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## Student Responses to Video Media Tutorial Basic Physics Practicum on Series and Parallel Circuits Material

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### Abstract

*This research aims to determine student responses to the development of basic physics practical video tutorial media on series and parallel circuits. This research is quantitative descriptive research. The samples used in this research were twenty-five students from the physics education study program in the odd semester of the academic year: 2022/2023 at one of the universities in Sumba who took Basic Physics courses. Data collection in this research used a questionnaire containing statements using a Likert scale. The data obtained is analyzed for each indicator in the questionnaire, then the percentage score obtained will be calculated. Based on the results of data analysis, it was found that the student response to the basic physics practical video tutorial media on series and parallel circuit material was very positive (91.3%) meaning that the use of practical video tutorial media in basic physics practicum activities on series and parallel circuit material received a response good thing from students. The percentage of each aspect measured obtained the following values: (1) the attractiveness of the practical tutorial video media was 92% (very positive category); (2) the use of practical video tutorial media by 94% (very positive category); and (3) the role of practical video tutorial media in series and parallel series practicum was 88% (very positive category). The results obtained show that the practical video tutorial media is highly accepted by students as a medium that can assist in basic physics practical activities, especially in series and parallel circuit material. The implication of the results of this research is that it is easier for students to understand the steps when carrying out practicum activities because there are practicum video tutorials that help students learn material related to the practicum that will be carried out, especially for practicum material regarding series and parallel circuits..*

**Keywords:** Resonss, Video Tutorial Practical, Series and Parallel

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## INTRODUCTION

Basic physics (mechanics, electricity, magnetism) is a study program subject and is mandatory for undergraduate physics education students. This course discusses quantities, units, measurements, vectors, motion in one dimension, motion in two dimensions, dynamics, work and energy, linear momentum and collisions, rotation, balance, gravity, electricity and magnetism. After attending this lecture, students are able to identify the basic concepts of unit quantities, motion in one dimension, motion in the dimensional world, dynamics, work and energy, linear momentum and collisions, rotation, balance, gravity, electricity and magnetism and apply them for various purposes. This course has a weight of 3 credits, of which 2 theory credits and 1 practical credit. Basic physics practicum (mechanics, electricity, magnetism) is part of the basic physics course (mechanics, electricity, magnetism) that must be taken by Physics Education students.

Basic physics practicum requires students to do more activities in the laboratory, but as is known, currently the whole world is being hit by an epidemic called Covid-19. On March 24 2020 the Minister of Education and Culture of the Republic of Indonesia issued Circular Letter Number 4 of 2020 concerning the Implementation of Educational Policies in the Emergency Period of the Spread of COVID, in this Circular Letter it is explained that the learning process is carried out at home through online/distance learning to provide learning experiences which is meaningful for students (Astini, 2020). So that all teaching and learning activities are carried out online for all education units.

The spread of Covid-19 in mid-2021 has decreased, so that educational activities are starting to open, but not completely. At the beginning of September 2021, face-to-face learning activities were held simultaneously. However, activities in the laboratory have not yet been opened. So it is hoped that there will be a solution that helps pupils and students to get a real picture of the practical activities that occur in the laboratory so that when students enter the laboratory they already have knowledge of the activities that occur in the laboratory.

The use of technology in education during this pandemic is very important. Technology can be used as a forum for interaction between students and lecturers as well as interaction between students and teachers. This is in accordance with Putra's statement (2013), the utilization of science and technology (science and technology) as a means of supporting learning is one of the positive impacts in developing knowledge. Technology that is often used in the world of education is the use of technology using PowerPoint, audio and visuals, and animated videos. However, in its interpretation, using PowerPoint is often considered boring because it only contains writing and images. The use of technology in the world of education mostly uses PowerPoint media, even though there are still several types of technology such as video media. One of the video media is video tutorials.

Video tutorials are learning media that convey messages to students in the form of audio and visuals which include interactive learning material so that students and students can learn independently. The use of video tutorials in the world of education is very rare by teachers and other educational staff. The use of video tutorial media will really help teachers and other teaching staff in delivering learning material. Video tutorials can help students understand practical material. In accordance with research by Andreas and Gusmareta (2018) which states that the use of practical video tutorials is practical and effectively used as a learning medium. Sudjana and Rivai (2011) also stated that there are several benefits of video media, namely; (1) can foster motivation; (2) the meaning of the message will become clearer, so that it can be understood by students; and (3) enable mastery and achievement of delivery objectives.

The use of video tutorials for the basic physics practicum process during this pandemic allows students to pay attention and listen to the instructions given in the video, so that students can understand and comprehend the material that will be carried out in the practicum process. Students not only see the practical process in animation but can actually see the basic physics practical process in series and parallel circuit material that occurs in the laboratory. The impact of the pandemic on the learning process and basic physics practicums in laboratories is very large, namely the implementation of basic physics practicums (mechanics, electricity, magnetism) which is ineffective and poses a risk to the spread of Covid.

The use of video tutorials in practical activities is not only needed during the Covid era, but after Covid, practical video tutorials have become an alternative media that can support practical activities. Siregar et al (2023) obtained data that by using interactive video-based procedural texts in operations practicum, all students felt satisfied and successful in using interactive video-based procedural texts during operating systems practicum courses. The use of interactive video tutorial media can increase students' insight and competence, with video tutorial media it will provide alternative solutions for implementing practicums, especially when there are restrictions on face-to-face learning activities (Nugroho, et al., 2023). In practicum and learning activities, the use of video tutorial media can be used as a differentiation media that is integrated with the learning carried out in learning activities (Saprudian, et al., 2023).

The novelty of this research is the use of video tutorial media before students carry out practical work in the laboratory. Apart from that, the results of the empirical study carried out found that There is not much research that specifically examines the development of practical tutorial media, especially on series and parallel circuit material, so that the resulting product became one of the recommended media that could be used in carrying out practical activities for students. This is because in previous practicum activities, students directly carried out practicum activities in the laboratory so that sometimes students were not prepared to understand the steps that would be taken when doing practicum. In general, the aim of this research is to find out students' responses to the development of practical tutorial media in basic physics practical activities for series and parallel circuits. There are 3 aspects that measured in this research, (1) the attractiveness of practical video

tutorial media; (2) ease of media use practical video tutorial; (3) the role of practical video tutorial media in series and parallel circuit practicum. By knowing the student's response to the video being developed, it will be the basis for knowing whether the practicum video tutorial being developed is easy to use and provides benefits for students, especially in helping students carry out practical activities in basic physics practicum, especially for series and parallel circuit material.

Based on these obstacles, to facilitate the student learning process, it is necessary to develop learning media based on video tutorials on basic physics practicals (mechanics, electricity, magnetism) on series and parallel circuits.

## RESEARCH METHODS

The research method employed was quantitative descriptive research, with the goal of determining student reactions to the use of practical video tutorials in learning, particularly in practical activities in basic physics courses. Research was conducted as part of the Weetebula College of Teacher Training and Education's (STKIP) physics education study program. Because of the limited population size, a type sampling strategy was used in this study. The research's subjects were twenty-five odd semester Basic Physics students enrolled in the 2022–2023 school year.

The data collection technique in this research uses a questionnaire containing statements. Data obtained from this questionnaire was used to determine student responses to the practical video tutorial that had been developed. The aspects measured in the student response questionnaire are divided into 3, namely: (1) the attractiveness of the practical video tutorial media; (2) ease of use of practical video tutorial media; (3) the role of practical video tutorial media in series and parallel circuit practicum. The student response questionnaire is in the form of a statement where the scores obtained use a Likert scale, namely strongly agree (score 5), agree (score 4), disagree (score 3), disagree (score 2) and strongly disagree (score 1). The data that has been collected is then analyzed for each indicator in the questionnaire, then the percentage of scores obtained will be calculated. Based on the percentage of scores obtained for each indicator, you can see the categories of student responses to the indicators related to the categories in Table 1.

**Table 1.** Student Response Categories (Source: Riduwan, 2007)

Score Percentage	Category
81% - 100%	Very Positive
61% - 80%	Positive
41% - 60%	Enough
21% - 40%	Negative
0% - 20%	Very Negative

## RESULTS AND DISCUSSION

The results of this research describe students' responses to the development of video tutorial media for basic physics practice (mechanics, electricity, magnetism) material on series and parallel circuits during the pandemic which is very suitable for use as an alternative learning in emergency and normal situations. The use of video tutorial media in the teaching and learning process is a positive step in the use of science and technology (IPTEK) in line with current technological developments. Technological advances are able to change the habitual pattern of face-to-face learning processes into distance learning processes (Astini, 2020; Andreas & Gusmareta, 2018; Putra, et al., 2013; Sudjana & Rivai, 2011). This was of course done because of the influence of the emergence of Covid-19 which required significant changes, both in terms of the equipment used and different learning patterns (Saprudian, et al., 2023; Siregar, et al., 2023). In this research, before being used or assessed by students regarding the development of video tutorial media, the researcher conducted a feasibility test of the material and media through media experts and experts on the material used in the video tutorial. This feasibility test was carried out with the aim of finding out the quality of the video tutorial product before it was given to students. Suitability of the media used in video tutorials is very necessary as a support in carrying out basic physics practicum (mechanics, electricity, magnetism) in series and parallel circuits.

The suitability of the media certainly very helpful in explaining the material in the video tutorial so that students are able to understand the content of the material in the video tutorial well (Saprudian, et al., 2023; Siregar, et al., 2023; Astini, 2020). Without using appropriate media it will certainly affect the content of the material because basic physics practicum certainly requires steps along with the tools used so that students are immediately familiar with them so that when doing the practicum they already know and understand how to

use the media properly and correctly (Haryanti & Suwerda, 2022; Machfud, 2021; Aria, 2013). Below are pictures of examples of practical video tutorials and the use of practical video tutorials in practical activities as shown in Figure 1 and Figure 2.



Figure 1. Example of Practical Video Tutorial



Figure 2. The Use of Practical Video Tutorial in Practical Activities

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The use of appropriate media in the basic physics practicum process (mechanics, electricity, magnetism) in series and parallel circuits is of course very well supported by the use of good material in accordance with the context of discussion, namely the development of basic physics practicum video tutorials (mechanics, electricity, magnetism) in series and parallel. In the context of video tutorials, it is very necessary to present the contents of the material clearly and easily understood by students and other viewers (Machfud, 2021; Muthiah, 2018; Mirwanto, 2017). The content of the material explained in the basic physics practical tutorial video is certainly the main key to whether the video is appropriate or not, which is supported by a clear and easy-to-understand presentation of the material (Rima, 2020; Krismanto, 2016). The clear presentation of material is of course supported by practicing the use of tools or media correctly and clearly so that the steps are easy to understand properly and correctly.

After validation by media experts of the practical video tutorial media that was developed, the video was then used in practical activities related to series and parallel circuit material in basic physics practical activities. Then at the end of the practical activity, the researcher gave a questionnaire to students regarding student responses to the video tutorial media used in the practicum. Based on the questionnaire data that was filled in by students, results were obtained regarding student responses to basic physics practical video tutorial media on series and parallel circuits which are presented in Table 2.

Based on the data in Table 2, it was found that the student response to the basic physics practical video tutorial media on series and parallel circuit material was very positive (91.3%) meaning that the use of practical video tutorial media in basic physics practicum activities on series and parallel circuit material received a good response from students. The results obtained show that the practical video tutorial media is highly accepted by students as a medium that can assist in basic physics practical activities, especially in series and parallel circuit material.

**Table 2.** Data on Student Responses to Practical Tutorial Video Media

Table 2. Data on Student Responses to Practical Tutorial Video Media					
No	Aspects that are measured	*Rata-rata	**Criteria	Score Percentage (%)	Response Category
1	The attractiveness of practical video tutorial media	4.61	Strongly agree	92	Very Positive
2	Ease of media use Practical video tutorial	4.72	Strongly agree	94	Very positive
3	The role of practical video tutorial media in series and parallel circuit practicum	4.40	Agree	88	Very Positive
Amount		13.73		274	
Average		4.57		91.3	Very positive
**Criteria		Strongly agree			
Information					
*Scores are in the interval 1 – 5					
**Criteria:					
1.0 – 1.5 (strongly disagree)    2.6 – 3.5 (not agree)    4.6 – 5 (strongly agree)					
1.6 – 2.5 (disagree)    3.6 – 4.5 (agree)					

Based on the results of the student response questionnaire regarding the development of practical video tutorial media, it was found that the use of practical video tutorials in basic physics practical activities on series and parallel circuit material was responded to very positively by students. The results of measurements carried out for 3 (three) aspects, namely: (1) the attractiveness of practical video tutorial media; (2) ease of media use practical video tutorial; (3) the role of practical video tutorial media in series and parallel circuit practicum, show that students responded very positively to the practical tutorial video. The use of video tutorial media in practicum activities is very effective in helping students understand the practicum activities that will be carried out. This is in accordance with the results of research conducted by Alatas, et al., (2022) which explains that the use of video media is very effective in helping students understand the practical activities that will be carried out (Safriawan, et al., 2021; Ritonga, 2020; Susilawati, 2017; Putra, et al., 2013).

Apart from that, there is also video media for practicum activities as initial material that can be accessed for learning before carrying out practicum activities. Especially for students studying during the pandemic where it is very difficult to access face-to-face practical activities in the laboratory (Nugroho, et al., 2023; Saprudin, et al., 2023). This video tutorial media is a guide that can be accessed by students before and during practicum activities (Siregar, et al., 2023). The use of video tutorial media also has an impact on students' activeness in learning (Machfud, 2021), apart from that, easy access to the use of video tutorial media makes students more comfortable in the learning process (Saprudian, et al., 2023; Sudjana & Rivai, 2011), especially in preparation for exams practical learning process.

Therefore, the use of practical video tutorial media is very important which can support the learning process, especially practical activities. The use of practical video tutorial media is not only carried out during practicum, but can be studied by students before practicum activities are carried out, this is what differentiates the research conducted from the results of another relevant research (Krismanto, 2016; Rima, 2020). Easy access for students before, during practicum and after practicum to help students prepare an understanding of taking part in practicum activities (Ritonga, 2020; Putra, et al., 2013), make practicum activities easier and help to remind students regarding practicum procedures that have been carried out as material for writing practicum reports to make research activities and products (Putra, et al., 2013; Ritonga, 2020; Safriawan, et al., 2021; Susilawati & AN, 2017). This research is something new in the development of science and technology. However, the results of this research are still limited to video tutorial media on basic physics practical material regarding series and parallel circuits, so there is a need for development to study student responses regarding video tutorials on other practical material. Apart from that, there needs to be a combination of learning using an LMS such as MOODLE. The use of LMS MOODLE has been carried out for virtual

practicums but has not more been developed for practicum tutorial media (Sudana, et al., 2022). This is an opportunity to conduct studies for subsequent research.

## CONCLUSION

From the research that has been conducted, it can be concluded that students' responses to the practical video tutorial media in basic physics practical activities for series and parallel circuit material gave a very positive response. This can be interpreted as meaning that students receive very well the use of practical video tutorial media which can assist in basic physics practical activities for series and parallel circuit material. For each aspect of the questionnaire, student responses obtained an average score of 4.57 (strongly agree criteria). This indicates that the practical video tutorial media used in basic physics practical activities for series and parallel series material is very interesting as a media guide for practical activities, practical video tutorials are easy to use in practical activities and as a medium that can help in basic physics practical activities in the material. series and parallel circuits. For further research, practical video tutorial media can be developed on practical material either in physics practicum or in practicum outside of physics material. Apart from that, research can be carried out related to blended learning by combining practicum activities with the use of LMS in the process of implementing practicum activities.

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