The Development of Engagement Skills In Learning Among University Students Through Generative Artificial Intelligence Applications (Chat GPT)

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Abstract

By creating an interactive online learning environment based on the edX Digital platform's integration with a few generative artificial intelligence applications, the present research aims to increase university students' engagement skills in learning and their sense of digital trust. In order to do this, a sample of undergraduate students from King Khalid University's College of Education was chosen at random and split into two groups: Another empirical group, consisting of 29 students, utilized the Blackboard platform, whereas the first empirical group, consisting of 28 students, used the edx platform with certain generative artificial intelligence applications. To examine the research data, a "T" test, a digital trust scale, and an engagement in learning scale were developed. According to the study, the edX Digital platform performs better than the Blackboard platform when it comes to establishing learning engagement skills when it integrates with certain generative artificial intelligence technologies. The results also revealed that there is no statistically significant distinction in the development of digital trust skills between the Blackboard platform and the integration of the edx Digital platform with certain applications of Generative artificial intelligence among College of Education students.

Keywords: *Chat GPT, Generative Artificial Intelligence AI, Engagement in Learning.*

Introduction

The provision of interactive educational content to students can be facilitated by teachers through online learning, which comprises platforms and applications that facilitate the efficient use of high-quality participatory educational content by multiple students at different times and locations that suit their needs and circumstances. In addition, online learning helps to develop and construct an interactive learning environment that caters to the individual needs of every student. Interactive instructional information may be recorded and consulted eventually. Widespread Massive Open Online Courses (MOOCs) have become a possibility as a result of the Internet's rapid expansion. Through the University of Manitoba's "Connectivism and Connective Knowledge" course, George Siemens is credited for coining this phrase for the first time in 2008 AD. The Open University's pedagogy and technology platforms serve as the foundation for these courses' concept. But the MOOC did not begin in earnest until 2012. Over 160000 people from all over the world signed up for the "Introduction to Generative Artificial Intelligence" MOOC when it was initially introduced by Stanford University [11].

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A number of digital learning platforms, most notably Coursera, EdX, Udacity, and others, emerged as a result of the popularity of open educational courses. These platforms stood out for offering educational information in an expert and interactive way. These endeavors were not distant from the Arab world. Open educational projects have been launched by Arab organizations; the most well-known being Rwaq and edraak platforms. But unlike their international equivalents, these Arab projects are the products of people or institutions rather than being the product of university launches [5, 3].

[13] makes note of the fact that social constructivism theory constitutes the basis and tenets of e-learning platforms. They aid in the learner's acquisition, creation, or generation of the content. To encourage online interaction, conversation, and engagement, they can be created, altered, or amended by the instructor or the student. E-learning platforms are described as a collection of online educational services that incorporate social networks and e-learning management systems. They offer information, interactive tools, and resources to educators, parents, and students in order to support and improve the quality of the educational content that is offered to students via a secure and user-friendly web-based system [12].

In order to motivate students to study and engage in online educational communities, [8] focused on creating a digital learning platform based on participatory tales and suggested the necessity of having digital platforms available for the delivery of undergraduate courses. Reference 10 concentrated on using deeply divided open online courses (MOOCs) with college students. The investigation came to the conclusion that the students could create new software that helped their nation's smart cities be designed.

The area of education uses generative artificial intelligence systems for a variety of purposes, including tracking and extracting educational data to monitor student behavior and offer assistance to children who may be at risk of quitting school. When assessing a student's response to a multiple-choice math question, teachers typically focus on the student's score and grades. However, generative artificial intelligence applications can go deeper and uncover more information about the true challenge the student is facing. These applications can identify whether the student is struggling with a general concept or whether there is ambiguity in the question that the student finds confusing. Accordingly, generative AI programs can determine which fundamentals the learner skipped and then assist him in learning the proper way [14].

According to the study [17], chatbots are one of the contemporary uses of generative artificial intelligence that can be used to give students educational content in an engaging and fun way. By breaking up a single lecture into a series of interactive questions and incorporating texts, images, videos, and comments instead of writing and presenting the content all at once, chatbots help to create adaptive learning that is tailored to each student's needs and schedule. The study suggested that teacher preparation programs incorporate generative artificial intelligence applications to stay up to date with the constantly evolving demands of the job market. This is because these applications are significant in the field of education.

[1] said that achieving student involvement in the courses provided through digital platforms is urgently needed. Since engagement is one of the key factors that lowers student attrition while studying—and since the rate of student attrition in courses taught remotely increases by (10–20%) compared to courses taught in traditional classrooms—these courses must be based and designed on interaction in order to ensure effective participation, engagement, and non-dropout rates. Hence, selecting materials and creating activities that guarantee students' successful involvement is crucial for instructors using digital learning environments.

The teaching and learning processes have undergone significant change as a result of the world's reliance on interactive digital learning platforms. Thus, one technique that can assist in determining what a student is doing and what he cannot accomplish is generative artificial intelligence and its many applications. Applications using generative artificial intelligence may also create adaptable digital content and intelligently offer it to students based on their requirements and skill levels. As a result, generative AI apps aid in identifying each learner's ability and offer support and explanation for any material that he finds unclear. Thus, generative AI systems can effectively aid in the development of the learner's various aptitudes and competencies.

Research Problem

[15] Verifies that the courses that colleges offer don't aid in students' engagement and integration. This is because the way that the educational software template presents chapters, lessons, and activities to students is comparable to that of the educational book template. Therefore, the study suggested that, among other things, focus should be paid to creating digital material that supports good emotional reactions in students, stimulates them to respond either positively or correctively, and helps them engage successfully through behavioral interaction. In the age of remote learning, [9] suggests that digital inclusion is essential to the learning process. Students who are not interested in their studies are said to be "unmotivated" and learn less. In order to focus on anything else during virtual learning sessions, many students switch off the microphones and cameras. This leads to a gap and a decline in pupils' academic success, which is caused by an engagement gap.

[4] shows that 90% of students view and read the educational content that teachers post on digital platforms, but they do not engage with it, offer feedback, or incorporate it into their studies. These students are referred to as "Lurkers," and 9% of them contribute to the creation of educational content by making comments and publishing it; they are referred to as "Commenters." The remaining (1%), known as "Creators," are the ones that continuously produce instructional content and incorporate fresh components into it. Therefore, it is important to increase student involvement in online courses in order to provide a foundation for interaction, effective participation, engagement, and non-dropout rates (Abdul Samea, 2019).

The majority of students appear to be more engaged in the social relationships they build via web-based resources and platforms, as evidenced by [16]. Despite the fact that students utilize these technologies on a regular basis, educational institutions are still sluggish to embrace digital tools and platforms that may facilitate their integration into the curriculum. Therefore, the study conducted by the chief [6] came to the conclusion that the Faculty of Education's students had insufficient engagement abilities. As a result, this study suggested using digital stimuli to assist students in acquiring learning engagement techniques. According to Al Shaya (2015), when a digital platform is hacked, some users may be afraid or lack confidence to entrust their files and personal information to the organizations who provide them. A serious issue will arise if the organization offering the service decides to sell or otherwise profit from the users' information that the hacker may be able to get. As a result, a lot of consumers lack faith in the capabilities of digital platforms.

The issue of the current study was determined to be "poor engagement skills and digital trust among university students" based on the aforementioned information. As a result, the present study aims to address this shortcoming by integrating generative AI applications with the worldwide edX platform to help students improve their confidence and digital participation.

Research Questions

The current research attempts to answer the following two questions:

- How does the combination of the Digital edx platform and Generative artificial intelligence applications improve students' ability to participate in learning at King Khalid University's College of Education?
- How does the King Khalid University College of Education's students' development of digital trust skills change as a result of the integration between the Digital edx platform and Generative AI applications?

Research Hypotheses

The current research attempts to verify the validity of the following hypotheses:

H1: There is no statistically significant difference between the mean scores of the first empirical group (which used the edX platform) and the second empirical group (which used the Blackboard platform) when the engagement scale is applied to learning after it has been applied. **H2:** Following the application of the digital trust scale, the mean scores of the first empirical group (utilizing the edX platform) and the second empirical group (utilizing the Blackboard platform) do not vary statistically significantly ($p < 0.05$).

Research Objective:

Through integration between the worldwide edX platform and various generative artificial intelligence applications, the present project intends to enhance digital trust and engagement skills in learning among students at King Khalid University's College of Education.

Research Significance

- Bringing up the necessity for university education administrators to be mindful of the usage of digital platforms in higher education.
- Calling university education administrators' attention to the necessity of being mindful of the use of generative artificial intelligence applications in the sphere of higher education.
- Promoting independent learning, idea sharing, and integration of digital platform settings into the classroom.
- Making university administrators aware of the necessity of forming an educational alliance between their institution and the world's leading digital learning platforms, such as EdX, Coursera, Udacity, and Future Lean.

Research Determinants

The current research is limited to the following determinants:

- Bachelor's students at the College of Education, King Khalid University.
- Generative artificial intelligence applications: Chatbot and Otter Voice Notes
- The course "Using computers in education - 424 TRB-2".
- Engagement skills in learning: cognitive skills, behavioral skills, and emotional skills.
- Digital trust skills: Ease of access-Ease of use-Information quality-Design form-Information security

Definitions of Research Terms

Digital Platforms

Students at King Khalid University's College of Education can use generative artificial intelligence

applications in the course material of "Using Computers in Education" to enhance their confidence and digital engagement. The learning environment is interactive and online.

Generative Artificial Intelligence Applications:

These are courses that King Khalid University's College of Education offers and integrates with the edX platform to support and mentor students while they study the "Using Computers in Education" course. thus they can get integrated into the world of computers.

Engagement in Learning

It is the amount of work that students put in to comprehend material and engage in the tasks and activities offered by the edX platform, either individually or in groups. A student's degree of positive attitude formation and tendency formation toward using the global edX platform is determined by how well they score on the appropriate scale.

Digital Trust

The amount of effort students put out to understand the subject matter and participate in the individual or group assignments and activities provided by the edX platform is what matters. The degree to which a student develops a favorable attitude and an inclination toward using the global edX platform depends on how well they do on the relevant scale.

Research Methodology

The current research used the quasi-experimental approach based on the design of the two groups with the pre and post-application of performance measures.

Research Procedures

To know the effect of integrating edX platform with Generative artificial intelligence applications on developing engagement skills in learning and digital trust among students of the College of Education, King Khalid University, the following was conducted:

Selection of the Research Sample

The research sample was selected from the "Bachelor's" students at the College of Education, King Khalid University, in a random manner, which consisted of two groups: The first empirical group, consisting of (29) students, was trained through edX platform through the free account (https://www.edunext.co). The second empirical group, a division of (28) students, was trained using the learning management system (Blackboard) available at the university. To ensure the equality of the two groups, the research tools were applied beforehand, and the findings were as shown in Table (1).

Table 1: Findings of the "T" test in the Scale of Inclusion in Learning and the Digital Trust Scale in the Pre-application.

Tool	Group	Mean	SD	Degree of freedom	Calculated T value	Significance level	Significance
Learning Engagement scale	1st empirical group	42.90	3.33		1.749	0.848	Not significant
	2nd empirical group	41.36	3.31	55			
Digital trust scale	1st empirical group	45.10	3.06		1.564	0.438	Not significant
	2nd empirical group	43.89	2.77				

Table (1) shows that the calculated (T) value, (1.749), (1.564) in the learning engagement scale,

and the digital trust scale, all of which are non-functional, at the level of significance (0.05), the significance of both sides, and the degree of freedom (55). This indicates that there are no statistically significant differences between the two groups in the pre-application of the scale of engagement in learning and the scale of digital trust, which indicates the equivalence of the two groups.

Second: Preparing Research Materials

Designing a learning environment based on the integration of edX platform and Generative artificial intelligence applications:

To design a learning environment based on the engagement of the Digital edx platform with Generative artificial intelligence applications, some previous studies were reviewed, such as:

The study of Al Halafawi, Zaki, and Al Atifi (2017), [2] and the general model of ADDIE design was used as follows:

The First Stage: Analysis

At this stage, the following procedures were taken:

▪ Determining the general objectives of the learning environment based on the engagement of the Digital edx platform with Generative artificial intelligence applications, where the general objective of this environment is to develop engagement skills in learning in (the use of computers in education) among the students of the research sample.
▪ Determining the characteristics of learners: Seventh-level undergraduate students at the College of Education, King Khalid University, studying the course "Using Computers in Education 424 TRB-2" in the first semester of the academic year (2021 AD), they belong to the same environment with similar circumstances, and their skills in using computers and Internet networks are almost identical. The number of students in the first empirical group was (29) students, and the number of students in the second empirical group was (28) students.
▪ Educational material: The training content has been identified in the form of (5) training units.

The Second Stage: Design

The design stage includes defining procedural goals for the existing learning environment, integrating edX platform with Generative artificial intelligence applications, setting a comprehensive conception of the content, the learning strategy, the various activities appropriate to it, and the evaluation methods, as follows:

The procedural objectives of the learning environment based on the integration of edX platform with Generative artificial intelligence applications:

First Topic: Digital Platforms

After completing this content, the student should be able to:

▪ Discuss the nature of Digital platforms.
▪ Explain the characteristics of technological innovations.
▪ Review the most important emerging technologies.
▪ Discuss the role of emerging technologies in the development of education.

The Second Topic: Designing Interactive Digital Content

After completing this content, the student should be able to:

- Know the Digital content.
- Define the elements of digital content.
- Employ digital content authoring tools.
- Design digital content according to SCORM standards.

The Third Topic: Designing Educational Websites

After completing this content, the student should be able to:

- Know what the educational site is.
- Define web design specifications.
- Know the Drupal system for web design.
- Design an educational website.

The Fourth Topic: Digital Walls

After completing this content, the student should be able to:

- Know about Digital walls.
- Explain the importance of Digital walls in education.
- Design a digital wall.
- Able to publish the Digital wall.

The Fifth Topic: Words Cloud

After completing this content, the student should be able to:

- Discuss what the word cloud is.
- Conclude the importance of the word cloud in education.
- Design a word cloud in his field of specialization.
- Employ the word cloud in the opinion poll.

The chat bot application was designed through the (Chat fuel) platform. This platform does not require programming experience, but through it, the automated chat is easily designed without any programming experience. The Otter Voice Notes application has also been integrated through the website (https://otter.ai) with edX Digital platform.

The learning environment content

The content of the learning environment edX platform with Generative artificial intelligence applications included the following topics:

- The First Topic: Emerging platforms and technologies.
- The Second Topic: Digital content design.
- The third Topic: designing educational websites.
- The Fourth Topic: Digital walls.
- The Fifth Topic: word clouds.

The learning strategy and activities used in edx platform and Generative artificial intelligence applications:

In light of the procedural objectives and the content of the learning environment, the learning strategy proceeded using edX platform by entering the platform and starting to study the content and reviewing the objectives, then studying the Digital content by interacting with the Otter application and the Chatbots application, as well as between the students and the teacher, then the students complete the required project, then it is presented to the teacher in order to obtain feedback. As for the learning strategy through the learning management system "Blackboard", it is done through students entering the platform, then reviewing the objectives, studying the content, then interacting with each other and between the students and the teacher, then the students complete the required project and then get the feedback figure (2) and figure (3).
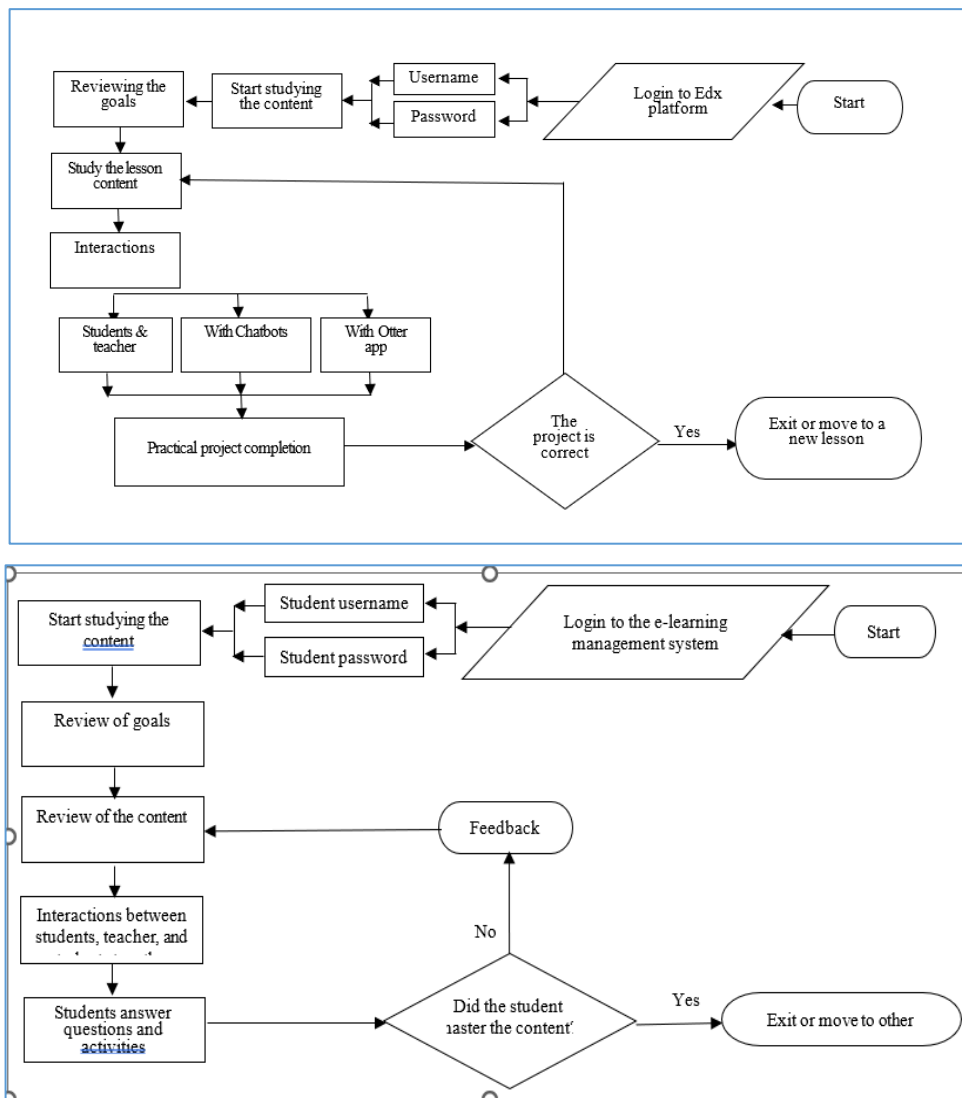

Figure 3: Flowchart of the Learning Management System "Blackboard" Strategy.

Assessment Methods

The assessment methods varied to include the tribal calendar at the beginning of each topic to determine the previous learning, formative assessment during each content to guide student learning and provide feedback and the final assessment, which takes place after completing the study of all training content designed according to the engagement of the Digital edX platform with Generative artificial intelligence applications.

To identify the engagement skills in learning and the digital trust of the research sample.

The Third Stage: Development

At this stage, the researchers used some programs and applications, the most important of which are the following:

- Blackboard system
- Video Scribe software
- https://www.edX.org platform
- https://answergarden.ch website
- Articulate Storyline Program
- https://ar.padlet.com
- Chat bot application.
- Otter Voice Notes application

The Fourth Stage: Implementation

At this stage, the Digital content was published on EdX platform, the trial version, and it is available to (50) users. It also explained how to enter the platform and the tasks to be performed.

The Fifth Stage: Evaluation:

At this stage, the content of edX Digital platform with Generative artificial intelligence applications was presented to a group of specialists in the field of curricula and "educational technologies". In addition, the measurement tools represented in the engagement scale in learning, and the digital trust scale were applied, after studying all the training content of the students of the research sample.

Third: Preparing Performance Measures

The scale of engagement in learning

The scale of engagement skills in learning was prepared according to the following steps:

Determining the purpose of the scale

The objective of the scale is to scale engagement skills in learning the "Using Computer in Education" course with its three dimensions, which are: The cognitive dimension, the behavioral dimension, and the emotional dimension using the Digital edx platform integrated with Generative artificial intelligence applications for "Bachelor's" students at the College of Education at King Khalid University.

Paragraphs of the Scale

The scale consists of three dimensions: the cognitive dimension and the number of its phrases

(11), the behavioral dimension and the number of its phrases (9), and the emotional dimension and the number of its phrases (11). Thus, the number of scale phrases became (31) phrases.

Adjusting the scale through

- Presenting the initial image of the scale to a group of arbitrators: After completing the formulation of the scale's vocabulary, it was presented to a group of specialists in the field of curricula, educational techniques, and psychology. Their opinions explained the appropriateness of the scale for the purpose for which it was set, with the deletion of some phrases of the second dimension of the scale, and the reformulation of some phrases from the linguistic point of view.

Exploratory application of the scale

After knowing the opinions of the arbitrators, the scale was applied Digital ally through the website https://cutt.us/Jf7m7 on an exploratory sample of (22) undergraduate students at the College of Education, King Khalid University to identify the appropriateness of phrases from a linguistic and scientific point of view. Their responses illustrated the appropriateness of the scale statements without any linguistic or scientific ambiguity.

Internal consistency of the scale (statistical validity)

The following table shows the Pearson correlation coefficient matrix that was discovered between the scale's dimensions and overall score:

Item	Cognitive	Behavioral	Emotional
Cognitive	1		
Behavioral	0.64	1	
Emotional	0.37	0.50	1
The scale as a whole	*0.89	*0.80	*0.68

It is clear from the above that the correlation coefficient of the first dimension with the scale as a whole is equal to (0.89), and the correlation coefficient of the second dimension with the scale as a whole is equal to (0.80), while the correlation coefficient of the third dimension with the scale as a whole is equal to (0.68), all of which are significant and statistically acceptable values. This indicates that the dimensions of the scale the same thing as the scale as a whole, which indicates the validity and dimensionality of the scale.

Calculating the average time of the scale:

The scale time was calculated by finding the average of all students' times, each according to his speed, and it was approximately equal to (30) minutes.

Calculating the reliability of the scale:

After presenting the scale to a group of arbitrators and its exploratory testing on (22) students using the (Cronbach's alpha) equation, it was found that it is approximately equal to (0.83), which is an appropriate reliability coefficient.

The final version of the scale:

After formulating the scale and adjusting it statistically, the scale becomes valid for final application.

Digital trust building scale:

The digital trust building scale was prepared according to the following steps:

Determining the Purpose of the Scale:

The objective of the scale is to provide the Bachelor's degree at the College of Education at King Khalid University with the skills of building digital trust in dealing with digital platforms. The dimensions of the scale are accessibility, ease of use, information quality, website format and design, and information security.

Paragraphs of the scale:

The scale consists of five dimensions, which are shown in Table (2).

Table 2: The Number of Dimensions and Items of the Scale in its Initial Form.

S	The Dimension	No. of phrases
1	Easy access to the platform	5
2	Easy use of the platform	8
3	Quality of information on the platform	9
4	Form and design of the platform	6
5	Information security in the platforms	10
Total	5	38

- Setting the scale through: Presenting the initial image of the scale to a group of arbitrators:

After completing the formulation of the scale's vocabulary, it was presented to a group of specialists in the field of curricula, teaching methods, educational techniques, and psychology and their opinions explained the appropriateness of the scale for the purpose for which it was set, with the deletion of some phrases of the scale, with the modification of the wording of some phrases from the linguistic point of view.

Exploratory application of the scale:

After knowing the opinions of the arbitrators, the scale was applied Digital ally through the website https://cutt.us/3UIMb on an exploratory sample of (22) undergraduate students at the College of Education, King Khalid University to identify the appropriateness of phrases from a linguistic and scientific point of view. Their responses illustrated the appropriateness of the scale statements without any linguistic or scientific ambiguity.

Internal Consistency of the Scale (Statistical Validity):

Spearman correlation coefficient matrix was found between the dimensions of the scale and the total score according to the following Table.

Dimension	Ease of access	Ease of use	Information quality	Platform form and design	Information security
Ease of access	1.00				
Ease of use	0.61	1.00			
Information quality	0.57	0.73	1.00		
Platform form and design	0.34	0.67	0.59	1.00	
Information security	0.54	0.49	0.61	0.54	1.00
The entire scale	*0.70	*0.65	*0.80	0.54	0.84

It is clear from the above that the correlation coefficient of the first dimension with the scale is equal to (0.70), and the correlation coefficient of the second dimension with the scale is equal to (0.65). The correlation coefficient of the third dimension with the scale is equal to (0.80), the correlation coefficient of the fourth dimension with the scale is equal to (0.54), and the correlation coefficient of the fifth dimension with the scale is equal to (0.84) as significant and statistically acceptable values. This indicates that the dimensions of the scale are the same thing as the scale, which indicates the validity and dimensionality of the scale.

Calculating the average time of the scale.

The time of the scale was calculated by calculating (75%) of the students' responses, and it was approximately equal to (50) minutes.

Calculating the reliability of the scale:

After presenting the scale to a group of arbitrators and experimenting with it on (22) students using the (Alpha Cronbach) equation, it was found that it is approximately equal to (0.86), which is an appropriate reliability coefficient.

Final version of the scale:

After formulating the scale and adjusting it statistically, the scale became valid for final application (Appendix 3).

Fifth:

Pre-application of measurement tools:

The tools of the scale of engagement in learning and the scale of digital trust were applied pre-applied to the two research groups in the first semester (2021 AD).

Sixth:

Implementation of the Research Experiment:

After clarifying the purpose of the experiment, the research experiment was carried out at the College of Education during the first semester (2021 AD), and the number of members of the first empirical group was (29 students). As for the second empirical group, it numbered (28 students), and the experiment lasted about (6) weeks.

Seventh: Post-application of measurement tools:

After the completion of the research experiment, the measurement tools represented in: The scale of engagement in learning, and the scale of digital trust in the course "Using computers in education" is a post-application to the research sample, correcting and monitoring it.

Research Findings and their Interpretation

The following study issues were addressed after keeping an eye on the students' post-application scores on the engagement in learning and digital trust scales for the "Using Computers in Education" course:

What is the impact of integrating the Digital edX platform with generative artificial intelligence applications on students at King Khalid University's College of Education in terms of improving their ability to participate in learning?

Create the following hypothesis in order to respond to this query:

After applying the engagement scale to learning, there is no statistically significant difference (p < 0.05) in the mean scores of the two empirical groups (one using the edX platform and the other using the Blackboard platform). The (T) test was used statistically for two independent samples to compare the learning engagement ratings for the first experimental group and other empirical groups in order to assess the validity of this hypothesis. The results of the "T" test are displayed in Table (3), which highlights the variations in the first empirical group's and the other empirical group's mean scores on the engagement scale for the course "Using Computers in Education."

Table 3: The t Value and its Statistical Significance between the Mean Scores of the Students of the First and the Other Empirical Groups in the Engagement Scale.

Group	Tool	N	M	A	Degree of Freedom	t Value	Significance
1st Group	Education	29	52.69	4.91	55	*7.923	Significant
2nd Group	engagement scale	28	43.41	4.13	55	*7.923	Significant

Table (3) shows that the calculated (T) value is (7.923), which is a function of the level (0.05), the significance of both sides, and the degree of freedom (55), which indicates the existence of statistically significant differences between the first empirical group and the other empirical group in the post application of the engagement scale in learning the course "Using computers in education". Thus, the first hypothesis of the research was rejected, where there is a statistically significant difference at the level of (0.05) between the mean scores of the first empirical group (which used edX platform with some Generative artificial intelligence applications), and the other empirical group that used Blackboard platform, in the post application of the engagement scale in learning, in favor of the first empirical group.

The researchers believe that the previous finding could be due to the following:

- The edx Digital platform is characterized by its user interface, which includes buttons, drop-down lists, an outgoing and receiving message box, and other features. Everything mentioned above helped draw in students and engage them in the material covered in computer use in education course.
- The availability of a generative artificial intelligence application on the edX platform, namely chat bots, which assisted in determining students' proficiency after they had reviewed the lesson's material and then helped them with the challenging and unclear portions. Because users could ask questions and receive prompt responses, the app encouraged students to participate actively in their education.
- The layout, caliber, and contemporary digital material of the "Using Computers in Education" course, together with the students' execution of real-world projects, enhanced the students' participation in the educational process.
- Otter Voice Notes App integration with edX platform: Otter Voice Notes App is a generative artificial intelligence tool that assists students in capturing and sharing knowledge, either by turning sounds into text or just audio recordings.
- The fundamental idea behind the edX platform is that learners may study on their own by doing their own information searches and interacting with others to share knowledge. The research sample's students were all motivated to further their knowledge and gain new skills in the field of technology, and this atmosphere increased the students' involvement in the classroom at the College of Education.
- A customized learning environment for every student is represented by the integration of

the Chatbots application with the edX platform. By using the pre-made solutions, each student was able to find what he needed using this program. Additionally, because this setting is not bound by space or time, a significant portion of the student body participated in the learning process.

- The integration of the edx platform with the Chatbots application offers this feature for instant communication and immediate feedback because students are now accustomed to using instant communication platforms in the modern era, and mobile applications are now a necessary component of every student's life.

- Using chatbots to integrate the edx platform Assist students in staying up to date with current trends and patterns by utilizing the internet for browsing, information acquisition, and immediate assistance. This will encourage students to participate actively in the learning process.

The answer to the second question: "What is the effect of integration between the Digital edx platform and Generative artificial intelligence applications in developing digital trust skills among students at the College of Education, King Khalid University?"

To answer this question, formulate the following hypothesis:

There is no statistically significant difference at the level (0.05) between the mean scores of the first empirical group (which used edX platform) and the second empirical group (which used "Blackboard" platform) in the post application of the digital trust scale. To test the validity of this hypothesis, the statistical treatment was carried out using the (t) test for two independent samples to compare the application scores of the digital trust scale for the first experimental and the other empirical groups.

Table (4) shows the findings of applying the "t" test to indicate the differences between the mean scores of the first empirical group and the second empirical group in the digital trust scale.

Table 4: The t Value of and its Statistical Significance between the Mean Scores of the Students of the First and Second Empirical Groups in the Digital Trust Scale.

Group	Tool	N	M	A	Degree of freedom	T Value	Significance
1st Group	Digital trust scale	29	66.52	7.05	55	1.368	Insignificant
2nd Group		28	64.04	6.68	55	1.368	Insignificant

Table (4) shows that the calculated value of (t) is (61.368), which is non-functional at the level of (0.05), and the significance of both sides, with a degree of freedom (55). This indicates that there are no statistically significant differences between the first empirical group and the second empirical group in the post application of the digital trust scale in the "Use of Computers in Education" course. Thus, the second hypothesis of the research hypotheses was accepted, as there is no statistically significant difference at the level (0.05) between the mean scores of the first empirical group (which used edX platform), and the second empirical group that used Blackboard platform, in the post-application of the scale Digital trust.

The researchers believe that the previous finding could be due to the following:

- edX platform that includes applications for Generative artificial intelligence, and "Blackboard" platform include an easily and securely accessible link.

- edX and Blackboard platforms provide tools for the user to verify his identity before starting

to enter the platform and study the educational content.

- The user in both edX and Blackboard platforms can securely register his data on the platform by sending a confirmation message via his mobile phone, and then the student deals with confidence and security with the content of the platform.
- The user in both edX and Blackboard platforms can easily and securely share the content of any platform, where each platform provides content protection tools, when a file has an extension (exe), for example, it is not shared with any other user.
- In case the user loses or forgets the password, EdX and Blackboard provide accurate password recovery tools through the user's mobile number, or by sending a message to the platform manager to verify the identity of the student. Therefore, all students on edX and Blackboard platforms feel safe and confident in dealing with any of these platforms.

Scientific and Practical Significance of the Research Findings

Through tables (3, 4), the researchers explain the practical or applied importance of the research findings by finding the effect size of the independent variable on the dependent variables.

Table 5: The Scientific and Applied Significance of the Research Findings.

Independent variable	Dependent variable	Cohen's (d)	η^2	Effect size
Edx integration with AI Apps	Education engagement	2.13	0.53	Big
	Digital trust	0.29	0.03	Small

Table (5) clearly shows the size of the effect of the Digital edX platform's use of generative AI applications in helping students at King Khalid University's College of Education develop their engagement skills while taking the course "Using Computers in Education" (0.53), which is a significant percentage. The remainder can be attributed to a wide range of additional characteristics, such as classmates, specialization, student experience, and surroundings. The effect size of utilizing the edX Digital platform with generative AI applications on the growth of digital trust skills was (0.03), indicating a minor effect size.

Discussing the Research Findings

The current research aims to develop engagement skills and digital trust in the course "Using Computers in Education" among students at the College of Education, King Khalid University by designing a learning environment based on the engagement of the Digital platform (EdX) with some applications of Generative artificial intelligence.

First: What is the effect of the integration between the Digital edX platform and Generative artificial intelligence applications on the development of engagement skills in learning among students at the College of Education, King Khalid University?

The findings showed that the ability of the students of the first empirical group that used edX platform was higher and statistically significant than the ability of the students of the second group that used "Blackboard" platform in developing engagement skills in learning. This means that the students of the first empirical group benefited from edX platform and Generative artificial intelligence applications better than the students who trained through "Blackboard" platform. This may be due to the employment of Generative artificial intelligence applications within edX platform and giving the learner the ability to share information with others. Moreover, the user interface of edX platform facilitated the engagement of students into the learning process anywhere and at any time. This result is consistent with the findings of the study of [6], and the study of [7].

Second: What is the effect of the integration between the Digital edX platform and Generative artificial intelligence applications in developing digital trust skills among students at the College of Education, King Khalid University?

The findings showed that the ability of the students of the first empirical group that used edX platform was almost equal to the ability of the students of the second group that used "Blackboard" platform in digital trust skills. This means that the students of the first empirical group benefited from edX platform and Generative artificial intelligence applications almost to the same extent as the students who trained through "Blackboard" platform. This may be because both edX and Blackboard platforms each provide a secure system for entering the platform, as well as the ability to verify the user's identity when changing the password. EdX and Blackboard platforms also provide safe handling without fear on mobile phones, as well as through them the learner can share files safely without fear. All of this led to the equal role of edX and Blackboard platforms in developing digital trust skills among students of the College of Education, King Khalid University.

Research Recommendations

On the basis of the results of the present study, the following suggestions may be made:

- The necessity of using international e-learning platforms like EdX and Coursera to teach university students digital engagement skills.
- The necessity of focusing on increasing university faculty members' proficiency with generative artificial intelligence applications in the field of education.
- The need to pay attention to the design of courses through Digital platforms; Research encourages educational inclusion and digital trust.
- The need to pay attention to the engagement of Generative artificial intelligence applications in interactive Digital platforms.

Suggested Research

Several of the following studies might be recommended in light of the research findings:

- A suggested training course built around e-learning platforms to help university students become more adept at making decisions and in digital entrepreneurship.
- Creating a "design thinking"-based online learning environment to help College of Education students build digital platforms and enhance their digital intelligence.
- The impact of utilizing generative AI applications on university students' ability to think technologically, build digital transformation abilities, and anticipate the future.

Conflict of interest

The authors declare that there is no conflict regarding the publication of this paper.

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