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E-LEARNING AND ITS RELATIONSHIP TO ACADEMIC ANXIETY AMONG GRADUATE STUDENTS IN RIYADH

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ABSTRACT

The study aimed to identify the level of e-learning among graduate students at Imam Muhammad bin Saud Islamic University in Riyadh, determine the level of academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University related to e-learning, and to reveal the nature and direction of the correlation between e-learning and academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University. To achieve these objectives, a correlational approach was used, and a sample of 378 male and female graduate students at Imam Muhammad bin Saud Islamic University was selected. The e-learning questionnaire developed by Walker and Fraser (2021) and the academic anxiety scale developed by Jerrell et al. (2019) were used. The study results showed that the level of e-learning among graduate students in Riyadh at Imam Muhammad bin Saud Islamic University. It came with a degree of agreement (sometimes), which ranked first: active learning dimension, was with a degree of agreement (often), while student independence dimension ranked second, with a degree of agreement (sometimes). Practical learning dimension ranked third, with a degree of agreement (sometimes). Teacher support and encouragement dimension ranked fourth, with a degree of (sometimes). In the fifth place was student interaction and cooperation dimension, with a degree of (sometimes). Personal relevance dimension ranked last, with a degree of (sometimes). Moreover, the study found that the level of academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University regarding e-learning was rated as (sometimes). Academic expectations dimension ranked first, rated as (sometimes), while competence dimension ranked second, rated as (sometimes). The communication dimension ranked third, with a level of agreement (sometimes). A positive correlation was found between all dimensions of e-learning and all dimensions of digital stress among graduate students at Imam Muhammad bin Saud Islamic University.

KEYWORDS: E-learning, Academic anxiety, Graduate students, Riyadh.

1. INTRODUCTION

The current era has witnessed a great revolution in communication technology, thanks to which the world has become a small village. This development has encompassed most areas of life, increasing interest in developing the educational process and helping students use technological techniques and digital means in education. This has contributed to the spread of modern technological means among the majority of students in particular, and members of society in general. This has helped universities adopt educational policies that adapt to technological developments, which has necessitated the introduction of technology into all their educational activities, including the adoption of e-learning policies.

Given the importance of developing education, Saudi Arabia has sought, within its Vision 2030, to develop the education system and provide all segments of society with access to education and learning. To achieve this goal, it has sought to use modern technology, including e-learning, remove all obstacles to its use, and continuously update and develop all its aspects (Al-Turki, 2022, p. 297).

The focus on developing higher education in universities has led to keeping pace with technological developments, with many universities turning to e-learning. This has contributed to a major shift in the services provided by educational institutions to their beneficiaries, resulting in significant changes in curricula, teaching methods, and approaches that seek to achieve e-learning objectives (Ibn Sharik et al., 2022, p. 381).

E-learning aims to improve and enhance the outcomes of the educational process by providing students with the best interactive teaching methods, in order to help educational institutions address all the challenges that stand in the way of the traditional education system, such as large class sizes, lack of educational technology, limited resources, and a lack of teaching methods that develop students' creative abilities. This has led many educational institutions to turn to e-learning (Amish, 2021, p. 90).

The integration of artificial intelligence technologies into educational contexts has become commonplace in an era characterized by rapid technological innovation. E-learning and the integration of online communication tools to enhance the educational experience have presented challenges for both university students and faculty members that go beyond the traditional boundaries of the classroom, including students' feelings of digital fatigue, which causes academic anxiety for many of them (Abu Seman et al, 2024).

Academic anxiety is one aspect of general anxiety triggered by exams and reflects an individual psychological problem that students experience during the exam period. It manifests as a fear of failure or of not getting the grades students expect. High academic anxiety affects students' psychological state, increases their stress levels and impairs their concentration, which has negative repercussions on their academic achievement (Karthik & Harini 2025, p. 79).

Despite the positives of e-learning, some studies have found that it has negatives related to increased academic anxiety among some students, as indicated by Bantasan (2022, p. 47), which found that the extensive use of technology as a primary means of adapting to changes in the education system contributed to the continuation of the educational process even in times of crisis, including the COVID-19 pandemic. However, students experienced anxiety, stress, and digital fatigue, which led to increased academic anxiety and stress.

The importance of e-learning in improving the educational process and increasing the interest of universities and faculty members in employing it to enable students to learn outside the university walls, and to limits its impact on students and the educational process, this study was conducted to examine the relationship between e-learning and academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University.

1.1. Statement of the Problem

The Saudi government has adopted a range of strategies and measures at the national level to support and encourage the optimal investment in information and communication technology tools in the educational process, in addition to developing a set of e-learning programs and applications and employing them in the educational process. To achieve this, a range of educational platforms have been developed. and some Saudi universities have been allowed to employ distance (e-learning) to facilitate student learning anywhere and at any time that suits them (Ameesh, 2021, p. 96).

Although e-learning in universities has many advantages, it also has some disadvantages, including the loss of direct interactive influence between students and between students and faculty members, and concerns about the quality of computer-based educational services. Many students do not have sufficient skills to use computer programs, and many others feel bored and monotonous during e-learning lectures. Some find it

difficult to maintain focus and attention on what is presented in e-learning, and many feel lonely and isolated during e-learning lectures (Al-Hussein and Al-Murshidi, 2022, p. 264).

A study conducted by Kaspersky (2024) found that e-learning has negative effects on students. The study concluded that 60% of the students in the sample suffered from digital fatigue due to the constant need to stay online to follow learning activities and interact with the lecturer, which leads to increased psychological pressure and academic anxiety. A recent study by Wati et al. (2025) found that e-learning affects students' academic anxiety, with 62% of study participants suffering from high levels of digital stress and 58% suffering from academic anxiety at varying levels ranging from mild to high.

As for the results of local and Arab studies, Al-Hussein and Al-Murshidi (2022) found that there are a number of factors that contribute to e-learning anxiety among university students, including fear of accidentally clicking on the wrong icon during e-learning sessions, discomfort at not being able to express what they want during e-lectures, boredom and monotony during e-learning lectures, and fear of declining academic performance during e-learning sessions. Leithi (2023) found that Helwan University students had a moderate level of achievement anxiety.

Based on the above, the problem of the current study can be formulated as follows: What is the relationship between e-learning and academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University?

1.2. Research Questions

The study sought to answer the following main question: What is the relationship between e-learning and academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University? This question branches out into the following questions:

1. What is the level of e-learning among graduate students at Imam Muhammad bin Saud Islamic University?
2. What is the level of academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University related to e-learning?
3. What is the nature and direction of the correlation between e-learning and academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University?

1.3. Research objectives

The main objective of this study is to examine the relationship between e-learning and academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University. To achieve this main objective, the following sub-objectives must be achieved:

1. To identify the level of e-learning among graduate students at Imam Muhammad bin Saud Islamic University.
2. To determine the level of academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University related to e-learning.
3. To determine the nature and direction of the relationship between e-learning and academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University.

1.4. Significance of the Research

1. The significance of this research lies in the importance of graduate students due to their effective role in the advancement and prosperity of society, and in determining the impact of e-learning on academic anxiety.
2. It is hoped that this research will shed light on the subject of e-learning and its negative aspects that may affect graduate students, in order to work on mitigating them.
3. It is hoped that the research will help reveal the negative effects of e-learning on graduate students, making it easier for university officials to develop specialized training programs aimed at reducing academic anxiety.

The research results are expected to provide scientific data and indicators for officials and decision-makers in Saudi universities, which can be used to develop training and guidance programs aimed at reducing the negative effects of e-learning.

2. RESEARCH LIMITATIONS

The current research was limited to the following subject, spatial, human, and temporal limitations:

Subject limitations: The study focused on identifying the level of e-learning, determining the level of academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University related to e-learning, and revealing the nature of the correlation between e-learning and academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University.

Spatial limitations: The research was limited to Imam Muhammad bin Saud Islamic University.

Human limitations: The research was limited to graduate students at Imam Muhammad bin Saud Islamic University.

Temporal limitations: The study was conducted during the first semester of the academic year 1447 AH.

2.1. Definitions of terms

I. E-learning: E-learning is defined as: "A modern educational system that delivers scientific material or educational and training programs using modern technological media that enable students to access and benefit from educational courses from their homes without having to go to university" (Al-Hussein & Al-Murshidi, 2022, p. 265).

E-learning is defined procedurally in this study as a modern educational system that delivers scientific material or educational and training programs to graduate students in Saudi universities using modern media technology that delivers educational courses to students in their own homes, allowing them to benefit from them without going to university. It is measured by the score obtained by the examinee on the e-learning questionnaire used in the current study.

II: Academic anxiety: The concept of academic anxiety is defined as an emotional state that affects some students before and during exams, accompanied by tension, agitation, and negative mental preoccupations that interfere with the concentration required during the exam, which negatively affects student performance. (Karthik & Harini, 2025, p. 78)

From the above, it is clear that e-learning is a modern learning method, unlike the traditional methods used in teaching students. This method relies on delivering educational content through information and communication technologies and their various media, allowing students to actively interact with the educational content, faculty members, and colleagues simultaneously or asynchronously at a time, place, and speed that suits the learner's circumstances and abilities. All scientific and educational activities and their requirements are managed electronically through dedicated electronic systems.

3. E-LEARNING OBJECTIVES

E-learning is a comprehensive system that relies on the efficient use of information and communication technology in the educational process, focusing on technological applications and the internet, which help learners to learn and access resources anytime, anywhere. E-learning aims to achieve a number of objectives, including (Ibn

Academic anxiety is defined procedurally in this study as an emotional state that affects some graduate students in Saudi universities before and during academic exams, accompanied by tension, agitation, and negative mental preoccupations that interfere with the concentration required during the exam, thereby negatively affecting student performance. It is measured by the score obtained by the examinee on the academic anxiety scale used in the current study.

3.1. E-learning

There are several definitions of the concept of e-learning, including the following:

The concept of e-learning refers to the educational process that takes place using technology and the internet, whereby the scientific content of study materials is disseminated through the internet, providing students with the opportunity to use a variety of sources full of knowledge and information from outside the educational material (Ameesh, 2021, p. 93). E-learning is also defined as "a self-learning process carried out by students through the use of artificial intelligence technologies such as mobile phones or computers, allowing learners to learn outside the educational institution, anytime and anywhere" (Shalabi, 2025, p. 66).

Kim and Park (2022) define e-learning as: "An educational system that aims to provide educational programs to students anytime, anywhere, using interactive information and communication technology through the Internet, television channels, email, computers, and teleconferencing." Sharik et al., 2022): Providing an interactive and efficient learning environment through the use of advanced and modern electronic tools, relying on a variety of learning resources, improving student interaction with faculty members and colleagues through platforms dedicated to meaningful discussions and dialogues, training faculty members, and equipping them with the digital skills that enable them to deal with e-learning with high efficiency, training students in the skills of using technology tools and equipping them with the skills that enable them to learn independently through e-learning, developing the learning process by providing educational content that is suitable for all age groups, in addition to its ability to take into account individual differences among students. Shalabi (2025) adds that there are a number of specific objectives that distinguish e-learning from other learning methods, the most important of which are the following: Raising the cultural, scientific, and intellectual level of students. Overcoming the problem of a shortage of qualified

staff in the educational process; overcoming the problem of a lack of material resources for education, such as classrooms; providing multiple and diverse educational resources that take into account individual differences among students; and providing educational opportunities for those whose circumstances do not allow them to attend traditional learning in universities.

It is clear from the above that e-learning has a set of objectives that help improve the educational process, enrich it with diverse sources, make it non-traditional, and allow students to proceed at their own pace. In addition, it helps eradicate digital illiteracy among students and equips them with the technical skills that help them interact with e-learning activities. It also helps students whose life circumstances do not allow them to attend classes regularly, and overcomes the lack of physical resources for building classrooms and laboratories due to the current increase in university enrollment.

3.1.1. The importance of e-learning

E-learning contributes to improving learning outcomes and makes them more attractive, as it helps achieve educational goals with high efficiency and less time and effort. Moreover, e-learning suits the characteristics of learners and takes into account the individual differences between them. E-learning is one of the main sources that provide learners with up-to-date information that can be accessed in a short time. E-learning also contributes to equipping students with future skills that enhance their interaction with the requirements of scientific and practical life (Alsudais et al, 2023). E-learning has a number of characteristics that distinguish it from other types of education, including easy access to learning, context determination, where e-learning helps students learn in their immediate context, flexibility, where e-learning provides learners with a greater degree of freedom, and increased interaction (Talib, 2022).

Additionally, e-learning encourages self-learning, without considering the teacher as the sole source of information, as well as providing multiple sources of knowledge and enabling easy and rapid updating of information content. Each student learns according to their abilities and at a pace that suits their abilities (Arishi, 2025).

The above highlights the importance of e-learning in improving the education process and its ability to take into account individual differences among learners. It also fills the gaps that may result from a shortage of faculty members in some universities and enhances students' ability to rely on themselves to acquire knowledge and skills. It also improves learners' motivation to learn and achieve, and it equips them with future skills that prepare them for working life and meet the requirements of the labor market.

3.2. Academic anxiety

Anxiety is defined as a feeling that an individual experiences during stressful situations in which they perceive danger. It the feeling of frustration, guilt, helplessness, and a lack of control over their surroundings (Al-Hussein & Al-Murshidi, 2022, p. 269).

While academic anxiety is a psychological condition that many students suffer from before and during exams, this anxiety can range from a mild feeling of discomfort to high levels that may affect the student's academic performance and mental health. There are a number of definitions that address this concept, including the following:

Academic anxiety is defined as a type of anxiety resulting from the stress and psychological pressure that students feel before or during exams, where the student experiences anxiety, tension, fear of failure, and constant thinking about possible negative outcomes (Leithy, 2023, p. 547). While Wati et al. (2025, p. 50) define academic anxiety as "an emotional state that affects some students before and during exams and while studying, accompanied by tension and emotional agitation that negatively affects students' thought processes, which in turn negatively affects their mental tasks during exams."

In this study, academic anxiety is defined as an emotional state that affects some graduate students in Saudi universities before and during academic exams, accompanied by tension, agitation, and negative mental preoccupations that interfere with the concentration required during the exam, which negatively affects student performance. It is measured by the score obtained by the examinee on the academic anxiety scale used in the current study.

3.3. The relationship between e-learning and academic anxiety among students

The relationship between e-learning and academic anxiety among students is reflected in some of the negative aspects of e-learning and the use of related digital technologies, which lead to academic anxiety. It has been found that e-learning leads to the emergence of certain factors that increase the level of academic anxiety, including the feeling of academic pressure resulting from the need to succeed in e-learning tasks and activities and the desire to obtain good results in academic tests (Omar & Qa'id, 2024). When students feel that their digital skills needed to interact with e-learning are weak, they enter a state

of tension and feel weak in their performance and interaction with e-learning activities, which increases their level of academic anxiety (Jerrell et al., 2019). The fear of failure and the inability to achieve the objectives of e-learning lessons are psychological factors that contribute significantly to raising the level of academic anxiety in e-learning. Many students worry about the negative consequences of failure when dealing with e-learning lessons, or because they compare themselves to other students who are more capable of succeeding, which leads to feelings of frustration and academic anxiety (Amir & Qa'id, 2024, p. 890).

Another reason is the student's personal history with anxiety. If the student has had previous experiences with anxiety or suffers from certain psychological disorders, they may be more prone to academic anxiety, which increases when participating in e-learning due to uncertainty about their ability to cope with its requirements (Karthik & Harini, 2025). Another cause is social and family pressure: pressure from parents or friends can cause academic anxiety resulting from e-learning. Sometimes, the families of some students emphasize the importance of academic excellence, which puts additional pressure on the student to achieve outstanding success (Jerrell et al, 2019).

From the above, it is clear that there is a relationship between e-learning and academic anxiety through the emergence of a set of factors and causes that contribute to the emergence of academic anxiety in e-learning. Some of these are personal reasons related to the characteristics and traits of the student, as some students have a predisposition and experience that increases their feelings of academic anxiety. Others are related to their social environment, such as family and friends, who exert psychological pressure on them, increasing their feelings of academic anxiety. Academic pressure and students' feelings of weakness in technical skills also increase the level of academic anxiety.

3.4. The effects of academic anxiety resulting from e-learning

Academic anxiety resulting from e-learning has multiple effects on students' psychological, physical, and mental aspects. These effects can range from mild to severe and include the following:

I: Psychological effects: These are related to the internal effects on students and are as follows (Hall et al, 2021):

1. Stress and nervousness: Some students experience feelings of nervousness and stress during e-learning, manifested in the student's inability to relax or think logically.
2. Mental preoccupation: The student's mind is preoccupied with concerns about the difficulty of completing e-learning tasks, which hinders their ability to concentrate and perform the required tasks correctly.
3. Low self-confidence: With increased academic anxiety, students may feel unsure of their ability to succeed in e-learning, which negatively affects their academic performance.

II: Physical effects: These are related to the physical effects on students and are as follows (Karthik & Harini, 2025):

1. Rapid heartbeat: Anxiety about e-learning can lead to an increase in the student's heart rate and high blood pressure.
2. Other physical symptoms: such as insomnia, headaches, excessive sweating, and digestive disorders.
3. Severe physical fatigue: Constant anxiety about succeeding in e-learning can lead to physical fatigue and feelings of exhaustion.

III: Effects on student academic achievement: These are related to the effects on student academic performance and are as follows (Hamama, 2024, p. 203):

1. Decline in concentration: Academic anxiety leads to distraction and an inability to concentrate on e-learning activities and on the student's test results.
2. Forgetting information: In some cases, students may forget the information covered in e-learning lessons due to the effect of anxiety on memory.
3. Reduced productivity: Students may feel unable to complete e-learning activities on time as a result of constant stress.

From the above, it is clear that academic anxiety resulting from e-learning has multiple effects on students' psychological, physical, and mental aspects. These effects intensify as the level of academic anxiety increases. Therefore, efforts must be made to guide and advise students on mechanisms to reduce their academic anxiety resulting from e-learning, and to train students in the technical skills they need to interact with e-learning activities and tests in order to increase their self-confidence and improve their motivation towards this type of learning, so that its objectives can be achieved with high efficiency.

4. THEORIES EXPLAINING ACADEMIC ANXIETY

Several theories have explained the academic anxiety that students experience during academic tests, including the following:

1. Cognitive theory: According to this theory, the

cognitive aspect is responsible for the poor academic performance of students who are anxious during academic tests. Although the emotional aspect appears to be stronger and more intense in anxious students than in non-anxious students, this theory argues that anxious students spend a significant amount of time during the exam focusing on stimuli that are unrelated to the task at hand (Lavasani & Weisani, 2023).

2. Affective theory: This theory views academic anxiety as no different from other forms of anxiety and phobia, because the object of fear is clear. Academic anxiety appears as an emotional response that is less intense than fear. According to the affective theory, the cause of academic anxiety is due to increased activity in the nervous system, which triggers a physical response in the human body and causes certain emotional symptoms that are the result of physiological activity, which is considered to be the cause of cognitive errors (Musbah, 2025, p. 1013).

3. Behavioral theory: This theory is based on the idea that every stimulus has a response, and academic anxiety is a response to a stimulus, which is a type of mislearning. Proponents of this theory believe that most types of anxiety arise from conditioning, where something is incidentally associated with an experience that causes anxiety in the individual. This experience is often the result of a mistake. The behavioral theory adds that academic anxiety is a behavior learned from mistakes made during socialization, which manifests itself in reality through a stimulus, with anxiety as the response (Kim & Park, 2022).

4. Cognitive-affective theory: This theory views academic anxiety as occurring for cognitive and affective reasons, with academic anxiety consisting of cognitive and physiological components. The cognitive components include impressions of incompetence, especially when students have weak e-learning skills, while the physiological components are manifested in the activity of the autonomic nervous system. These components are interrelated and represent part of trait anxiety, a type of self-anxiety that is more active in anxious students during academic tests due to their presence in an evaluative context. This type of academic anxiety reflects a high level of autonomic nervous system activity in the student (Wati et al., 2025).

From the above, it is clear that the difference in the interpretation of these theories stems from the difference in the perspectives of the psychological schools that adopt these theories. In this study, the affective-cognitive theory perspective is adopted in the interpretation of academic anxiety, as it interprets it based on the perspectives of both the affective theory and cognitive theory, combining the two interpretations so as not to overlook any aspect of the two causes of academic anxiety.

4.1. Previous studies

Previous studies that addressed the study variables related to e-learning and e-anxiety were presented according to their year of publication, from oldest to newest, as follows:

The study by Mirna and Samaha (2020) aimed to assess the prevalence of symptoms of depression, academic anxiety, and stress among Lebanese university students during the quarantine period due to the COVID-19 pandemic and the impact of e-learning on the prevalence of these symptoms. The study relied on a descriptive survey approach. The sample consisted of 520 university students, and an anxiety scale was used to collect data. The results of the study concluded that learning via e-learning platforms led to the emergence of depression and academic anxiety disorders among university students. A close relationship was also found between e-learning and the prevalence of depression, academic anxiety, and stress. The sudden shift to exclusive e-learning methods led to the emergence of symptoms of academic anxiety and depression in a large percentage of students due to the demanding workload required.

The study by Al-Hussein and Al-Murshidi (2022) aimed to reveal the most important factors contributing to e-learning anxiety among university students. It utilized a descriptive survey approach and an anxiety scale, with a sample of 302 students. The study found that the most significant factors contributing to e-learning anxiety were: poor internet service in residential areas, fear of accidentally clicking on the wrong icon during e-learning sessions, discomfort with not being able to express oneself during online lectures, boredom and monotony during e-learning lectures, feeling panicked at the mere thought of the possibility of an internet outage during online exams, and fear of declining academic performance during e-learning sessions. Moreover, the study found statistically significant differences between the responses of the sample individuals according to the gender variable (male-female), in favor of males. There were also differences in favor of first-year students based on the year variable (first-fourth) and in favor of applied practical colleges based on the college variable (theoretical-applied practical).

The study by Kim and Park (2022) aimed to identify the impact of e-learning on learning

outcomes and academic anxiety levels among nursing students during the COVID-19 pandemic, and to determine students' satisfaction with remote e-learning. An analytical approach was employed. A sample of 310 students from two nursing colleges in South Korea was selected. An online questionnaire was used to collect data. The results showed a correlation between e-learning and learning outcomes, with satisfaction with e-learning mediating this correlation. Moreover, the study found that the assessment anxiety of nursing students caused by the COVID-19 pandemic mitigated the effect of satisfaction with e-learning, and that students' anxiety related to the COVID-19 pandemic played a negative role in the e-learning outcomes of nursing students.

Meanwhile, the study by Alsudais et al. (2023) aimed to identify the role of e-learning in the spread of academic anxiety during the ongoing COVID-19 pandemic. A descriptive approach and an anxiety scale were used, and a sample of 325 individuals was selected. The study found that academic anxiety levels were higher among students with low performance during e-learning compared to students with high performance. However, the difference was not statistically significant. The anxiety scale is an effective tool for assessing the level of academic anxiety in e-learning environments, and the levels of academic anxiety among medical students in e-learning were high.

The study by Garmoui et al. (2024) aimed to identify the impact of using e-learning on the academic performance of doctoral students in Algeria. To achieve this goal, a descriptive survey approach was utilized, and a questionnaire was employed as a data collection tool. It was distributed to a sample of 159 doctoral male and female students at Algerian universities. The results of the study showed that there is a significant positive impact of the use of e-learning systems on the academic performance of doctoral students in Algeria. The study also found that there is a positive impact on the intention to use, usage skills, and quality of e-learning system services on the academic performance of doctoral students in Algeria.

The aim of Abdel-Alim's (2024) study was to identify the effectiveness of an AI-based educational system in developing e-learning management skills and reducing the level of career anxiety among educational technology students at the Faculty of Specific Education at Minia University, according to their level of self-management. The experimental approach was adopted, and a sample of 40 male and female students was selected and divided into two groups, experimental and control. An AI-based educational program was used, and an e-learning management skills test was used. The results of the study showed that the artificial intelligence-based educational system is effective in developing e-learning management skills and reducing the level of concern about the professional future among education technology students at the Faculty of Specific Education at Minia University according to their level of self-management, with the differences between the two groups favoring the experimental group.

The study by Wati et al. (2025) aimed to identify the impact of the digital learning environment on academic anxiety and digital stress among adolescents in the current era. A descriptive approach was used in this study. A purposive sample of 100 individuals who regularly use e-learning platforms (4 hours per day) and are active on social media (5 accounts) was selected. An electronic questionnaire was used to collect data, as well as the Digital Stress Index (DSI) and the Generalized Anxiety Disorder-7 (GAD-7) scale. The results showed that 62% of participants suffer from high levels of digital stress, and 58% suffer from anxiety at varying levels. The main factors contributing to digital stress were multiple study requirements, the digital divide among students, and sleep disturbances due to prolonged use of electronic devices.

Meanwhile, Karthik and Harini's (2025) study aimed to identify the impact of academic anxiety and digital stress on the academic performance of Indian university students, while also taking into account the mediating role of academic fatigue. A descriptive approach was used in this study, and a sample of 356 male and female students from Indian universities with diverse academic backgrounds was selected. The study used academic stress scales, an academic burnout scale, and a self-perceived academic performance questionnaire. The results showed that academic burnout affects students' academic performance and is associated with the psychological and emotional distress experienced by students. Students who experience high levels of digital stress also have a negative impact on their academic performance.

4.2. Commentary on Previous Studies

The current study is similar to some previous studies in its objectives of determining the relationship between e-learning, digital stress, and academic anxiety among students, including the study by Wati et al. (2025). The current study is also

similar to previous studies in its selection of university students as its sample, including the study by Al-Hussein and Al-Murshidi (2021) and the study by Abdel-Aleem (2024). The current study is also similar to some previous studies in its reliance on the correlational approach, including the following: Leithy's study (2023). However, the current study differs from some previous studies in its reliance on the correlational approach, including the following: Abdul-Alim's study (2024), which used an experimental approach. The current study also differs from some previous studies in its selection of a sample of university students, including: Wati et al's study (2025), which used a sample of adolescents.

4.3. Field Study Procedures

Study methodology: A descriptive correlational approach was employed in this study because it was the most appropriate for achieving the study objectives and answering its questions.

Study population: The study population consisted of all graduate students at Imam Muhammad bin Saud Islamic University for the academic year 1447 AH/2025 AD, numbering 7,618 male and female students. They were classified based on gender into males (3,943) at a rate of 51.75% and females (3,675) at a rate of 48.25% (Center for Education Statistics and Decision Support, 1447 AH).

Study sample: The study tools were distributed electronically to a sample of 378 graduate students at Imam Muhammad bin Saud Islamic University, of whom 196 were male (51.85%) and 182 were female (48.15%). This number is consistent with Krejcie and Morgan's (1970) table, which determines the acceptable research sample size at a significance level of 0.05.

5. STUDY TOOLS

5.1. E-learning questionnaire

The e-learning questionnaire designed by Walker and Fraser (2021) was used to be applied to graduate students at Imam Muhammad bin Saud Islamic University, with the aim of identifying the reality of e-learning from the perspective of graduate students at Imam Muhammad bin Saud Islamic University. The questionnaire consisted of 34 statements distributed across six axes, namely: Dimension 1: teacher support and encouragement, consisting of 8 statements. Dimension 2: student interaction and cooperation, consisting of 6 statements. Dimension 3: personal relevance, consisting of 7 statements. Dimension 4: practical learning, consisting of 5 statements. Dimension 5: active learning, consisting of 3 statements. Dimension 6: student independence, consisting of 5 statements.

Validity of the e-learning questionnaire: The validity of the e-learning questionnaire in the current study was confirmed by the researcher through the following procedures:

1. Validity of the questionnaire by reviewers: After translating and designing the questionnaire in its initial form, it was presented to a group of reviewers specializing in the field of study from among the faculty members of Saudi universities, numbering 11 reviewers, to ensure the accuracy of the language and clarity of its meanings. Appropriate amendments and suggestions were made.

2. Construct validity (internal consistency) of the questionnaire: After confirming the validity of the e-learning questionnaire, which was applied to a sample of 46 male and female students outside the study sample, and after collecting the data, Pearson's correlation coefficient was calculated to determine the construct validity of the questionnaire by calculating the correlation coefficient between the score of each axis of the questionnaire and the total score to which the statement belongs. Table 1 shows the correlation coefficients for the e-learning questionnaire.

Table 1: Pearson's correlation coefficient between each statement and the total score on all dimensions of the e-learning questionnaire

Teacher support and encouragement		Student interaction		Personal relevance		Practical learning		Active learning		Student independence	
1	0.521*	1	0.714**	1	0.662**	1	0.677**	1	0.656**	1	0.714**
2	0.718**	2	637.**	2	0.721**	2	0.509*	2	0.502*	2	0.532*
3	0.723**	3	0.707**	3	0.723**	3	0.727**	3	0.633**	3	0.746**
4	0.722**	4	712.**	4	0.708**	4	709.**			4	0.709**
5	719.**	5	0.671**	5	0.740**	5	0.679**			5	0.700**
6	0.654**	6	0.514*	6	0.734**						
7	0.718**			7	681.**						
8	728.**										
Total score 708.**		Total score 701.**		Total score 722.**		Total score 679.**		Total score 626.**		Total score 705.**	

* Significant at the (0.05) level ** Significant at (0.01) level

Table (1) shows that the correlation coefficients between the statements and the total score on all dimensions of the e-learning questionnaire are good and acceptable for scientific research purposes, as they were all significant at a significance level of less than (0.05).

5.1.1. Reliability of the e-learning questionnaire:

The reliability of the e-learning questionnaire was verified using Cronbach's alpha equation for each axis of the questionnaire separately and for the total statements, after applying it to a sample outside the study sample, which consisted of 46 male and female students. Table 2 shows the values of the questionnaire reliability coefficients.

Table 2: Reliability coefficient values according to Cronbach's alpha equation for the various dimensions of the e-learning questionnaire

Cronbach's alpha coefficient	Number of statements	Questionnaire dimensions
0.883	8	Teacher support and encouragement dimension
0.8577	6	Student interaction and cooperation dimension
0.876	7	Personal relevance dimension
0.851	5	Practical learning dimension
0.824	3	Active learning dimension
0.8567	5	Student independence dimension
0.889	**34**	**Overall reliability of the questionnaire**

Table (2) indicates that the reliability coefficients of the e-learning questionnaire for Cronbach's alpha equation were suitable for scientific research purposes, as the reliability coefficients ranged from (0.824 to 0.883), while the overall reliability coefficients for the questionnaire reached (0.889).

5.1.2. E-learning questionnaire scores

After confirming the validity, reliability, and applicability of the questionnaire and finalizing it, five levels were assigned to each statement, with a score of 1 for "very low," (2) for "low," (3) for "moderate," (4) for "high," and (5) for "very high." Responses were monitored according to a five-point Likert scale to determine the degree of agreement with the statements for each axis of the questionnaire. This scale was used to assess the degree of agreement with the questionnaire statements and their dimensions, as shown in Table 3.

Table 3: Degree of agreement according to the five-point Likert scale

No.	Degree of agreement	Category range
1	Very low	From 1 to 1.80
2	Low	From 1.81 to 2.60
3	Medium	From 2.61 to 3.40
4	High	From 3.41 to 4.20
5	Very high	From 4.21 to 5.00

5.2. Academic Anxiety Scale

The Academic Anxiety Scale developed by Jerrell et al. (2019) was used. The scale consists of 35 items in its final form, distributed across three dimensions: competence, communication, and academic expectations. The psychometric properties of the Academic Anxiety Scale were verified in this study using Pearson's correlation coefficient and divergent validity to verify the validity of the scale, and Cronbach's alpha coefficient and split-half reliability to verify the reliability of the scale, as follows:

5.2.1. Description of the Academic Anxiety Scale

The final version of the scale consists of 35 items distributed across three dimensions: competence (10 items), communication (12 items), and academic expectations (13 items).

Verification of the psychometric properties of the Academic Anxiety Scale:

To verify the psychometric properties of the Academic Anxiety Scale, the scale was applied to a sample of 45 students outside the study sample. Pearson's correlation coefficient and divergent validity were used to verify the validity of the scale, and Cronbach's alpha coefficient and split-half reliability were used to verify the reliability of the scale, as follows:

5.2.2. Validity of the Academic Anxiety Scale:

To verify the validity of the academic anxiety scale, the scale was applied to a sample of 46 students outside the study sample. After collecting the data, Pearson's correlation coefficient was used to verify the internal consistency, and Mann-Whitney's test was used to verify the divergent validity, as follows:

A. Internal validity of the academic anxiety scale: Pearson's correlation coefficient was calculated to determine the internal validity of the academic anxiety scale. The correlation coefficient was calculated between the score of each item on the scale and the total score for the dimension to which the item belongs, as shown in Table 4:

Table 4: Pearson correlation coefficients for all dimensions of the academic anxiety scale by total score for each dimension (n = 46)

Competence dimension		Communication dimension		Academic expectation dimension	
No.	Correlation coefficient	No.	Correlation coefficient	No.	Correlation coefficient
1	0.657**	1	0.643**	1	0.777**
2	0.659**	2	0.641**	2	0.707**
3	0.801**	3	0.677**	3	0.785**
4	0.731**	4	0.707**	4	0.587**
5	0.734**	5	0.632**	5	0.768**
6	0.709**	6	0.696**	6	0.747**
7	0.778**	7	0.668**	7	0.834**
8	0.867**	8	0.599**	8	0.644**
9	0.694**	9	0.848**	9	0.753**
10	0.745**	10	0.803**	10	0.773**
		11	0.787**	11	0.655**
		12	0.712**	12	0.730**
				13	0.796**

** Significant at the (0.01) level

Table (4) shows that all correlation coefficients for the academic anxiety scale items with the total score for the dimension to which they belong were significant at the 0.01 level, with correlation coefficients for the competence dimension ranging from 0.657 to 0.867, for the communication dimension from 0.599 to 0.848, and for the academic expectation dimension from 0.587 to 0.867. 0.867, for the communication dimension between (0.599, 0.848), and for the academic expectation dimension between (0.587, 0.834). This indicates high internal consistency coefficients and high reliability indicators sufficient for scientific research purposes, which can be trusted in applying the scale in the current study. Table 5 shows Pearson's correlation coefficients between the total score for each dimension of the academic anxiety scale and the total score for the scale:

Table 5: Pearson's correlation coefficients between the total score for each dimension of the academic anxiety scale and the total score for the scale (n = 46)

Dimension	Correlation coefficient	Dimension	Correlation coefficient
Competence dimension	0.709**	Academic expectation dimension	0.706**
Communication dimension	0.723**		

** Significant at the (0.01) level

Table (5) shows that all correlation coefficients for each dimension of the academic anxiety scale with the total score of the scale were significant at the (0.01) level, with correlation coefficients ranging between (0.706, 0.723), all of which are good correlation coefficients. This indicates high internal consistency coefficients for the scale and points to high and sufficient reliability indicators that can be trusted in applying the academic anxiety scale in this current study.

B. Divergent validity of the academic anxiety scale: The endpoint comparison method was used to identify the divergent validity of the academic anxiety scale. The researcher took 33.0% of the highest-scoring male students and 33.0% of the lowest-scoring female students when the statistical significance of the difference between the means of the two groups was calculated. Since the total number of the sample was 46 students, in order to extract the number of individuals in the top or bottom third of the distribution, this number was multiplied by the value (0.33), and found that it equals (15.18). The researcher selected (15) male and female students from the group with the highest grades and (15) male and female students from the group with the lowest grades. The mean and standard deviation for each group were then calculated, and the Z-value was calculated to test the significance of the difference between them. Table 6 shows the results of the Mann-Whitney test.

Table 6: Results of the Mann-Whitney test for differences between the high-scoring group and the low-scoring group in the academic anxiety scale scores of the sample students (n = 46)

Groups	No.	Mean ranks	Sum of ranks	Z-score	Statistical significance
(%33)Highest distribution	15	58.50	877.5	4.869	0.001
(%33)Lowest distribution	15	36.50	547.5		

The results in Table 6 indicate that there are statistically significant differences between the scores of students in the upper group and those in the lower group on the academic anxiety scale, in favor of students in the upper group, with a mean score of 58.50, compared to 36.50 for students in the lower group. This test clearly shows the difference between the group with higher scores and the group with lower scores on the academic anxiety scale, indicating that the academic anxiety scale is valid for the current research sample because it was able to distinguish between individuals in the sample.

5.2.3. Reliability of the academic anxiety scale

The researcher measured the reliability of the academic anxiety scale using the Cronbach's alpha reliability coefficient and half-split. Table 7 shows the reliability coefficient for the dimensions of the scale, as follows:

Table 7: Cronbach's alpha coefficient and half-split to measure the reliability of the academic anxiety scale

Ser.	Dimension	Coefficient of reliability	
		Alpha Cronbach	Half-split
1	Competence dimension	0.884	0.865
2	Communication dimension	0.891	0.869
3	Academic expectation dimension	0.887	0.870
Overall reliability		0.902	0.882

Table 7 shows that the academic anxiety scale has statistically acceptable reliability, with a total reliability coefficient (alpha) of 0.902 and a half-split coefficient of 0.882, which are high reliability scores. The reliability coefficients of the study tool ranged between 0.884 and 0.887 for Cronbach's alpha and between 0.865 and 0.887 for split-half reliability, which are high and reliable reliability coefficients for the application of the academic anxiety scale.

5.2.4. Correction of the academic anxiety scale:

The statements of the academic anxiety scale were answered according to the five-point Likert scale according to the following scale for each statement: (always, often, sometimes, rarely, very rarely), so that (always) received five points, (often) received four points, (sometimes) received three points, (rarely) received two points, and (very rarely) received one point. This was used to judge the degree of agreement with the questionnaire statements and their dimensions, as shown in Table 8.

Table 8: Degree of agreement according to the five-point Likert scale

No.	Degree of agreement	Range of category
1	Always	From 1 to 1.80
2	Often	From 1.81 to 2.60
3	Sometimes	From 2.61 to 3.40
4	Rarely	From 3.41 to 4.20
5	Very rarely	From 4.21 to 5.00

6. FIELD STUDY RESULTS

6.1. Results related to the first question: What is the level of e-learning among graduate students at Imam Muhammad bin Saud Islamic University?

To determine the level of e-learning among graduate students at Imam Muhammad bin Saud Islamic University, the frequencies, means, standard deviations, and rankings for all dimensions of this axis were calculated.

Table 9 shows a summary of the results for all dimensions of the level of e-learning among graduate students at Imam Muhammad bin Saud Islamic University:

Table 9: All dimensions of the e-learning level among graduate students at Imam Muhammad bin Saud Islamic University

Dimensions	Mean	SD	Degree of agreement	Ranking
Teacher support and encouragement dimension	3.19	0.94	Sometimes	**4**
Student interaction and cooperation dimension	3.18	0.88	Sometimes	**5**
Personal relevance dimension	3.08	0.90	Sometimes	**6**
Practical learning dimension	3.22	0.89	Sometimes	**3**
Active learning dimension	3.43	0.93	Often	**1**
Student independence dimension	3.27	1.02	Sometimes	2
Overall score for all dimensions	3.22	0.95	Sometimes	

Table (9) indicates that the mean of all dimensions of e-learning among graduate students at Imam Muhammad bin Saud Islamic University was (3.22), with a standard deviation of (0.95). This mean falls within the third level of approval: i.e., a degree of agreement (sometimes). Active learning dimension ranked first, with a mean of 3.43 and a degree of agreement (often), while student independence

dimension ranked second, with a mean of 3.27 and a degree of agreement (sometimes). Practical learning dimension ranked third, with a mean of 3.22 and a degree of agreement of "sometimes." Teacher support and encouragement dimension ranked fourth, with a mean of 3.19 and a degree of agreement of "sometimes." Fifth was student interaction and cooperation dimension, with a mean score of 3.18, and a degree of agreement of "sometimes". Last was personal relevance dimension, with a mean score of 3.08, and a degree of agreement of "sometimes". The reason for this result is that e-learning is used by graduate students at Imam Muhammad bin Saud Islamic University to an acceptable degree, as it is considered one of the relatively modern trends adopted by the university. This requires time and training for faculty members and students to address the negative aspects of e-learning implementation, to benefit greatly from it, and to achieve learning objectives efficiently.

6.2. Results related to the second question: What is the level of academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University regarding e-learning?

To determine the level of academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University regarding e-learning, frequencies, means, standard deviations, and rankings were calculated for all dimensions of this axis.

Table 10 shows a summary of all dimensions of the level of academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University related to e-learning:

Table 10: All dimensions of the level of academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University related to e-learning

Dimensions	Mean	Standard deviation	Degree of agreement	Ranking
Competence dimension	2.96	0.97	Sometimes	2
Communication dimension	2.81	1.14	Sometimes	3
Academic expectation dimension	2.98	0.92	Sometimes	1
Overall score for all dimensions	2.91	0.98	Sometimes	

Table (10) indicate that the mean of all dimensions of academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University related to e-learning was (2.91), with a standard deviation of (0.98). This mean falls within the third level of agreement: that is, a degree of agreement (sometimes). The academic expectation dimension ranked first, with a mean of 2.98 and a degree of agreement (sometimes), while the competence dimension ranked second, with a mean of 2.96 and a degree of agreement of (sometimes). The communication dimension ranked third, with a mean of 2.81 and a degree of agreement of (sometimes). This result is attributed to students' awareness of the importance of dealing with e-learning and providing its requirements in a proper manner that does not significantly affect academic anxiety, as well as addressing the problems they face in dealing with this type of learning. Therefore, its impact was moderate, i.e., a degree of (sometimes). This result differs from the study by Alsudais et al. (2023), which found that medical students' levels of academic anxiety in e-learning were high. The reason for this difference may be due to the difference in the study sample and the type of study.

6.3. Results related to the third question: What is the nature and direction of the correlation between e-learning and academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University?

To determine the nature and direction of the correlation between e-learning and academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University, Pearson's correlation coefficient was used. Table 11 shows these results:

Table 11: Pearson correlation coefficient to illustrate the nature and direction of the correlation between e-learning and academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University

E-learning Dimensions	Dimensions of academic anxiety	Correlation coefficient	Significance level
Teacher support and encouragement dimension	Competence dimension	0.577	0.01**
	Communication dimension	0.583	0.01**
	Academic expectation dimension	0.541	0.01**
Student interaction and cooperation dimension	Competence dimension	0.601	0.01**
	Communication dimension	0.616	0.01**
	Academic Expectation Dimension	0.619	0.01**
Personal relevance Dimension	Competence Dimension	0.622	0.01**
	Communication Dimension	0.595	0.01**
	Academic Expectation Dimension	0.587	0.01**
Practical learning dimension	Competence dimension	0.588	0.01**

	Communication dimension	0.606	0.01**
	Academic expectation dimension	0.624	0.01**
Active learning dimension	Competence dimension	0.599	0.01**
	Communication dimension	0.579	0.01**
	Academic expectation dimension	0.613	0.01**
Student independence dimension	Competence dimension	0.608	0.01**
	Communication dimension	0.577	0.01**
	Academic expectation dimension	0.635	0.01**
Overall Score	Competence dimension	0.586	0.01**
	Communication dimension	0.631	0.01**
	Academic expectation dimension	0.624	0.01**

* Significant at (0.05) level **Significant at (0.01) level and above

Table (11) indicates a statistically significant positive correlation between the overall e-learning score and academic anxiety among graduate students at Imam Muhammad bin Saud Islamic University, at a significance level of (0.01) and across all dimensions. A statistically significant positive correlation was also found between all dimensions of e-learning and all dimensions of digital stress among graduate students at Imam Muhammad bin Saud Islamic University. This result indicates a relationship between e-learning and academic anxiety among students. E-learning negatively affects students' lives and leads to academic anxiety, causing them to feel unfocused while following e-learning lectures and performing various tasks and activities. The existence of a set of tasks that students must perform in e-learning increases their level of academic anxiety. This is consistent with the findings of a study by Mirna and Samaha (2020), which found a close relationship between e-learning and the prevalence of academic anxiety among students.

7. CONCLUSION

The study showed that graduate students at Imam Muhammad bin Saud Islamic University experience a moderate level of e-learning use, generally rated as "sometimes," with active learning being the most practiced dimension. Academic anxiety related to e-learning was also moderate, with academic expectations ranking highest. The results further revealed a positive correlation between all dimensions of e-learning and all dimensions of academic anxiety, indicating that as engagement with e-learning increases, academic anxiety tends to rise accordingly.

8. LIMITATION

The study is limited to graduate students at Imam Muhammad bin Saud Islamic University, which may limit the generalizability of the findings to other universities or undergraduate students. In addition, the cross-sectional design also restricts the ability to establish causal relationships between e-learning and academic anxiety. Furthermore, other factors that may influence academic anxiety, such as technological skills, academic workload, and instructor support, were not examined.

RESEARCH RECOMMENDATIONS

In light of the findings of the current research, the following recommendations can be made:

1. Raise awareness among graduate students in Saudi universities about the procedures and mechanisms for reducing the impact of e-learning on academic anxiety through seminars and scientific publications.
2. Involve graduate students at Saudi universities in training programs to reduce the negative effects of e-learning, especially with regard to alleviating digital stress.
3. Develop guidance programs for university students to help them cope well with the requirements of e-learning and the mechanisms for participating in it.
4. Train students to plan and prepare well to participate effectively in e-learning lectures, and train them in time management to organize the tasks required of them.

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1