

THE IMPACT OF VIRTUAL CLASSROOMS ON THE DEVELOPMENT OF DIGITAL APPLICATION SKILLS AMONG TEACHERS OF DIGITAL SKILLS IN NAJRAN REGION

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ABSTRACT

Digital application skills are important for educators of digital skills. Besides, the use of virtual classrooms is on the rise during the COVID-19 pandemic in higher education institutions. This led to new questions about how to explore the effects on the development of digital skills teachers of digital skills in the virtual classroom. The aim of this study is to explore the effects of using virtual classrooms in developing the skills of digital applications among teachers of digital skills in the Najran region. The participants were affiliates of the Optimum Investment Program, who were divided into two groups (experimental and control). The experimental group studies the "Digital Applications" course through virtual classrooms. The control group is taught in the traditional way in the classroom. In order to achieve the objective of the study, a digital application skills observation card was used as a tool for the study. The results showed the effectiveness of virtual classrooms in developing the skills of digital applications among teachers of digital skills in Najran, compared to the traditional method. The results provide important evidence of the advantages of virtual classrooms in the studies and development of the educational field.

Keywords: virtual classes; digital applications; digital skills; digital skills teachers

INTRODUCTION

Higher education is facing a challenge in how to achieve learning outcomes during the COVID-19 pandemic. Therefore, it is important to go beyond the factors of time and space to improve flexibility in the learning path (Ahmed, Alharbi, & Elfeky, 2022; Lakhali, Bateman, & Bédard, 2017; Raes et al., 2020). More specifically, if students are not allowed to attend educational institutions, the alternative is to move from traditional to online learning (Basilaia & Kvavadze, 2020; A. I. M. Elfeky & Elbyaly, 2019; Sintema, 2020). Because of the lockdown that accompanied the onset of the pandemic, educational materials in many universities were delivered through virtual classrooms, which is the most popular online learning field (Chowdhury, 2020). Virtual classrooms are a common technology in the current global context (Masada, 2017; Sultana, Jibon, & Kashem, 2020). The virtual classroom is a technology product (Asadi, Khodabandeh, & Yekta, 2019; M. Y. H. Elbyaly & Elfeky, 2022b). This is because it is an electronic learning environment, that is easily accessible via the Internet at a reasonable price, and this environment is flexible (Alhawiti, 2017). The virtual classroom can also be defined as an electronic classroom

that offers an educational course that can be expanded in content, space, and time (A. I. M. Elfeky & M. Y. H. Elbyaly, 2021; Ricolfi, 2020). It features an interactive learning environment that features audio and video broadcasts and discussion boards (Almalki & Elfeky, 2022; Ruthotto, Kreth, Stevens, Trively, & Melkers, 2020). A class enables students to attend from different locations overcoming space restrictions. In addition, by recording the lecture, students can view it from different times, overcoming the restrictions of time, and that is why it was called an assumption (Hussain Al-Qahtani, 2019).

Virtual classrooms offer many services to both students and faculty members, such as sharing educational files and videos, desktop sharing, and simultaneous chat (Sultana et al., 2020). Besides, online learning through virtual classrooms can be an alternative to traditional learning so that learning activities can continue during the COVID-19 pandemic (A. I. M. Elfeky, Alharbi, & Ahmed, 2022; Nahdi & Jatisunda, 2020). On this basis, this pandemic has forced all students and faculty members to prepare to perform their teaching tasks in a virtual learning environment (M. Y. H. Elbyaly & Elfeky, 2022a; Purwanto, 2020). The virtual classroom provides an interactive learning environment by integrating Internet technology where students and faculty members can collaborate, interact, explain their ideas, and communicate in well-structured pedagogical and technical procedures (Alharbi, Elfeky, & Ahmed, 2022; Sultana et al., 2020).

Many previous studies dealt with virtual classrooms by research and experimentation. Including the study of Asadi et al. (2019), which compared a virtual classroom with a traditional classroom according to undergraduate English language students. The results showed that the students who engaged in the virtual class were better than their colleagues who studied in the traditional class, and the virtual class allowed more interaction between the faculty member and the students. In addition, the study of Hussain Al-Qahtani (2019), which investigated the perceptions of both faculty members and students in the English Department towards virtual classes. The results revealed that most of the faculty members and students have positive perceptions towards the virtual classroom, and the results revealed the enhancement of communication skills because of the use of the virtual classroom. As well as the study of Alhawiti (2017), which examined the effectiveness of virtual classes on the English language proficiency of students of Community College in Tabuk compared to the traditional method. The results revealed the effectiveness of the virtual classes compared to the traditional method in terms of developing English language proficiency, which was shown through the result of the achievement test of the English language. In addition, the Collaborate Ultra Experience LTI virtual classroom is a unique addition for students who benefit from the use of virtual environments. Which is used by integrating it into the Blackboard system. This application aims to facilitate smooth, real-time interaction between students and faculty members with the support of IT infrastructure and new technologies (Masadeh & Elfeky, 2016; Suwais & Alshahrani, 2018).

On the other hand, digitization is a process of transformation that has already affected many parts of industry and society and is expected to increase its transformative speed and impact (Elfeky, 2017; Weigel & Fishedick, 2019). Digital applications are programs used to process and edit

various multimedia elements (texts, images, sounds, videos, etc.), as these programs convert multimedia elements into a digital form that can be processed and edited by computer (reference). Digital applications on computers and smart devices are becoming increasingly popular as society's focus shifts to the age of digitization (Alexopoulos, Hudson, & Otenigbagbe, 2020; Elfeky & Elbyaly, 2017). There is a relationship between digital application skills and achieving the educational goals of digital skills teachers (A. I. M. Elfeky & Elbyaly, 2016; Riel, Christian, & Hinson, 2012; van Laar, van Deursen, van Dijk, & de Haan, 2019). Teachers of digital skills must be proficient in the skills of digital applications (Djumalieva & Sleeman, 2018). In order to achieve the educational goals of the courses entrusted to them. The teaching staff who teach digital skills teachers in the Najran region indicate that their digital application skills are low, given that their original specializations are different, and they are being prepared to be able to teach digital skills courses. Therefore, this study seeks to address these gaps by using the Collaborate Ultra Experience LTI virtual classroom environment to explore the impact on the skills of digital applications among teachers of digital skills in the Najran region.

RESEARCH PROBLEM

The problem of the current research emerged through the researchers' observation of a shortcoming in achieving the objectives of the "Digital Applications" course for a large percentage of digital skills teachers in Najran region who are registered in the Optimum Investment Program. As mentioned in the introduction to the research; there is a relationship between digital application skills and achieving the educational goals of digital skills teachers (Elfeky & Elbyaly, 2021; Riel et al., 2012; van Laar et al., 2019). That is, teachers of digital skills must be proficient in the skills of digital applications (Djumalieva & Sleeman, 2018; Elfeky & Elbyaly, 2023). In order to achieve the educational goals of the courses entrusted to them. This indicates the need to develop the skills of digital applications among the employees of the Optimum Investment Program, in a way that helps in achieving the educational goals that will be assigned to them after passing this program. Several previous studies have also indicated the effectiveness of virtual classes in achieving many learning outcomes (Asadi et al., 2019; Elbyaly, 2016; Elbyaly & El-Fawakhry, 2016; Elfeky, 2019; Hussain Al-Qahtani, 2019). However, little is known about whether virtual classrooms are effective in developing digital application skills among teachers of digital skills in the Najran region. Accordingly, the problem of the current research can be formulated in an attempt to identify the impact of virtual classrooms on the development of digital application skills among teachers of digital skills in Najran.

RESEARCH OBJECTIVE

The main objective of this research is to explore the impact of using virtual classrooms in developing the skills of digital applications among teachers of digital skills in Najran region.

RESEARCH IMPORTANCE

- Benefiting from the digital transformation in the educational process to face the dangers of epidemics and disasters that our societies may be exposed to.

- Employing the skills of digital applications in a way that contributes to achieving the objectives of the educational courses.
- Directing attention towards benefiting from the skills of digital applications when preparing teachers of digital skills in Najran.
- Developing digital applications skills in the “Digital Applications” course.

RESEARCH LIMITS

Objective Determinants

This research is limited to exploring the effect of using virtual classrooms on developing digital skills teachers in the Najran region in the "Digital Applications" course. Where the virtual classroom application provided by the Deanship of E-Learning and Distance Education was used for employees of Najran University, which is the Collaborate Ultra Experience LTI application, which is provided within the Blackboard e-learning management system.

Human determinants

The sample of this research is limited to teachers of digital skills in Najran.

Temporal determinants

The research was conducted during the first semester of the academic year 2022/2023.

Spatial determinants

The spatial determinants of the research were represented in the College of Education, Najran University.

Research Terms

Virtual Classes

It is an Internet-based educational electronic environment that is used to facilitate the smooth interaction of learners and teachers in real time with the support of modern technology and information technology infrastructure (Elbyaly & Elfeky, 2023a, 2023b; Suwais & Alshahrani, 2018). It is procedurally defined in this research as an educational electronic environment based on physical separation between students and teachers, by providing a different educational electronic experience characterized by the use of live audio and video broadcasting, the white board, file and application sharing, chat room, simultaneous internet surfing, and feedback.

Digital Applications

Digital applications are programs used to process and edit various multimedia elements (texts, images, sounds, videos, etc.), as these programs convert multimedia elements into a digital form that can be processed and edited by computer (Alanzi & Alhalafawy, 2022; Alshammary & Alhalafawy, 2023; Alzahrani, Alshammary, & Alhalafawy, 2022; F. K. Alzahrani & Alhalafawy, 2023; Najmi, Alhalafawy, & Zaki, 2023). The researchers adopt this definition as a procedural definition for this study.

METHODOLOGY

The methodology of the research was to use the experimental approach (with semi-experimental designs), which aims to know the effect of an independent variable (virtual classrooms) on the dependent variable (digital application skills), and this resulted in the use of a semi-experimental design known as the pre- and post-design using two groups (experimental), and a female control).

Table 1: Quasi-experimental research design

		Treatment	Post-test
Experimental Group	Digital applications skills observation card	Virtual classes	Digital applications skills observation card
Control Group		Traditional way	

Research Tool (Digital applications skills Observation Card)

The scientific steps were followed in building the research tool, and it was approved in order to ensure its suitability for use and application in the research. Where the current research requires the preparation of an observation card to measure the performance of digital skills teachers in the skills of digital applications. The researchers followed the following steps in building and adjusting the observation card. First: Determining the purpose of the observation card: This card aimed at measuring the performance level of digital skills teachers in digital applications skills. Second: Determining the performances included in the card: In its final form, this card includes (24) main skills and (261) sub-skills.

- Describe the performance in a short phrase.
- The statement must be precise, clear and concise.
- Each statement should measure a specific and clear behavior.
- Begin the phrase with a behavioral verb in the present tense.

Third: Quantitative assessment of students' performance: The researchers used quantitative assessment in degrees in order to identify the levels of the participants in each skill. Since the sub-skills within each main skill are interconnected and sequential, forgetting any sub-skill leads to the participant not continuing to perform the following sub-skills. This prompted the researchers to search for a mechanism to ensure the students' continuity in performing the skill. This was done with Rating Scales, consisting of five levels, according to Likert, as follows:

- The card included five levels of performance as follows:
 - Correct performance from the first time (the participant gets the full score).
 - Making a mistake, with the participant discovering the mistake himself (after alerting the teacher) and correcting it himself, (the participant gets $\frac{3}{4}$ of the mark).
 - Making a mistake, with the participant discovering the mistake himself and correcting it with the help of the teacher (the participant gets $\frac{1}{2}$ point).

- Making a mistake, with the participant discovering the mistake with the help of the teacher and correcting it himself (the participant gets ¼ mark).
- Performing an error, with the participant discovering the error with the help of the teacher and correcting it with the help of the teacher (the participant’s score is zero).
- The evaluation scores for the performance levels were distributed as follows:

Table 2: Quantitative assessment of performance levels

level of performance					
correct performance		error detection		correcting the mistake	
yes	no	By himself	lecturer	By himself	lecturer
2	0	1	0	½	0

The participant's performance is recorded by putting a tick (√) in front of the level of performance appropriate to his performance. The total score for the participant is obtained by collecting those scores, through which the level of his performance in the skills included in the card is judged. Accordingly, the total marks in the observation card is (522) marks. Fourth: Instructions of the note card: The researchers took into account that the instructions of the note card be clear and specific. The purpose of the card is also specified so that any observer can use it accurately. These instructions direct the participant to read the contents of the card accurately, to identify performance levels and to quantify each level. Fifth: The initial image of the observation card: After defining the purpose of the observation card and defining the performances included in the card, the observation card was formulated in its initial form, which consisted of (24) main skills, and (261) sub-skills that fall under the main skills. Sixth: Adjusting the observation card: In this step, the validity and stability of the card is checked, in order to ensure its suitability for use as a tool for evaluating the skills to be performed. This has been verified by verifying the authenticity of the card. By presenting it to a group of arbitrators and experts in the field of educational technology, curricula and teaching methods. This is done with the aim of verifying the authenticity of the card by ensuring the validity of the procedural wording of the card, its clarity, and the possibility of observing the performance, and by verifying the stability of the note card. By counting the number of observers on the performance of one participant, then calculating the coefficient of agreement between their estimates using the Cooper equation:

agreement ratio =	The number of sub-skills that have been agreed upon	X 100
	The number of sub-skills that have been agreed upon + the number of sub-skills that have been disagreed on	

This is done through the assistance of two colleagues, after presenting the observation card to them to learn about its content and the instructions for its use. Then observe the performance of three of the participants, and then calculate the coefficient of agreement of the three observers for each

participant separately. The following table shows the observers' agreement coefficient on the performance of the three participants.

Table 3: Coefficient of agreement among the observers on the performance of the three participants

Coefficient of agreement on the performance of the first participant	Coefficient of agreement on the performance of the second participant	Coefficient of agreement on the performance of the third participant	Average agreement coefficient for the three participants
92%	86%	89%	89%

From the previous table, we see that the average coefficient of agreement of the observers on the three participants was (89%). This means that the observation card is stable enough to be applicable as a measurement tool. Seventh: The observation card in its final form: The observation card is now in its final form, after confirming its validity and stability, and it has become valid to achieve its objective, which is to measure the performance level of the participants in the skills of digital applications.

Research Sample

The research sample consisted of (60) digital skills teachers registered in the Optimal Investment Program at the College of Education - Najran University during the first semester of the academic year 2022/2023 AD. They were divided into two groups (experimental and control). The experimental group consisted of (30) participants and the control group consisted of (30) participants. The experimental group studies the “Digital Applications” course through virtual classrooms, Collaborate Ultra Experience LTI, and the control group studies in the traditional way. In addition, checking the equivalence of the two groups before application necessitated the application of the research tool (Digital Application Skills Observation Card) prior to the two groups, as follows:

Ensure That the Two Groups are Equal in Digital Application Skills

Applying the note card beforehand to all the research sample participants. In addition, by analyzing the extracted data with T. test for independent samples to identify the significance of the differences between the mean scores of the two research groups to verify their equivalence before the start of the experiment. Table (4) reveals the differences between the scores of the participants in the pre-application using the Application Skills Observation Card.

Table 4: Significance of differences between the two research groups in the pre-measurement of the applications skills observation card

Group	M	SD	Mean Difference	T. Ratio	Sig.
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Experimental Group	123.6	6.854	3.7	8.413	0.365
Traditional Group	127.3	7.634			

It is clear from the previous table the differences between the mean scores of the two research groups in the pre-application of the applications skills observation card. Where it was not statistically significant at the level (0.05). That is, the research sample participants were homogeneous in the level of applied digital skills before exposure to the experiment.

Experimental Processing Material

To present the content of the “Digital Applications” course through virtual classrooms (the Collaborate Ultra Experience LTI application was used). The content of the course was organized into (7) lectures to present the educational material, after referring to a number of educational design models to come up with procedural steps to guide them in the design and production of the lectures provided. In order to achieve the objectives of the research, in terms of defining objectives, content and designing activities according to the characteristics of the learners. Where the lectures were presented to the experimental group through virtual classes. Taking advantage of the capabilities offered by the virtual classroom application, which are live video and audio broadcasting, chat room, application or desktop sharing, whiteboard, and synchronous browsing of the web. On the other hand, these lectures were presented in the traditional way in the classroom of the control group.

STATISTICAL PROCESSING

To ensure the homogeneity of the groups in the skills of digital applications, and to analyze the data of the final experiment (the post-application of the research tool), the T. test for independent samples was used to compare the arithmetic averages of the level of skills of digital applications for the two research groups.

RESULTS

To answer the main research question, by extracting the arithmetic mean scores for the post application of the digital applications skills observation card for both research groups. This is to try to find out if there are statistically significant differences between the two groups (experimental and control) due to the use of virtual classrooms. Table (5) shows the results of the T. test to compare the average scores of digital applications skills for the two research groups.

Table 5: T test results for comparing the average scores of digital applications skills for the two research groups (experimental and control)

Group	M	SD	Mean Difference	T. Ratio	Sig.
Experimental Group	496.8	2.928	59.5	9.102	0.037
Traditional Group	437.3	6.273			

From the previous table, it is clear that the value of "T" for the difference between the mean scores of students of the two groups (experimental and control) in digital application skills amounted to (9.102). The average score of the experimental group participants was (496.8). While the average score of the control group students was (437.3). Thus, we find that the value of "t" is statistically significant. In such cases, the statistical significance is directed in favor of the higher group on average, which is the experimental group, by an increase of (59.5) over the control group. Thus, the statistical significance is directed in favor of the experimental group (higher on average), which is taught in virtual classrooms, compared to the control group, which is taught in the traditional way, and thus we have answered the main research question.

DISCUSSION

The level of digital applications skills among teachers of digital skills in Najran region who are registered in the Optimum Investment Program was investigated in the "Digital Applications" course. Where the results indicated that the use of virtual classrooms had an impact on the development of digital application skills among the participants in the experimental group due to the use of virtual classrooms. The results of this research agreed with the results of other previous researches that looked at the effect of using virtual classrooms on different learning outcomes. Including what Asadi et al. (2019) showed that students who were engaged in the virtual class performed better than their classmates who studied in the traditional class. What was also revealed by Hussain Al-Qahtani (2019) is that the use of virtual classrooms enhanced communication skills. Alhawiti (2017) also confirmed the effectiveness of virtual classes compared to the traditional method in terms of developing English language proficiency, which was shown through the result of the achievement test of the English language. This did not appear in previous studies of differences between boys and girls in different learning outcomes due to the use of virtual classrooms within learning management systems, and this was confirmed by the results of the current research.

RECOMMENDATIONS

- The need to train male and female faculty members on the skills of employing virtual classrooms in the educational process.
- Using other technical products to develop digital application skills.
- Paying attention to the development of digital application skills at different educational levels.

SUGGESTED RESEARCH

- Conducting similar studies at the bachelor's level to confirm the success of using virtual classrooms in other environments.
- Conducting further studies to explore the possibility of developing digital application skills with augmented reality.
- Conducting studies to reveal the impact of using the project method on developing digital application skills.

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