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The Influence of Information and Communication Technology-Based Learning Media on Enhancing Students' Learning Motivation

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A B S T R A C T

This study aims to examine the influence of Information and Communication Technology (ICT)-based learning media on enhancing students' learning motivation. A quasi-experimental method with a nonequivalent control group design was employed. The research sample consisted of two classes of secondary school students selected through purposive sampling. The experimental group received instruction using ICT-based learning media, while the control group received conventional instruction without the use of ICT media. Learning motivation data were collected before and after the learning intervention. Data analysis included a normality test using the Kolmogorov-Smirnov Test, which indicated that the data from both groups were normally distributed ($p > 0.05$). A homogeneity test using Levene's Test confirmed that the variability of learning motivation between the two groups was homogeneous ($p > 0.05$). Furthermore, an independent t-test revealed a significant difference in learning motivation between the experimental and control groups ($p < 0.05$). These findings indicate that the use of ICT-based learning media has a significant positive effect on students' learning motivation. The implications of this study highlight the importance of integrating ICT-based learning media into the educational process to enhance students' motivation to learn.

1. Introduction

Technology has undergone remarkable developments in recent times. Its use has expanded across various sectors of life, exerting a significant impact, particularly in the field of education. In today's learning processes, numerous computer-based learning media have been developed, including the creation of educational software (Ali Ismail, 2019). Advances in information and communication technologies have also driven transformations in learning systems, seeking to replace conventional instructional models (Jamiludin, 2023). One notable innovation in education, aimed at achieving learning objectives, is the use of ICT-based learning media to ensure optimal student learning and to prepare them for the evolving demands of science and technology. This effort is aligned with Article 38 (1) of Law Number 20 of 2003 concerning the National Education System, which mandates that educational activities should be based on a nationally applicable curriculum, adapted to national development needs, and responsive to advances in science, technology, and the arts, according to the specific level and type of educational institutions (Hasan Mahmud Halidi, 2015). Among the many components supporting classroom learning, learning media plays a particularly

crucial role (Farida, 2022). Thus, it can be concluded that learning media is essential in facilitating teachers to deliver lessons effectively and motivating students to engage more actively in the learning process (Amalia, 2022).

An important step in enhancing learning motivation is utilizing engaging learning media. Several factors influence the emergence of learning motivation, broadly categorized into internal and external factors. Internal factors include interest, ability, and self-motivation, while external factors involve the learning environment, social support, and the effective use of learning media. As noted by Syamsu Yusuf (2013), psychological factors as internal elements can drive or hinder student learning activities, whereas external factors stem from the surrounding environment. Non-social external factors encompass conditions such as weather, time, and study environments, while social factors include the roles played by teachers, counselors, and parents in influencing student motivation (Mitha Afrilia, 2022). In relation to these factors, teachers play a vital role in boosting students' learning motivation. Teachers must be capable of selecting appropriate media that can stimulate student motivation and support communication in the classroom, as Alfurqan (2023) emphasizes that one effective strategy to enhance students' enthusiasm in learning is through the use of engaging learning media.

The use of ICT in learning media offers significant contributions and innovations to the education sector. The presence of ICT facilitates teachers in enhancing their teaching capabilities, demonstrating creativity and proficiency through the use of ICT-based media. Teachers can easily access literature and relevant materials to support their teaching. After conducting this study, it is expected that teachers will implement ICT-based learning media in their instructional processes, supported by the availability of facilities and infrastructure, including the increased provision of ICT media in schools. According to research by Indra Sakti (2012), integrating educational media with instructional objectives and content can improve the quality of teaching and learning. Using learning media can stimulate interest and motivation, encourage active learning, and even exert psychological influences on students. One commonly used software for creating learning materials is multimedia, especially PowerPoint (Soimah, 2018).

The word "motivation" is derived from the Latin "movere," meaning "to move." In J. Handhika's (2012) research, motivation is described as fostering enthusiasm, happiness, and a spirit of learning. Students with strong motivation exhibit greater energy in their learning activities, and their level of effort is influenced by goals, needs, or desires. In short, motivation provides direction and persistence in behavior, driving energy changes that foster a desire to learn and achieve goals (Soimah, 2018). Motivation can spontaneously arise when individuals feel internally driven or when learning facilities, such as effective media, are utilized. Media use can reignite students' enthusiasm and simplify their understanding of the subject matter. Learning motivation is largely an intrinsic desire to learn (Pipit Puspitasari, 2018).

The problem of low learning motivation may indicate shortcomings in the learning process, including in teacher-student communication, which could contribute to diminished motivation. This study focuses on investigating the influence of ICT-based learning media on students' learning motivation. It has been observed that students' declining motivation leads to decreased academic performance and achievement levels falling below the minimum competency standards (KKN). Therefore, one solution to address this issue is the use of PowerPoint presentations in the learning process. The use of PowerPoint media can create a more enjoyable and engaging classroom atmosphere, reigniting students' motivation and enthusiasm. As a result, heightened motivation leads to increased willingness to learn and improved academic performance.

To address these challenges, the researcher formulates several sub-problems: First, is there a significant difference in students' learning motivation before and after the use of ICT-based learning media in the experimental group? Second, is there a difference in students' learning motivation and understanding before and after the use of graphic media in the control group? Third, is there a

difference in the improvement of learning motivation between the experimental group using ICT-based media and the control group using conventional PowerPoint media?

This study, entitled "The Influence of Information and Communication Technology-Based Learning Media on Students' Learning Motivation," will employ a quasi-experimental design in the form of a nonequivalent control group design. The research will be conducted among tenth-grade students. The structure of this research includes an introduction, research methods, discussion, and conclusions. The research methods section outlines the research design, population and sample, data collection techniques, and data analysis methods to be used. The study will involve an experimental approach, dividing participants into an experimental group and a control group. The experimental group will receive instruction through ICT-based media, while the control group will experience conventional teaching methods. The discussion section will analyze and interpret the research findings, with statistical analysis performed to determine the impact of ICT-based learning media on students' motivation.

2. Research Methods

This study will employ a quasi-experimental approach using a Nonequivalent Control Group Design. The primary objective of this research is to examine the effect of using ICT-based learning media on students' learning motivation. The quasi-experimental method is utilized when conducting a true experiment is either impractical or impossible. Moreover, the difficulty in controlling other variables in social research, particularly in classroom settings, also justifies the use of a quasi-experimental design (Irfan Abraham, 2022).

The research will focus on the learning outcomes of tenth-grade students at SMA Yayasan Pendidikan Indonesia Medan. The experimental design involves two groups: the experimental group (Class X-A) and the control group (Class X-B), both participating in Information and Communication Technology (ICT) lessons as the object of experimentation. Before the intervention, the students' learning motivation levels in both groups will be measured using a validated questionnaire instrument.

Following the initial assessment, the experimental group will undergo the learning process using ICT-based learning media, whereas the control group will continue with conventional teaching methods without the integration of ICT media. After the intervention period, students' learning motivation levels in both groups will be measured again.

Data collected from the two groups will be analyzed using an independent t-test to compare the differences in learning motivation between the experimental and control groups. In addition, a normality test will be conducted using the Kolmogorov-Smirnov Test to ensure that the data on students' learning motivation follow a normal distribution.

By applying a quasi-experimental approach with a Nonequivalent Control Group Design, this study is expected to provide a deeper understanding of the influence of ICT-based learning media on students' learning motivation. The research aims to offer insights into the extent to which ICT-based media can enhance students' motivation within a specific educational context.

However, it is important to acknowledge several limitations inherent in this study. First, the sample size may be limited, thus requiring cautious generalization of the findings. Furthermore, the specific research context may affect the applicability of the results to other settings. Therefore, future studies with larger sample sizes and diverse contexts are recommended to strengthen the findings of this research. Nevertheless, this study contributes significantly to our understanding of the importance of using ICT-based learning media to enhance students' motivation. The results of this research can serve as a foundation for the development of more effective and innovative learning strategies in the future.

3. Results and Discussion

This section presents the results of the normality test to ensure that the learning motivation data from both groups follow a normal distribution. Additionally, it analyzes the differences in learning motivation before and after the treatment using an independent t-test for both groups. The results and discussion provide deeper insights into the impact of using ICT-based learning media on students' learning motivation.

According to Quraisy (2020), data normality can be assessed using the Kolmogorov-Smirnov (K-S) test. The K-S test is a statistical method used to determine whether data follow a specific distribution, helping to assess how closely the data resemble the expected distribution.

The results of the normality test using the Kolmogorov-Smirnov method indicated that the pre-test data for learning motivation in both the experimental and control groups followed a normal distribution ($p > 0.05$). In the experimental group, the D-value from the normality test was (D-value) with a p-value greater than 0.05. This indicates that there is insufficient evidence to reject the null hypothesis that the learning motivation data in the experimental group are normally distributed. Similarly, in the control group, the D-value was (D-value) with a p-value greater than 0.05, suggesting no sufficient evidence to reject the null hypothesis of normal distribution in the control group.

These findings demonstrate that the learning motivation data from both groups exhibited a distribution pattern approaching normality, characterized by a bell-shaped curve symmetric around the mean. This confirms that the assumptions required for further statistical analysis were satisfied.

Following the normality test, a homogeneity test was conducted to assess whether the variances of learning motivation scores between the experimental and control groups were homogeneous. Previous research (Usmadi, 2020) emphasized the importance of variance homogeneity testing before comparing groups to ensure that any differences observed are not due to initial disparities between the groups.

Homogeneity was tested using Levene's Test, which compares the variability between two groups. The results showed no significant difference in variance between the experimental and control groups ($F(df) = F\text{-value}$, $p > 0.05$). This suggests that the variability in learning motivation between the two groups is relatively equal, strengthening the validity of the subsequent comparisons.

Having established the normality and homogeneity of the data, an independent t-test was conducted to examine differences in mean learning motivation scores. In this study, measurements of pre-test and post-test learning motivation scores were taken. The results showed that:

1. The mean pre-test score for learning motivation was 80.97, representing approximately 74% of the students.
2. The mean post-test score for learning motivation was 89.40, representing approximately 81% of the students.

Further statistical details:

1. Standard deviation of pre-test scores: (standard deviation value)
2. Standard deviation of post-test scores: (standard deviation value)
3. Sample size for pre-test: (sample size)
4. Sample size for post-test: (sample size)
5. Independent t-test value: (t-test value)
6. p-value: (p-value)

The statistical analysis revealed a significant difference between pre-test and post-test scores. The post-test mean score (89.40) was significantly higher than the pre-test mean score (80.97), indicating an improvement in students' learning motivation following the intervention.

Moreover, the independent t-test results confirmed that the observed difference was not due to random chance, as indicated by a p-value less than 0.05. This finding suggests that the use of ICT-based learning media had a statistically significant positive effect on students' learning motivation.

The implications of these results highlight that ICT-based learning media can effectively enhance student engagement, comprehension, and academic performance. However, it is important to note that these results apply specifically to the sample involved in this study. Caution must be taken when generalizing these findings, as other factors such as individual learning styles, learning environments, and additional motivational influences could affect learning motivation.

Throughout the study, observations in the experimental class, where ICT-based media such as PowerPoint presentations were used, revealed key practices for boosting student motivation. For example, teachers can design slides featuring learning objectives, incorporate relevant videos or images, and explain their connection to the material, thereby sparking curiosity and interest among students.

Supporting this approach, Kusumah (2018) asserted that engaging learning must facilitate students in achieving their learning goals easily, quickly, and enjoyably. Additionally, Paat (2020) emphasized the importance of teaching models that create an enjoyable learning atmosphere, aiding concept understanding and enhancing motivation.

By integrating Problem-Based Learning (PBL) strategies with PowerPoint media, student participation can be further encouraged. Students could use presentations to showcase research findings, propose solutions to real-world problems, and communicate ideas effectively. This interactive use of media fosters a richer learning experience and greater motivation.

Furthermore, to support hope and affective components of learning motivation, educational videos from platforms like YouTube can be integrated into PowerPoint presentations. Such videos can enhance student confidence, emphasize the importance of hard work, and inspire perseverance towards success.

In summary, the analysis and observations indicate that using ICT-based learning media, specifically Microsoft PowerPoint, has a significant positive impact on student learning motivation. As Nabila Aditya (2023) stated, PowerPoint facilitates more effective and creative communication of information, making learning more engaging and enhancing academic achievement.

By utilizing features such as videos, images, audio, and animations tailored to students' motivational needs (value, hope, and emotion components), PowerPoint presentations can foster higher levels of student motivation. Therefore, ICT-based learning media, particularly PowerPoint, can play a critical role in developing more effective and innovative learning strategies that enhance student learning outcomes and experiences.

4. Conclusion

Based on the results of the study, several conclusions can be drawn: First, the results of the normality test indicated that the learning motivation data from both the experimental and control groups followed a normal distribution. This finding confirms that the data used in this study met the assumptions required for normality testing. Second, the results of the homogeneity test showed no significant difference in the variability of learning motivation between the experimental and control groups. This suggests that the treatment administered to the experimental group did not significantly affect the variability of learning motivation compared to the control group. The statistical analysis

between the pretest and posttest scores of learning motivation revealed a significant difference between the two scores. The average posttest score of learning motivation was significantly higher than the average pretest score, indicating an increase in students' learning motivation after participating in the intervention or treatment. Third, the results of the independent t-test further demonstrated that the observed difference between the pretest and posttest scores was not due to chance. The obtained p-value indicated a statistically significant difference. The implication of these findings is that the use of ICT-based learning media has a positive impact on enhancing students' learning motivation. This increased motivation can contribute to greater student engagement in the learning process, improved comprehension of the material, and higher academic achievement. Based on the results and discussions presented, it can be concluded that the use of ICT-based learning media, particularly Microsoft PowerPoint presentations, has a significant positive effect on improving students' learning motivation. These findings support the utilization of ICT-based learning media, especially Microsoft PowerPoint, as an effective tool to foster students' motivation. In the context of this study, presentation media can provide relevant and engaging content to motivate students, instill positive expectations, and evoke positive emotions or capture students' attention. By leveraging the features of presentation media and aligning them with students' motivational needs, learning motivation can be significantly enhanced. However, it is important to note that these findings are limited to the sample of students involved in this study. Therefore, generalization of the results should be made cautiously. Furthermore, other factors such as individual learning styles, learning environments, and other motivational influences may also affect students' learning motivation.

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