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Innovation Learning Process in New Normal Era: Effectiveness of Online Proctored Examination (OPE) Technology to Increase Student Honesty in Physics Lecture

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Abstract.
This study aims to determine the effectiveness of online proctored examination (OPE) technology in increasing students' honesty levels. This research is a pre-experiment using one group pre-test and post-test design methods. OPE in Physics lectures was conducted on a group of randomly chosen 34 students. The level of honesty of students was measured using the autoproctor application, which is used in the implementation of the OPE. Then, the level of honesty before using OPE at meeting 1 was compared with after getting used to using OPE at meeting 6. The data were analyzed using paired sample t-tests and quantitative description. The results show that OPE technology was effective in increasing students' honesty levels. This is indicated by the results of the paired sample t-test using the Wilcoxon test of 72.5 with a p-value of < 0.001. In addition, the average increase in the pre-test and post-test honesty scores recorded by the autoproctor application was 64.9% for the pre-test and 92.6% for the post-test. The effectiveness of OPE in learning is supported by the results of responses to a questionnaire that measures the relative advantage, compatibility, ease of use, trialability, and observability of using OPE. The results of the questionnaire responses show an average score of 78.7, namely the use of OPE was classified as effective in learning. The results of this study can be used as a reference for teachers and academic practitioners to increase the level of honesty of students in online exams using OPE technology.

Keywords: innovation learning process, OPE Technology, Student Honesty

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1. INTRODUCTION

One of the main things that a person target in life is a success. Taking the highest level of education is one of the ways a person achieves the desired success. Many people think that achieving by getting a high grade / GPA is the main thing that needs

to be pursued to achieve success in the future. However, this assumption is not true, the grade / GPA ranks 30 as a success factor [1]. There is another factor that is most important for achieving success in the future, namely the honesty factor. Currently, the final score is a benchmark for the success achieved by someone from the results of taking the education level. Other aspects such as honesty, discipline, and hard work are generally still ignored in the learning process, even though it is regulated in the current curriculum. A high final score is the goal of students regardless of the process to get it through fraudulent means such as plagiarizing part or even all of the work of others. This is what causes many undergraduate and postgraduate college graduates to have high grades/GPAs without skills due to a lack of honesty during the learning process so that they contribute to the high percentage of unemployed graduates with bachelor's and master's degrees in Indonesia, which is 6.97% [2]. Character education is the key from an early age to build students' honest attitudes in studying until exams [3].

During the Covid-19 pandemic, the learning process applied is generally online-based. This causes lecturers/tutors and students to be required to adapt quickly to changes in the learning process so that the difficulty of supervising students learning directly becomes something that is felt by the lecturers/tutors. Students' honesty in answering exam questions given by lecturers also cannot be guaranteed 100% of the answers themselves because there is no direct supervision such as conventional exams that are carried out in real classes in the pre-covid-19 period at school [4]. This is an obstacle for lecturers to provide objective scores from student exam results. Lecturers tend to give scores according to the final result without knowing the process of students taking the exam [5], whether it is done alone or with the help of others. If this continues, the aspect of honesty in students will not develop. Students will tend to prioritize the final result rather than the process even though they have to act fraudulently / dishonestly [6]. The impact will be more and more graduates from education in Indonesia who have high grades without good character.

In efforts to overcome this, the aspect of honesty is an important thing that must be applied in every learning process, especially in exams. In the current new normal era, the Blended Learning approach is very commonly used by educators in the learning process. Blended Learning that combines synchronous learning (direct learning at the same time) and asynchronous (indirect learning at different times) provides freedom for lecturers/tutors to carry out exams in synchronous or asynchronous learning environments [7]. If the lecturer/tutor places the exam in a synchronous learning environment which utilizes video conferencing as a learning medium, the lecturer/tutor can only see students from behind their laptop/mobile phone camera. This supervision technique is

less effective because the supervision is not comprehensive, it only detects student body movements without knowing whether there is help from other media. Meanwhile, lecturers who place exams in an asynchronous learning environment without using a supervisor application will have more difficulty measuring their validity, because students have the freedom to commit fraudulent actions such as asking friends, cheating from other sources, etc [8].

Therefore, an exam supervisor application that can detect the level of honesty of students during the exam is needed to support the Blended Learning approach applied in this new normal era. With the supervisor application for this exam or what can be called the Online Proctored Examination (OPE), it is hoped that cheating in the exam can be minimized and has an impact on increasing the level of honesty in each student. It is hoped that students will not be able to freely commit fraud in the implementation of OPE and can indirectly form an honest character in students so that students become more hardworking and disciplined in learning [9]. Therefore, the implementation of this OPE needs to be tested for its effectiveness in minimizing cheating that may be done by students while carrying out online exams in the hope of forming an honest character which has an impact on increasing the quality of education in Indonesia, especially Aceh Province and maintaining academic integrity.

2. RESEARCH METHOD

This research is a pre-experiment using one group pre-test and post-test design methods [10]. The population of this study was all students majoring in Physics Education, FKIP – Syiah Kuala University, and a sample of 34 students was chosen randomly. Samples were given treatment by carrying out Online Exam Proctoring in Physics lectures. At the first meeting, the students' honesty level was measured using the autoproctor application which was used in the Online Exam Proctoring (pre-test). Then, the implementation of OPE is carried out every week from meetings 2 to 5. Then ends with measure the honesty level of students using this autoproctor application at the 6th meeting (post-test). The data collection technique used students' honesty scores recorded on the autoproctor application during OPE and a questionnaire instrument that measured the effectiveness of the OPE implementation in the blended learning-based learning process. Student honesty scores recorded on the autoproctor application record several aspects, namely (1) face detected; (2) noise detected; and (3) switching tabs. The questionnaire instrument that measures the effectiveness of the implementation of OPE in learning based on the instrument developed by Raman, R.,

et al., 2021 measures the relative advantage, compatibility, ease of use, trialability, and observability of the using OPE as many as 25 items [11]. The pre-test and post-test data on students' honesty levels were analyzed using the paired sample t-test, while the results of the responses from the questionnaire that measured the effectiveness of OPE implementation were analyzed using quantitative descriptive by comparing the percentage of student response scores with the interpretation table of the effectiveness of using OPE in Table 1:

TABLE 1: OPE implementation effectiveness interpretation table.

No.	Score	Criteria
1	86-100	Extremely effective
2	76-85	Very Effective
3	60-75	Moderately Effective
4	55-59	Slightly Effective
5	≤54	Not Effective at All

3. RESULTS AND DISCUSSION

In the implementation of the Online Proctoring Exam (OPE) in this learning, students attend lectures using the Blended Learning approach, which combines 2 learning environments, synchronous (direct learning at the same time) and asynchronous (indirect learning at different times). In synchronous learning, students attend lectures face-to-face via video conference and continue with giving test questions using OPE technology which can be done at any time according to the time frame set by the lecturer (asynchronous learning). The examination using OPE technology is assisted by the autoproctor application which can be accessed via https://www.autoproctor.co/. After taking the OPE-based exam, the student's honesty score will be recorded based on the face detected, noise detected, and tab switching made by the student during the exam. The results showed that at the first meeting where students had never taken an OPE-based exam, the average recorded student honesty score was 64.938 (pre-test). After being given treatment by administering the OPE-based exam 4 times from meetings 2 to 5, at meeting 6, the average student honesty score was 92.615 (post-test). This data shows an increase in the level of honesty of students before and after taking the OPE-based exam as can be seen in the Figure 1:

After that, assumption checks were carried out in the form of a test of normality using the Shapiro-Wilk, and the data obtained from the pre-test and post-test scores of students' honesty levels were not normally distributed, as can be seen in the Table 2:

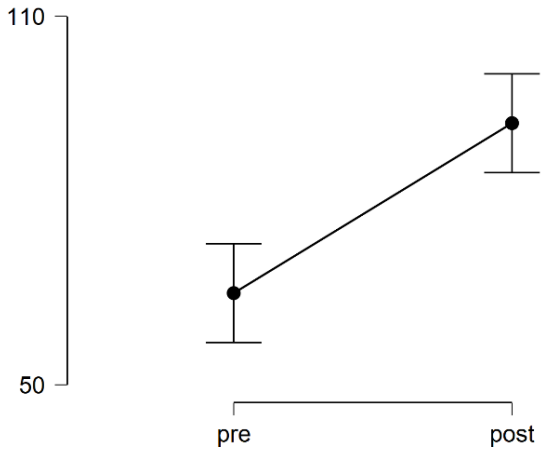

Figure 1: The average score of students' honesty levels before and after using OPE

TABLE 2: Assumption checks.

			W	p
pre	-	post	0.902	0.005

Note. Significant results suggest a deviation from normality.

Due to the data not being normally distributed, testing the effectiveness of using OPE technology on students' honesty levels using a non-parametric test (paired sample t-test Wilcoxon) and the following results were obtained:

TABLE 3: Paired sample t-test.

Measure 1		Measure 2	Test	Statistic	df	p	Effect Size
pre	-	post	Student	-4.953	33	< .001	-0.849
			Wilcoxon	72.500		< .001	-0.742

Note. For the Student t-test, the effect size is given by Cohen's *d*. For the Wilcoxon test, the effect size is given by the matched rank biserial correlation.

The results above show that there is a difference between the pre-post and post-test scores of students' honesty levels after taking the OPE-based exam. This shows that the use of OPE technology can effectively increase students' honesty in online exams that are carried out on an asynchronous basis. The increase in student honesty scores can be caused by (1) students are not accustomed to implementing OPE in the learning process; (2) they are used to online exams without supervision during the covid pandemic so they ignore OPE technology; and (3) do not have the skills to operate OPE technology in learning. Innovation products need time to adapt in their use so that students who are initially not used to using the technology become accustomed to it [12]. The problem is

that less honest characters are formed for 2 years during the covid pandemic because they have been used to unsupervised exams [13] so by implementing this OPE the honest character in themselves are slowly re-formed. The formation/learning process is strongly influenced by the guidance and supervision of experts to obtain optimal results [14], as well as one's level of honesty. In addition, the IT skills possessed by students were also an obstacle at the beginning of the OPE implementation it had an impact on their honesty scores. This is due to a large number of recorded body movements, voices, and tab switching to ask how to operate this OPE technology. Of course, this is recorded as fraudulent behavior by the OPE system because this system has been programmed to detect suspicious movements regardless of what is being said [15]. After getting used to carrying out OPE, students' IT skills increase so that the level of honesty detected by the system becomes more valid and recorded increases.

The effectiveness of using OPE technology in increasing student honesty is also measured by the effectiveness of this OPE technology in learning. If this OPE technology is not effectively used, it will not have an impact on other variables, one of which is the level of honesty. So it is necessary to measure the effectiveness of OPE technology and the results of student responses who have used OPE technology 6 times are as follows:

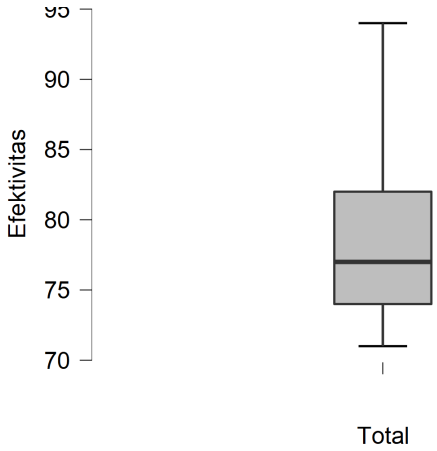

Figure 2: OPE technology effectiveness response score average.

The graph above shows the average score of student responses to the implementation of OPE is 78.7. When compared with the table on the interpretation of the effectiveness of the implementation of OPE, the score shows that the implementation of OPE in learning is very effective. This is reviewed from several aspects, namely relative advantage, compatibility, ease of use, trialability, and observability. The aspect of relative advantage measuring the advantages of implementing OPE can positively influence students to use it. The compatibility aspect measures whether the implementation of the OPE is compatible based on its function when compared to the implementation

of conventional exams in real classes. The ease of use aspect measures whether the implementation of OPE is considered easy or complicated by students. The trialability aspect measures the extent to which the implementation of this OPE attracts students to continue to try it themselves. The observability aspect measures how the results of the OPE implementation according to students [11].

If viewed from an aspect, the relative advantage aspect of OPE technology has the highest score of 81.8 which is considered very effective, while the lowest is in the observability aspect with an average score of 72.4 which is moderately effective as illustrated in the Figure 3:

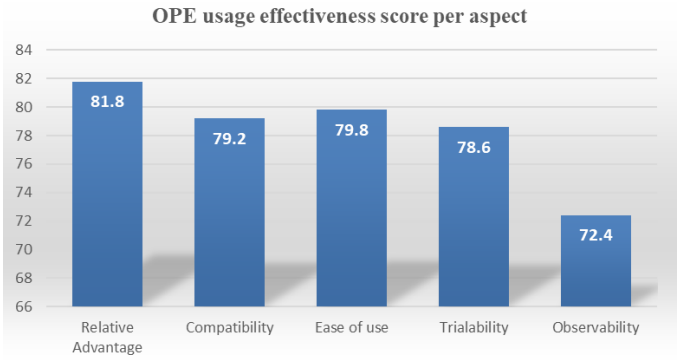

Figure 3: Average OPE technology effectiveness response score per aspect.

From the data above, the four aspects are classified as very effective, except for the moderately effective observability aspect.

3.1. Relative Advantage

Students feel the benefits of implementing this OPE during online learning using the Blended Learning approach because with OPE technology their skills in online learning are increasing. Online-based OPE technology requires students and lecturers/tutors to access the internet every time the learning process takes place [16] so that students who are initially unskilled in implementing OPE will become skilled and accustomed based on instructions/directions from lecturers/ tutor [17].

3.2. Compatibility

Students and lecturers/tutors feel more confident and believe in the validity of the exam that is taking place. The existence of online supervisors in the implementation of OPE minimizes cheating committed by students [18]. because all student activities

are detected by this supervisory application such as face detected, noise detected and switching tabs [16] so students have more confidence in the exam taking place effectively even though it is not held in the same place.

3.3. Ease of Use

Students also feel that the implementation of OPE is appropriate to complement the learning process that is generally used in this new normal era, namely the Blended Learning approach. The Blended Learning approach used by students is face-to-face online learning and facilities in the form of various learning media that they can access to support their learning independently outside of face-to-face lecture hours [19]. The evaluation stage in the form of an exam is an important aspect of the learning process that needs to be given to measure the achievement of the learning process that has been implemented [20]. In addition to online exams with direct supervision via video conference, exams using the OPE method can be an appropriate reference to support online learning using a blended learning approach because the implementation of OPE does not have to be carried out at the same time [21]. Besides being able to be carried out at any time by the predetermined exam time frame, the OPE implementation can save time and lecturers/tutors in supervising the exam without reducing the validity of the ongoing exam. Students also said that the OPE implementation was easy to use/follow based on clear instructions from the lecturer/tutor. All types of innovations in learning need initial guidance in using them [22], as well as the implementation of this OPE where students need clear explanations and instructions from tutors before using them so that the implementation of OPE can run effectively and efficiently.

3.4. Trialability

Students said the implementation of the OPE was a new experience for them. This experience allows them to gain new knowledge that they can apply in the future so that they can experiment independently at another time. The times will require prospective teachers to be innovative in the learning process [23] so that the implementation of this OPE can be one of the innovations that can be used by future teacher candidates in the learning process.

3.5. Observability

Students have not seen enough skills in using this OPE technology. This can be due to the lack of experience that students have in using OPE considering that the implementation of OPE in this study only lasted 6 (six) times. The frequency of using an innovative product affects the interest of producers who want to use it continuously. The more often it is used, the advantages and disadvantages of a product will be known and cause an increase/decrease in the interest of producers to use it [24]. The continuous implementation of OPE is expected to increase the average observability score.

4. CONCLUSION

The implementation of the Online Proctored Examination (OPE) in the Department of Physics Education using the Blended Learning approach is very effective. The use of OPE technology is proven to increase the honesty level of physics education students so that academic integrity can be maintained. This technological innovation can be one of the references for teachers/lecturers/tutors to carry out online exams with the help of supervisor applications in learning in the new normal era that applies the Blended Learning approach in the process.

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