-based project learning method because each stage involves student activity.

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