Guided discovery learning model with the teacher-student active learning approach, assisted by the WhatsApp solution alternative application on the COVID-19 pandemic

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Abstract. All the Covid-19 pandemic has destroyed the normal activities of life on earth, including the education sector. As a professional educator, the Covid-19 pandemic disaster is a challenge to become the new normal in education. The internet is a vital tool for the implementation of online learning, the object of research is students of the 4th semester of electrical engineering study program UNISNU Jepara Indonesia with the Guided Discovery Learning model with the Teacher-Student Active Learning approach assisted by the WhatsApp application. Based on the results Mid-Semester Examination and Final Semester Examination, the SPSS calculation results show a positive correlation of 0.918, so it can be concluded that the Guided Discovery Learning model with the Teacher-Student Active Learning approach assisted with the WhatsApp application as a model and alternative learning approach for the Covid-19 pandemic and as a form of continuous learning online.

1. Introduction

Covid-19 is a global virus, almost all countries in the world has a major impact on the world's citizens who are deadly regardless of social status, age and gender. As a basic anticipation, if traveling should use a mask and wash hands at all times and it is advisable at home, go if necessary. The impact of Covid-19 for all countries is in principle the same the main thing is the economic problem relating to the food problem with total a lot of mass unemployment with the cessation of almost all economic activities.

The era of the technological revolution, new opportunities for students to interact classmates, teachers, with mobile device content [1,2]. Mobile learning provides students with unlimited possibilities to achieve their goals real-time learning situations, and authentic interactions that make active learning meaningful, and effective, distinct from traditional contextual classrooms [3-5]. Mobile devices can support a variety mobile application skill in or outside the classroom, and increase positive attitudes regarding the learning process. Researchers discussed the covid-19 pandemic as with the use of mobile applications, such as for sending text messages and using a variety and using a variety of applications, students and teachers have more opportunities to encourage learning and make learning more meaningful [6-8].

Most students have found this device to be the perfect ally for carrying out academic activities because of the new capabilities (everywhere, convenience and connectivity) provided by mobility [9-12].
In this study, WhatsApp technology as a means of delivering material in the Covid-19 pandemic conditions with the guided discovery learning model and the teacher-student active in learning approach was carried out systematically and methodologically. As a learning model, the guided discovery learning model places the teacher as a facilitator who assists and facilitates students during learning. In this model, students are encouraged to think for independently, analyze themselves, so that they can find general principles based on the teaching material presented by the teacher. How far teacher assistance is needed depends on the average student abilities as well the characteristics of the material being studied. “Students are required to find knowledge without guidance, develop concept understanding. The instructions are only for providing a suitable environment, which in software may be a micro or simulated world. Discovery active learning, or learning without instruction, involves the formulation and testing of hypotheses [13,14].

The teacher provides guidance in the form of instructions / instructions in learning, students get feedback at each stage of the learning task, this is done because students still need guidance from the teacher so that they are more focused in order to achieve learning goals they want to achieve. Students are expected to be motivated to learn, carry out any investigative activity to find knowledge, be more enthusiastic about addressing science issues, especially mathematics, and be able to solve the problem by applying concepts found in various contexts / fields.

Constructivism learning is related to the develop of scientific literacy [15]. The guided discovery learning model is a constructivist learning model that allows students to build their own knowledge based on activities and observations made [16]. The teacher provides guidance in the form of instructions / instructions in learning, feedback to help students be active at each stage of the learning task, this is done because students still need guidance from the teacher so that they are more focused on achieving learning goals they want to achieve. Students are expected to be motivated to learn, carry out any investigation activities to find knowledge, be more enthusiastic about addressing science issues, especially mathematics, and be able to solve the problem by applying concepts found in various contexts or fields.

“Generally, one can say that successful discovery learning is related to reasoning from hypotheses, to applying a systematic and planned discovery process (like systematic variation of variable values), and to the use of high-quality heuristics for experimentation.” [17]. Since students are natural / independent, they need guidance [1] conducting two meta-analyses allowed the conclusion that directed discovery learning did not benefit learners, whereas guided discovery learning led to better outcomes than explicit instruction.

Guided discovery, is a constructivist learning model that allows students to build their own knowledge based on activities and observations made [16]. The teacher provides guidance in the form of instructions/instructions in learning in the form of feedback to help students at each stage of the learning task, this is done because students still need guidance from the teacher to be more focused in achieving the learning objectives the carry want to achieve.

Active Learning is learning that allows “students to speak and listen, read, write, and reflect when they face subject matter through problem solving exercises, small informal groups, simulations, case studies, and other activities that all require students to apply what they have learned” [18]. Active learning according to [19] is learning that allows students to participate in the learning process, where students carry out an activity in accordance with the learning objectives and not only passively listen to teacher explanations.

2. Methods

The research method is ex post facto, which is research that is carried out after an event has occurred [15]. Ex post facto research aims to determine the symptoms or phenomena caused by an event, in this case the Covid-19 pandemic. The research method is based on direct face-to-face learning before the Covid-19 pandemic, followed by indirect face-to-face learning during the Covid-19 pandemic. Data is the value of attendance, activeness, independent assignments before and after the Covid-19 pandemic using the Guided Discovery Learning (GDL) active learning method with the
Teacher-Student Active Learning (TSAL) approach assisted by WhatsApp. While the data analysis technique used the analysis-compare test mean-paired sample t test with SPSS-20 software.

3. Results and Discussion
Based on the results of the Mid-Semester Examination (MSE) and Final Semester Examination (FSE), calculations are carried out using SPSS, as shown in Table 1.

|                  | Mean  | N   | Std. Deviation | Std. Error Mean |
|------------------|-------|-----|----------------|-----------------|
| Pair 1 MSE       | 72.8824 | 17  | 6.61327        | 1.60395         |
| Pair 1 FSE       | 70.2941 | 17  | 6.37147        | 1.54531         |

The test results show that the correlation between MSE and FSE is 0.918 with a sig. of 0.000. This suggests that between the two means MSE and FSE are closely and significantly related. The t count value is 3.928 with sig 0.001 <0.05, it can be concluded that H₀ is rejected, Hₐ is accepted, meaning that the average MSE conditions of direct learning before the Covid-19 pandemic have a positive effect on FSE results during the Covid-19 pandemic.

4. Conclusion
After seeing the results and discussion of data processing with SPSS software, it can be concluded that active learning of the Guided Discovery Learning Model with the Teacher-Student Active Learning approach assisted by the WhatsApp application in the era of the Covid-19 pandemic can be an alternative solution. From the Results and Discussion shows that WhatsApp as a medium for connecting online learning is quite effective, it is shown that the results of the final semester exams are quite increasing, and student activity in learning is very dynamic, indicators in the WA group and individual students actively ask questions orally and in writing.

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