

## **Application of Learning Media Game an Intel's Science Missions Based on Borland Delpi 7 on Static Electricity Material to Improve Students' Cognitive Learning Outcomes**

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**Abstract:** The current low student physics learning outcomes are because students tend to feel less interested and bored in learning physics because they consider physics to be a difficult subject to learn, and students assume that physics lessons have nothing to do with their daily lives. By because that innovation is needed learning media that could visualize, provide Theory, and give competence test. The results of the research on the application of learning media for games an Intel's science missions based on Borland Delpi 7 on static electricity by giving a post test were successful in improving students' cognitive learning outcomes, with an average score of 85 in the experimental class and included in the good category. Because by using learning media Game An Intel's Science Missions based on Borland Delphi 7 students are not only taught knowledge and concepts in static electricity material but also brought into their daily life and have their own experiences in finding answers in a game. Of course, with this, learning becomes more motivating for students and more fun to do. So From that it can be concluded from this research is a learning media Educational game-based is suitable for use in natural science subjects on static electricity, and is effectively used to increase results cognitive learning student.

**Keywords:** Learning Media, Game An Intel's Science Missions Based on Borland Delpi 7, Static Electricity, Cognitive Learning Outcomes

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### **1. Introduction**

Education is an element that deserves attention besides science and technology in placing Indonesia at the same level as that which has been achieved by developed countries <sup>1</sup>. The awareness that everyone will not progress without education is an indication of concern for education. Education is essentially an activity carried out by students which results in personal changes <sup>2</sup>. This principle implies that what must be prioritized is the learning activities of students, not something that is given to students <sup>2</sup>.

With the development of the potential of students, they will have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation and state <sup>3</sup>. Science learning in schools still experiences many obstacles which result in less optimal learning being carried out so that it becomes a factor in low learning outcomes. Several previous studies that strengthened, including <sup>4</sup> stated the lack of varied learning that was applied, as well as the lack of involvement of students in learning.

<sup>5</sup> state that use games in education could made as something supplement in implementation learning and interaction between students and games is proportional to the quality feedback provided by the game. This is due to attraction games which can make the player addicted so that can utilized as media which combine element education and entertainment or often called play while study. With thereby play while learn this can add interest to learn as well as student motivation to win games by learning more.

Technology computer is wrong one technology which can utilized as media learning games. Through system computer, teacher can designing/designing something program device soft which containing learning information. In computer games there are several element which could push somebody linger for play it. These elements include a good appearance, musical accompaniment, content which interesting, as well as enjoyment when complete levels or stage for going to levels next. Programs computer could used as a tool to develop learning media for this game, wrong only Borland Delphi 7. Borland Delphi 7 is one such program easy to use to create dialogs, buttons, tables and components others, because Borland Delphi 7 has components that are supported by many Third Party Software. Besides that, program which made use Delphi have size which small because program could arranged becomes single executables which means sizes program the will more small compared with other commonly used programs such as Macromedia Flash, Construct 2, adobe Flash CS3 and other etc.

## 2. Methodology

Research on the application of learning media game "An Intel's Science Missions" based on Borland Delphi 7 to Improve Cognitive Learning Outcomes of Grade IX Middle School Students conducted at SMP PGRI Pekanbaru in Pekanbaru in the odd semester of the 2022/2023 Academic Year. The research was conducted from October 2022 to November 2022.

The research method used in this study is experimental. This study used a quasi-experimental design with the posttest only control design with Nonequivalent <sup>6</sup>. The form of research design chosen was the Post-test Only Control Group Design. In this design there are two classes each chosen randomly. The first class given treatment (X) is called the experimental class and the other class is not given treatment called the control class. In the experimental class learning will be applied by applying An Intel's game learning media Science Missions based on Borland Delphi 7 whereas conventional learning is applied in the control class.

The population in this study were all students of class IX SMP PGRI Pekanbaru, which consisted of 2 classes with a total of 57 students. In this study the authors used a saturated sample. According to <sup>7</sup> "Unsaturated sampling is a sampling technique when all members of the population are used as samples. This is often done when the population is relatively small, less than 10 people, or research that wants to make generalizations with very small errors. Another term for a saturated sample is a census, where all members of the population are sampled. The reason for this study using a saturated sample technique is because the population is small, so the sample in this study uses the entire population to be used as respondents of 57 students.

The research method was collected by documentation and learning outcomes tests. Giving tests is done by giving a post-test (cognitive learning achievement test) in the control class and the class that applies An Intel's game learning media Science Missions based on Borland Delphi 7 are in the form of multiple choice tests. Giving a post-test is done after the learning process from both classes with the same questions. The data obtained is primary data obtained from research conducted by researchers directly. Researchers also collected secondary data in the form of data obtained from science teachers at SMP PGRI Pekanbaru. In addition to the primary data obtained from the post test, the researcher also collected secondary data, namely the test scores for the previous chapter.

## 3. Results and Discussion

The data analyzed in this study were data on students' cognitive learning outcomes in the experimental class and the control class on static electricity. Data on cognitive learning outcomes were obtained from the results of the post-test which was carried out after using the media Game learning "An Intel's Science Missions" based on Borland Delphi 7 in class IX.1 as a class that is given treatment and conventional learning in class IX.2 as a control class at SMP PGRI Pekanbaru. Cognitive learning outcomes of students on static

electricity material were analyzed through the percentage of the number of students who gave rise to indicators of learning outcomes by using the calculation on the equation for the percentage of occurrence of indicators of student cognitive learning outcomes and then categorized into the coverage in Table 1.

Percentage of cognitive learning outcomes obtained after completion of the learning process. Cognitive learning outcomes in question are students' ability to learn a concept at school and expressed in scores through test results <sup>8</sup> to determine the level of success in learning achievement <sup>9</sup>.

Based on student learning outcomes data in the appendix which is processed using the cognitive learning outcomes percentage equation, then, the emergence of cognitive learning outcomes indicators of students on static electricity material through the use of media Game learning "An Intel's Science Missions" based on Borland Delphi 7 in the experimental class and conventional learning in the control class is shown in Table 1.

Table 1: Percentage of Appearance of Cognitive Learning Outcomes Indicators

No.	Intervals (%)	Category	Experiment class		Control Class	
			%	Total Students	%	Total Students
1	$90 \leq x \leq 100$ %	Very Good	22,58	7	3,85	1
2	$75 \leq x < 89$ %	Well	67,75	21	76,92	20
3	$65 \leq x < 74$ %	Fairly Good	9,67	3	19,23	5
4	$55 \leq x < 64$ %	Not good	0	0	0	0
5	$0 \leq x < 54$ %	Very Poor	0	0	0	0
Average			85,06		80,73	
Category			Well		Well	

Based on Table 1 it can be seen that the average cognitive learning outcomes of students in the experimental class that use the media Game learning "An Intel's Science Missions" based on Borland Delphi 7 is higher than the control class using conventional learning. This is shown in the experimental class the average cognitive learning outcomes of students reached 85.06% and 80.73% in the control class. The average percentage of students' cognitive learning outcomes in the experimental class and control class is in the same category, namely good, but the average experimental class is higher than the control class with a difference of 4.33%.

Based on Table 1, it can be seen that the cognitive learning outcomes of students in the experimental class using the learning media *Game* "An Intel's Science Missions" based on Borland Delphi 7 are higher than the control class which is taught by conventional learning. The percentage of students' cognitive learning outcomes in the experimental class and control class are in the same category, namely good, but from the percentages of the two groups it can be seen that the experimental class is higher than the control class with a difference in value of 4.33%, so it can be concluded that learning by applying learning media *Game* "An Intel's Science Missions" based on Borland Delphi 7 static electricity material can improve students' cognitive learning outcomes. the graph of scores from aspects of students' cognitive learning outcomes in the experimental class and control class can be seen in Figure 1.

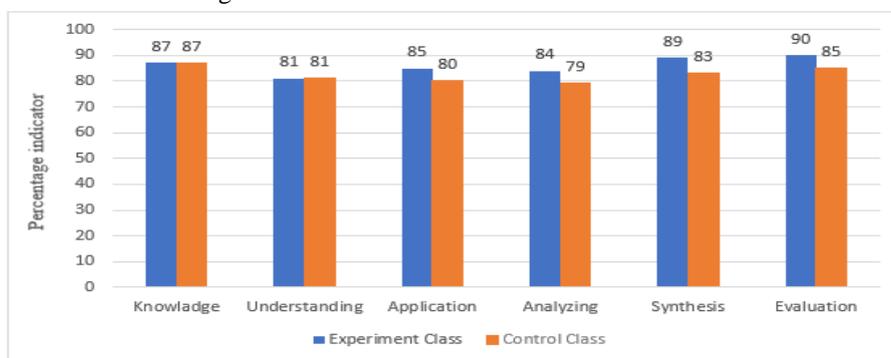


Figure 1: Graph of cognitive learning outcomes of the two groups

Based on Figure 1 it can be seen that the cognitive learning outcomes of experimental class students for each indicator are different, where 6 aspects namely (Knowledge, Understanding, Application, Analyzing, Synthesis, Evaluation) with 15 questions based on indicators of cognitive learning outcomes are categorized as very good, good, and quite well. In the experimental class it was found that there were 5 aspects of cognitive learning outcomes that were categorized as good and 1 aspect was categorized as very good. Whereas in the control class, it was found that 6 aspects were categorized as good.

In general, the percentage of indicators in the experimental class is higher than the control class. There are two aspects that are the same in the experimental class and the control class, namely knowledge and understanding each has a percentage of 87% and 81%. Whereas in the other 4 aspects the experimental class has a higher percentage value than the control class, the highest percentage value is in the evaluation aspect with a value of 90%, while in the control class it is 85%. Based on the learning outcomes data, it proves that each student has different learning outcomes according to cognitive learning outcomes indicators.

From the value of learning outcomes after the application of learning media *Game* "An Intel's Science Missions" based on Borland Delphi 7 classes that were given treatment, students' cognitive learning outcomes were higher in the good category. So it can be seen from Table 1 that the ability to bring up indicators of cognitive learning outcomes of students in the experimental class is higher than the class that uses conventional learning.

This is supported by <sup>9</sup> statement The four principles of computer-based media design according to Arsyad are learning must be fun, interactive with dynamic computer support, practice opportunities for users must motivate the availability of feedback, and train students in an informal environment.

This research by applying learning media *Game* "An Intel's Science Missions" based on Borland Delphi 7 succeeded in improving students' cognitive learning outcomes in static electricity material, with an average score of 85 in the experimental class and included in the good category. Because by using learning media *Game* "An Intel's Science Missions" based on Borland Delphi 7 students are not only taught knowledge and concepts in static electricity material but also brought into their daily lives and have their own experiences in finding answers in a game. Of course, with this, learning becomes more motivating for students and more fun to do. So from that it can be concluded from this research is a learning media educational game-based is suitable for use in science subjects on static electricity, and is effectively used to improve results cognitive learning student.

#### 4. Conclusion

Based on the research that has been done, learning physics using learning media *Game " An Intel's Science Missions"* based on Borland Delphi 7 in class IX SMP PGRI Pekanbaru, it is concluded that the application of learning media *Game " An Intel's Science Missions"* based on Borland Delphi 7 on effective static electricity material used in learning and can foster interest and learning motivation of class IX junior high school students, especially in static electricity material so that it can improve student learning outcomes with educational *game -based learning* and the use of the learning media *game "An Intel's Science Missions"* which was developed based on Borland Delphi 7 in Theory static electricity can improve the cognitive learning outcomes of class IX junior high school students, with the percentage level of cognitive learning outcomes of students on static electricity material being 85% in the good category.

#### Reference

- [1]. Djauhari, M. A. Pendidikan untuk apa? *J. Sosioteknologi* 5.9, 113–122 (2006).
- [2]. Izzah, N. & Mulyana, V. Meta Analisis Pengaruh Integrasi Pendidikan STEM dalam Model Project Based Learning Terhadap Hasil Belajar Siswa. *J. Penelit. Pembelajaran Fis.* 7, 65–76 (2021).
- [3]. Raharjo, S. B. Jurnal Penelitian dan Evaluasi Pendidikan. *J. Penelit. Dan Eval. Pendidik.* 2, 246–267 (2012).
- [4]. Meilani, D. & Aiman, U. Implementasi Pembelajaran Abad 21 terhadap Hasil Belajar IPA Peserta Didik dengan Pengendalian Motivasi Belajar. *Indones. J. Prim. Educ.* 4, 19–24 (2020).
- [5]. Purnomo, T. H., Sugiyanto & Akhlis, I. Educational computer game materi listrik dinamis sebagai media pembelajaran fisika untuk siswa SMA. *J. Pendidik. Fis. Indones.* 7, 121–127 (2011).
- [6]. Gribbons, B. & Herman, J. True and Quasi-Experimental Designs True and Quasi-Experimental Designs. 5, 1996–1997 (1997).
- [7]. Sugiyono, S. *Metode penelitian pendidikan: (pendekatan kuantitatif, kualitatif dan R & D)*. (Alfabeta, 2015).
- [8]. Susanto, A. *Teori Belajar & Pembelajaran di Sekolah Dasar*. (Kencana Prenada media Group, 2013).
- [9]. Arsyad, A. *Media Pembelajaran*. (Raja Grafindo Persada. Asyhar, Rayandra., 2016)