



Received : 7 April 2024

Revised : 9 April 2024

Accepted : 29 April 2024

Publish : 30 April 2024

Page : 30 – 37

The Effect of Discovery Learning with Powtoon and Word-wall on the Interest and Learning Outcomes on XI MIPA Students

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Abstract: This research is a quasi-experiment which aims to investigate the effect of the Discovery Learning Model supported by Powtoon Media and Word-wall Game on the interest and learning outcomes of class XI MIPA SMAN 9 Makassar students in learning chemical bonds. The independent variable is the use of the Discovery Learning Model with Powtoon and Word-wall Game media, while the dependent variable is student interest and learning outcomes. The research population consisted of students from class XI MIPA SMAN 9 Makassar, with a sample consisting of class XI MIPA 1 as the experimental group and class XI MIPA 2 as the control group. Data analysis uses descriptive and inferential statistics. The results show that the average learning interest and learning outcomes of the experimental group are significantly higher than the control group. Hypothesis testing using the Mann Whitney test confirmed significant differences between the two groups in learning interest and learning outcomes. These findings show that the Discovery Learning Model supported by Powtoon Media and Word-wall Game has a positive influence on the interest and learning outcomes of class XI MIPA students at SMAN 9 Makassar in chemical bonding material.

Keywords: Discovery Learning Model; Powtoon Media; Word-wall Game; Interest in Learning; Learning Outcomes

INTRODUCTION

Learning activities have an important role in achieving learning outcomes. Teachers are not only required to transfer knowledge but are expected to be able to arouse, improve, educate and maintain students' enthusiasm for learning. Therefore, a teacher must have innovation in designing learning activities, both in selecting models and learning methods so that the teaching and learning process can run well. One learning model that can make students more active in learning is the

Discovery Learning Model. Learning model emphasizes understanding the concept of students, and learning will be more meaningful if students are active involved in discovering concepts which is being studied. Therefore, teacher should give rise to a problem encourage students to do discovery, so that students will mobilize all abilities he has to solve it problem and find a concept or previously unknown principles (Yunsyahana, 2022).

From the results of interviews conducted at SMAN 9 Makassar, chemistry

teachers have implemented the Discovery Learning Model, but the results have not met expectations, especially in the stimulus syntax and data collection sections. As a result, students have not been able to reach the KKM completion criteria that have been set, namely 80%. This also has an impact on the lack of interest from students, thereby affecting student learning outcomes. This can be seen when the teacher explains that students are less enthusiastic, less confident in speaking and less understanding of the material that has been taught. Based on these problems, chemistry learning must be directed at a learning process that can activate and involve students to think and participate actively in the learning process. One effort that can be made to overcome this problem is to maximize the application of the Discovery Learning Model by integrating Powtoon media and Word-wall games.

Powtoon is an online application program that can be used to create presentations with videos that can be used as teaching resources. The advantage of Powtoon is that it is easy to use because the final result is in the form of a video and can create animations that attract students' interest. There are many animation options available in Powtoon so we no longer need to create animations manually. Animation equipment that can support the creation of interesting and funny animated learning videos. This animated video media combines two media at once (visual and audio), so that delivering the material feels easier. Learning is delivered more constructively so that it can strengthen memory and foster students' interest in learning. Therefore, considering the importance of the role and function of learning media in supporting success in the learning process, there needs to be an effort to further optimize the utilization and use of IT learning media, especially in chemistry subjects (Ariyanto et al., 2018).

By utilizing existing and developing technology, one of the learning media that can be used to support learning activities is by using games (Cynthia, 2021). Considering the

characteristics of today's students who fall into the category of "digital natives" or students who grew up in a technologically advanced society, the use of games in educational activities is very important (Adita et al., 2017). One game that can be used as a learning medium is word-wall. Word-wall is a platform that we can access via Google by entering the word-wall. We can use word-wall to create games, whose function is to help students review the subject matter they have studied in a fun way.

Referring to research conducted by (Tiwow et al., 2022) high school chemistry learning using powtoon media provides higher learning outcomes and the influence of students' learning interest is high. Meanwhile, research conducted by (Prianti & Rezania, 2022) concluded that students' interest in learning was higher in classes that used Powtoon media compared to classes that did not use it. Apart from that, learning with the Discovery Learning Model is based on research from (Anjelina et al., 2021) which shows successful learning in the experimental group with high results and is proven to be able to improve student learning outcomes because they have reached the criteria for completeness. According to research (Mudawamah, 2022), the use of the Discovery Learning Model in teaching has an impact on improving learning outcomes in the experimental group.

The powtoon media and word-wall games in the Discovery Learning Model are expected to be able to create an active, creative, innovative learning atmosphere and a fun learning atmosphere so that students do not feel bored in the learning process. Students' activeness in participating in the learning process will support students' process in understanding concepts, so that the Powtoon media and Word-wall games in the Discovery Learning Model are expected to be able to increase students' interest and learning outcomes.

LITERATURE REVIEW

According to (Octavia, 2020), a learning model is a conceptual framework that describes systematic procedures for organizing learning experiences to achieve certain learning goals. The learning model functions as a guide for learning designers and teachers in planning and implementing learning activities. One learning model that is recommended so that students can be active in the learning process is the Discovery Learning Model. This is in accordance with several research results that the Discovery Learning Model can increase students' interest and learning outcomes and make it easier to understand concepts in material. Not only interest and results, the Discovery Learning Model can also improve critical thinking skills, collaboration between students in groups and provide opportunities for students to independently manage learning materials (Prasasti et al., 2019; Panggabean et al., 2023; Susmiati, 2020; Tarmizi, 2021). The Discovery Learning model focuses on a series of information that contains data obtained from observations by examining existing concepts and as a facilitator, teachers must be creative to make students active in discovering knowledge independently in order to obtain increased learning outcomes and student activities (Sani, 2019).

The Discovery Learning model has an effect on improving student learning outcomes and student activities. This can be seen from the results of research (Putri et al., 2017) which reveals that the increase in this case is that students can master the learning material by going through several processes such as the process of observing, asking, associating and communicating the modules studied during the learning process.

According to (Graham, 2015), Powtoon is a freeware service or free online program that can be used to create presentations or animated videos that can be utilized by internet users in an easy way. Powtoon has very interesting animation features including handwriting animation, cartoon animation, and more lively transition

effects as well as very easy timeline settings (Pangestu & Wafa, 2018). The features available in Powtoon allow educators to create interesting presentations, so that they can arouse students' interest in paying attention to the material presented. Powtoon is useful for deepening students' understanding, creating interactive learning strategies, and helping students solve problems. PowToon can make animated videos more interesting, and it can be described that chemistry is very close to our lives. With this interactive media, students can learn independently because students can operate the media independently (Sembiring, 2023).

Learning media is wrong one of the most important parts of learning activities and teaching or in the delivery process teacher's message or information to students. Thus, in order to achieve the process effective and efficient learning as well interesting, the choice of learning media precisely designed in accordance with students' needs can be helped achieve this. Additionally, Media learning also acts as a resource learning for students (Arief et al., 2021). The use of learning media by teachers is one of the factors that influences the effectiveness of the learning process. According to (Putri et al., 2021) word wall is a website that provides various educational games which aim to be fun assessment tools and evaluation tools for students. It is easy to use, students can access it via their respective gadgets and laptops.

According to (Firmansyah, 2018) "interest in learning is related to attitude and interest in learning. If a lesson does not interest a person for some reason, then he immediately puts it aside if he finds it difficult. Conversely, if a task is interesting because it provides pleasant results, he tends to devote more time to that task." In other words, interest in learning indicates a tendency to actively try to gain benefits from learning activities. From the opinions of several experts above, it can be seen that the characteristics of interest in someone include: feelings of joy, attention and activity which are the result of feelings of pleasure and

attention. Learning is a process of change in human personality and this change is manifested in the form of increasing the quality and quantity of behaviour such as increasing skills, knowledge, attitudes, habits, understanding, skills, thinking power, etc.

Learning outcomes are the results achieved by students after carrying out learning activities. This learning outcome is an assessment achieved by students to determine their understanding of the lesson or material being taught. Learning outcomes appear as changes in student behavior that can be observed and measured in the form of knowledge, attitudes and skills (Ekayani, 2021).

METHODS

This type of research is quasi-experimental research (Quasi Experimental). This research is aimed at finding out the influence of the Discovery Learning Model assisted by Powtoon Media and the Word-wall Game on the Interest and Learning Outcomes of XI MIPA Students at SMAN 9 Makassar (Main Study of Chemical Bonds). This research was conducted at SMAN 9 Makassar class XI MIPA located at Jl. Karunrung Raya No.2, Karunrung, Kec. Rappocini, Makassar City. This research was carried out in the odd semester of the 2023/2024 academic year and adjusted the chemistry subject hours. The research design used in this research is post-test Only Control Group Design. The population in this study were all students in class XI MIPA SMAN 9 Makassar for the 2023/2024 academic year, consisting of twelve classes, namely from class implementing superior classes. The sample from this study was class XI MIPA 1 as the experimental group and class XI MIPA 2 as the control group. The sampling technique in this research is simple random technique, namely taking sample groups from the population at random. This is because all classes have the same level of ability (homogeneous). Data collection was carried out using a learning interest questionnaire and learning outcomes tests.

RESULT AND DISCUSSION

The first objective of this research is to examine the influence of the Discovery Learning Model assisted by Powtoon media and the Word-wall game on students' interest in learning the subject of chemical bonds. The results of this learning interest are obtained from the questionnaire scores distributed to students after learning. This can be seen from the average score on the learning interest questionnaire of participants in the experimental group and the control group on four indicators, namely: Feelings of joy, attention, involvement and interest. The percentage of achievement for each indicator of student learning interest can be seen in Table 1.

Table 1. Percentage of achievement of each indicator of learning interest for experimental group and control group students

Indicator	Percentage	
	Experimental	Control
Like	90.2%	73.2%
Attention	90.8%	75.4%
Involvement	90.4%	73.2%
Interest	91.8%	78.4%

Based on Table 1, it is known that there are differences in students' learning interest consisting of several indicators between the experimental group and the control group. Each of these indicators shows that the level of interest in learning of experimental group students is higher than that of the control group. The low increase in interest in the control group was due to the methods used by teachers tending to make students feel bored. The difference in learning interest scores between the experimental group and the control group was then analysed further to provide a decision using statistical tests. From this statistical test, the Z_{count} value was 4.16 and the $Z_{table}(\alpha)$ value was 1.64. This shows that H_0 is rejected and H_1 is accepted, so it can be concluded that the experimental group's interest in learning is better than the control group.

Based on the learning interest questionnaire and during the learning process, it can be seen that students in the experimental group became more interested and happier.

Students feel more able to express their opinions directly, and the use of videos in Powtoon media and Word-wall games is more interesting for students. This shows that the Powtoon media and Word-wall games in the Discovery Learning Model can increase students' enthusiasm during the learning process. In accordance with the theory by (Muliani & Arusman, 2022) that interest in everything that is done in several activities is involved with a feeling of liking, pleasure, and a sense of satisfaction so that students become active and participate in the learning process.

The second objective of this research is the influence of the Discovery Learning

Model assisted by Powtoon media and the Word-wall game on students' learning outcomes in the subject of chemical bonds. The results of the analysis show the influence of the Discovery Learning Model assisted by Powtoon media and the Word-wall game on student learning outcomes in the subject of chemical bonds. In accordance with one of the advantages of the Discovery Learning Model which helps students to improve and enhance their skills and cognitive processes. Percentage of Achievement of Each Student Learning Outcome Indicator can be seen in Table 2.

Table 2. Percentage of achievement for each learning outcome indicator for experimental group and control group students

Indicator	Percentage	
	Experimental	Control
Describes the tendency of an element to reach stability	74.4%	57.6%
Determines the arrangement of the valence electrons of noble gas atoms and the valence electrons of non-noble gases	88%	82%
Determines the electronic configuration and Lewis's structure in the process of forming ionic bonds	74.6%	74.6%
Infer the type of bond based on the physical characteristics of ionic compounds	82.6%	65.3%
Explain the meaning of covalent bonds (single, double and triple bonds)	72%	68%
Analyse the electronic configuration of covalent bond formation		
Determines the process by which coordinating covalent bonds occur	81%	74%
Analyse the polarity of compounds	76%	76%
Explain the process of forming metallic bonds and their relationship to the physical properties of metals	68%	74%
Average	78.5%	71.7%

Based on Table 2, it shows the percentage of achievement of each learning outcome indicator for students in the experimental group and group. The results are that the average completion of each indicator in the experimental group has an average value of 78.5% and the control group has an average value of 71.7%. This means that the average completion of each indicator in the experimental group is higher than the average completion of each indicator in the control group. This shows that learning using Powtoon media and Word-wall games in the Discovery Learning Model in the experimental group can help students understand the concepts of the material being taught, so that it can improve student learning outcomes. Apart from that, in the achievement of indicators in the experimental group there

were 5 indicators that were not completed, while in the control group there were 8 indicators that were not completed.

The difference in learning outcome scores between the experimental group and the control group was then analysed further to provide a decision using statistical tests. From this statistical test, the Z_{count} value was 1.94 and the $Z_{table}(\alpha)$ value was 1.64. This shows that H_0 is rejected and H_1 is accepted, so it can be concluded that the learning outcomes of the experimental group are better than the control group.

The difference in learning outcomes between the experimental group and the control group on chemical bonding material was due to the influence of the help of the Powtoon media and the Word-wall game in

the Discovery Learning Model which was applied where the Powtoon media was in the stimulus and data collection stages while the Word-wall game was in the evaluation section. Powtoon media is useful for deepening students' understanding, creating interactive learning strategies, and helping students solve problems. Meanwhile, the word wall game provides various educational games which aim to be fun assessment aids and evaluation tools for students. This is also supported by research (Wahyuningtyas & Sulasmono, 2020) that using media during learning can make it easier for students to understand the subject matter so as to obtain satisfactory learning results. Satisfactory learning results mean that learning objectives can be achieved optimally.

CONCLUSION

This research concludes that the use of the Discovery Learning Model supported by Powtoon Media and Word-wall Game has a significant influence on the interest and learning outcomes of class XI MIPA students at SMAN 9 Makassar in chemical bonding material. The findings showed that the experimental group who took part in learning with this approach showed higher interest in learning and achieved better learning outcomes than the control group. The implication of these findings is the importance of using innovative and technology-assisted learning methods in increasing student interest and learning outcomes, especially in the context of chemistry learning. This research contributes to the development of educational science and technology by revealing the potential effectiveness of the Discovery Learning Model assisted by Powtoon Media and Word-wall Game in improving student learning outcomes. Thus, it is hoped that this research can provide a basis for further development in the implementation of learning methods that focus on the use of technology to improve the quality of chemistry education in secondary schools.

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