

# Effects Of Schoology Online Cooperative Learning To Learning Achievement

Lustiana Sari, Dwi Sulisworo, Moh Toifur, Nurul Huda Abd Rahman

**Abstract :** Physics teachers began to believe that online learning provides opportunities for improving student learning achievement. This study aims to determine the impact of online learning assisted by Schoology on student learning achievement in physics learning. The research subjects were 11th-grade students in secondary schools in Yogyakarta, Indonesia. The design of this study is a pretest-posttest controlled group. The material taught is the dynamics of rotation and balance of objects. This study used covariates, including prior knowledge, numerical abilities, and interest in learning to avoid the influence of other factors on learning achievement in cooperative learning online use a pair check type. The results of ANCOVA show that there are differences in learning achievement outcomes between students who take online learning with students who study conventionally. Covariates were as a predictor of learning achievement. Better results for the class taught online is due to the Schoology feature that is close to social media activities. These results provide opportunities for practical learning that are more in line with the daily habits of students who tend to like social media activities.

**Index Terms:** Cooperative learning, pair checks type, Schoology, learning achievement, learning interest, physics learning, online learning.

## 1 INTRODUCTION

The development of technology in education is essential to connect the gaps between learning interest and student's learning achievement [1]. E-learning is developing rapidly and plays a role as an effective and efficient learning media [2]. It has changed traditional learning to become online learning by offering long-distance learning and access to online content in flexible time [3]. E-learning also gives better opportunities to develop interaction between students and the teacher to join in the online discussion, collaboration, two-way communication [4]. At this time, many applications can support online learning. The applications are called Learning Management System (LMS). Web-based LMS is an online learning media that can access learning materials anytime and anywhere [5]. The use of LMS gives benefits to both students and the teacher. From the student side, the benefits are that they can easily access learning materials and attend the long-distance learning process [6]. From the teacher side, the benefits are that the management of assignments become more structured, efficient, and safe [7]. One of LMS that is free and easy to use for its similarity to social media such as Facebook is Schoology [8]. Schoology is online learning, class management, and social network platform that attempt to improve student's learning interest through online learning outside the classroom [9] [10]. It is a virtual environment where every member has a profile with personal information, can share opinions and information, can hold discussion forum and can use many features such as courses, group discussion, quiz, attendance, analytics, bulletin boards, and personal message, that support the learning process [11]. A problem that usually occurs in learning is the ineffectiveness of the learning model so that the implementation of the learning process could not give maximum learning achievement.

Students are afraid to ask the teacher about materials they have not understood, and they are also reluctant to ask their friends, so their learning interest becomes low. They are less enthusiastic about participating in class discussion actively and less-prepared in material mastery before the learning starts. Besides, some students also find it hard to solve physics questions. The teacher needs to design a new learning strategy and sharpen the student's numerical ability. Learning interest is a feeling of pleasure, likes, and attention to efforts to gain knowledge [12]. In learning activities, students at school learned various knowledge and endeavored so that all students get good grades, which, of course, can be achieved by having a high learning interest [13]. In the psychology test, there is numerical ability test we can use a speed test, which may consist of basic arithmetic, such as addition, subtraction multiplication and division, number sequences and fundamental mathematics, such as percentages, powers, and fractions [14]. Learning innovation will change the old paradigm to be the new one where learning approach can develop and explore student's knowledge concretely and independently, particularly in exploring student's knowledge individually and in a group. Besides learning media, the teacher must implement a learning model that can construct the student's knowledge. Suitable learning model can be seen based on learning strategies and the process of transferring knowledge from the teacher to students [15]. One of the alternatives to improve student's learning achievement is by implementing cooperative learning of pair check type by using the peer-tutoring method. Cooperative learning is widely recognized as a pedagogical practice that promotes socialization and learning among students from pre-school through to tertiary level and across different subject domains [16]. The use of cooperative learning in a classroom allows students to work together towards a common goal [17]. Pair check is a cooperative learning method that requires the student's independence and ability in solving problems. Pair check is a learning model in group work where students work in pair to finish assignments given by the teacher and can sharpen thinking skills. Learning by using pair check model in physics enables students to have excellent communication skills, sharpen numerical ability, and have high learning

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motivation and interest so that they improve learning achievement [18]. By using suitable learning model, the teacher will get more convenient in the learning implementation in the classroom so that the learning objectives can be achieved and completed as expected. This research aims to determine the significant difference of student's learning achievement between experimental and control classes, and to find out the influence of numerical ability, learning interest and learning method used towards student' learning achievement. The researchers expect that the research can be a reference for today's learning strategies and develop learning alternatives that can improve student's learning achievement.

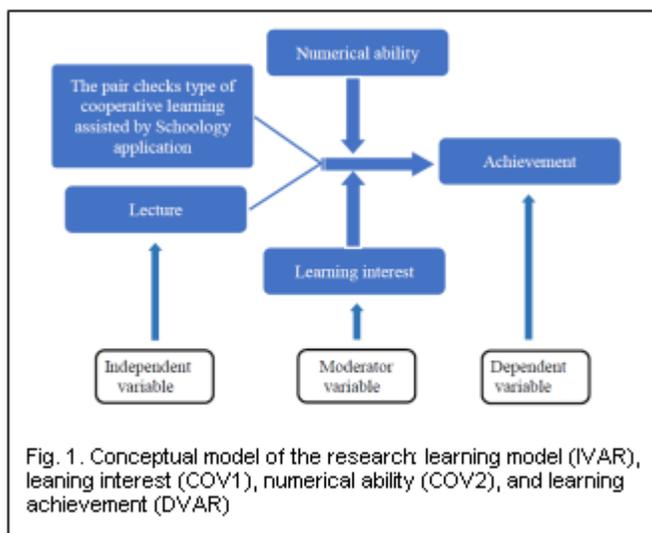
## 2 METHOD

### 2.1 Participants

The research was conducted at the public high school in Yogyakarta, Indonesia. The population was all eleventh-grade students. The samples used were two groups as control (24 students) and treatment (24 students) groups. The learning subject matter was the dynamics of rotation and balance.

### 2.2 RESEARCH DESIGN

The conceptual model of this research was shown by Fig. 1. The dependent variable is learning strategy: online cooperative learning (IVAR1) and conventional learning (IVAR2). The dependent variable was learning achievement (DVAR). The covariates are learning interest (COV1) and numerical ability (COV2).



Therefore, this research is quasi-experiment with pretest and posttest control group design. The research design involved two classes; those are the experimental class and control class. The experimental class (IVAR1) used cooperative learning model of pair check type by using Schoology application, while the control class (IVAR2) used conventional learning.

### 2.3 Learning Activities

The teacher introduced one of LMS (Learning Management System) which is Schoology application to students and

assisted the students to register for an account. Next, the teacher-directed the students to access learning materials via Schoology, and the teacher explained the learning materials. After that, the learning process used cooperative learning of pair checks type. Students were divided into some groups. Every group consisted of four students. In one group, there were two pairs. In each pair in one group, one student became the trainer, and one became the partner. To train the student's ability, the teacher gave students opportunities to identify and answer questions as much as possible related to learning materials learned with structures as follows [19]:

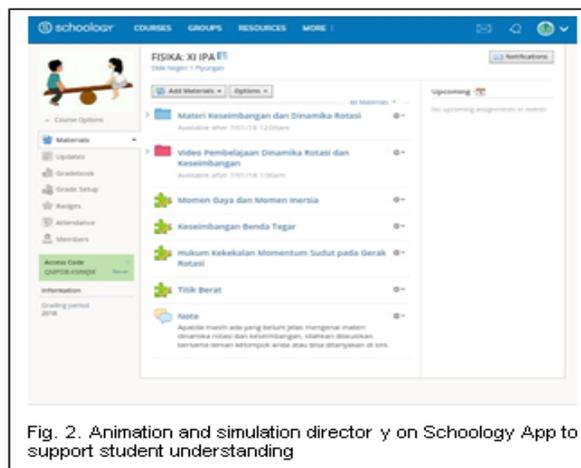
- The teacher delivered the questions to the partner. The partner answered the questions, and the trainer checked the answers. For each correct answer, the trainer gave a coupon.
- Role-switch. The trainer became the partner, and the partner became the trainer.
- The teacher delivered the questions to the partner. The partner answered the questions, and the trainer checked the answers. For each correct answer, the trainer gave a coupon.
- Every pair returned to the team and cross-checked the answers to each other.

After the above activities finished, the teacher assisted, discussed, and gave the direction of the answers of various questions given, and the team checked the answers. The team that got most coupons would get prizes. After that, the teacher concluded the critical points during the learning activities. Next, the teacher held a question-answer session to check the mastery of materials learned and discussed during learning. Last, the teacher gave posttest.

## 3 RESULT AND DISCUSSION

### 3.1 Result

The learning process using Schoology can facilitate students in learning materials at school. Schoology is an application designed to support the online learning process, online distribution of learning materials, and virtual collaboration between the teacher and students. Students can access learning anytime and anywhere. Here are some screenshots of the Schoology application (see Fig. 2 and Fig. 3) related to the learning material.



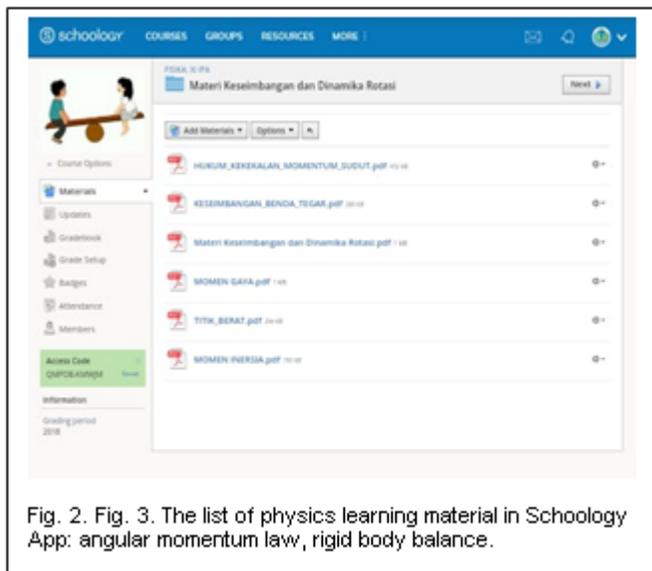


Fig. 2. Fig. 3. The list of physics learning material in Schoology App: angular momentum law, rigid body balance.

Table 1 shows the statistical descriptive of pre-test and post-test student's learning achievement score in the experimental and control classes.

**TABLE 1**

*STATISTICAL DESCRIPTIVE OF STUDENT'S LEARNING ACHIEVEMENT*

Class		N	Average	STDV	Min	Max
Pre-test	IVAR1	24	45.33	4.018	35	53
	IVAR2	24	46.67	3.724	37	53
Post-test	IVAR1	24	84.58	2.903	80	90
	IVAR2	24	80.21	4.139	70	88

It informs the average score, standard deviation, minimum, and maximum score. The average score (mean) of pre-test or COV1 in experimental class was 45.33, and control class was 46.67. It is so different from the average score of post-test in the experimental class (84.58) is higher than the control class (80.21). It shows that the cooperative learning model of pair check type by using Schoology application can improve student's learning achievement. The second phase before conducting data analysis was precondition testing consisting of normality test and homogeneity test. The result of the normality test shows that the scores of the pretest, numerical ability, learning interest and student's learning achievement of experimental and control classes usually are distributed that the significances are higher than 0.05. In the homogeneity test, the experimental and control classes have similar variants with significance scores higher than 0.05. The homogeneity test used the Levene test. The t-test was applied to ensure the apple to apple comparison between control and treatment group. Based on the result of the analysis, the result of the t-test is as Table 2.

**TABLE 2**

*THE RESULT OF T-TEST FOR COMPARING TWO GROUPS*

Groups	N	Average Score	$t_{\text{calculation}}$ $n$	Df	Sig. (2-tailed)	$\alpha$
IVAR1	24	84.58	4.240	46	0.000	0.05
IVAR2	24	80.21	4.240	41.222	0.000	

Table 2 shows the result of t-test analysis, which  $t_{\text{calculation}}$

(4.240) was higher than  $t_{\text{table}}$  (2.0129) with ( $p$ -value < 0.05). In other words, there is a significant difference of student's learning achievement between the experimental class that used cooperative learning of pair check type by using Schoology application and control class that used conventional learning. The next phase was ANCOVA.

**TABLE 3**

*ANCOVA RESULT TO ANALYZED THE INFLUENCED FACTORS*

Source	Type I Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	735.910 <sup>a</sup>	3	245.303	132.321	.000
Intercept	325875.521	1	325875.521	1.758E5	.000
IVAR	229.687	1	229.687	123.898	.000
COV1	489.433	1	489.433	264.009	.000
COV2	16.790	1	16.790	9.057	.004
Error	81.569	44	1.854		
Total	326693.000	48			
Corrected Total	817.479	47			

a. R Squared = .900 (Adjusted R Squared = .893)

Based on ANCOVA test, the influence of learning interest (COV1), numerical ability (COV2), and learning method (IVAR) used towards student's learning achievement can be viewed from the significant number in the Corrected Model. It shows that the significance number ( $p$ -value) is 0.000, which is less than 0.05. Therefore, in the level of confidence of 95%, it can be concluded that COV1, COV2, and IVAR influence the student's DVAR (learning achievement).

### 3.2 DISCUSSION

In this study at the beginning, testing was carried out to ensure that the two groups had equal abilities to be compared. The test results show that the classes used for cooperative learning online and for conventional learning have the same initial abilities. Then in the two classes, different learning was carried out according to the research design. The measurement results on learning achievement after the learning process shows that students who are taught by cooperative online learning tend to have higher learning achievement than students who are taught conventionally. These results have been revised from predictors of learning achievement, namely learning interest and numerical abilities. This excellent result is optimism for physics teachers to take advantage of online learning. The success of the learning process comes from the activity of students in searching for information of every problem presented by using available sources by utilizing learning media of Schoology application used by students as the primary learning sources. The cooperative learning model is different from the conventional one. In the conventional method, students explore knowledge from books, teachers, and learning, which are mostly monotonous from the first until the last meeting with similar learning model. Given the same test, students who attend the cooperative learning model of pair-check type by using Schoology application, and students who attend conventional learning have a significant difference in learning achievement. Learning Management System (LMS) by using Schoology as the platform in the learning process gives many benefits for students such as students can quickly finish assignments, it can improve learning achievement and gives learning access outside the classroom. Besides, development and

implementation of effective e-learning make students more motivated, active, and fully participate in learning activities, and improve student's learning achievement [20]. Cooperative learning by using Schoology application gives more opportunities for students to independently explore knowledge so that students do not feel depressed in learning [21]. Cooperative learning of pair-check type by using Schoology application utilizes media of the internet to follow the development of technology at this time. Students are more active in learning and more accessible in understanding materials given by the teacher because students can solve problems by downloading and learning the materials on Schoology application and cooperate in pair. It shows that learning by using Schoology can develop the student's interest. Besides, students can learn individually, in pair or a group [10, 14].

#### 4 CONCLUSION

Based on the explanation above, the result of the research shows that cooperative learning of pair check type can improve student's learning achievement and train cooperative skill among students. Besides learning method, learning media is also necessary to support the learning process. Learning media by using Schoology application can develop the student's learning interest. Learning interest plays a vital role to achieve the expected learning achievement. Teaching materials given are dynamics of rotation and balance. The materials are physics materials of XI IPA in the odd semester of the revised curriculum of 2013.

#### 5 ACKNOWLEDGMENT

This research is funded by the Ministry of Research, Technology and Higher Education through Postgraduate Research Grant Scheme Year 2019.

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