

STUDENT'S RESPONSE TO PHYSICS HANDOUTS BASED ON ANDROID AS LEARNING MEDIA ON THE TOPIC OF ALTERNATIVE CURRENT (AC)

Respon Siswa Terhadap Handout Fisika Berbasis Android Sebagai Media Pembelajaran Pada Topik Arus Bolak balik (AC)

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Keywords

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Abstract

This research aims to find out the student's responses to physics handouts based on android as a learning media on the topic of alternating current (AC). Data were collected by questionnaires to describe as quantitative descriptive research. The data were described in a rating scale as in the Likert Scale obtained from the provision of 25 questions that were distributed to students privately. According to the result, the average assessment showed a percentage of 82.32% in the excellent category. So, the implications suggested that physics handouts based on android had received a good response based on the questionnaires and have been valid as a learning media.

Kata Kunci

Respon Siswa
Handout Fisika
Media Pembelajaran
Android

Abstrak

Penelitian ini bertujuan untuk mengetahui respon siswa terhadap materi materi fisika berbasis android sebagai media pembelajaran pada materi arus bolak-balik (AC). Data dikumpulkan dengan kuesioner untuk digambarkan sebagai penelitian deskriptif kuantitatif. Data dideskripsikan dalam skala penilaian seperti pada Skala Likert yang diperoleh dari pemberian 25 pertanyaan yang dibagikan kepada siswa secara privat. Berdasarkan hasil penilaian rata-rata menunjukkan persentase sebesar 82,32% dalam kategori sangat baik. Jadi, implikasinya menunjukkan bahwa handout fisika berbasis android telah mendapat respon yang baik berdasarkan angket dan telah valid sebagai media pembelajaran.

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INTRODUCTION

Physics is a branch of mathematics that requires basic skills in calculating and applying formulas, besides that physics not only contains theoretical things but the need for reasoning in understanding every concept that exists.[1]. Learning Physics is not enough just to use using lectures method and exercises but need other learning method and other teaching materials which could support achieve the purposes of learning so the concept and the fundamentals of the physics material could be understood by students well [2,3].

In order to improve the quality of education, there needs to be an improvement in the quality of learning, especially physical learning. Not limited to the models and methods used but also the need for the development of good quality teaching materials to support students in

receiving learning. Teachers are required to create a more pleasant and communicative atmosphere [4]. Teaching materials have an important role. in the learning and teaching process. Moreover, Teaching materials consist of printed materials such as textbooks, modules, LKS, handouts, posters, leaflets, teaching books, and non-printing for example video, audio, photos, images, and audiovisual [5,6].

The handout is one of the teaching materials that can be used as a medium to convey learning [7,8]. Handouts in Indonesian means leaflets or sheets of paper in the form of printed teaching materials are given to learners as a support for learning with the aim of helping learners avoid a lot of notes and complementing information not obtained in other teaching materials [9,10].

Teachers in choosing good teaching materials need to consider strategies that are suitable to be applied to learners by the selection

of the right learning media so that students can understand better when delivering learning materials [11–13]. Moreover, in the study of physics is not enough if only studied in theory but also the need for the application of existing material concepts [14]. Teachers can use technology-based media as an alternative in choosing learning media [15,16]. Especially during the covid-19 pandemic, the average learning is done online (online) or online, therefore the use of online devices or media such as android-based handouts is increasingly needed in overcoming learning problems for teachers and learners [17,18].

One of the familiar online devices is android phone which is already used by most people. Especially, in terms of the teaching and learning process between teachers and learners to facilitate the learning process [19,20]. Teachers can use the android system as a learning medium in the form of handouts combined so that it can be used as a support in carrying out the learning process [21,22]. Learning media includes two elements, namely in the form of hardware and software [23,24].

This physics handout based on android is expected to help students in understanding learning materials, especially materials about alternating current circuits (AC). The handout is also expected to help overcome the problem of teaching material limitations in times of pandemic by making teaching materials based on android (online) and able to attract students' learning interest [25,26]. Research on android-based physics learning media has been widely developed [27–29]. However, there are still few researchers who raise handouts as a research theme so this is a new thing from various existing studies [21]. The purpose of this study is to find out the student's response to physics handouts based on android as a learning media, especially in the topic of Alternative Current(AC).

RESEARCH METHOD

In this android-based physics handout research using this type of research is descriptive research, with techniques in data collection used through questionnaire techniques. The questionnaire sheet is structured based on student assessment score guidelines commonly used in quantitative research [30]. Then, it is distributed to students to find out their response to android-based physics handout learning that is used as a data instrument through an *online* form. The questionnaire sheet distributed to students has been validated by material experts as many as 55 questions grouped into 2 sections, the

analysis of material content and analysis of material needs. In research instruments, researchers used the Likert scale to measure the attitudes, perceptions, and opinions of a person or group of people toward the potential and problems of an object. Instruments use a *rating scale* in obtaining and collecting information.

In this study the sample tested was 25 students as respondents. Questionnaire sheets is distributed through google form sent to the teacher of class XI high school. Data analysis techniques using the Likert scale based on research questionnaires that have been disseminated to students. In assessment, the feasibility of the physics handout based on android as a learning media, used assessment textbook and criteria of interpretation of scores. The assessments get categorize as SB (Excellent), B (Good), (Fair), K (Less than fair) and SK category (Far Less than fair) [31]. The suspension is intended to find out the feasibility of physics handouts based on android as a learning media. The guidelines in the suspension of assessment criteria by students are loaded Table 1.

Table 1. The guidelines in the suspension of assessment

No.	Category	Score	Interval (%)	Description
1.	SB	5	81-100	Excellent
2.	B	4	61-80	Good
3.	C	3	41-60	Fair
4.	K	2	21-40	Less than fair
5.	KB	1	0-20	Far less than fair

[32,33]

The analysis aims to determine and infer students' response to physics handout based on android as a learning media at the topic of alternative current (AC). The indicators of student response questionnaires assessed include practicality, interest and attention, providing assistance to learn to students, interest, readability, easy to use, and low cost in detail described in Table 2.

Table 2. The indicators of student response questionnaires

Indicator	Observed Aspect
Practicality	Based on the student's response showed that the media is on good criteria
Interest and attention	Based on the student's response shows the attention and interest of students with high criteria
Provide help to learn	Students found it helpful in learning to use handout media
Engagement	Students got engaged in using physic handout as learning media

Readability	Students could read well the writing on the handout.
Easy to use	Students found it so easy to used physics handout based on android.
Fee	Based on the student's response showed the use of categorised physics handout media as a medium at a very low cost

[32,34,35]

RESULT AND DISCUSSION

Physics handouts based on android are feasible as learning media must matched to the criteria and assessment indicators. The assessment was measured using student response questionnaires analyzed using the Likert Scale. Physics handout is said to be based on android when it contains several media in it such as text, images, photos, animations, hyperlinks, and so on. While the physics handout as a learning media matched the percentage of the average score at least in the category of good based on the student response questionnaire. If the android-based physics handout learning media is in the category of good enough then a small revision is needed without conducting field tests. Meanwhile, if the physics handout based on android got a response with a bad category then a thorough revision and field trial is needed [7].

In the physics handout based on android as learning media has a display that can be opened through handphone and there are main menu such as instructions and learning competencies, sub topics of the materials and evaluation, and experiment as in Figure 1. On the menu of learning instructions contained about the explanation of how to use this physics handout based on android as in application. The learning competency menu contained about the things that need to be achieved by students in learning using the media. The menu of sub topics of the materials and evaluation contained about the subject expression that had been summarized in accordance with the needs and examples to facilitate the learning process. The experiment menu containing about the experimental activities conducted by students regarding the material of alternating current circuits virtually and online or directly connected to PhET.(Figure 2). So that students could still did experimental activities even online without being hampered by distances. The following are some handout displays of handout in the topic of alternative current (AC) that are opened in handphone..

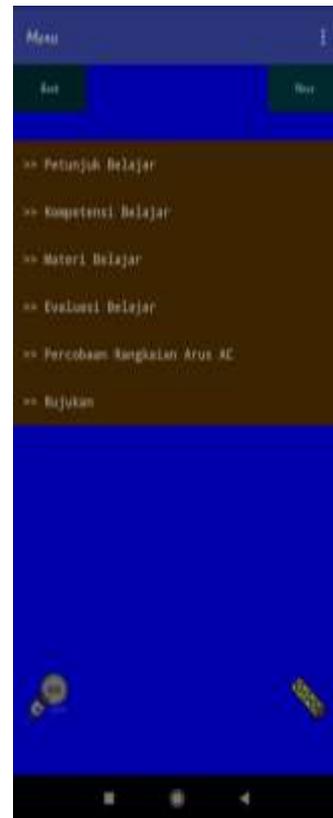


Figure 1. The main menu display of the handout contains hyperlinks that are linked to other menu.



Figure 2. Display of alternating current (AC) circuit experiment menu display

Based on the appearance of the physics handout menu on android phone, researchers used the rating scale method.in questionnaire

description. Rating scale is raw data obtained in the form of numbers then described into quantitative sense. In the rating scale, respondents did not answer any of the qualitative answers that had been provided but answered one of the quantitative answers that had been provided. The respondents referred to here were students of class XI high school, 25 respondents. Before carrying out the test, researchers contacted physics subject teachers to share handout apps and questionnaire sheets with students. Researchers also briefly explained the application and how to fill out a response questionnaire sheet through the teacher to send to each respondent. Furthermore, respondents use the application and fill out questionnaires and provide assessments in the form of responses, and suggestions through questionnaire sheets that had been given. Recapitulation of student response questionnaires that contain indicators of practicality, interest and attention, providing assistance to learn to students, engagement, readability, easy to use, and fee with the results obtained through the rating scale in detail can be seen on Table 3.

Table 3. Recapitulation of Student Response Questionnaire

Indicators about Physics Handout based on android as learning media	Score Percentage in Assessment (%)	Category
Practicality	78,8	Good
Interest and Attention	75	Good
Provide help to learn	85,5	Excellent
Engagement	76,4	Good
Readability	78,12	Good
Easy to use	88,15	Excellent
Fee	94,25	Excellent
Average Percentage	82,32	Excellent

[32]

According to Table 3, the results showed that the physical handout media received a good response on the practicality indicator of 78.8%. As practical learning tools to obtain response results with good categories (8,36). In addition, this is also an advantage of physics handout based on android Because it is practical and can be accessed anywhere.. On the indicators of interest and attention and interest and readability obtained consecutive rating scores of 75%, 76.4%, and 78.12% with good categories, because in this handout application can be read well even though on some displays there is quite small writing, but still can be read. Contextual-based handout development that obtains response results with categories both on aspects of interest, readability and attention of students

[37]. Meanwhile, on the indicator can aid students to learn with the percentage of assessment score is 85.5% is in the category is excellent.. In terms of usability is also easy to use based on the results of questionnaires from respondents with a rating score of 88.15%. This becomes an advantage of *android-based* handout products because it can facilitate teachers and students in the learning process and is useful as a learning guideline. The creation of interactive multimedia handout that obtains response results with excellent criteria on usability indicators and ease in helping students learn the learning process [11]. While the percentage of assessments with the categorized handout media indicator is very cheap at 94.25% which means students feel that the handout media does not cost much because it only relies on android phones. The assessment of these respondents is feasible. Meanwhile, the assessment that gets a low percentage is in the interest and attention indicator section with the percentage of the assessment score is 75% and this needs an increase for the next stage of development as a form of improvement.

CONCLUSION

According to the assessment score of the student's response to physics handout based on android as a learning media, the average percentage of assessment is 82.32% with an excellent category. The physics handout is feasible to be used as a medium of learning for students. Thus, physics handout as a medium in the topic of alternative current (AC) was concluded that this handout interesting and has its own advantages such as easy to use, helping the learning process of students, and economically able to satisfy respondents.

The advice is for further research the android-based physical handout learning media on alternating current circuit (AC) material needs to be done further research to find out the effectiveness or learning outcomes of students in using the media.

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