Utilization of the Kahoot Application to Minimize Academic Dishonesty Students in Physics Examinations

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Abstract. This study aims to investigate the utilization of the Kahoot application to minimize academic dishonesty during physics examinations. The research was a Quasi-Experimental approach, employing a one-shot case study design. The study's sample involves 23 eleventh grade students from one senior high school, in Aceh, Indonesia, selected using a purposive non-probability sampling technique. Data were collected through observation, questionnaires, and interviews. The instruments in this study utilized indicators developed by Anderman and Murdock, comprising three categories: (1) Providing, utilizing, or receiving various information, (2) Using prohibited materials, and (3) Exploring someone's weaknesses, procedures, or processes to gain an advantage. The data is examined using percentage analysis methods and is interpreted by cross-referencing with the interpretation table for utilization. The results of this study indicate that 94.15% of the students agree that the Kahoot application is beneficial in minimizing cheating during the examination process. The timer feature effectively prevents the use of prohibited materials, but it still allows for the exchange of answers within a brief time frame. Therefore, further research is essential to explore more effective solutions to minimize this cheating behavior.

Keywords: kahoot, academic dishonesty, physics examination

1   Introduction

In the learning process, evaluation plays a significant role in determining the level of understanding and skills of students towards the taught material. Evaluation also serves as a tool for improving and enhancing the quality of learning. Therefore, the relationship between learning and evaluation is closely intertwined and inseparable. Evaluation is a process of collecting data to determine to what extent, in what aspects, and how educational goals have been achieved [1]. Evaluation results serve as one of the indicators of educational success. In its implementation, evaluation must be guided by several fundamental principles: validity, competency-oriented, sustainable, comprehensive, meaningful, fair and objective, open, sincere, practical and recorded, as well as accurate.

The importance of the role of learning evaluation for students demands that teachers perform evaluations in an engaging manner, as the evaluation process is not eagerly

anticipated by students. Learners tend to feel afraid, pressured, or that the evaluated material is too difficult [2]. This impacts the evaluation outcomes, which may not accurately reflect the students' actual conditions due to incomplete evaluation efforts. One realm of evaluation in learning is the cognitive domain, which involves mental activities (brain) such as thinking, understanding, applying, analyzing, and evaluating. One way to conduct cognitive evaluation is through written or conventional exams. Conventional evaluations open opportunities for students to cheat, such as copying from peers, discussions, and more, where the evaluation results are not purely the students' own abilities. Effective exam administration entails students completing exams with their own capabilities. However, in reality, some students still resort to cheating during exams. Common forms of academic dishonesty include copying from a friend's work during exams, copying a friend's assignment, accessing the internet via a mobile phone, using books during exams, and copying and pasting from the internet [3]. This cheating can occur due to weak exam supervision [4]. Such actions need to be minimized or even eliminated in the academic world. Cheating during exams is a familiar issue in education and can have negative consequences on exam outcomes and data validity. Therefore, an effective solution to minimize cheating during exams is greatly needed.

As we know, technology nowadays can be an innovation to optimize the evaluation process. Technology also offers various conveniences, such as digital evaluation. Many technological innovations, in the form of applications for learning or evaluation, are available today, including Padlet, Quizlet, Edmodo, Kahoot, Google Classroom, and others [5]. Kahoot is an interactive online application used as a learning tool in schools. Kahoot is presented in the form of an online game, a quiz. In teaching and learning activities, the Kahoot application can be used for evaluation purposes, such as pre-tests, post-tests, reinforcement of material, remedial actions, and daily quizzes [6]. Kahoot features a time limit for each question, thus minimizing student cheating. The Kahoot application is an application that can reduce the habit of cheating during the exam process [18]

The advantage of this application is that it trains students to think quickly and accurately, as the application imposes time constraints on answering questions. Efforts to minimize student cheating during exams involve answering questions within a set time [7]. Kahoot can also make the evaluation environment more enjoyable, facilitating teachers in evaluating and recording students' scores. Evaluation through games can have a positive impact on students, as engagement through playing tends to enhance understanding and the effectiveness of message delivery [5]. However, the specific benefits of the Kahoot application for minimizing student cheating during exams, especially in the subject of Physics, are not widely known. Therefore, it is important to conduct research to determine the benefits of the Kahoot application in minimizing student cheating during Physics exams.

2   Method

This study employs a quantitative approach with a quasi-experimental research design. The design used in this study is a one-shot case study design, where subjects are given a specific treatment once, followed by observation during the application of the treatment, and then a post-test is conducted [8]. The research was conducted at one senior high school in Aceh, Indonesia. The sample was the XI-C class, with a total of 23 students. The sampling technique employed was non-probability purposive sampling.

The instruments used in this study include the Kahoot media observation instrument, interviews, and a student response questionnaire. The questionnaire, observation, and interviews are based on cheating indicators developed by Anderman and Murdock [9], consisting of three categories: (1) Providing, utilizing, or receiving various information, (2) Using prohibited materials, and (3) Exploiting someone's weaknesses, procedures, or processes to gain an advantage.

In the Kahoot usage observation sheet, observers will be provided with options through checkmarks for each statement item, scoring 1 if the observer answers "Yes" and scoring 0 if the answer is "No". Meanwhile, the student response questionnaire uses a Likert scale as outlined in Table 1

Tabel 1. Likert Scale of Student Response Questionnaire

Criteria	Code	Score
very agree	SS	1
agree	S	2
disagree	KS	3
strongly disagree	TS	4

Then, the data from observations and questionnaires will be analyzed using the following percentage formula:

$$P = \frac{f}{n} \times 100\% \tag{1}$$

In this context, "P" signifies the percentage result, "F" represents the total obtained score, and "n" denotes the maximum possible score. The percentage result (P) is calculated by dividing the total obtained score (F) by the maximum possible score (n).

Furthermore, the percentage results from observation and students response questionnaire are interpreted referring to Table 2.

Tabel 2. Interpretation of Observation Results and Questionnaire Responses

No	Percentage (%)	Criteria
1	80-100	Excellent
2	66-79	Good
3	56-65	Satisfactory
4	46-55	Poor
5	0-45	Failed

The results of observation data and student response questionnaires are analyzed together to determine the utilization of the Kahoot application in minimizing student cheating during the Physics exam process using the following equation:

$$\text{Percentage of Utilization} = \frac{X+Y}{2} \tag{2}$$

In this context, "X" represents the percentage result obtained from the student response questionnaire, while "Y" indicates the percentage result derived from observation. X reflects direct feedback from students, whereas Y involves direct observations made by researchers.

The results of the analysis of observation data and student response questionnaires are interpreted referring to Table 3

Tabel 3. Index of Utilization Categories

Score Range	Utilization Category
0-19.99 %	Not Useful at All
20%-39.99%	Not Useful
40%-59.99%	Moderately Useful
60%-79.99%	Useful
80%-100%	Very Useful

3   Results and Discussion

This research was conducted to determine the benefits of the Kahoot application in minimizing student cheating during the Physics exam process. Prior to the exam, the researcher prepared tools such as a projector, computer, speakers, and others. During the research process, students were given 20 questions using the Kahoot application with a total time of approximately 17 minutes in the computer laboratory. Throughout the exam, there were 3 observers monitoring the conduct of the exam with an observation sheet consisting of 10 statements referring to the use of Kahoot to prevent student cheating. The research results from the observation indicated that the Kahoot application was beneficial in minimizing student cheating with a result of 96.6%. Detailed data from the observation results can be seen in Table 4.

Tabel 4. Observation Results of Utilizing Kahoot in Minimizing Student Cheating

No	Observed Aspects	Percentage
1	Kahoot media makes it difficult for students to discuss.	100%
2	Students don't have the opportunity to look at material cheats.	100%
3	Kahoot media enables students to answer questions more quickly and accurately.	100%
4	Kahoot media makes it difficult for students to cheat.	100%
5	The evaluation atmosphere becomes more engaging and interactive.	100%
6	Kahoot facilitates teachers in quickly grading.	100%
7	Kahoot media is used in the learning evaluation process.	100%
8	Students easily use Kahoot media.	100%
9	The steps for using Kahoot are easily understood by students.	66.67%
10	The Kahoot application assists supervisors in minimizing cheating.	100%
Total		96.6 %
Category		Excellent

According to the observers, the students were very enthusiastic and excited during this exam process. This was due to Kahoot having a suspenseful yet enjoyable background sound feature. The Kahoot application can assist teachers in swiftly and accurately grading student scores. This is evident through features within the Kahoot

application, such as downloadable grade data for teachers, ranking displays, images, and audio that can ignite students' spirits to engage in learning evaluation activities [10]. Based on observation results, all aspects received a score of 100%, except for aspect 9, "The steps for using Kahoot are easily understood by students," which scored 66.6%. This was indicated by some students still asking their peers about using Kahoot after the researcher's initial explanation. This lack of understanding stemmed from students not paying sufficient attention during the explanation, but many students also easily grasped how to use this media, from accessing the link to answering the questions.

Students' comprehension of using digital learning media can also be assessed by their focus when the teacher explains the media [11]. Observation results also show that this Kahoot media can reduce students' opportunities for cheating, such as glancing at a friend's answers, viewing cheat sheets, browsing the web for answers, discussing by directly asking or sharing answers. Kahoot has a timed feature for each question, making evaluation activities shorter and more effective, thus believed to minimize student cheating [5]. When using Kahoot media, the scores students obtain after answering each question are displayed on an LCD screen, revealing the top 1, 2, and 3 ranks. This challenges students and encourages them to compete with each other to achieve the best scores possible. In the face of failure in the game, they are motivated to strive for victory and are optimistic about reaching their goals [12].

The observation results obtained are further substantiated by the student response questionnaire regarding cheating behavior during the physics exam using the Kahoot application, consisting of 14 statements. This questionnaire refers to 3 indicators, where the second indicator, "Using prohibited materials," received the highest percentage with a score of 95.45%, while the first indicator, "Providing, using, or receiving any information," received the lowest percentage with a score of 92.23%. This indicates that the second indicator, "Using prohibited materials," is the most challenging behavior for students during the Kahoot exam, while the first indicator, "Providing, using, or receiving any information," is a behavior that students might still engage in during the Kahoot exam. For detailed information, please refer to Fig. 1.
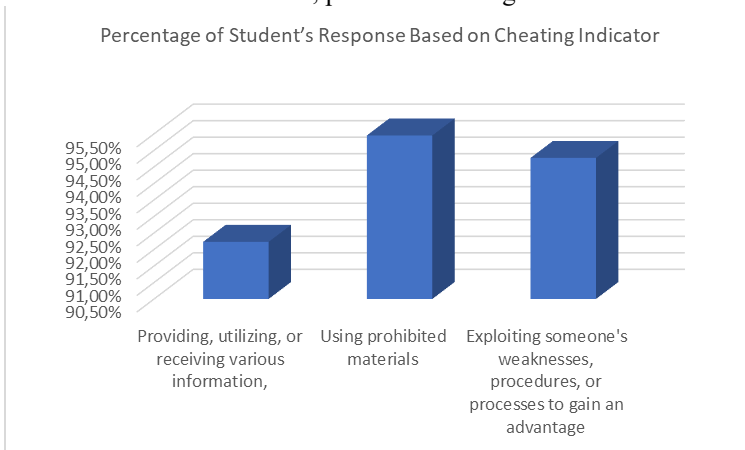

Fig. 1. Percentage of questionnaire response results based on cheating indicators

Fig. 1 illustrates that the second indicator obtained the highest score because students feel that accessing cheat sheets would cause them to miss the opportunity to answer, resulting in the current question being skipped. This is due to the timer present in the

Kahoot application, making it challenging for students to engage in cheating. The Kahoot application can minimize cheating incidents by providing a short time frame to answer each question, which prevents students from having the chance to cheat by searching for answers online or in books [13].

When analyzed per statement, the second indicator consists of 3 statements as seen in Fig. 2. The first statement received a score of 93.2%, the second statement received a score of 95.5%, and the third statement received a score of 97.7%. This third score falls within the "very beneficial" category.
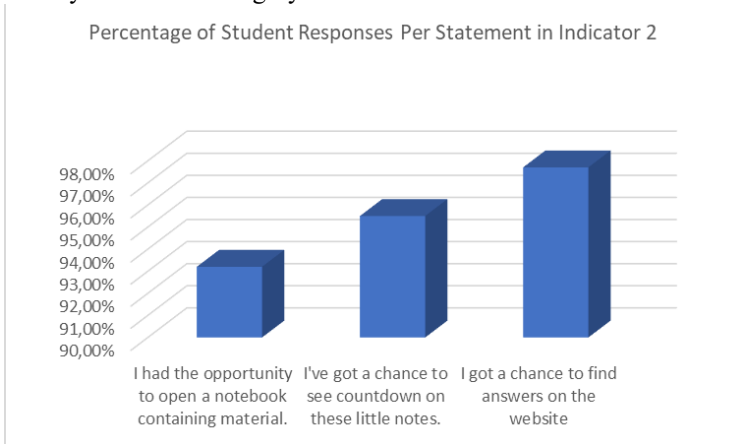
Fig. 2. Graph of percentage of honesty level per statement in indicator 2

In Fig. 2, the first statement, having the lowest score, indicates that the Kahoot application still provides an opportunity for students to view notes containing materials. Supported by interview results, some students admitted to briefly searching for notes in their books; however, not many of them found the answers. One student also confessed to searching for material notes related to the questions, but it took up a lot of time, causing them to skip the displayed question. The third statement received a higher score compared to other statements, demonstrating that the Kahoot application is highly beneficial in reducing negative student behavior of seeking answers on specific websites. Based on interviews with several students who attempted to open websites like Google, they mentioned that typing in the question they were looking for and reading explanations from Google caused them to lose the opportunity to answer. Some tried to access the web because they lacked confidence in their own answers, but their attempts were unsuccessful. Low self-efficacy or low belief in personal ability is the most influential factor in academic dishonesty [14].

The first indicator in Fig. 1 received the lowest score. This is evident from several students sharing or whispering answers. This situation arises because some students are not well-prepared and have difficulty answering [15]. However, many students also chose not to share their answers as they wanted to focus on answering the questions, avoid wasting time, and avoid intervention by supervisors during the exam process. This indicator consists of 6 statements as shown in Fig. 3:
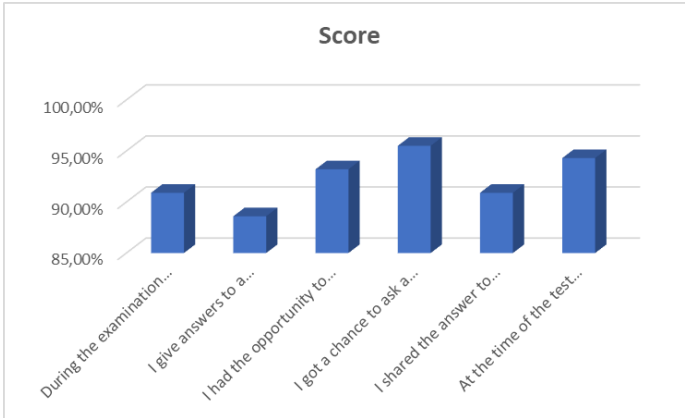
Fig. 3. Graph of percentage of honesty level per statement in indicator 1

Fig. 3 above depicts the second statement obtaining a questionnaire result with a score of 88.6%, which falls into the category of "very beneficial," but is lower compared to other statements. Based on the results of interviews with students who agreed, it can be concluded that these students engaged in cheating during the exam by directly providing answers through whispering. This was done because the person asking the question had already given an answer earlier. Interviews with students who chose to disagree revealed that they did not want to share answers because there was a teacher supervising, and they needed to focus on answering the questions. Far from cheating attitudes, many students chose to answer exam questions honestly, even if their final scores were low. Cheating can cause students to lose self-confidence as they rely solely on others' answers. Cheating also denies students the opportunity to develop their own abilities to independently complete tasks or exams [16].

In the statement "I have the opportunity to ask a friend for answers using signals (hands or other body parts)," the fourth statement obtains the highest score of 95.5%, falling into the "very beneficial" category. According to interviews with students, they mentioned that asking for answers using signals made them fearful of being seen by teachers/supervisors, which could lead to reprimands or penalties. Interviews also revealed that asking for answers using signals wasted students' time in answering their own questions. This aligns with research [17] stating that digital evaluation media can reduce cheating incidents due to the time constraints participants have for asking or requesting answers. This is because digital evaluation media come with time limits.

4   Conclusion

Based on an analysis of data and discussions pertaining to the implementation of the Kahoot application in Physics exams as a means to reduce cheating among students at MAS Insan Qur'ani, it can be inferred that Kahoot is a valuable tool for mitigating dishonesty during these exams. This includes activities such as discussions, questioning, and sharing answers, among others. The timer feature effectively prevents the use of

prohibited materials, but it still allows for the exchange of answers within a brief time frame. Therefore, further research is essential to explore more effective solutions to minimize this cheating behavior.

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