Analysis of learners' behaviorism towards the use of website-based learning media in mathematics learning

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Abstract

This research aims to analyze the behaviorism of students towards the use of web-based learning media, especially in mathematics learning. By taking into account user behavior, the development of learning media will be more effective. The research method used is descriptive qualitative using an instrument in the form of a behaviorism questionnaire that has been validated by experts and used to determine how students' behaviorism in learning mathematics by utilizing website media. Technical data analysis was carried out by determining the percentage of students' response answers, then each statement in the questionnaire would be analyzed descriptively by transforming the data obtained into attitudes. The results showed that students' behaviorism towards the use of website-based learning media is more motivated to learn mathematics and can help in understanding mathematical concepts and provide interesting learning activities for students.

Keywords: learning media, website, behaviorism

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1. Introduction

Education is an important aspect in developing students' potential, but the rapid development of information technology today has a significant impact on learning methods. Teachers and learners are required to be able to adapt to the use of information and communication technology in learning (Tantri, 2021). There is a relationship between learner behavior and the use of technology in mathematics that contributes greatly to improving learner behavior towards mathematics (Higgins & Huscroft-D'Angelo, Jacqueline Crawford, 2019). The use of technology in mathematics learning helps learners to be able to increase learner involvement, increase learning motivation and can help learners to be able to understand mathematical concepts (Murphy, 2016). In connection with this, it is necessary to make a breakthrough as a solution so that the mathematics learning process continues to run optimally. One form of technology utilization in learning is through the use of appropriate learning media. Learning media serves as a means of visualization for students, in order to provide an overview of the concept of material, increase interest and motivation to learn, facilitate the explanation of material, increase interest and motivation to learn, facilitate the explanation of material, and can clarify abstract concepts to be moreconcrete and simple (Hamdi et al., 2020).

The importance of innovative changes in the learning process, especially by using technology to make it more interesting for students (Ali & Lestari, 2023). Online learning media that can help improve the quality and quantity of learning, one of which is the use of website-based learning media. Website is a collection of pages summarized in domains and subdomains that contain multimedia in the form of audio, text, images, and video and can be accessed through a web browser (Lestari & Ali, 2023). Web-based learning media has various advantages in learning, such as easy accessibility, flexibility of time and place, and a variety of learning resources that can be accessed (Nurrita, 2018). According to Danang & Qohar (2017) (Aditya, 2018) stated that the use of web-based learning media can reduce the static atmosphere and can create an effective, interesting, interactive learning process and can arouse students' learning motivation.

Another advantage of using the website as a learning media is that it contains interactive multimedia that can be used in the learning process in order to increase students' motivation to learn independently (Danaswari & Gafur, 2018). Activities on web-based learning media have advantages over the use of social media, because they can be learned quickly (Halat, 2013). The use of web-based learning media was chosen because it has a significant impact on increasing students' involvement in the learning process (Lo, Jia Jiunn., Chan, Ya Chen & Yeh, 2012). However, most of the existing websites do not pay attention to user feedback and characteristics. According to (Pradita, 2021) a good website must consider and pay attention to its users. According to the learning theory of behaviorism psychology developed by behavioristic psychologists, one example of behaviorism theory is that there is a change in behavior as a result of the learning process experienced by students (Wiryana, 2022). Based on the theory of behaviorism, it states that changes in attitudes and behavior in students occur as a result of the interaction between stimulus and response, changes from students due to the desire to know something that has not been understood (Sipayung & Sihotang, 2022).

Previous studies have revealed the positive potential of web-based learning media in improving students' learning achievement. However, an in-depth understanding of students' responses to the use of this media, particularly from the perspective of behaviorism theory, is still needed. Therefore, this study aims to analyze students' behavior based on behaviorism theory in the context of using web-based learning media in mathematics subjects, in order to contribute to the development of a more effective learning model that is suitable for students' characteristics. Thus, this study aims to analyze the behaviorism of students towards the use of web-based learning media, especially in mathematics learning.

2. Material and Methods

The research method used in this study is descriptive, qualitative with the research objective to describe the behaviorism of students towards the use of web-based learning media. The research was conducted in one of the public junior high schools in Ciamis district with 61 students as research subjects. Participants were randomly selected. The instrument in this study is a behaviorism questionnaire which is used to find out how students' behaviorism in learning mathematics by utilizing website media. In accordance with learning theory, behaviorism emphasizes its study on the formation of behavior formed through the relationship between stimulation and observed response (Ismail, Rafki Nasuha., Mudjiran., 2019). Pavlov's theory states that changes in behavior can be made through training and habituation to stimuli received (Santrock, 2021). According to (Nugraha, S. A., Sudiatmi, T. & Suswandari, 2020) identifying the influence of social media on mathematics learning behavior, states that the intensity of accessing social media affects learning behavior, including cognitive, affective and psychomotor aspects. The preparation of the behaviorism questionnaire was made by adjusting the behavior of students when learning online according to (Ahmad, 2023) indicators of online learning attitudes consist of active communication, dexterity in using applications and completing tasks independently. Collection techniques through questionnaires distributed to students. Questionnaires distributed to students have previously been validated by two experts.

Aspects and Indicators of Learner Behaviorism in the Use of Website-Based Learning Media

In the preparation of the questionnaire behaviorism is devoted to the behavior of students in the use of web-based learning media. The following instrument description can be seen in the form of Table 1:

Table 1
Aspects and Indicators of Learner Behaviorism

Aspects	Indicators	Item Statement
Behavior before learning mathematics using the website	Learners have initiative in utilizing the website in learning mathematics	1, 4, 5
	Learners have a regular schedule for accessing the website for maths learning	2, 3
Behavior when learning mathematics using the website	Learners use the website to help with the learning process of mathematics	6, 7, 8, 9
	Learners have active engagement when learning using the website	14, 15
	Learners have an interest in the website during learning	10, 11, 12, 13, 16
Behavior when learning mathematics using the website	Learners are motivated to learn with the website	17, 18

Based on Table 1, the behaviourism of students in using website-based learning media has 3 aspects, 6 indicators and as many as 18 statement items that are the focus of this research. The questionnaire was designed using a Likert scale developed by Rensis Likert, originally created to measure attitudes. The closed scale is designed to measure how much respondents agree or disagree with a particular statement (Sullivan GM, 2013). Validation of student behaviorism questionnaires in the use of web-based learning media is carried out by experts in the fields of counseling guidance and psychology. The validation of the behaviorism questionnaire includes face validity, namely the clarity of language and editorial so that it is clear and not confusing, as well as content validity, namely conformity with the instrument grids, aspects and indicators used. Based on the results of the recapitulation of the percentage and category of face validity eligibility as follows:

Table 2
Face validity of student behaviorism questionnaires in the use of web-based learning

Aspects	Percentage	Feasibility Category
Behavior before learning mathematics using the website	80%	worth
Behavior when learning mathematics using the website	92,3%	very feasible
Behavior when learning mathematics using the website	100%	very feasible

as well as content validity, namely conformity with the instrument grids, aspects and indicators used. Based on the results of the recapitulation of the percentage and category of content validity eligibility as follows:

Table 3
Content validity of student behaviorism questionnaires in the use of web-based learning

Aspects	Percentage	Feasibility Category
Behavior before learning mathematics using the website	70%	worth
Behavior when learning mathematics using the website	92,3%	very feasible
Behavior when learning mathematics using the website	100%	very feasible

Based on the results of the assessment of validators one and two to validate the students' behaviorism questionnaire, it is declared valid and can be used with minor revisions. The questionnaire is given to students, to find out the behavior of students in using website-based learning media in mathematics learning.

Technical data analysis is carried out by determining the percentage of answers to students' responses, then each statement in the questionnaire will be analyzed descriptively by transforming the data obtained into attitudes, such as the Thurstone, Guttman and Likert scales, which then the data will be analysed quantitatively (Lestari, K. E., & Yudhanegara, 2018). The determination of the percentage of student answers for each statement item is carried out by the formula below:

$$P = \frac{f}{n} \times 100\%$$

The percentage of answers per statement item that has been averaged will be interpreted in accordance with the criteria put forward according to (Lestari, K. E., & Yudhanegara, 2018):

Table 4
Interpretation of Percentage of Statement Answers

Criteria	Interpreting
$P = 0\%$	No one
$0\% < P < 25\%$	A small part
$25\% < P < 50\%$	Almost Half
$P = 50\%$	Half of it
$50\% < P < 75\%$	Mostly
$75\% < P < 100\%$	Almost All
$P = 100\%$	The whole

3. Result and Discussion

Before giving questionnaires to respondents, researchers prepared research materials, namely 18 questions that represent indicators of learner behaviourism (learner behaviour) in the use of web-based learning media that have been validated by experts. The research was conducted by 61 public junior high school students in Ciamis. Data collection was distributed on 20 and 21 November 2023. Questionnaire data collection with questions in the form of a Likert scale scale developed by Rensis Likert, originally created to measure attitudes with Yes / No answers. Based on the results of the analysis of students' behaviourism in the use of web-based learning media.

Based on table 3, it can be seen that the results of the analysis of the percentage of students' behaviourism questionnaires show that as many as 55.57% with the interpretation that most students have the initiative to use the website in learning mathematics. This shows that students have the desire in themselves independently to learn mathematics through the website and will facilitate researchers in implementation. The websites accessed by students to learn mathematics include: branly, teacher's room, as much as 44.26% with the interpretation that almost half of the students have a regular schedule in accessing websites to learn mathematics. Although the

percentage is not too high, this shows that almost half of the learners are disciplined in scheduling time to study online, in one week the average learner accesses the website 2 times according to the schedule of mathematics lessons at school, 74.59% with the interpretation that most learners use the website to help the mathematics learning process. This indicates consistent and continuous engagement in the use of online learning resources (Manek & Tanuwijaya, 2021).

Table 5
Percentage Analysis Results of Student Behaviorism Questionnaire

Indicator	(%)	Interpreting
Learners have initiative in utilizing the website in learning mathematics	55,57%	Most
Learners have a regular schedule in accessing the website for math learning	44,26%	Almost half
Learners use the website to help with the learning process of mathematics	74,59%	Most of the
Learners have active engagement when learning using the website	35,24%	Almost half
Learners have an interest in the website during learning	62,62%	Most
Learners are motivated to learn with the website	53,87%	Most

The utilisation of digital technology, including web-based online learning, has been proven to increase learner engagement and learning effectiveness. As many as 35.24% with the interpretation that almost half of the learners have active involvement when learning using the website. This shows that there is an indication that the use of website-based learning media can have a positive impact on the active involvement and learning outcomes of learners. in line with research (Syaiful, Rahman., Wahid, Munawar & Ega, 2014) which shows a significant effect on improving the cognitive learning outcomes of students after the use of website-based learning media. As many as 62.62% with the interpretation that most students have a connection to the website during learning.

A total of 53.87% with the interpretation that most students are motivated to learn with the website and feel that learning by accessing the website can help in understanding mathematical concepts. These results indicate that the use of technology, especially websites, can make a positive contribution to the understanding of mathematical concepts by students. This is supported by research (Novialdi et al., 2020) which states that website-based learning media can improve understanding of mathematical concepts.

4. Conclusion

The results of the analysis of students' behaviorism towards the use of web-based learning media are obtained from the results of google analytics. These results include: the duration of users in accessing the website is on average 2 minutes, the devices used through laptops and cellphones with android and windows systems, in accessing the website as many as 89.94% of users access through chrome. Behaviorism of students after the use of website-based learning media found that students are more motivated to learn mathematics and can help in understanding mathematical concepts and provide interesting learning activities for students.

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