**OPEN ACCESS**
International Journal of Educatio Elementaria and Psychologia
Vol. 1 No. 1. February 2024, pp. 1-15 DOI. https://doi.org/10.70177/ijeep.v1i1.890

**Research Article**

# The Effect of Online Application Use on Student Academic Achievement in Higher Education

Khoirul Fadhil [1], Susi Herawati [2], Rizki Pebrina [3], Adam Mudinillah [4]
[1] Universitas Islam Negeri Mahmud Yunus Batusangkar, Indonesia
[2] Universitas Islam Negeri Mahmud Yunus Batusangkar, Indonesia
[3] Universitas Islam Negeri Mahmud Yunus Batusangkar, Indonesia
[4] Sekolah Tinggi Agama Islam Al-Hikmah Pariangan Batusangkar, Indonesia

**Corresponding Author:**

Khoirul Fadhil,
Universitas Islam Negeri Mahmud Yunus Batusangkar, Indonesia.
Jl. Jenderal Sudirman No.137, Limo Kaum, Kec. Lima Kaum, Kabupaten Tanah Datar, Sumatera Barat 27217, Indonesia
Email: khoirulfadhil@gmail.com

## Article Info

Received: Feb 19, 2024
Revised: Feb 22, 2024
Accepted: Feb 25, 2024
Online Version: Feb 27, 2024

## Abstract

This study aims to analyze the impact of using online applications, specifically E-Learning and WhatsApp, on student academic performance in colleges. E-Learning offers flexibility in time and place, along with quick access to information, while WhatsApp facilitates effective communication among students, lecturers, and study groups. The research involved a survey of 200 students from various majors at Mahmud Yunus Batusangkar State Islamic University (UIN). Data were collected through questionnaires measuring the intensity of E-Learning and WhatsApp usage and academic achievement. Results show that students utilize both platforms extensively. The descriptive analysis reveals an average GPA of 3.52 (SD = 0.48), an average daily E-Learning usage of 3.2 hours (SD = 1.2 hours), and an average daily WhatsApp usage of 2.8 hours (SD = 1.1 hours). Correlation analysis indicates a significant positive relationship between E-Learning usage and academic performance ($r = 0.52$, $p < 0.01$), suggesting that higher E-Learning usage correlates with better academic outcomes. Similarly, WhatsApp usage also shows a significant positive relationship with academic performance ($r = 0.48$, $p < 0.01$).

**Keywords:** E-learning, Student, WhatsApp



Journal Homepage https://journal.ypidathu.or.id/index.php/ijeep ISSN: (P: 3047-843X) - (E: 3047-8529)
How to cite: Fadhil, K., Herawati, S., Pebrina, R & Mudinillah, A. (2024). *The Effect of Online Application Use on Student Academic Achievement in Higher Education*. International Journal of Educatio Elementaria and Psychologia, 1(1), 1-15. https://doi.org/10.70177/ijeep.v1i1.890
Published by: Yayasan Pendidikan Islam Daarut Thufulah

## INTRODUCTION

In this digital era, the use of online applications has become an integral part of everyday life, including in the world of education (Faizan, Barsha, Eqbal, & Munshi, 2023; Mervyn Hsin, Mohamed, Mohd Yazit, & Ho, 2023; Ravana dkk., 2024). Universities have begun to utilize e-learning and WhatsApp applications to support the teaching and learning process. This study aims to determine the effect of using e-learning and WhatsApp applications on student academic achievement.

In this digital era, information and communication technology (ICT) has become an inseparable part of human life, including in education (Méndez, Solís, & Gonzalez, 2023; Putri & Hartono, 2024; Shah dkk., 2024). The development of ICT has brought significant changes in the teaching and learning process, including in higher education. One form of ICT utilization in learning is the use of E-learning and WhatsApp.

According to Crow and Crow in, "Education is not only seen as a means of preparing for future life, but also for the present life that individuals experience in their development towards maturity.

The teaching and learning process must be changed due to the rapid advancement of ICT. Now the learning system uses information technology from elementary school to college. It will be left behind with technological advances that continue to develop if it does not keep up with the times. According to Purnomo et al. millennials are a group of young people who are very different from previous generation (Anzano-Oto, Vázquez-Toledo, & Latorre-Cosculluela, 2023; Rhongo & da Piedade, 2024; Wajahat, 2024). According to Gideon, millennials are referred to as "kids today" because they are too dependent on devices. because they believe that devices and technology allow them to access various important information on a daily basis. With this development, technology should be beneficial for education, especially for students.

According to Carr & Hayes in, The use of information technology such as the use of the internet which has various applications such as social media, is one of the media where users can communicate with each other, find information and make friends. As is known, various social media are facebook, twitter, line, BBM, whatsapp, instagram, path, ask.fm, linkedin, snapchat and several other social media.

Teaching system, according to is an organized combination of human elements, materials, facilities, equipment, and procedures that interact to achieve a goal. According to Rusman, there are three important components in learning planning: learning conditions, learning methods, and learning outcomes. By utilizing technology in the learning process, many learning media are available for use. Learning, according to Slameto, is “a process of effort made by a person to obtain a new change in behavior as a whole, as a result of his own experience in interaction with the environment. According to Gagne, however, “learning is a process by which an organism changes its behavior as a result of experience" (Syaiful Sagala in

Learning, based on the above understanding, can be defined as the process of changing behavior through various activities, such as reading, observing, listening, imitating, and so on, as well as the results of experiences that a person experiences when interacting with his environment.

Learning is an educational interaction activity between teachers and students and other learning components that have the aim of developing knowledge, attitudes and skills, (Suhaji in View of Implementation of E-learning Platform Andragogy in Blended Learning at Padang State University, n.d.).

In the opinion of, E-learning is carried out through the use of computer or mobile devices that support learning. Electronic learning is an important tool that can be used to improve student education and motivation.

Information technology (IT) which has an internet platform standard can be a solution to these problems because the nature of the internet is that it allows everything to be connected, cheap, simple and open so that the internet can be used by anyone (everyone), anywhere

(everywhere), anytime (everytime) and is free to use (available to every one) (Aissani, Kaba, El-Refae, Wehbe, & Kanaan, 2023; Kadir dkk., 2024; Parmar, Mada, Reddy, & S, 2024). The use of information technology in the learning process is an alternative that must be implemented to increase learning motivation among students so that they are more involved in the learning process. Information technology is becoming increasingly important in the learning process, from elementary school to higher education.

E-learning, a technology that uses information and communication to facilitate learning, has been widely used since the 1970s.

Based on the assumption E-learning is learning conducted through the internet network that allows people to learn anywhere (Agrawal & Krishna, 2024; Rido dkk., 2023; Tsani & Nisa', 2023). E-learning is divided into two categories) relating to computer-based learning and network-based learning. E-learning Computer-based learning is learning that uses computers as tools.

Ghirardini, says that "E-learning can be defined as the use of computer and Internet technologies to deliver a broad array of solutions to enable learning and improve performance." This means that E-learning is defined as the use of computer and internet technologies to deliver a broad array of solutions to enable learning and improve performance.

Dabbagh and Ritland call E-learning with the term online learning which defines online learning as an open learning environment and distributed pedagogical tools, internet, network-based technology, to facilitate learning and build knowledge through action and interaction.

Through E-learning learning materials can be accessed anytime and from anywhere, besides that the material that can be enriched with various learning resources including multimedia can be quickly updated by the teacher. E-learning also has many benefits, including according to (AlZaabi, 2023; Espino dkk., 2023; Sil dkk., 2023), in more detail, the benefits of E-learning can be seen from 2 angles, namely: 1) From the perspective of students (as learners) E-learning allows the development of high learning flexibility (Blanco & Ramirez, 2019). That is, students can access learning materials at any time and repeatedly.

Khan describes several components that must be known if an institution wants to implement E-learning, namely (1) learning design; (2) multimedia components; (3) the meaning of the experience (Pan dkk., 2020). When talking about learning, it talks about how behavior changes through experience. Menkhoff in E-learning is considered to be able to increase student learning motivation compared to conventional learning because students feel boredom and decreased levels of interest in commonly used media ".

The change from traditional learning systems to online learning systems in the era of the Covid-19 pandemic has created various challenges for students. These challenges include difficulties in adapting to the online learning system, lack of adequate internet access, and lack of direct interaction with lecturers and classmates (Böck, Landes, & Sedelmaier, 2023; Gawade, Hegde, Marulkar, & Bhansali, 2023; Obaidat, Al-zou'bi, Mughaid, & Abualigah, 2023). This can result in a decrease in learning motivation and student academic achievement. To overcome these problems, E-learning was created.

Since E-learning facilitates access to information (collection of course materials) and allows them to submit paperless assignments, students prefer to use it (Pasquadibisceglie dkk., 2020). Because E-learning-assisted learning can improve student activeness, results, and learning motivation (Ardiansyah & Diella, in Никаноров et al., 2018).

Students give a positive response to the use of E-learning because it makes it easier for them to access information (collection of lecture materials) and paperless in collecting assignments (Hadjipanayis dkk., 2019). Because, with the existence of E-learning assisted learning it can improve student performance in carrying out learning which consists of activeness, results, and learning motivation.

Student academic achievement is one indicator of the success of education in higher education. A decrease in student academic achievement can result in various things, such as the

obstruction of the study completion process, the difficulty of getting a job, and the low competitiveness of the nation in the international arena.

This study aims to analyze the impact of using E-learning and WhatsApp on student academic achievement in higher education. The results of this study are expected to provide useful information for universities in improving the effectiveness of using E-learning and WhatsApp in learning, so that it can help improve student academic achievement.

E-learning and WhatsApp are online learning platforms that are widely used by students in higher education. Understanding the impact of their use on students' academic performance is important to ensure that these platforms are used effectively and efficiently in supporting the teaching and learning process.

According to Suryadi (Ahamad dkk., 2023; ALTINAY dkk., 2024; Choudhury, Senapati, & Sarma, 2023)The existence of WhatsApp social media is one proof of the development of technology and communication that must be addressed positively. The WhatsApp application is the second most popular application, which is used by various groups of people in Indonesia, including college academics such as students and lecturers at Muhammadiyah University of North suamtera, WhatsApp applications, especially in this case, will make it easy for individuals to communicate and comment on various cases and topics discussed by other individuals. Aminoto & Dani, said that the existence of WhatsApp Messenger is inseparable from the digital generation who always wants updates to various internet-based technologies.

The group menu option can be used as a place for teachers to discuss with students or between students in solving problems. Okvireslian revealed that whatsApp is effective for classroom learning, both in opening, core and closing activities. However, whatsapp has the disadvantage of limited memory.

One solution to overcome the problem of declining student academic performance is to increase the effectiveness of using E-learning and WhatsApp in learning. This can be done in various ways, such as:

a. Improving the quality of E-learning and WhatsApp content: E-learning and WhatsApp content must be designed to be interesting, interactive, and easily understood by students.
b. Improving training and mentoring for students: Students need to be trained and assisted in using E-learning and WhatsApp effectively and efficiently.
c. Strengthening technology infrastructure: Universities need to strengthen technological infrastructure so that students can access E-learning and WhatsApp easily and smoothly.

This research was conducted because there have not been many studies that examine in depth the impact of using E-learning and WhatsApp on student academic achievement in higher education (Hidayah & Wiyono, 2024; Khaskheli, Jiang, Raza, & Qamar Yousufi, 2024; Sawalha dkk., 2023). The results of this study are expected to make a new contribution to the understanding of the effectiveness of online learning platforms in supporting the teaching and learning process in higher education.

This research contributes to filling the gaps that exist in previous research in several ways:

a. Focusing on widely used online learning platforms: This study focuses on E-learning and WhatsApp, which are online learning platforms widely used by students in higher education.
b. Using robust research methods: This study uses a quantitative research method with a survey design that involves a large enough sample, so that the research results can be better generalized.
c. Analyzing causal relationships: This study uses regression analysis to analyze the causal relationship between the use of E-learning and WhatsApp and students' academic performance.

Several previous studies have examined the impact of using E-learning and WhatsApp on student learning outcomes. Abdul Masri Purba, the results of his research The result of this study is that the application of communication media with WhatsApp groups is effective because it is one of the good alternatives used in the online learning process to enter learing. so that students become active in eleraning even if they are not face to face. and Aminah Zb with the results of her research is It is hoped that educators, especially lecturers and teachers, can use schoology-based E-learning assisted by WhatsApp Group as a solution or alternative to online learning amid the COVID-19 Pandemic (Dei, Kankam, Anane-Donkor, Peasah, & Puttick, 2023; Fazriyah & Kusrohmaniah, 2023; Nkonki, Tsipa-Booi, & Mqukuse, 2023). This research is different from previous research in several ways:

a. Research focus: This study focuses on the impact of using E-learning and WhatsApp on student academic achievement, while previous studies focused on the impact of using E-learning and WhatsApp on student learning outcomes.
b. Research method: This study uses a quantitative research method with a survey design, while the previous study used a qualitative research method with a case study.
c. Causal relationship analysis: This study uses regression analysis to analyze the causal relationship between the use of E-learning and WhatsApp with student academic achievement, while previous studies did not conduct causal relationship analysis.

This study has some novelty compared to previous studies, namely: Focus on widely used online learning platforms: This study focuses on E-learning and WhatsApp, which are widely used online learning platforms.

## RESEARCH METHOD

This research was conducted at Mahmud Yunus State Islamic University (UIN) Batusangkar City Batusangkar in the odd semester of the 2023/2024 academic year (Enakrire, 2024; Hawamdeh dkk., 2023; Mukhter, Choudhary, Ganie, & Mukhter, 2023). Research method is a procedure carried out in research activities by paying attention to scientific principles and achieving research objectives This research uses qualitative methods. Where qualitative research is a type of research that produces findings that cannot be achieved using statistical procedures or other quantification methods.

### Research Design

Quantitative research is a research method that can be clearly explained through numbers (Sugiyono, 2019). This is a solid foundation for a deep understanding of phenomena that can be measured numerically (Muhammad Darwin, in Fitria et al., 2020; Nofrianda et al., 2023). This study used a quantitative research design with a descriptive and analytic quantitative approach. The descriptive approach was used to describe the characteristics of the research sample, namely the intensity of use of E-learning and WhatsApp, as well as student academic achievement. The analytic approach was used to analyze the relationship between the intensity of using E-learning and WhatsApp with students' academic achievement.

### Research Procedure

This research procedure consists of several stages, namely:

1. Determination of Population and Sample: The research population is all students of Mahmud Yunus State Islamic University (UIN) Batusangkar. The research sample was 200 students selected using stratified proportional random sampling technique. The strata used are faculty and study program.
2. Instrument Development: The research instrument used was a questionnaire. This questionnaire consisted of three parts, namely:

a. The first part: Measuring the intensity of the use of E-learning and WhatsApp.
b. The second part: Measuring student academic achievement.
c. The third part: Measuring student demographic data.

3. Instrument Validity and Reliability Test: The questionnaire was tested for validity and reliability before use. The validity test was conducted using construct validity and convergent validity methods. Reliability test was conducted using Cronbach's Alpha method.
    a. Data Collection: Data is collected by distributing questionnaires to the research sample. The questionnaire can be distributed in person or online.
    b. Data Analysis: Data were analyzed using descriptive and inferential statistics. Descriptive statistics were used to describe the characteristics of the research sample. Inferential statistics were used to analyze the relationship between the intensity of using E-learning and WhatsApp with students' academic achievement.

**Research Subjects and Research Ethics**

**Research Subjects**

The subjects of this study were students of Mahmud Yunus State Islamic University (UIN) Batusangkar who met the following criteria:

a. Active status as a student.
b. Currently taking semester 3-8.
c. Attending lectures online.
d. Willing to participate in the research.

**Research Ethics**

This research was conducted by observing the principles of research ethics, namely:

a. Informed consent: Research participants were given complete information about the study, including the purpose of the study, study procedures, and potential risks and benefits. Participants are free to choose whether or not they want to participate in the study.
b. Confidentiality: The data of the research participants were kept confidential and used only for the purpose of this study.
c. Honesty: The researcher endeavored to be honest and objective in conducting this study.
d. Fairness: All participants were treated fairly and there was no discrimination of any kind.
e. Data Collection Technique and Data Analysis

**Data Collection Technique**

The data collection technique used in this research is a questionnaire. The questionnaire was distributed to the research sample directly or online. This questionnaire consists of three parts, namely:

a. The first part: Measuring the intensity of using E-learning and WhatsApp.
b. The second part: Measuring students' academic performance.
**c.** The third part: Measuring student demographic data.

**Method of Data Processing and Data Analysis**

The data collected from the questionnaire was processed and analyzed using SPSS software. The data analysis consisted of:

a. Descriptive analysis: Used to describe the characteristics of the research sample, namely the intensity of using E-learning and WhatsApp, as well as student academic achievement.
b. Correlation analysis: Used to analyze the relationship between the intensity of using E-learning and WhatsApp with students' academic achievement.

## RESULTS AND DISCUSSION

According to Septriyani, et al, achieving optimal learning outcomes is securing the ideal learning process as well. Furthermore, together so that the cycle and learning outcomes become ideal, starting from the preparation steps, the application of learning, and up to the assessment steps must be prepared and carried out properly as well (Nofrianda et al., 2023).

According to Agung Setiawan, et al in (Nofrianda et al., 2023) An interesting and pleasant learning atmosphere in the classroom needs to be realized so that the learning process can run well and educational goals can be achieved so that the quality of education increases. Efforts to create an interesting and pleasant learning atmosphere in the classroom require several breakthroughs, both in curriculum development, learning media innovation and the fulfillment of educational infrastructure. As an online learning media, elearning has the potential to have a major influence on student learning motivation (Anggraini & Lestari, in Indarthi et al., 2021).

Ghozali (in Ariyanto et al., 2022), it means that the higher the number the more valid the questionnaire instrument is, while the Sample and Population According to Sugiyono (in Ariyanto et al., 2022) shows the degree of accuracy between the data that actually occurs on the object and the data collected by the researcher.

### Sample Data Description

Table 1 shows a description of the research sample data based on variables of age, gender, faculty, and study program.

Table 1: Sample Data Description

| **Variables** | Frequency | **Persentase (%)** |
|---|---|---|
| Age | 18-21 | 140 |
| | 22-25 | 60 |
| Jenis Kelamin | Male | 100 |
| | Female | 100 |
| Gender | Faculty of Tarbiyah and Teaching Science | 50 |
| | Faculty of Sharia | 50 |
| | Faculty of Economics and Islamic Business | 50 |
| | Faculty of Ushuluddin Adab and Da'wah | 50 |
| Faculty | Islamic Religious Education | 25 |
| | Informatics Management | 25 |
| | Islamic Psychology | 25 |

**Intensity of E-learning and WhatsApp Use**

Figure 1 shows the average intensity of using E-learning and WhatsApp per day. Based on Figure 1, the average intensity of using E-learning per day is 3.2 hours with a standard deviation of 1.2 hours. The average intensity of WhatsApp use per day is 2.8 hours with a standard deviation of 1.1 hours.

**Student Academic Achievement**

The average GPA of students is 3.52 with a standard deviation of 0.48.

**Relationship between the Intensity of E-learning and WhatsApp Use with Student Academic Achievement**

Correlation analysis shows that there is a significant positive relationship between the intensity of E-learning usage and students' academic achievement ($r = 0.52$, $p < 0.01$). This shows that the higher the intensity of E-learning use, the higher the academic achievement of students.

Correlation analysis also shows that there is a significant positive relationship between the intensity of WhatsApp usage and students' academic achievement ($r = 0.48$, $p < 0.01$). This shows that the higher the intensity of WhatsApp usage, the higher the students' academic achievement.

Linear regression analysis showed that the intensity of E-learning and WhatsApp usage together contributed significantly to students' academic performance ($F = 25.63$, $p < 0.01$).

**Comparison with Previous Research**

a. The results of this study are in line with previous research which shows that the use of E-learning and WhatsApp can improve student learning outcomes. Abdul Masri Purba, the results of his research the result of this study is that the application of communication media with WhatsApp groups is effective because it is one of the good alternatives used in the online learning process to enter learing. so that students become active in E-learning even though they are not face-to-face. and Aminah Zb with the results of her research is It is hoped that educators, especially lecturers and teachers, can use schoology-based E-learning assisted by WhatsApp Group as a solution or alternative to online learning amid the COVID-19 Pandemic.

b. Discussion of Findings
   a. The findings of this study indicate that the use of E-learning and WhatsApp has a significant positive impact on student academic achievement. This can be explained by several reasons:
   b. ***E***- E-learning and WhatsApp provide easy and quick access to information: Students can access learning materials, discuss with lecturers and classmates, and complete assignments through E-learning and WhatsApp. This can help students understand the learning materials and complete assignments better.
   c. g) E-learning and WhatsApp increase the flexibility of learning time and place: Students can study whenever and wherever they want by using E-learning and WhatsApp. This can help students manage their study time more effectively.

d. h) E-learning and WhatsApp improve communication and collaboration: E-learning and WhatsApp allow students to communicate and collaborate with lecturers and classmates easily. This can help students to study and complete assignments better.

c. Implications and Follow-up

The findings of this study have implications for universities in improving the effectiveness of using E-learning and WhatsApp in learning (Sara et al., n.d.). Universities need to ensure that E-learning and WhatsApp are easily accessed and used by students. Universities also need to provide training to lecturers and students on how to use E-learning and WhatsApp effectively in learning.

This research can be followed up in several ways:

a. Conduct research with a larger and more diverse sample.
b. Conduct research with a longitudinal design to determine the long-term effects of using E-learning and WhatsApp on students' learning.

With the emergence of e-learning and the shift of learning methods in schools from traditional paper-based to ICT-based ones, it is clear that information technology plays an important role in learning models (Purnmawati in Susatio Et Al., 2022). E-learning is generally defined as a learning process that utilizes and uses electronic media such as satellites, CD ROM, interactive TV, audio/video recordings, intranets, extranets, and the internet, both formally and informally (Septiani, Susatio et al., 2022).

**Interpretation of Results in the Form of Data Tabulation**

Table 2: Description of Sample Data

| **Age** | **Frequency** | **Persentase (%)** |
|---|---|---|
| | 18-21 | 140 |
| | 22-25 | 60 |
| Gender | Male | 100 |
| | Female | 100 |
| Fakulty | Faculty of Tarbiyah and Teaching Science | 50 |
| | Faculty of Sharia | 50 |
| | Faculty of Economics and Islamic Business | 50 |
| | Faculty of Ushuluddin Adab and Da'wah | 50 |
| Study Program | Islamic Religious Education | 25 |
| | Informatics Management | 25 |
| | Islamic Psychology | 25 |

Table 3: Intensity of Use of E-learning and WhatsApp

| Platform | Average (Hours) | Standard Deviation (Hour) |
|---|---|---|
| *E-learning* | 3.2 | 1.2 |
| WhatsApp | 2.8 | 1.1 |

Table 4: Correlation between Intensity of E-learning and WhatsApp Use with Student Academic Achievement

| Variable | Correlation (r) | Significance (p) |
|---|---|---|
| Intensity of E-learning Use | 0.52 | < 0.01 |
| Intensity of WhatsApp Use | 0.48 | < 0.01 |
| Variable | **Correlation (r)** | **Significance (p)** |

Table 5: Linear Regression of E-learning and WhatsApp Usage Intensity on Student Academic Achievement

| Variable | Regression Coefficient (B) | Significance (p) |
|---|---|---|
| Intensity of E-learning Use | 0.23 | < 0.01 |
| Intensity of WhatsApp Use | 0.18 | < 0.01 |
| R2 | 0.27 | < 0.01 |

**Data Interpretation**

Based on Table 1, it can be seen that the research sample consists of students aged 18-25 years with an almost equal proportion of men and women. Students come from various faculties and study programs.

Table 2 shows that the average intensity of E-learning use per day is 3.2 hours with a standard deviation of 1.2 hours. This shows that students quite often use E-learning in their learning process. The average intensity of WhatsApp usage per day is 2.8 hours with a standard deviation of 1.1 hours. This shows that students also use WhatsApp quite often to communicate and collaborate in their learning process.

Table 3 shows that there is a significant positive relationship between the intensity of E-learning usage and students' academic achievement ($r = 0.52$, $p < 0.01$). This shows that the higher the intensity of E-learning use, the higher the academic achievement of students. A significant positive relationship was also found between the intensity of WhatsApp usage and students' academic performance ($r = 0.48$, $p < 0.01$). This shows that the higher the intensity of WhatsApp usage, the higher the academic performance of students.

Table 4 shows that the intensity of E-learning and WhatsApp usage together contribute significantly to students' academic performance ($F = 25.63$, $p < 0.01$). The positive regression coefficient for the intensity of E-learning and WhatsApp use indicates that the higher the intensity of E-learning and WhatsApp use, the higher the students' academic achievement. The R2 value of 0.27 indicates that the intensity of E-learning and WhatsApp use explains 27% of the variation in students' academic performance.

**Impact of E-learning and WhatsApp Usage**

The findings of this study show that the use of E-learning and WhatsApp has a significant positive impact on students' academic performance. This can be explained by several reasons:

- E-learning and WhatsApp provide easy and fast access to information: Students can access learning materials, discuss with lecturers and classmates, and complete assignments through E-learning and WhatsApp. This can help students in understanding.

## CONCLUSION

This study aims to analyze the impact of using E-learning and WhatsApp on students' academic achievement in higher education. Based on data obtained from 200 students of Mahmud Yunus State Islamic University (UIN) Batusangkar, this study found several important facts.

The research sample consisted of a heterogeneous group of students aged 18–25 years with a balanced gender ratio. Participants were drawn from various faculties, including the Faculty of Tarbiyah and Teacher Training Sciences, Faculty of Sharia, Faculty of Economics and Islamic Business, and Faculty of Ushuluddin Adab and Da'wah, with study programs ranging from Islamic Religious Education and Informatics Management to Islamic Psychology and Islamic Tourism. The findings revealed a high intensity of E-learning and WhatsApp usage among students, with an average daily E-learning usage of 3.2 hours (SD = 1.2 hours) and WhatsApp usage of 2.8 hours (SD = 1.1 hours). Correlation analysis demonstrated a significant positive relationship between the intensity of E-learning and WhatsApp usage and students' academic performance. Specifically, the correlation coefficient for E-learning was 0.52, and for WhatsApp, it was 0.48, both with a significance level of $p < 0.01$. These results indicate that increased usage of these platforms is associated with higher academic achievement among students.

This finding is reinforced by the linear regression analysis. The results of the analysis showed that the intensity of E-learning and WhatsApp usage together contributed significantly to students' academic performance. This means that these two platforms have a mutually supportive influence in improving student learning achievement.

Theoretical Foundations and Comparison with Previous Research

This study aligns with previous research, such as those by Abdul Masri Purba and Aminah Zb, which highlight the positive impact of E-learning and WhatsApp on student learning outcomes. E-learning facilitates access to materials, offers flexibility in learning time, and promotes interactivity that enhances student understanding. Similarly, WhatsApp, as an instant communication tool, allows efficient collaboration and discussion among students, lecturers, and classmates, making the learning process more dynamic and collaborative. The findings of this study, supported by Subiyantoro and Ismail (2017), confirm that E-learning and WhatsApp significantly improve academic performance through various mechanisms. These include ease of information access, as E-learning allows students to access learning materials anytime and anywhere, providing flexibility to accommodate other commitments. Furthermore, the flexibility of time and place offered by both platforms enables students to study at their convenience with the availability of devices and internet connectivity. WhatsApp fosters effective communication and collaboration, facilitating discussions on learning materials, group assignments, and problem-solving. Additionally, the interactive nature of E-learning and the collaborative environment enabled by WhatsApp increase student motivation, making the learning process more engaging and enjoyable. Overall, the integration of E-learning and

WhatsApp in education creates a supportive and adaptable learning environment that significantly enhances student achievement.

## AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.
Author 2: Conceptualization; Data curation; In-vestigation.
Author 3: Data curation; Investigation.
Author 4: Formal analysis; Methodology; Writing - original draft.

## CONFLICTS OF INTEREST

The author(s) declare no conflict of interest.

## REFERENCES

Agrawal, S., & Krishna, S. M. (2024). Examining Procrastination in Online Learning Environments: Implications for Student Performance. *ACM Int. Conf. Proc. Ser.*, 126–131. Association for Computing Machinery. Scopus. https://doi.org/10.1145/3678392.3678411

Ahamad, S., Shaikh, N., Panda, S. N., Bansal, R., Tomar, A., & Shukla, S. S. (2023). Investigating the Impact of Social Media as a Tool for E-Learning in the Digital Era. Dalam Sunil J. & Benham A. (Ed.), *AIP Conf. Proc.* (Vol. 2587). American Institute of Physics Inc. Scopus. https://doi.org/10.1063/5.0150401

Aissani, R., Kaba, A., El-Refae, G. A., Wehbe, M. H., & Kanaan, H. (2023). Evaluating Distance Learning Experience During Corona Pandemic as Perceived by Media Students in Arab Universities. *Journal of Higher Education Theory and Practice*, *23*(4), 239–254. Scopus. https://doi.org/10.33423/jhetp.v23i4.5904

ALTINAY, F., BAHCELERLI, N. M., SHARMA, R. C., ATAMTURK, N., ALTINAY, Z., DAGLI, G., & ALTINAY, M. (2024). LEARNING LIFE SKILLS THROUGH MULTICULTURAL EXCHANGE: AN EXAMINATION OF PROSPECTIVE ENGLISH LANGUAGE TEACHERS' EXPERIENCES. *Turkish Online Journal of Distance Education*, *25*(3), 294–309. Scopus. https://doi.org/10.17718/TOJDE.1356342

AlZaabi, A. (2023). How Did We Deliver Team-Based Learning (TBL) Remotely to Overcome Digital Divide and Internet Access Inequality? *International Journal of Emerging Technologies in Learning*, *18*(17), 113–125. Scopus. https://doi.org/10.3991/ijet.v18i17.35633

Anzano-Oto, S., Vázquez-Toledo, S., & Latorre-Cosculluela, C. (2023). Digital reality in Compulsary Secondary Education: Uses, purposes and profiles in social networks. *New Review of Information Networking*, *28*(1–2), 26–48. Scopus. https://doi.org/10.1080/13614576.2023.2219244

Böck, F., Landes, D., & Sedelmaier, Y. (2023). Improving Learning Motivation for Out-of-Favour Subjects. Dalam Jovanovic J., Chounta I.-A., Uhomoibhi J., & McLaren B. (Ed.), *International Conference on Computer Supported Education, CSEDU - Proceedings* (Vol. 1, hlm. 190–200). Science and Technology Publications, Lda. Scopus. https://doi.org/10.5220/0011841400003470

Choudhury, S., Senapati, C., & Sarma, N. N. (2023). Management education in technology-mediated ODL platform – implications for educators in context of shifting learning path and digital divide. *Asian Association of Open Universities Journal*, *18*(2), 144–159. Scopus. https://doi.org/10.1108/AAOUJ-08-2022-0117

Dei, D.-G. J., Kankam, P., Anane-Donkor, L., Peasah, T. E., & Puttick, C. P. (2023). Strategies for enrolment management in private universities in Ghana during the COVID-19

pandemic. *International Journal of Educational Research Open*, *5*. Scopus. https://doi.org/10.1016/j.ijedro.2023.100294

Enakrire, R. T. (2024). The usefulness of computer skills for enhanced teaching and learning among lecturers in an open distance e-learning (ODEL) environment. *Education and Information Technologies*, *29*(13), 16597–16612. Scopus. https://doi.org/10.1007/s10639-024-12519-z

Espino, A. M. E., Nunez, J. H., Moscoso, B. B., Alvitez, A. R., Ynjante, O. R. E., Perez, W. C., … Choquecota, J. Q. (2023). Forms of participation and learning of mathematics in virtual workgroups in engineering students. Dalam da Rocha Brito C. & Ciampi M.M. (Ed.), *EDUNINE - IEEE World Eng. Educ. Conf.: Reimaging Eng. - Toward Next Gener. Eng. Edu., Merging Technol. A Connect. World, Proc.* Institute of Electrical and Electronics Engineers Inc. Scopus. https://doi.org/10.1109/EDUNINE57531.2023.10102904

Faizan, M., Barsha, S., Eqbal, N., & Munshi, S. A. (2023). Blended Learning vs. E-learning: Determining the Best Mode of Education from the Perspective of the Learners. *DESIDOC Journal of Library and Information Technology*, *43*(1), 30–38. Scopus. https://doi.org/10.14429/djlit.43.1.18620

Fazriyah, L., & Kusrohmaniah, S. (2023). Student perception of online learning activities during COVID-19 pandemic: Psychological constraints and factors. *International Journal of Evaluation and Research in Education*, *12*(3), 1542–1549. Scopus. https://doi.org/10.11591/ijere.v12i3.25382

Gawade, S., Hegde, G., Marulkar, P. S., & Bhansali, A. (2023). Impact of Social Media Like WhatsApp for Education Domain. *Int. Conf. Inf. Syst. Comput. Networks, ISCON*. Dipresentasikan pada 2023 6th International Conference on Information Systems and Computer Networks, ISCON 2023. Institute of Electrical and Electronics Engineers Inc. Scopus. https://doi.org/10.1109/ISCON57294.2023.10111966

Hawamdeh, M., Al-Nassan, S. M., Obaidat, S. M., Shallan, A., Hawamdeh, Z. M., Eilayyan, O., … Alanazi, F. (2023). The Relationship Between Using Smartphones andText Neck Syndrome in Online Learning Among University Students in Jordan: A Survey Study. *Ortopedia, Traumatologia, Rehabilitacja*, *25*(6), 315–320. Scopus. https://doi.org/10.5604/01.3001.0054.2883

Hidayah, R. N., & Wiyono, K. (2024). STEM-Based Sound Wave E-learning for High School Students Collaboration Skills. Dalam Putri R.I.I., Hartono null, Bos R., Trundle K., Shahrill M., Meilinda null, & Kurniawan D. (Ed.), *AIP Conf. Proc.* (Vol. 3052). American Institute of Physics. Scopus. https://doi.org/10.1063/5.0201015

Kadir, R. A., Zulkifli, M. F., Tiun, S. B., Lakulu, M. M., Jusoh, S., & Faudzi, A. F. A. (2024). EduChat: AI-Powered Chatbot with Personalized Engagement for Online Learning. Dalam Arai K. (Ed.), *Lect. Notes Networks Syst.*: *Vol. 824 LNNS* (hlm. 589–597). Springer Science and Business Media Deutschland GmbH. Scopus. https://doi.org/10.1007/978-3-031-47715-7_40

Khaskheli, A., Jiang, Y., Raza, S. A., & Qamar Yousufi, S. (2024). Social isolation & toxic behavior of students in e-learning: Evidence during the time of the COVID-19 pandemic. *Interactive Learning Environments*, *32*(5), 1924–1943. Scopus. https://doi.org/10.1080/10494820.2022.2133145

Méndez, M. T., Solís, I. R., & Gonzalez, J. C. (2023). Comparative Analysis of Virtual Teaching-Learning and In-Person Teaching-Learning 2019-2022: Ricardo Palma University, Lima, Peru. Dalam Callaos N., Horne J., Ruiz-Ledesma E.F., Sanchez B., & Tremante A. (Ed.), *CICIC - Decima Terc. Conf. Iberoam. Complejidad, Informatica Cibern. Context. Int. Multi-Conf. Complex., Inform., Cybern., IMCIC - Mem.* (hlm. 72–78). International Institute of Informatics and Systemics, IIIS. Scopus. https://doi.org/10.54808/CICIC2023.01.72

Mervyn Hsin, J. W., Mohamed, M. A. B., Mohd Yazit, R. N. S. B. R., & Ho, J. C. Y. (2023). Challenges Faced by Students in Online Architectural Design Studio During COVID-19 Pandemic: Universities in Sarawak. Dalam Nia E.M., Ling L., Awang M., & Emamian S.S. (Ed.), *Lect. Notes Civ. Eng.* (Vol. 310, hlm. 81–91). Springer Science and Business Media Deutschland GmbH. Scopus. https://doi.org/10.1007/978-981-19-8024-4_7

Mukhter, I., Choudhary, R., Ganie, A. U. R., & Mukhter, S. S. (2023). The Scope and Challenges of Learning Through Social Media Sites During the Pandemic: What Really Matters. Dalam *Pandemics in the Age of Soc. Media: Inf. And Misinformation in Developing Nations* (hlm. 172–188). Taylor and Francis. Scopus. https://doi.org/10.4324/9781003315278-10

Nkonki, V., Tsipa-Booi, N., & Mqukuse, B. (2023). Student Perspectives on WhatsApp Support for Developing School Experience e-Portfolios on Google Sites. Dalam Johnston S.J. & Singh S. (Ed.), *Proc. Eur. Conf. E-Learn., ECEL* (Vol. 2023-October, hlm. 219–225). Academic Conferences and Publishing International Limited. Scopus. Diambil dari https://www.scopus.com/inward/record.uri?eid=2-s2.0-85179135170&partnerID=40&md5=bee977ff5d4ae092811fc0ec4cd817d5

Obaidat, I., Al-zou'bi, A., Mughaid, A., & Abualigah, L. (2023). Investigating the cyberbullying risk in digital media: Protecting victims in school teenagers. *Social Network Analysis and Mining*, *13*(1). Scopus. https://doi.org/10.1007/s13278-023-01152-2

Parmar, P., Mada, P., Reddy, D., & S, Y. (2024). Effectiveness of App Based Learning in Forensic Medicine—Perceptions of Students. *Journal of Punjab Academy of Forensic Medicine and Toxicology*, *24*(1), 93–97. Scopus. https://doi.org/10.5958/0974-083X.2024.00015.9

Putri, R. I. I., & Hartono, Y. (2024). Designing PISA-Based Numeracy Problem on Shape and Space Using Palembang Tourism During Covid-19 Context. Dalam Putri R.I.I., Hartono null, Bos R., Trundle K., Shahrill M., Meilinda null, & Kurniawan D. (Ed.), *AIP Conf. Proc.* (Vol. 3052). American Institute of Physics. Scopus. https://doi.org/10.1063/5.0201035

Ravana, V., Yue, W. S., Palpanadan, S. T., Noranai, Z., Harun, H., Ibrahim, M. Y., & Bosro, M. Z. M. (2024). A Scoping Review: Developing a Collaborative Learning Culture for ESL Learners. Dalam Razak R.A., Abdullah M.M.A.B., Rahim S.Z.A., Rosli M.F., J. S., & Tahir M.F.M. (Ed.), *AIP Conf. Proc.* (Vol. 2799). American Institute of Physics. Scopus. https://doi.org/10.1063/5.0183217

Rhongo, D. L., & da Piedade, B. (2024). E-Student in the Mozambican Context: An Analysis of Higher Education Students' Challenges Regarding to E-learning Implementation. Dalam Auer M.E., Vidal E.V., Cukierman U.R., & Caro E.T. (Ed.), *Lect. Notes Networks Syst.*: *Vol. 899 LNNS* (hlm. 343–354). Springer Science and Business Media Deutschland GmbH. Scopus. https://doi.org/10.1007/978-3-031-51979-6_36

Rido, A., Prakoso, B. H., Perez-Amurao, A. L., Kuswoyo, H., Purba, M., Siswanto, H. W., … Sari, N. (2023). Exploring Synchronous and Asynchronous Technological Applications and Challenges in Online English Language Classrooms in Indonesia and Thailand. *Proc. Int. Conf. Educ. Technol. ICET*, 30–35. Institute of Electrical and Electronics Engineers. Scopus. https://doi.org/10.1109/ICET59790.2023.10434971

Sawalha, A., Alkhawaldeh, A., Betoush, N., Amaireh, L., Alhassan, M., & Hawamleh, M. A. (2023). Social Networks Competency in Education Among Working Civil Engineering Students. *Proc. - Int. Conf. Soc. Networks Anal., Manag. Secur., SNAMS*. Dipresentasikan pada Proceedings - 2023 10th International Conference on Social Networks Analysis, Management and Security, SNAMS 2023. Institute of Electrical

and Electronics Engineers Inc. Scopus. https://doi.org/10.1109/SNAMS60348.2023.10375404

Shah, S., Mahboob, U., Junaid, S. M., Siddiqui, S., Jamil, B., & Rehman, S. (2024). Challenges faced by teachers of postgraduate health professions blended learning programs: A qualitative analysis. *BMC Medical Education*, *24*(1). Scopus. https://doi.org/10.1186/s12909-024-05213-8

Sil, A., Das, A., Patra, A. C., Kumar, R., Pandhi, D., De, D., … Das, N. K. (2023). Impact of COVID-19 pandemic on dermatology teaching program in India: A survey on the faculty and residents' perspective. *Indian Dermatology Online Journal*, *14*(5), 643–652. Scopus. https://doi.org/10.4103/idoj.idoj_85_23

Tsani, I., & Nisa', A. L. (2023). Evaluation of Academic Atmosphere Formation in Islamic Junior High School Through Digital Learning System. *Munaddhomah*, *4*(2), 352–367. Scopus. https://doi.org/10.31538/munaddhomah.v4i2.436

Wajahat, S. (2024). E-learning experiences of students in Pakistan during COVID-19: Barriers and perceptions. *E-Learning and Digital Media*, *21*(1), 1–23. Scopus. https://doi.org/10.1177/20427530231217945

Zhang, S., Ming, X., Zhang, M., Zeng, D., Zhou, X., & Zhang, X. (2025). The Relationship Between Campus Bullying and Anxiety in Chinese Students With or Without Developmental Dyslexia: The Moderating Role of Self-Confidence. *Dyslexia*, *31*(1). Scopus. https://doi.org/10.1002/dys.1794

Zhao, R. B., & Chang, Y.-C. (2019). Students' Family Support, Peer Relationships, and Learning Motivation and Teachers Fairness Have an Influence on the Victims of Bullying in Middle School of Hong Kong. *International Journal of Educational Methodology*, *5*(1), 97–107. https://doi.org/10.12973/ijem.5.1.111