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GLOBAL ACADEMIC EXCELLENCE

IMPACT OF E-LEARNING ON THE ACADEMIC PERFORMANCE OF UNIVERSITY STUDENTS

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Abstract:

E-learning has recently grown in importance and usage among educational institutions worldwide due to the expansion of internet technology. Web-based learning, online learning, dispersed learning, computer-assisted education, and internet-based learning are all used to describe e-learning. E-learning is an online learning platform that gives users, or students access to information or expertise. Because e-learning is intangible and digital, poor time management, the learning model's newness and the lack of physical monitoring of students' progress can lead to university students failing academically. Thus, this study aims to determine the effect of e-learning on students' academic performance. A quantitative survey-based research approach is used in this study. The populations in this study are STML final-year students in UUM. The methodology used a quantitative questionnaire type of Google form with a total sample of 150 people. A Google form survey was distributed via Telegram, WhatsApp, and Facebook to collect the information from respondents. The data analysis technique used in this study is Statistical Product and Service Solutions (SPSS). Based on the findings of this research, e-learning was determined by four aspects (usability, easy-to-use, quality of education system, and quality of information). The results show that e-learning has a positive relationship with academic performance. Also, the results across gender, age groups, and academic programs demonstrate no significant differences in academic performance under e-learning.

Keywords:

E-learning, Academic Performance, University Student

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Introduction

The development of communication and information technology has impacted our lives. With the development of ICT, the term "e-learning" describes the acquisition, use, dissemination, and distribution of knowledge through electronic methods (Almaiah et al., 2020). E-learning is also known as distributed learning, web-based learning, internet-based learning, online learning, or computer-assisted education. In essence, it is an online learning platform that provides users or students with access to knowledge. In e-learning, geographical proximity is not a consideration.

Traditional face-to-face training has been significantly negatively impacted by the pervasive coronavirus (COVID-19) outbreak. Nations have been obliged to use various methods in response to the COVID-19 pandemic, including avoiding big gatherings and preserving social seclusion. As a result, authorities moved fast to substitute distant learning conducted through various digital platforms for conventional face-to-face instruction (Amir et al., 2020). For instance, most universities advise students to use social media platforms like Facebook, Twitter, and Microsoft Teams or free interactive online tools like Zoom and Google Classroom for online learning (Dhawan, 2020).

UUM encourages students and professors to use e-learning tools for learning and teaching. The e-learning tools supported by UUM are divided into official and unofficial. The official e-learning tools include Webex Meet and UUM Online Learning, while the unofficial ones include ZOOM, YouTube Video, Google Meet, and Microsoft Teams. These e-learning platforms use internet-based learning to support students of UUM to study in any possible way.

However, e-learning has the potential to negatively affect a university student's morals, academic performance, and social life. The education system is also likely to be exposed to piracy or plagiarism since it is challenging to monitor improper disciplinary behaviour, such as student cheating, which immediately results in subpar academic performance and educational waste. Additionally, the use of e-learning techniques by universities makes it impossible for students to study many branches of science that need a physical presence, such as running lab experiments or undergoing intense training (Achuthan et al., 2021).

Therefore, this study aimed to determine the effect of e-learning on university students' academic performance. There is no alternative to using online learning and teaching platforms for lecturers and students. Students can contribute content to social media sites like Facebook to start conversations (Kent, 2016). These activities significantly influence the academic performance of a student in the university. Students need help to achieve their full potential and develop their abilities. Even if the content needs to be more prepared, the way it is distributed is problematic. Students need help to participate or ask questions in an online class actively. Education professionals are interested in learning how e-learning differs from conventional academics regarding how well students do. The answer can only be found by analyzing student academic performance.

Research Questions

1. Are students able to perform excellently by using e-learning?
2. What is the relationship between the use of e-learning and the academic performance of university students?

International Journal of Modern Education
IJMOE
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3. Are there any significant differences in academic performance under e-learning across gender, age groups, and academic programs?

Research Objectives

1. To study the effects on the academic performance of university students through the use of e-learning.
2. To investigate the relationship between the use of e-learning and the academic performance of university students.
3. To examine whether there are any significant differences in academic performance under e-learning across gender, age groups, and academic programs.

Scope of the Study

Technology has grown so quickly; students may now feel as though they are in a classroom by using e-learning to cross geographic barriers. E-learning allows students to distribute resources in several formats, including slideshows, PDFs, videos, and Word documents. Students can host webinars and connect with lecturers via chat and message boards. Thus, this research will determine the impact of e-learning on university students' academic performance. This study will use quantitative methods and focus on students, mainly to understand the impact of e-learning on their academic performance. The study covered one hundred fifty (150) university students from a sample of students from University Utara Malaysia. One hundred and fifty (150) undergraduate students from the School of Technology Management and Logistics (STML) will participate in the study, including 50 with a bachelor's degree in operations management, 50 with a bachelor's degree in technology management, and 50 with a bachelor's degree in logistics management's final year student. Participants in the study were randomly selected. The researcher chose UUM because the researcher studied at UUM. The information collected in this study is mainly from the collection of statistical data and data links through quantitative techniques to achieve the research results.

First, this study will show whether e-learning impacts university students' academic performance. E-learning can bring good and bad effects. These influences will greatly affect the academic performance of university students and make it difficult for them to continue their studies or have good job opportunities in the future. In addition, the study also shows the extent to which demographic characteristics affect university students' academic performance, particularly whether gender, age group, and academic program affect academic performance differently. Academic performance sometimes differs between males and females. Academic performance also sometimes varies by age. Some academic programs rely primarily on communication and information technology, while others require a physical presence, making it difficult to teach using e-learning models. Therefore, e-learning has different effects on different academic performances.

The findings of this study are noteworthy because they give insight into features of e-learning and academic performance that will aid future research efforts in these areas. Again, the research gives knowledge and guidance that policymakers may find helpful. As a result, planners and other social scientists will benefit greatly from this study. Finally, the results of this study will provide future researchers with a conceptual framework for predicting how e-learning affects UUM students' academic performance on factors such as gender, age group, and academic program. Future researchers will be able to conduct studies to determine the effectiveness of these aspects and work toward remedies after discovering them.

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Literature Review

E-learning

E-learning, often known as online or electronic learning, is the learning process using electronic media and technology. Despite having a base in formal education, e-learning is delivered online via electronic devices like computers, tablets, and even mobile phones. Users may quickly learn whenever they want, wherever they are, with few restrictions because of this (Pauline Chitra et al., 2018).

E-learning is a fresh choice that can assist students in learning about the epidemic. Instructors must film lectures using internet platforms throughout the lockdown and social seclusion, and students must view the recordings. As an alternative, e-learning tools like Zoom, Webex, and Google Classroom enable interaction and communication between students and teachers. The utilization platform has replaced more conventional approaches that can involve students directly.

Using this teaching strategy will help make lessons successful, according to studies on the effects of e-learning apps on learning and creativity. Modern teaching and learning theories have changed the curriculum's focus from instruction to student-centred learning. Modern individuals may also employ cutting-edge teaching and learning techniques to break away from location and time constraints, thanks to the advent of new communication technologies. There are six primary forms of e-learning (Rawashdeh et al., 2021). The following list of the six types:

1. E-learning without electronic connectivity but with a physical presence (face-to-face)
2. Electronic communication and presence-free e-learning (self-study)
3. Electronic communication and distance learning using the internet (asynchronous)
4. Electronic communication and virtual presence in e-learning (synchronization)
5. Hybrid/hybrid asynchronous e-learning with sporadic presence and electronic communication
6. Online education and simultaneous hybrid/hybrid electronic communication

Academic Performance

Academic performance is influenced by how hard students study for tests. Several variables influence students' academic performance (Eze et al., 2016). Academic performance is evaluated using the overall average grade and the average grades from the preceding semesters. The Cumulative Grade Point Average is widely used to evaluate a student's performance in light of their success in various classes and academic areas.

Students' capacity to exhibit the knowledge they have learned in tests, quizzes, assignments, presentations, and final exams determines their academic performance (Barkley, 2004). The value of student academic performance is clear to both students and institutions since it verifies the efficacy of their educational programs. Additionally, views of one's skills and abilities are linked to improved performance (Vartika Kashyap, 2019).

Two elements or variables influence a student's academic performance. These variables include both internal and external variables. They have a significant impact on students' academic performance. Students' English proficiency, class size, timetable, test results, textbooks, assignments, learning facilities, class atmosphere, teacher's role in the class, innovations used in the class, and the testing system are among the internal components of the classroom.

International Journal of Modern Education
IJMOE
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Extracurricular activities, family troubles, employment and financial concerns, social and unique challenges, and other factors all fall under external variables.

According to research, a variety of factors affect students' academic performance. Students' academic performance may be impacted by, among other things, disparities in academic programs, gender, and age (Martí-Ballester, 2019).

Gender

Gender is often categorized as either female or male, despite variances in the biological traits that make up gender and how those traits are represented. Gender is also used to refer to the socially created roles, behaviours, and identities given to men, women, and people of all genders. It affects how people behave and interact with one another, how they see themselves and other people, and how the distribution of power and resources in society. Gender made no difference in academic performance. The results of students' standardized scientific tests were unaffected by gender inequalities.

However, as Parsons et al. (2018) demonstrated, males outperformed women in some situations, and women outperformed men in others. In science, male students performed better than female students, but female students performed significantly better in reading and writing. However, data on education reveal that female students do better than male students and get greater degrees at all levels of the educational system. Female students outperformed male students in class because they were more committed to their studies and consequently less likely to miss class. There is conflicting evidence regarding how gender inequalities affect students' academic performance. It is necessary to determine whether any significant differences between undergraduate male and female students that are reflected in their academic performance.

Age

Age is determined by calculating the amount of time (often in whole years) that has passed between a person's birth date and a specific moment (e.g. date of a particular survey). Cognitive growth and maturity (related to age) are required for students to perform well. As people age, several developmental developments are frequently impacted. It also impacts several human performance domains (Ukueze, 2007).

According to research, older students are more adept at managing their time. Meanwhile, these studies showed that older students were more likely to be successful in online courses, while other studies found no significant difference in age at the successful completion of online courses (Akpom, 2013).

Academic Program

A collection of courses and associated activities that have been given a particular Classification of Instructional Programs (CIP) code and are organized towards the accomplishment of specific learning outcomes as determined by the university constitute an academic program. The comprises degree, major, minor, certificate, concentration, and speciality programs at the undergraduate, graduate, and professional levels (Sutherland & Hall, 2018).

Bachelor's degree programs are the second tier of academic courses. These typically require 120 semester hours to finish or about four years. Those looking for Bachelor's degrees have

International Journal of Modern Education
IJMOE
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access to various programs and subject areas. Some of them provide science degrees (Grayson, 2004). Others are accessible in various industries, including business, education, and others. The impact of academic performance on undergraduate students' academic programs must be investigated.

Theoretical Framework

Constructivism Theory

Constructivism holds that by having experiences and reflecting on them, people develop their knowledge and understanding of the world. When learning anything new, students interpret it based on their prior understanding and experiences. They might revise their opinions or disregard the new information as unimportant. Nevertheless, students need to be able to research, evaluate, and ask questions to be active knowledge-makers. In the constructivist method of instruction, students are encouraged to use active learning techniques to broaden their knowledge and assess their comprehension. These techniques include experiments and real-world problem-solving utilizing data (Etmer & Newby, 2008).

Self-directed learning (SDL), a teaching-learning approach supported by constructivism as an educational philosophy, is anticipated to be employed in e-learning. According to the constructivist ideology, learning is an active process that involves personal experience, maturity, and engagement with one's environment. This perspective sets itself apart from objectivism by considering the learner a passive recipient of information (Etmer & Newby, 2008).

Student academic performance in e-learning may be lower than in a packed teaching style based on objectivist educational philosophy, except in a planned approach involving the efforts and studies for the enjoyment of the self-learner. In addition to providing material, the SDL instructor is prepared to coach students and support their development (Lee et al., 2008). Through the use of self-regulated learning, students design a whole learning process that covers problem perception, adoption, and alternative appraisal (Lee, 2006).

Facilitation Theory (The Humanist Approach)

A pioneer of the learning theory is Carl Rogers. The primary concept of this theory is that individuals can learn because they have a "natural willingness to learn" and because they are both in control of and essential to the learning process (person-centred learning). Participants must be motivated and eager to learn for e-learning to succeed, regardless of their educational location. The lecturer's job is to serve as a facilitator; only an amount of lecturer effort can ensure success if the student has a desire and aptitude for learning (Holbrook et al., 2022).

The idea that modifying one's self-concept is a critical learning component is an intriguing contribution of Rogers' Facilitation Theory. These adjustments entail identifying one's strengths or weaknesses. The learners must perceive the ability to acquire knowledge through the e-learning system in the e-learning setup. A renewed sense of oneself helps to consolidate learning since it gives the learner the confidence or updated perspective to pursue a goal skill. The non-direct facilitative approach's underlying premise is that students can find the information independently (teachers only assist in the process), which minimizes the importance of information transfer and teaching function (Holbrook et al., 2022).

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Walberg's Theory

The theory of educational production put out by Walberg in 1981 is one of the few theories of academic performance that has been empirically tested. According to Walberg's theory of academic success, some students' psychological traits and the psychological environments they have located impact learning outcomes (cognitive, behavioural, and attitudinal) (Reynolds & Walberg, 1992). Walberg's research also identified nine essential factors that have a significant impact on learning outcomes, including student aptitude or prior achievement, motivation, age or developmental stage, quantity and quality of instruction, classroom climate, family environment, peer group, and exposure to media outside of the classroom (Walberg et al., 1986).

The student's attributes are reflected in the first three factors, ability, drive, and age. The last four variables (psychological environment) include peer group, family environment, classroom atmosphere, and media exposure. The fourth and fifth variables reflect instruction (quantity and quality) (DiPerna et al., 2002). Student characteristics unquestionably contribute significantly to academic success, but they only account for a small portion of the learning process.

Conceptual Framework

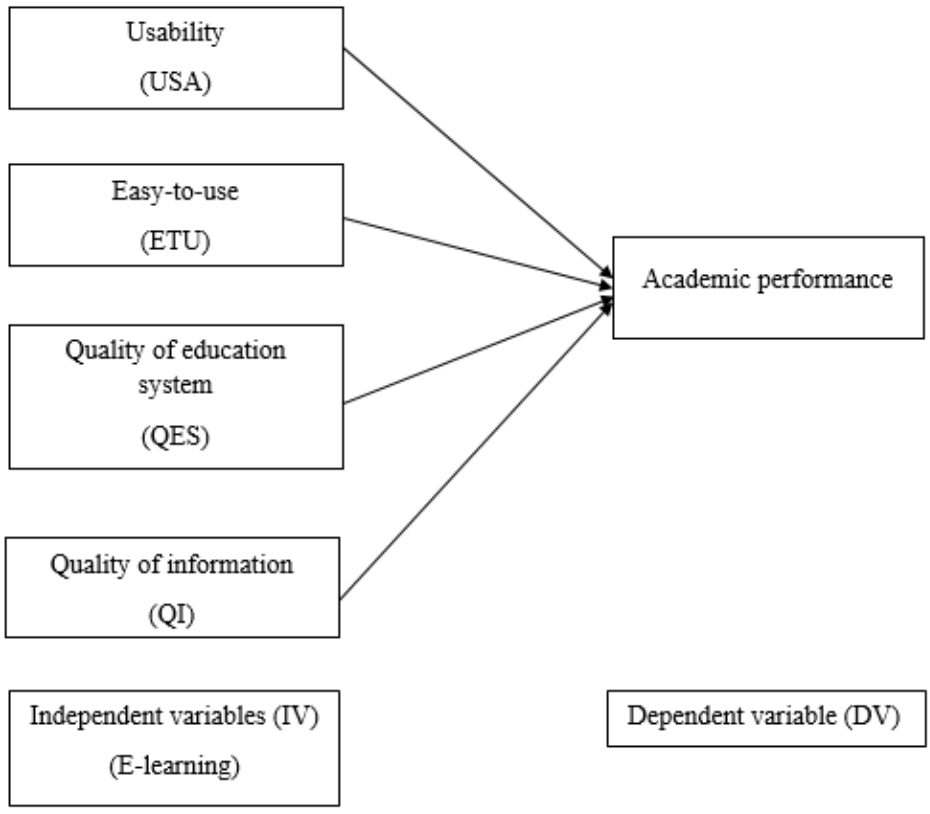

Figure 1: Theoretical Model

Hypothesis

According to the above theoretical framework, it is postulated that the dependent variable of students' academic performance is influenced by e-learning. Four hypotheses (H1, H2, H3, and H4) make this study distinctive from others.

International Journal of Modern Education
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According to research by Salamat et al. (2018), using the e-learning technique has a positive effect on students' academic performance. Because of some things, including the ease with which e-learning allows one to acquire a tremendous amount of knowledge with less time and effort and provides more learning flexibility while taking into account individual features. However, Tegegne's (2014) study revealed no differences in students' academic performance between traditional learning and learning that was enhanced by ICT. Thus, given the above discussion, the hypotheses can be developed as follows:

H1: There is a relationship between e-learning and academic performance.

H1.1: There is a relationship between usability and students' academic performance.
H1.2: There is a relationship between easy-to-use and students' academic performance.
H1.3: There is a relationship between the quality of the education system and students' academic performance.
H1.4: There is a relationship between the quality of information and students' academic performance.

Sometimes there are intellectual differences between males and females. According to research by Basri et al. (2018), females do academically better than males while utilizing e-learning. However, research by Kumar & Bajpai (2015) discovered that males excel in the classroom. Accordingly, the following hypothesis is developed:

H2: There are significant differences in academic performance under e-learning across gender.
Given that online learning may be an appealing learning format for adults and lifelong learners, recognizing the various substantial age ranges may help. The findings of Rizvi et al. (2019) indicate that age has a marginally significant impact on the overall learning outcomes of online learning. This study proposes the following hypothesis:

H3: There are significant differences in academic performance under e-learning across age groups.
While some academic programs heavily use communications and IT, others require in-person instruction and need to be better adapted to online learning. According to a study by Tegegne (2014), there is no statistically significant difference in how basic mathematics is taught online and in person regarding how well students succeed. The study of Basri et al. (2018) demonstrates that students in programs other than computer programming depend more on technology. Hence e-learning has a more significant impact on those students. As a result, e-learning will have a more considerable effect on other programs. Thus, given the above discussion, the hypothesis can be developed as follows:

H4: There are significant differences in academic performance under e-learning across academic program.

Methodology

The research methodology of this research will include the questionnaires distributed to hundred and fifty (150) undergraduate final-year students from the School of Technology Management and Logistics (STML), including 50 with a bachelor's degree in operations management, 50 with a bachelor's degree in technology management, and 50 with a bachelor's degree in logistics management's final year student. This study will use quantitative methods

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IJMOE
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to obtain data and information for analysis and to improve the reliability of the study. The researchers used the quantitative research method and provided it to respondents through an online survey or questionnaire, including WhatsApp and Telegram. The questionnaires are a popular and the most effective tool employed by researchers to collect data. The questionnaire consists of three parts: Section A is based on the demographic profile. Section B is the usage of online learning platforms (e-learning), and section C is the measurement of academic performance. Respondents were asked to choose their answers in sections B and C based on a six-point Likert scale from 1 to 6. After data is collected and it will be calculated using statistical analysis software such as SPSS 26 to analyze the data.

Results and Discussion

The primary data for this study was gathered using a tool in the form of a questionnaire. It was aimed at 150 STML final-year students at University Utara Malaysia (UUM). One month of data collection was carried out from November 16 to December 16, 2022. There were distributed and useable questionnaires from a total of 150. Table 1 provides an overview of the respondents' demographic characteristics and includes graphics to describe the data further.

This study's respondent has mainly focused on STML final-year students. Therefore, the data collection result should be 100% of STML final-year students as research respondents, mostly coming from semester seven and above (89.3%). The majority of respondents in the research can be said to be female (71.3%), more than male (28.7%). Based on race, respondent Malay (48%) has more than other respondents, which is Chinese (39.3%), Indian (10.7%), and other race (2%). In this research, the respondents often use online learning platforms in their daily routine (41.3%).

Respondent's Demographic (N = 150)		Frequency	Percent
Gender			
	Male	43	28.7
	Female	107	71.3
Age			
	18 – 19	0	0
	20 – 21	3	2.0
	22 – 23	118	78.7
	24 and above	29	19.3
Race			
	Malay	72	48.0
	Chinese	59	39.3
	Indian	16	10.7
	Other - Thai	1	0.7
	Bumiputera Sabah	2	0.14
Semester			
	Semester 1 - 2	0	0
	Semester 3 – 4	0	0
	Semester 5 – 6	16	10.7
	Semester 7 and above	134	89.3
Academic program			
	Operations management	50	33.3
	Logistics management	50	33.3

International Journal of Modern Education
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	Technology management	50	33.3
Frequency use online learning platforms in daily routine			
	Rarely	9	6.0
	Sometimes	30	20.0
	Often	62	41.3
	Always	49	32.7

Table 1: Summary of Respondents' Demographic

Factor Analysis and Reliability Analysis

Factor analysis was used to divide many variables into more manageable categories (Kyriazos, 2018). After completing the data-gathering procedure, factor analysis was used to evaluate the internal consistency of the measurement model.

For the first run of factor analysis, one item of usage of an online learning platform (ETU 5 = using an online learning platform will be accessible even after the start of face-to-face classes.) was deleted since it was found to encounter a communality value of 0.414 which was lower than 0.50 required. Cronbach's alpha score of between 0.780 and 0.819 is an acceptable degree of reliability (see Table 2).

Aspect	Item Deleted	Number of items after deleted	KMO Test	Factor Loading	Total Variance Explained (%)	Reliability
Usability	-	5	0.756	0.527-0.813	54.816	0.786
Easy-to-use	ETU5	4	0.746	0.719-0.834	60.605	0.780
Quality of Education System	-	5	0.826	0.726-0.832	62.430	0.846
Quality of information	-	5	0.808	0.713-0.788	58.335	0.819

Table 2: Factor Analysis and Reliability Test for Independent Variable

For the first run of factor analysis, one item of measurement of students' academic performance (AC4 = using e-learning allows me to interact with friends and work together on assignments) was deleted since it was found a communality value of 0.334, which was lower than 0.50 required. Each factor's Cronbach's alpha obtained a reasonable level, ranging from 0.615 to 0.768, proving the scale's dependability (see Table 3).

International Journal of Modern Education
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IJMOE
Volume 5 Issue 18 (September 2023) PP. 57-74
DOI: 10.35631/IJMOE.518005

Aspect	Item Deleted	Number of items after deleted	KMO Test	Factor Loading	Total Variance Explained (%)	Reliability
Personal Academic Achievement	-	4	0.757	0.559-0.672	59.035	0.768
Achievement Coursework	AC4	3	0.623	0.516-0.695	56.754	0.615
Academic Skill	-	4	0.654	0.527-0.692	47.692	0.631

Table 3: Factor Analysis and Reliability Test for Dependent Variable

Descriptive Statistics

The mean and standard deviation values were included in the descriptive statistics for this investigation. As mentioned in the section above, a six-point Likert scale was used to evaluate each variable. Table 4 displays an overview of the variables' descriptive statistics.

Constructs	Mean	Std. Deviation
Usability	5.0040	0.60887
Easy-to-use	5.0367	0.64336
Quality of education system	5.0467	0.62795
Quality of information	5.0067	0.59457
Academic performance	5.0894	0.48071

Table 4: Descriptive Statistics of the Variables

The mean scores for usability, easy-to-use, quality of education system, and quality of information varied from 5.00 to 5.05. All statements stated the agreed point. Another intriguing finding is that usability has the lowest mean score (5.00), although the quality of the education system has the most excellent mean (5.05). Using a six-point Likert scale suggests that students still believed that the e-learning was carried out precisely as they had anticipated. The academic performance is rated as agreed by respondents; the range is 5.09, which is the same as the results for independent variables. However, overall mean scores of independent and dependent variables are considered statement agree. Thus, this shows that students can perform excellently by using e-learning.

Test of Normality

According to the table above results, the data had skewness of usability, easy-to-use, quality of education system, quality of information, and academic performance are -0.070, -0.404, -0.261, -0.225, and 0.087 respectively, and kurtosis of between -0.302 and -0.694, respectively. According to Curran et al. (1996), the data are deemed normal when the skewness is between 0 and +/- 1.99, and the kurtosis is between 0 and +/- 6.99. Because data tests for all variables were standard, they may be applied to additional statistical analysis, including parametric analysis and tests for linear regression.

International Journal of Modern Education
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IJMOE
Volume 5 Issue 18 (September 2023) PP. 57-74
DOI: 10.35631/IJMOE.518005

Construct	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Usability	-0.070	0.198	-0.694	0.394
Easy-to-use	-0.404	0.198	-0.302	0.394
Quality of education system	-0.261	0.198	-0.384	0.394
Quality of information	-0.225	0.198	-0.396	0.394
Academic performance	0.087	0.198	-0.640	0.394

Table 5: Result Summary of Normality Test

Independent Simple T-test

An independent-sample t-test's hypothesis testing involves determining if two population means are identical. Compare the independent-samples t-test computed results to the samples t-test tabled values (Mishra et al., 2019).

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Academic performance	Equal variances assumed	2.341	.128	-.245	148	.807
	Equal variances not assumed			-.231	69.077	.818

Table 6: Independent Samples T-Test On Academic Performance Across Gender

According to the results of Leven's test for equality of variance, there is no discernible difference in the variance of academic performance. The p-value of the variances test (0.128) is higher than the 0.05 cut-off for conventional significance. The significant value of the independent t-test is 0.807. Thus, the outcome does not support the second hypothesis (H2) that there are significant differences between male and female academic performance. Therefore, it can be concluded that with e-learning, there is no appreciable variation in academic performance between various genders.

Analysis of Variance (ANOVA) Test

In order to determine if there are statistically significant differences between two or more categorical groups, the ANOVA test employs the variance test for the difference in means (Mishra et al., 2019).

International Journal of Modern Education
EISSN: 2637-0905
IJMOE
Volume 5 Issue 18 (September 2023) PP. 57-74
DOI: 10.35631/IJMOE.518005

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.038	2	.019	.080	.923
Within Groups	34.394	147	.234		
Total	34.432	149			

Table 7: Academic Performance Across the Different Age Groups

The ANOVA test for the table above shows a significant p-value is 0.923, which is more than 0.05. The alternative hypothesis is therefore refuted. The findings do not support the third hypothesis (H3) that there are significant differences in academic performance between age groups. This study demonstrates no appreciable differences regarding academic performance across the various age groups. Therefore, there are no disparities in academic performance between age groups while using e-learning. Since there are no age-related variations that are significant across the range of academic performance, additional Post Hoc analysis should not be carried out for group comparison.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.023	2	.012	.051	.950
Within Groups	34.408	147	.234		
Total	34.432	149			

Table 8: Academic Performance Across the Different Academic Programs

The p-value of 0.950, which is more significant than 0.05, is shown in the table. The alternative hypothesis is therefore refuted. The outcome does not support the hypothesis (H4) that there is a significant difference in academic performance between different academic programs. As a result, it is determined that there are no appreciable differences in academic performance among academic programs using e-learning. Since the academic performance of the various academic programs does not significantly differ from one another, further Post Hoc analysis for group comparison should not be conducted.

Pearson's Correlation Analysis

According to the Pearson correlation findings, all of the examined variables were discovered to have a positive relationship and that their correlations exist, with a 99% degree of confidence. As a consequence, there is a modest association between academic performance and usability (0.545), easy of use (0.499), quality of education system (0.578), and quality of information (0.472). According to Hair et al. (2007), a moderate association is represented by coefficients between +/- 0.41 and +/- 0.70. Combining the four aspects, the result shows e-learning has a moderate association (r = 0.617) with students' academic performance. Additionally, even though the Pearson correlation is used to describe the relationships between the variables under study, it is not easy to forecast how much e-learning would affect students' academic performance.

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IJMOE
Volume 5 Issue 18 (September 2023) PP. 57-74
DOI: 10.35631/IJMOE.518005

No	Construct	Construct					
		1	2	3	4	5	E-learning
1	Usability	1					
2	Easy-to-use	.687**	1				
3	Quality of education system	.605**	.644**	1			
4	Quality of information	.535**	.577**	.723**	1		
5	Academic performance	.545**	.499**	.578**	.472**	1	.617**

Table 9: Result Summary of the Pearson Correlation

Collinearity Test

The researcher assumed there was no association between the independent variables in this study because the correlation between them was too high. As a result, the collinearity test was used to determine whether there were issues or vice versa. VIFs of 2.5 or above is often seen as symptomatic of significant collinearity (Johnston et al., 2018). The outcome indicates that just one of the four variables, with VIF values of 2.1, 2.3, 2.6, and 2.2 have a collinearity problem. The researcher was used simply linear regressed against each of the four independent factors. This is due to the confounding effect of the four independent variables' interactions on the regression equation results.

Independent variables	Dependent Variable: Intension of Using E-Learning	
	Tolerance	VIF
Usability	.479	2.086
Easy-to-use	.437	2.288
Quality of education system	.385	2.599
Quality of information	.453	2.207

Table 10: Result Summary of the Collinearity Test

Regression Analysis

The results of a linear regression study of e-learning (usability, easy-to-use, quality of education system, and quality of information) on academic performance are displayed in the table below. Based on the results, it can be concluded that the dependent and independent variables have a linear relationship because the significant value of F is 0.000. Usability, easy of use, quality of education system, and quality of information may all be used to explain the R-square (R^2) value of academic performance, which ranges from 22.3% to 33.4%. When the four factors are combined, e-learning may be to blame for 38.1% of the variance in students' academic performance. Additionally, each independent variable's significant value for the

International Journal of Modern Education
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DOI: 10.35631/IJMOE.518005

dependent variable is less than 0.05, indicating a clear correlation between these independent factors and the dependent variable.

Dependent Variable: Academic Performance							
	Individual effect						Combine
Independent Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R^2	R^2
	B	Std. Error	Beta				
Usability	.430	.054	.545	7.913	.000	.297	
Easy-to-use	.373	.053	.499	7.010	.000	.249	
Quality of education system	.443	.051	.578	8.622	.000	.334	
Quality of information	.382	.059	.472	6.517	.000	.223	
E-learning				9.535			.381

Table 11: Result Summary of Simple Linear Regression

Discussion

The first hypothesis of the research is there is a relationship between e-learning and academic performance. The study's findings indicate that the t-value is 9.535. Therefore, H1 is supported. The findings align with other research that showed that an e-learning strategy positive relationship with student academic performance (Salamat et al., 2018). One of the reasons for this is the simplicity with which e-learning makes it possible to acquire a sizeable amount of knowledge with less time and effort and provides more learning flexibility while taking into account unique features.

The second hypothesis of the research is that there is a significant difference in academic performance under e-learning across gender. This study shows that there are no significant differences between male and female academic performance. Thus, H2 is not supported. Contrary to Basri et al. (2018) and Kumar & Bajpai (2015)'s findings, which revealed that by utilising an e-learning approach, men fared better academically than women, this result is contrary to both findings studies.

The third research hypothesis is that academic performance under e-learning is a significant difference across age groups. This study demonstrates no significant age-related disparities in academic performance while using e-learning. Therefore, H3 is not supported. This result is contrary to what Rizvi et al. (2019) discovered, which found that age has a marginally significant influence on the overall learning outcomes of online learning, this result contradicts those researchers' findings.

The fourth study hypothesis is that academic performance under e-learning significantly differs among academic programmes. This study demonstrates no appreciable variations in academic performance across academic programs when using e-learning. Hence, H4 is not supported. This study's findings align with those of a study by Tegegne (2014) found an e-learning strategy had no impact on student's results in the subject of mathematics. The results of the study by Basri et al. (2018), which demonstrate that e-learning strategies have a more significant impact on educational programmes other than non-computer ones, also provide credence to this.

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IJMOE
EISSN: 2637-0905
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DOI: 10.35631/IJMOE.518005

Conclusion

The study aimed to shed light on how e-learning affected university students' academic performance. It also attempts to empirically examine the relationship between e-learning and students' academic performance. This study has underlined the function of e-learning as the independent variable affecting the dependent variable, students' academic performance. The study's results show that e-learning positively correlates with students' academic performance.

Additionally, the data show no discernible changes in academic performance under e-learning across gender, age groups, and academic programs. Although student academic performance at the higher levels of our educational system has improved as a result of e-learning, an analysis of data collected from a sample of 150 people has revealed that some important issues still need to be carefully taken into account. It is safe to say that there is still a long way to go before the entire globe can reap the rewards of science and technological advancement.

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