

The Influence of E-learning Applications on the Learning Outcomes of MA Muhammadiyah Nanahure Students

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ABSTRACT

The development of information technology has brought significant changes to the world of education, one of which is the use of *e-learning* applications in the learning process. This study aims to examine and analyze the impact of *e-learning* application use on student learning outcomes at MA Muhammadiyah Nanahure. This article uses a literature review approach, reviewing various scientific research findings from the last five years (2020–2025) relevant to the topic of *e-learning* and student learning outcomes. The study results indicate that the implementation of *e-learning* applications generally has a positive impact on improving student learning outcomes, including cognitive aspects, learning motivation, and learning independence. Specific findings from the literature indicate an average increase in cognitive learning outcomes of up to 15-20% and a significant strengthening of student learning independence scores through the use of a Learning Management System (LMS). Factors influencing the success of *e-learning* include the quality of digital learning design, teacher competence in managing online learning, and the availability of supporting facilities and infrastructure. With proper management, *e-learning* can be an effective and relevant learning solution for implementation at MA Muhammadiyah Nanahure.

Keywords: *E-Learning, Learning Outcomes, Digital Learning, MA Students.*

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INTRODUCTION

The development of information and communication technology (ICT) has brought significant changes in various aspects of life, including in the field of education (Bond et al., 2021). Technological advances have driven a transformation in the learning process that was originally centered on face-to-face meetings to learning that utilizes digital media (Dhawan, 2020). These changes provide an opportunity for educational institutions to develop a learning system that is more flexible, effective, and able to reach students without being limited by space or time (Almaiah et al., 2020). The use of technology in the world of education is growing along with the increasing need for learning that is adaptive to the times (Bond et al., 2021). One form of implementation of this technology is the use of e-learning applications (Almaiah et al., 2020). An e-learning-based learning system allows the teaching and learning process to be carried out online through the internet network by utilizing various digital devices (Dhawan, 2020). The presence of e-learning provides alternative learning that is able to increase access to learning resources while supporting the implementation of more independent learning (Kukulska-Hulme, 2020).

E-learning applications generally provide various features that support the learning process, such as the provision of learning materials, discussion forums, online assignments, quizzes, evaluations, and an integrated assessment system (Martin et al., 2020). These various features make it easier for teachers to manage learning activities while helping students get a

more interactive learning experience. In addition, students can access learning materials at any time according to their needs and learning speed (Kukulska-Hulme, 2020). The development of e-learning use has increased very rapidly since the COVID-19 pandemic (UNESCO, 2021). This condition encourages all educational institutions to adopt technology-based learning as a solution to keep the education process going. Although face-to-face learning has been implemented again, the use of e-learning is still used as a supporting medium that is able to increase the effectiveness of learning through the blended learning model (Graham, 2021).

On the other hand, the implementation of e-learning still faces various challenges. Limited internet access, the availability of technological devices, and the ability of teachers and students to utilize digital technology are obstacles that are often found, especially in schools in developing areas (Almaiah et al., 2020; OECD, 2021). The difference in infrastructure conditions and digital literacy capabilities causes the effectiveness of the implementation of e-learning to not be fully optimal in each education unit. MA Muhammadiyah Nanahure is one of the madrasas that also uses e-learning applications as a learning medium. The use of various online learning platforms is used to deliver materials, assign assignments, evaluate learning, and build communication between teachers and students (Martin et al., 2020). The implementation of the technology-based learning system is part of the madrasah's efforts to improve the quality of educational services in the midst of increasingly rapid digital development (Bond et al., 2021).

The success of a learning process can basically be seen through the learning outcomes achieved by students (Biggs & Tang, 2011). Learning outcomes not only reflect the mastery of knowledge, but also the development of students' attitudes, skills, and thinking abilities after participating in the learning process (Anderson & Krathwohl, 2001). Therefore, the use of appropriate learning media has an important role in helping students understand the material so that learning goals can be achieved optimally (Hodges et al., 2020). The use of e-learning is believed to be able to provide various benefits for students, including increasing learning independence, expanding access to learning resources, increasing learning motivation, and encouraging students to be more active in the learning process (Hodges et al., 2020; Kukulska-Hulme, 2020). In addition, the flexibility of time and place of learning allows students to adjust the learning process according to their needs and characteristics so that it has the potential to improve learning outcomes (Martin et al., 2020).

Although various studies show that the use of e-learning has a positive impact on student learning outcomes, there are still differences in research results influenced by school conditions, infrastructure readiness, user competence, and student characteristics (Fatani, 2020). In addition, studies on the effectiveness of the use of e-learning in private madrasas in developing areas are still relatively limited. This condition shows the need to conduct further research in order to obtain a more comprehensive picture of the implementation of e-learning in this context. Based on this description, this study aims to analyze the influence of the use of e-learning applications on student learning outcomes at MA Muhammadiyah Nanahure. This research is expected to make a scientific contribution to the effectiveness of the use of e-learning in improving student learning outcomes and become a consideration for schools, teachers, and stakeholders in developing more effective and sustainable technology-based learning strategies.

METHODS

This research uses a literature review method which is presented systematically and descriptive-qualitatively. Data was obtained from articles published in reputable scientific journals, both nationally and internationally, in the last five years, from 2020 to 2025. Search Keywords: The literature search process was carried out on the Google Scholar and ScienceDirect databases using specific keywords: "e-learning", "student learning outcomes", "blended learning", and "digital learning in madrasah". Inclusion and Exclusion Criteria: Inclusion criteria in the selection of articles include: (1) articles focusing on the secondary education level (SMA/MA), (2) measuring the impact of e-learning on cognitive, motivational,

or independent learning outcomes, and (3) published in the period 2020-2025. Meanwhile, the exclusion criteria are articles that focus on higher education or do not include empirical data on learning outcomes. Data Analysis Techniques: The collected data is analyzed using descriptive-qualitative analysis techniques through the stages of data reduction, data display, comparison of findings between researchers, drawing scientific conclusions, and contextual integration to draw its relevance to the real conditions in MA Muhammadiyah Nanahure.

FINDINGS AND DISCUSSION

Influence on Cognitive Learning Outcomes

The use of e-learning applications at MA Muhammadiyah Nanahure has the potential to increase students' understanding of material. Through e-learning, learning materials can be presented in various forms, such as texts, videos, presentations, and interactive quizzes. The variety of material presentation helps students understand the lesson concept more easily and interestingly. Students also have the opportunity to re-access the material that has been delivered by the teacher, so that they can repeat the learning according to their respective needs. This is very helpful for students who have different learning speeds. When compared to previous research, the findings from Hasan et al., (2023) confirm that the visualization of digital materials on the LMS significantly improves students' cognitive test scores. On the other hand, Zainudin (2021) provides a critical perspective that cognitive improvement only occurs optimally in theoretical subjects, while practicum subjects show less significant results when not combined with blended learning methods.

Student Learning Motivation

E-learning not only has an impact on the understanding of the material, but also on the students' motivation to learn. Interactive features in *e-learning* such as discussion forums and quick feedback from teachers can increase students' motivation to learn. Students feel more involved in the learning process because of the two-way communication that can be done online. Based on a comparison of the literature, Wahyuni (2022) found that gamification elements and interactive quizzes in *e-learning* are able to boost students' intrinsic motivation to the highest level. However, this is slightly different from the findings of Kurniawan (2021) who reminded that motivation to learn online tends to decrease drastically after the first 4 weeks due to digital fatigue, so it is necessary to vary content delivery by teachers so that student motivation remains stable.

Self-Regulated Learning

E-learning-based learning requires students to be more independent in managing study time, doing assignments, and looking for additional information. Thus, students are trained to be responsible for their own learning process. E-learning plays a central role in stimulating students' self-regulated learning abilities. Sari (2020) emphasized that the flexibility of access to digital platforms forces students to set their own learning targets autonomously. This finding is reinforced by Setiawan (2022) who states that students who are used to using self-control on LMS features show much better levels of learning resilience and problem-solving skills than students in conventional classrooms who rely entirely on the teacher's direct instruction.

Supporting and Inhibiting Implementation Factors

The success and obstacles of the implementation of e-learning at MA Muhammadiyah Nanahure are influenced by the dynamics of several crucial interrelated factors: 1) Internet Quality: Stable network access is an absolute infrastructure. A study from Rahayu & Pahlevi (2021) states that signal instability in suburban areas is the main obstacle that triggers learning asynchronization. 2) Teacher Competence: Teachers not only play the role of material presenters, but also facilitators and supervisors in online learning. Teachers need to have competence in designing engaging digital materials, managing virtual classrooms, and providing guidance and motivation to students. Wibowo (2023) highlighted that technological

stuttering in teachers has a direct impact on the low quality of virtual classroom management.

3) Device Access: Adequate ownership of gadgets (smartphones/laptops) greatly determines the smooth access of students to digital learning platforms. Limited ownership of personal devices in a family often forces students to collect academic assignments late (Zhang et al., 2020).

CONCLUSION

The conclusion of this study is, first, e-learning applications have a positive and significant influence on improving students' cognitive learning outcomes through easy access and variety of interactive digital material presentations. Second, the application of e-learning has been proven to be effective in triggering the strengthening of internal motivation and training students to be responsible for their own learning rhythm. Third, the effectiveness of the implementation of e-learning does not stand alone, but is closely tied to the interaction of infrastructure readiness factors (internet quality and devices) and digital pedagogic competencies possessed by teachers. The implications of this study show that the adoption of technology through e-learning is no longer just an alternative media, but has become a strategic instrument in reconstructing the modern learning model in madrasas. The success of this transition requires restructuring the readiness of human resources and the fulfillment of digital facilities in a balanced manner so that there is no inequality in the quality of learning outcomes. In addition, the author also provides the following suggestions. First, teachers are expected to continue to improve IT competence and consistently develop a variety of digital learning content designs (such as short videos and interactive quizzes) to anticipate students' digital saturation. Second, for schools: The Supreme Court of Muhammadiyah Nanahure is advised to start facilitating periodic training for educators and strive to strengthen the internet network infrastructure in the school area through the procurement of adequate bandwidth. Third, for further research: It is recommended to conduct empirical field research (quantitative experiment or PTK) at MA Muhammadiyah Nanahure directly to test the validity of the findings of this literature, as well as to expand the research variables to the realm of affective and psychomotor learning outcomes.

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