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سعادة أ. د. رئيس تحرير المجلة المصرية للدراسات المتخصصة المحترم

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يسر **معامل التأثير والاستشهادات المرجعية للمجلات العلمية العربية (ارسيف – ARCIF)**، أحد مبادرات قاعدة بيانات **"معرفة"** للإنتاج والمحتوى العلمي، إعلامكم بأنه قد **أطلق التقرير السنوي الثامن للمجلات للعام 2023.**

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محتويات العدد

* **بحوث علمية محكمة باللغة العربية:**

The effect of interaction the two styles of sharing and two styles of adaptive systems in e-learning environment on the development of personal knowledge management skills among postgraduate students

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The effect of interaction the two styles of sharing and two styles of adaptive systems in e-learning environment on the development of personal knowledge management skills among postgraduate students

Prof. Dr. Alia Abdullah Al-Jundi
Sarah Saud Alkediwi

Abstract

The study aimed to determine the effect of merging between the sharing style and adaptation systems through an e-learning environment in developing personal knowledge management skills among female students at King Abdulaziz University. The study sample consisted of 44 students (they were divided into four experimental groups).

The model developed by Abdul Latif Al-Jazzar (2013) was followed for educational design.

Keywords: Sharing pattern, adaptation system, e-learning environment, personal knowledge management, developmental approach, instructional design.

ملخص:

العنوان : أثر التفاعل بين نمطين للتشارك ونمطين للتكيف في بيئة تعلم الكرتوني فـي تنميـة مهـارات إدارة المعرفة الشخصية لدى طالبات الدراسات العليا

المؤلفون : علياء عبد الله الجندى ، ساره سعود الكديوي

هدفت الدراسة إلى تحديد أثـر الـدمج بـين أسـلوب المشـاركة وأنظمـة التكيـف مـن خـلال بيئـة الـتعلم الإلكتروني في تنمية مهارات إدارة المعرفة الشخصية لدى طالبات جامعة الملك عبد العزيـز. تكونـت عينة الدراسة من 44 طالباً وطالبة (تم تقسيمهم إلـى أربـع مجموعـات تجريبيـة). وتـم اتبـاع النمـوذج الذي طوره عبد اللطيف الجزار (2013) للتصميم التعليمي.

الكلمات الدالة : نمط التشارك، نظام التكيف، بيئة التعلم الإلكتروني ، إدارة المعرفة الشخصية ، المنهج التنموي ، التصميم التعليمي.

Introduction

The electronic revolution in the field of information and the development of technological innovations necessitated the need to take the right decisions to keep pace with these developments in a manner commensurate with the requirements of life. Therefore, all different fields of life accelerate the acquisition of technological innovations necessary for the development of these fields, and the field of education is considered one of the most important fields that are interested in integrating technological innovations into its educational environment, as it is the basis on which all other fields are built.

To build the learner's knowledge and self-manage it, technological innovations help him provide more learning opportunities and give him ample freedom according to his abilities, aptitudes, and inclinations. Al-Khalifa (2008) stated that the call to shift towards digital education and learning and its integration into the educational process has produced many e-learning tools, environments and systems that support the educational process. In the current era, the need to achieve the principle of lifelong learning has also increased, due to the steady growth in knowledge in its various fields, which obliges individuals to learn continuously throughout life to keep pace with knowledge changes in their field of specialization and to keep them informed of everything new. This has led educators to strive to provide the best methods and means that contribute to providing an interactive learning environment to attract learners' interest, and as a result, adaptive electronic learning environments have emerged that allow building learning worlds for the learner to improve his skills and information.

E-learning environments are among the most important innovations in educational technology, as they transcend geographical and temporal boundaries to benefit from the educational services provided. Abdel Hamid (2005) indicates that network-based learning is the best example of the electronic environment and emphasizes the effective employment of the e-learning environment by securing a number of requirements, including the adoption of the e-learning system by educational

institutions, and the establishment of the e-learning infrastructure with a review of educational curricula and programs to comply with. With e-learning, in addition to modifying trends towards technological innovations in general and e-learning systems in particular.

Khamis (2016) confirms that electronic learning environments are alternative environments to the traditional physical environment, using the capabilities of information and communication technology to design, develop, manage, and evaluate various learning processes. The participatory learning environment is one of the environments in which the tools and capabilities of the Internet can be used appropriately in developing the skills of learners, (Holt et al. 1995. p.209).

Abdel Maqsoud (2016) indicated that the task of development by designers has become one of the essential tasks when designing electronic learning environments to become adaptive environments, considering the different learning styles of learners. Al-Mabaridi (2019) mentioned adapting the electronic content has become necessary to provide flexible learning that considers the individual differences among the learners and thus achieve the learning goals. Omran (2010) adds that colleges of education are particularly interested in preparing their students to become enlightened teachers who can deal with technological innovations effectively in line with the requirements and skills of the twenty-first century. Ragab (2019) stressed the necessity of integrating participatory e-learning environments with the adaptive feature to provide appropriate education that adapts to the needs, abilities, and characteristics of each learner.

Despite the interest of many studies in participatory learning and its importance in the learning process, the interest in studying the adaptive systems of learners and taking into account their cognitive differences still require further study - according to the knowledge of the two researchers - and based on the above, it becomes clear. that the importance of standing on the impact of the effect of interaction the two styles of sharing (sequential, parallel) and two styles of adaptive systems

(adaptation with student knowledge, adaptation with learning styles) in e-learning environment on the development of personal knowledge management skills among postgraduate students.

Statement of the Problem

Due to the difference of learners in terms of their patterns of receiving and analyzing information, and the fact that these differences are reflected in their personal knowledge management skills, the interest came in the necessity of merging between sharing patterns and adaptation systems in e-learning environments in order to raise the level of learning and improve the skills of learners. This was confirmed by Sharif's study (2013) that participatory learning environments embody the theory of constructive learning, as they help students organize and restructure knowledge, and represent what they know through the constructive approach to student activity that helps them build their knowledge on their own, instead of relying on the teacher. These environments also provide effective tools for knowledge representation, as they allow complex concepts to be presented in a clear way, in addition to facilitating the teaching and learning processes when students participate in the construction of content. Salovaara's (2005) study also added that the availability of a pattern of sharing within e-learning environments helps greatly in improving learning outcomes and deepening students' knowledge. The study of Akl et al. (2012) also recommended that e-learning environments are one of the most important fields in e-learning technology, and the use of e-learning environments requires good preparation in terms of their design, development, use and management according to specific standards in order to ensure the effectiveness of their employment in the educational process. McClaskey and Bray (2016) also indicate that adaptive learning environments are based on the difference in learning between students, since each learner has his own characteristics and cognitive style that distinguishes him from other learners, and therefore adaptive e-learning environments must be flexible that support their needs and preferences and take into account Diversity of their cognitive styles. The study of Abdel Maqsoud (2016) also

recommended increasing the trend towards using adaptive electronic learning environments instead of regular electronic environments in the educational process because of its good effect on the skillful performance of students.

It is also through the work of the two researchers as faculty members in Saudi universities and their observation of the weakness of personal knowledge management skills for female students in a number of electronic courses and educational activities in Saudi universities. To verify the above, the two researchers conducted a structured interview with (10) female faculty members in the various departments of the College of Education. The results were as follows: 90% of female faculty members believe that graduate students lack personal knowledge management skills, 85% of them support the need to teach students personal knowledge management skills, and 80% of female members support the use of learning styles and adaptive systems to provide students with personal knowledge management skills.

A structured interview was also conducted with (12) college students from outside the study sample, and the results were as follows: 90% of the students have the desire to develop personal knowledge management skills, and 80% of them prefer to develop personal knowledge management skills through the use of participatory e-learning environments and adaptation systems. Therefore, the current study sought to find out the effect of integrating the participatory style and adaptive systems through an e-learning environment in developing personal knowledge management skills among postgraduate students. The studies did not pay attention to the adaptive systems of female students, taking into account the individual differences between them, and the extent of the impact of different adaptive methods within participatory e-learning environments on the different aspects of learning for female students.

Based on the foregoing, it is clear that there are many challenges facing the development of personal knowledge management skills among female students of the College of Education at King Abdulaziz University. For postgraduate

students, and accordingly, the problem of the study can be identified by asking the following main question:

How can we design integrating the style of sharing and adaptive systems through an e-learning environment on the development of personal knowledge management skills among postgraduate students?

From this main question, the following questions branch out:

1- What is the effect of the two types of participation in the e-learning environment (sequential, parallel) on the development of personal knowledge management skills among postgraduate students at King Abdulaziz University?

2- What is the effect of adaptation systems (adaptation with student knowledge, adaptation with learning styles) on developing personal knowledge management skills among postgraduate students at King Abdulaziz University?

3- What is the effect of the size of the combination between the patterns of participation and the systems of adaptation in the e-learning environment on the development of personal knowledge management skills among postgraduate students at King Abdulaziz University?

Objectives of the study

The aim of the research is to treat deficiencies in personal knowledge management skills by integrating sharing and adaptation systems using the following:

1- Determining the impact of the two types of participation in the e-learning environment (sequential, parallel) on the development of personal knowledge management skills among postgraduate students at King Abdulaziz University?

2- Determining the impact of adaptation systems (adaptation with student knowledge, adaptation with

education styles) on developing personal knowledge management skills among postgraduate female students at King Abdulaziz University?

3- Determining the size of the effect of merging between sharing styles and coping systems in developing personal knowledge management skills among postgraduate students at King Abdulaziz University?

Hypothesis of the study

- There is no statistically significant differences at the significance level $(\alpha \leq 0.05)$ between the mean scores of the four experimental groups in the e-learning environment (sequential, parallel) to develop personal knowledge management skills.
- There is no statistically significant differences at the significance level $(\alpha \leq 0.05)$ between the mean scores of the four experimental groups, according to the different adaptation systems (adaptation with student knowledge, adaptation with learning styles) in the development of personal knowledge management skills.
- There are no statistically significant differences at the significance level $(\alpha \leq 0.05)$ between the mean scores of the four experimental groups by merging between sharing patterns and adaptation systems in the e-learning environment to develop personal knowledge management skills.

Significance of the study

Based on the objectives that the study sought to achieve, its importance lies in the following points:

1- This study may help to provide educational and technological treatment and help teachers to take into account learning methods through the electronic learning environment (participatory - adaptive) in order to help students learning effectively.

2- The importance of the current study comes from the importance of the topic related to the impact of merging between sharing patterns and adaptation systems in an adaptive e-learning environment in the College learners.

3- The current study may help shed light on the importance of personal knowledge management skills and the effectiveness of their employment among graduate students.

4- This study may help in drawing the attention of those in charge of education to pay attention to the individual differences and differences in coping patterns among students.

5- This study may provide decision-makers with accurate information about the level of personal knowledge management skills among female students of the Faculty of Education at King Abdulaziz University, which makes them more able to take initiatives and build strategies in order to overcome them.

Limitations of the study

The limits of the study were as follows:

- **Objective Limitations:** The study was limited to development of personal knowledge management skills among postgraduate students using e-learning environment (sequential, parallel) and adaptation systems (adaptation with student knowledge, adaptation with learning styles) in the development of personal knowledge management skills.
- **Spatial limitations:** The study was limited to the Faculty of Education at King Abdulaziz University.
- **Human Limitations:** The application of the study was limited to female students of the Faculty of Education at King Abdulaziz University.
- **Temporal limits:** The study was implemented in the third semester of the academic year 2023.

Terminology of the study

Collaborative Patterns:

The two researchers define the patterns of participation procedurally in this study as: a method of dividing the educational tasks among the learners within the sharing groups, and it takes several forms, the most important of which are the serial pattern and the parallel pattern.

Adaptive Learning Systems:

The two researchers also defined procedurally adaptive systems in this study as: e-learning methods that depend on the compatibility between the learner's capabilities and the capabilities of the available electronic educational environment.

Personal Knowledge Skills:

The two researchers define personal knowledge procedurally as: knowledge that is based on experience and self-acquisition of experience, and access to hypotheses specific to the students.

Theoretical framework

The participatory learning styles:

The concept of participatory learning styles:

There are many definitions of sharing patterns, and there was no agreement among researchers and theorists on one comprehensive definition, and this difference may be due to the researchers' specialization and their cultural and cognitive backgrounds that formed the concept of sharing patterns for them, and the concept of partnership patterns is a general and comprehensive concept that is suitable for application in various types of organizations on Different types, activities and sizes. Among these definitions are the following:

Jane et al. (2013) defined patterns of sharing through virtual communities as a participatory dialogue system to achieve a specific task, with the aim of improving the communication process between sharing groups and giving them the opportunity to express their opinions and present their

ideas, which provides an opportunity to exchange experiences among learners. Ali (2017) described the different ways through which students distribute and perform the tasks of producing digital learning units within groups in a participatory e-learning environment, in order to reach the best performance for each group, represented in: the parallel, sequential, selective, and synergistic style.

Classification of collaborative learning styles (sequential, parallel):

Kimmerle and Cress (2008) as well as David (2010 and Madeline (2008) see that there are multiple forms of sharing patterns through participatory web editors, and there are types that have the greatest impact on the success of the learning process, and among these patterns: sharing between Teacher-learner, we share between learner-learner, we share between learner-learners. While Chang (2015 Chang) believes that the sharing patterns are limited in participatory web editors to two patterns: the sharing pattern between the teacher and the learner, and the sharing pattern between the learner and the learner, where these two help the two types of learners in accomplishing their participatory tasks, through achieving the objectives and implementing some of the learning tasks assigned to them by the teacher.

It is worth noting that both Elgort and Smith (2008) and Salmons (2006) agreed that there are several patterns of sharing that students use when performing a task in a participatory learning environment within groups, namely: The sequential pattern means dividing the main task into subtasks so that each A student on a sub-task, and after completing it, the next student completes it, and so on. Parallel Style: It means dividing the main task into subtasks, provided that all students perform their subtasks at the same time. Selective Style: It means that each student works on performing the main task completely individually, then All students discuss within the group in order to choose the best performance of the task Synergistic style: where all students work together to perform the same task at the same time. Muhammad (2018) also

distinguished the patterns of sharing within groups into three patterns, which are (synergistic, serial, and parallel). The two researchers agree in the classification of sharing patterns with the study of Elgort and Smith (2008) and Salmons (2006), which can be divided into four patterns, namely, the serial sharing pattern, the parallel sharing pattern, the selective sharing pattern, and the synergistic sharing pattern.

The importance of participatory learning styles:

Among the studies that dealt with the importance of e-collaborative learning patterns, the study of Al-Ghoul (2012) showed that the use of collaborative patterns led to the development of the skills of faculty assistants at the Faculty of Education at Mansoura University in the use of some second-generation web services. Omar's study (2012) also confirmed that collaborative learning patterns contributed to the development of field training and teaching practices for students, computer teachers, at the Faculty of Specific Education in Damietta. In addition to the study of Hamdi and Hamada (2013), which recommended the need to expand the use of participatory learning patterns through social networks, due to its positive impact on the outcomes of the learning process. It can be said that the importance of sharing patterns is due to the fact that sharing patterns give students a high ability to achieve and social intelligence skills, increase sharing between students, and develop their various skills.

The Adaptive Systems:

Concept of Adaptive Systems:

There are many definitions of adaptation systems, and this difference may be due to the specialization of researchers and their cultural and cognitive backgrounds that formed the concept of adaptation systems for them. The concept of adaptation systems is a general and comprehensive concept that is suitable for application in various types of organizations of all types, activities and sizes. Among these definitions are the following:

Adaptive systems are defined by Azmy and El-Mohammadi (2017) as adaptive e-learning environments and as a type of e-learning characterized by flexibility that takes into account the individual differences of learners; Thus, it makes the learning process more flexible and dynamic by adapting the learning environment based on the learner's satisfaction, with the aim of increasing performance according to a set of predetermined criteria. Ragab (2019) also mentioned that it is an intelligent e-learning system that can identify their needs and adapt the learning provided to learners according to their characteristics and learning styles, with the aim of providing appropriate learning for each learner, in light of his input and the information he obtains.

Classification of adaptive systems

Leka al el (2016) mentioned the most important adaptive systems:

Adaptation to student knowledge:

A common example of adaptation in an e-learning system is the adaptation of educational materials and presentation of content according to the student's knowledge of the subject area. The main idea is that in the case of a student who is advanced in the level of knowledge, the system can provide a brief summary of the materials and hyperlinks for a more detailed description of them. In the case of a learner with little knowledge, the system can present more detailed information in a smooth logical flow.

Adaptation to learning styles:

This method of adaptation is based on the idea that the student can learn more efficiently depending on the material and according to his learning style (Felder, 2002.p.675).

Personal knowledge management skills:

There are many definitions of personal knowledge management skills, as they were defined by (Priti 2011; Li and Liu 2008; Cinque 2011) and mentioned as a set of problem-solving skills and methods in both logical concept and practical

application. In addition, it is a practical strategy to expand the scope of personal knowledge and transform it from tacit to explicit knowledge, organize it, focus on important information as part of private knowledge, and transfer scattered parts of information to the scope of systematic application. It is also a strategy to integrate the knowledge of the individual resulting from his interactions with peers in the adaptive learning network with his information and experience that he placed in his adaptive learning environment. Thus, the relationship between personal knowledge management skills and education design should be established.

Classification of Personal Knowledge Skills:

Pettenati al et. (2007) was able to categorize personal knowledge management skills under three intertwined categories: synthesis, organization, and sharing. Priti (2011) classifies the main skills of personal knowledge management as follows: Lifelong learning skills- Learning management skills - Reading and writing skills - Organizational skills - Networking and collaborative skills - Research and observation skills - Communication and visualization skills - Creative and innovative skills - The latest information and communication technology skills - Information management skills. Avery al et. (2001) and Tsui and Cheong (2010) classified these skills into seven personal knowledge management skills: (retrieving information; evaluating information; organizing information; collaborating on information; analyzing information; presenting information; and securing information). Academic Dictionaries Encyclopedias (2010) also refer to a number of more contemporary personal knowledge management skills: Reflection: the continuous development of how one works. Learning Management: Managing how and when an individual learns. Knowledge of information: Understanding important information and how to find unknown information. Organizational skills: personal libraries, personal arrangement and classifications.

Networking with others: Find out what your network of people knows, who may have additional knowledge and resources to help you. The “cultural anthropology” skills of

research, collection, attention, interviews and observation; Communication skills: perception, intuition, expression, visualization, and interpretation. Creative skills: imagination, pattern recognition, estimation, innovation and reasoning. Understanding of adapting complex systems. Collaboration skills: coordination, synchronization, experimentation, collaboration, and design. In addition, Ali (2014) classified them into: access to ideas and information, transfer of information and ideas, sharing information and ideas, publishing and securing information and ideas, evaluating, organizing and analyzing ideas and information. Through the foregoing, the two researchers classify personal knowledge management skills into the following: searching for and collecting information, analyzing and evaluating information, organizing and storing information, processing and disseminating information, disseminating and sharing information.

The importance of personal knowledge management skills:

The researchers believe that the importance of personal knowledge management skills lies in:

• Controlling the common content among students that improves methods of extracting knowledge and developing methods of searching for information.

• Developing data and information analysis due to the importance of integrating participatory patterns and adaptation systems to develop personal knowledge management skills, as many studies have been applied that shed light on these variables.

• One of the studies that shed light on sharing patterns and adaptation systems in an e-learning environment is the study of Muhammad (2018), which aimed to detect the impact of different sharing patterns within groups (synergistic - serial - parallel) in the e-training environment in developing the skills of developing web tasks among computer teachers, and that study found that the synergistic sharing pattern superiority over the sequential and parallel, and the superiority of the sequential

sharing pattern over the parallel in developing the skills of developing web tasks.

• As for the studies that were applied to the development of personal knowledge management skills, including the Salama study (2014), which aimed to determine the effectiveness of collaborative blended learning based on the tools of the second generation of the Web in the computer networks course in developing personal knowledge management skills for students of the Computer Science Division. The necessity of transforming the student/teacher from the role of a consumer of knowledge to the role of its producer, and this is achieved by helping him learn the skills of dealing with innovations and employing them in the educational process.

Study method and procedures

Post-measurement	Experimental treatment	Pre-measurement	Adaptation systems	Sharing pattern
Personal Knowledge Management Skills Scale	Adapting to learning patterns in a participatory e-learning environment with a sequential pattern -Adapting to student knowledge in a participatory e-learning environment with a sequential pattern	-Personal Knowledge Management Skills Scale	Adapting to learning patterns	**Sequential sharing pattern**
-Personal Knowledge Management Skills Scale	Adapting to learning patterns in a participatory e-learning environment with a parallel pattern Adapting to student knowledge in a participatory e-learning environment with a parallel pattern	-Personal Knowledge Management Skills Scale	Adapting to student knowledge	**Parallel sharing pattern**

The current study followed the treatment and preparing design. The experimental design was chosen $(2 * 2)$ for the experimental groups for the research, where the study tool was applied to them before to ensure the homogeneity of the students, then the experimental treatment was

conducted, and the comparison between their scores in the post application, to determine the significance of the differences resulting from the treatment, and the extent of the effect of the combination between the sharing style and the adaptation systems through an e-learning environment on dependent variables.

Methodology of the study

The current study used the developmental approach based on instructional design, which views educational technology as a process rather than just a product (Khamis, 2016). Which aims to build a relationship between sharing patterns and adaptation systems and provides solutions to the educational problem, and to determine the impact of merging them in the development of personal knowledge management skills, according to the stages of Abdel Latif El-Gazzar's developed model for developing e-learning environments (Elgazzar, 2013), which includes the analysis stage, the design stage , the creation and production stage, the evaluation and use stage, and it was used in building two forms of sharing style (sequential and parallel) and adaptation systems (adaptation to student knowledge and adaptation to learning styles).

Experimental processing:

First: Designing and developing the educational content of the e-learning environment:

After the two researchers examined some models of educational design and development, including: the model of Muhammad Attia Khamis (2006) for electronic educational design and development, the model of Elgazzar (2013) for the development of electronic learning environments, and the model of Nabil Jad Azmy (2015) for the educational design of virtual environments for multiple users, In light of this, the model of Al-

Jazzar (2013) was adopted in building the two patterns of participation (sequential, parallel) according to the adaptation system (adaptation with student knowledge, adaptation with learning styles) for the study sample, due to its suitability to the nature of electronic learning environments, the clarity of its stages and steps, and the ease of its application. Where the design passed according to the stages identified by the model used.

Second: Building the study tool:

The two researchers built the tool of the current study represented in a scale of personal knowledge management skills. The scale was built, so that the current scale included (32) items distributed over six dimensions, as follows: searching for and collecting information, numbering (5) items, analyzing and evaluating information, The number is (5) paragraphs, the organization and storage of information, the number is (6) paragraphs, the processing of information, the number is (5) paragraphs, the dissemination of information, the number is (5) paragraphs, the sharing of information, the number is (6) paragraphs. The validity and reliability of the scale was verified by presenting it to a group of experts specialized in the field of education and psychology in order to express an opinion on the accuracy and clarity of the paragraphs and the accuracy of the linguistic wording, and the appropriateness of each paragraph to measure the students' skills in managing personal knowledge and their suggestions were taken into account, as the required modifications were made. The scale was applied to an exploratory sample of (17) female students, where the correlation coefficients between the items and the total score of the scale ranged between (0.22 - 0.73), which indicates that the items have an acceptable level of validity, and thus the scale included in its final form (32) items. To calculate the stability, Cronbach's alpha equation was used, as the stability coefficient was (0.79), which indicates that the scale has an appropriate stability coefficient, which indicates its validity for application.

Third: conducting the basic experiment of the study:

A. The study experience went through several procedural steps represented in: selecting the study sample, holding a training workshop for the students of the four experimental groups, then applying the study tool beforehand, represented in the measure of personal knowledge management skills, after that the basic experiment was conducted, then the tool was applied post-factly to reveal the reality of the merger between The independent variables and their effect on the dependent variables, as follows:
A- Selection of the study sample: A random sample of (44) female postgraduate students was selected from the College of Education at King Abdulaziz University.

B. Holding a workshop: A workshop was held to train the female students who learned according to the adaptation of student knowledge in a participatory e-learning environment with a sequential pattern, and the female students who learned according to the adaptation of learning patterns in a participatory e-learning environment of a parallel pattern, and the female students who learned according to the adaptation With learning styles in a participatory sequential e-learning environment, And the students who learned according to adapting to student knowledge in a participatory e-learning environment with a parallel style and how to conduct asynchronous discussions between them on the topic of learning, and the method of adding posts and commenting on peer posts, and retrieving posts that have been added, and downloading and saving files, by an hour for each group (11) freshman.

C. Ensuring the equivalence (homogeneity) of the groups: The results of the pre-application of the study tools were analyzed, represented in the measure of personal knowledge management skills, in order to identify the differences between the groups, the significance of the differences, and to verify the equivalence and homogeneity among the members of the study sample

before conducting the basic experiment, using Levene's test, and the results are shown in (Table 1).

Table (1) Sample size test of homogeneity.

Test Statistic	F-Test	Degrees of Freedom	P-value
Personal knowledge management skills scale	0.65	66	0.42

It is clear from Table (1) that the (F) values for the pre-application of the study tool were not statistically significant, because the level of significance was greater than (0.05), where the level of significance of the personal knowledge management skills scale was (0.42), which confirms the existence of equivalence and homogeneity between study sample members:

Conducting the basic experiment: The experimental treatment of the study was applied, using participatory e-learning environments (sequential, parallel), presented in two treatments according to the students' adaptation system: the first treatment, the system of adaptation to student knowledge, and the second treatment, the system of adaptation to learning styles.

Fourth: Statistical data processing:

The application of the post-measurement tools: After completing the application of the basic experiment, the following post-professional study tool was applied: the measure of personal knowledge management skills, in order to measure the development of personal knowledge management skills:

- A t-test for independent groups, to compare the mean scores of students according to the two types of sharing in the e-learning environment (sequential, parallel) as well as the adaptation system (adaptation to student knowledge, adaptation to education styles)
- Two-way ANOVA analysis of variance for students' scores in the post application of the study tool, in order to determine the level of significance of the ratio of the effect of merging between sharing patterns in the e-learning environment and adaptation systems in

developing personal knowledge management skills, as well as the size of the effect of the e-learning environment in developing personal knowledge management skills.

- Shefee's test to compare the mean scores of the four experimental groups in the dependent variables.

Conclusion of the study

After completing the basic experiment of the study and applying the tool, the data were collected and analyzed using some statistical methods (arithmetic mean, standard deviation, and analysis of variance) as parametric statistics, in order to calculate the differences between the mean scores of the students, and the (t) test to determine the significance of the statistical differences between them. Presentation and discussion of the results below:

First: The results related to the first research question, "What is the effect of the two types of sharing in the e-learning environment (sequential, parallel) on the development of personal knowledge management skills among female graduate students?"

To answer this question, the following hypothesis was validated:

The first hypothesis: It states that "there is no statistically significant difference at the level (≤ 0.05) between the mean scores of the students of the four experimental groups in the development of personal knowledge management skills due to the effect of the difference in the style of sharing in the e-learning environment (sequential, parallel).

To validate this hypothesis, a t-test was used for independent groups to compare the mean scores of the students in the post application of the personal knowledge management scale, according to the e-learning style (sequential, parallel), and the results are listed in Table (2).

Table (2) the difference between the mean scores of students in the post application of the personal knowledge management ability scale according to the sharing style in the e-learning environment (Blocks and Treatment).

Test Statistic	Means		Standard Deviation		Degrees of Freedom	T-test	P-value
	Blocks	Treatments	Blocks	Treatments			
Personal knowledge management skills scale	50.91	51.35	0.75	1.04	68	2.02	0.05

It is clear from Table (2) that the calculated value of (T) for the measure of personal knowledge management skills was greater than the tabular value, and statistically significant at the level (0.05), which confirms the impact of the two types of participation in the e-learning environment (sequential, parallel) on the development of knowledge management skills personality, and it is noted that the level of significance tends towards the highest average (51.35) in favor of the parallel sharing style in the e-learning environment, and thus the hypothesis is not accepted.

Second: The results related to the second research question, "What is the effect of adaptation systems (adaptation with student knowledge, adaptation with learning styles) on developing personal knowledge management skills among postgraduate female students?"

To answer this question, the following hypothesis was validated:

The second hypothesis: It states that "there is no statistically significant difference at the level (≤ 0.05) between the mean scores of the four experimental groups in the development of personal knowledge management skills due to the effect of different adaptation systems (adaptation with student knowledge, adaptation with learning styles) among female students when they are used for the e-learning environment" and to validate this hypothesis, a t-test was used for independent groups to compare the mean scores of the students in the post application of the personal knowledge

management skills scale according to the adaptation systems (adaptation to student knowledge, adaptation to learning styles) and the results are shown in Table (3).

Table (3) The difference between the mean scores of the students in the post application of the personal knowledge management skills scale according to the adaptation systems (adaptation with student knowledge, adaptation with learning styles)

Test Statistic	Means		Standard Deviation		Degrees of Freedom	T-test	P-value
	Adaptation of student knowledge	Adapting to learning styles	Adaptation of student knowledge	Adapting to learning styles			
Personal knowledge management skills scale	61.62	50.65	0.954	0.597	68	5.03	0.01

It is clear from Table (3) that the value of (T) calculated for the measure of personal knowledge management skills is greater than the tabular value, and statistically significant at the level (0.01), which confirms the presence of a positive impact of adaptation systems in the development of personal knowledge management skills, and it is noted that the level of significance tends towards The higher mean (62.61) is in favor of the system of adapting to student knowledge, and thus the second hypothesis is not accepted.

Third: The results related to the third research question, "What is the size of the effect of merging between sharing patterns and adaptation systems in the e-learning environment in developing personal knowledge management skills among postgraduate female students?"

To answer this question, the following hypothesis was validated:

The third hypothesis: It states that "there is no statistically significant difference at the level (≤ 0.05) between the mean scores of the students of the four experimental groups in the development of personal knowledge management skills due to the effect of the combination of sharing styles and adaptation

systems in the e-learning environment." To validate this hypothesis, a two-way analysis was conducted of the students' dimensional scores in the personal knowledge management skills scale, to determine the level of significance of the categorical ratio of the effect of merging between sharing patterns (sequential, parallel) and adaptation systems (adaptation with student knowledge, adaptation with learning styles). In developing personal knowledge management skills, the results are shown in Table (4).

Table (4) The results of the two-way analysis of variance for the students' scores in the post application of the personal knowledge management skills scale.

Source of variability	Sum of squares	Degrees of freedom	Means of square	F-test	P-value
Participation style	16.015	1	16.015	30.89	0.01
Adaptive systems	3.309	1	3.309	6.383	0.05
Integration (participation style * adaptive systems)	5.309	1	5.309		
Residuals	33,176	64	518	10.24	0.05
Total	177845	68			
Adjusted total	57.809	67			

By extrapolating the results of Table (4), it is clear that the percentage of the sharing style (sequential, parallel) was statistically significant at the level of (0.01) in the development of personal knowledge management skills, as well as the percentage of adaptation systems (adaptation with student knowledge, adaptation with learning styles) a function of at Level (0.05) The percentage of the combination between the sharing style and the adaptation system came as a function at the level (0.05), which confirms the existence of a significant and positive effect of the interaction between them in the development of personal knowledge management skills, and thus the third hypothesis is accepted.

And since the results of the analysis of variance indicate that there are statistically significant differences between the patterns of participation and the adaptation systems in the e-learning environment in personal knowledge management skills, and therefore it was necessary to use the Shefee test to make a comparison between the mean scores of the students of the four

experimental groups on the dependent variable, and the results are recorded in the table (5).

Table (5) The differences between the mean scores of the students in the post application of the personal knowledge management skills scale.

Variables	Means	Blocks * Adaptive student knowledge	Blocks * Adapting to learning styles	Treatment * Adaptive student knowledge	Treatment * Adapting to learning styles
Blocks * Adaptive student knowledge	51.12		Function (*)	Function (*)	Function (*)
Blocks * Adapting to learning styles	50.70			Function (*)	Function (*)
Treatment * Adaptive student knowledge	52.12				Function (*)
Treatment * Adapting to learning styles	50.59				
(*) P-value (0.05)					

From the extrapolation of the results of Table (5), there are statistically significant differences between the groups, as follows:

- There is a statistically significant difference at the level (0.05) between the mean scores of the first group (serial X adapting to student knowledge) and the second group (serial X adapting to learning styles). With the students' knowledge with the highest average (51.12).
- There is a statistically significant difference at the level (0.05) between the averages of the first experimental group (serial X adaptation to student knowledge) and the third group (parallel X adaptation to student knowledge). Top average (52.12)
- There is a statistically significant difference at the level (0.05) between the averages of the first group (serial X

adapting to student knowledge) and the fourth group (parallel X adapting to learning styles).

- There is a statistically significant difference at the level (0.05) between the averages of the second group (serial X adapting to learning styles) and the third group (parallel X adapting to student knowledge).

It is clear from the presentation of the previous results that the students with the adaptation system excelled with student knowledge with the parallel sharing style. This indicates that the learning environment that was built provided them with sufficient details of information, in a way that suits the adaptation system for each of them, and provided them with equal opportunities to share topics, present ideas and present ideas. their experiences in the learning process. This confirms the role of the parallel sharing style, the e-learning environment, in providing a learning environment that contains many diverse tools, which consider the different educational situation and individual differences among students, as it provided them with systems to determine the educational tasks and duties that are assigned to them. The average scores of the students were calculated in the pre and post application of the personal knowledge management skills scale, and the value of (T) was calculated, and the ETA coefficient 2 was calculated, then the results were recorded in Table (6).

Table (6) Average scores of the pre and post applications of the personal knowledge management skills scale, the value of (T), and the Beta coefficient.

Test Statistic	Means		t-test		Degrees of freedom	Beta square	Function
	Porterior	Posterior	t-test statistic	P-value			
Personal knowledge management skills scale	11.32	51.13	276.39	0.01	67	0.81	high

It is clear from Table (6) that there is a statistically significant difference at the level (0.01) between the mean scores of female students in the personal knowledge management skills scale in favor of the post application, as the effect size of the sharing style was (0.81), which is a greater percentage of the reported value (≥ 0.14) than This indicates that there is a high effect of merging between sharing styles and coping systems in developing personal knowledge management skills.

Conclusion

- There is a statistically significant effect of the combination between the parallel sharing pattern and the adaptation of student knowledge in the e-learning environment in developing personal knowledge management skills.
- The compatibility of the two patterns of sharing and adaptation to develop personal knowledge management skills with the constructivist theory in its support for learner-centered learning, as it created a learning environment that contributed to making students active in learning personal knowledge management skills through their involvement and interaction instead of being negative receivers, which was reflected in the level of students in the scale used.
- The results of the current study are consistent with the results of Mohammed (2018) and Salama (2014), which found the effectiveness of using sharing patterns in developing personal knowledge management skills.
- There is a statistically significant effect of the combination between the pattern of serial sharing and adaptation with learning styles in developing personal knowledge management skills for postgraduate students.
- The adaptive learning environment provided the students with the opportunity to build an environment that teaches them by themselves in a parallel manner, and helped to

cooperate and share among themselves ideas, information and experiences in a parallel manner.

- It provided learners with free use of services, tools and technologies, which enabled them to manage their learning.

Recommendations of the study

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

- Adopting the use of different e-learning environments and different learning styles and systems to acquire students' personal knowledge management skills.
- Expand the use of sharing patterns and adaptive systems in teaching and learning personal knowledge management instead of using traditional and usual methods, in order to create interactive learning environments that are flexible and stimulating for learners.
- Benefit from previous studies and research in the field to identify sharing patterns and appropriate adaptation systems for personal knowledge management skills based on the stage of study and age groups of learners.
- Directing researchers to conduct further studies on sharing patterns and adaptive systems in teaching and learning personal knowledge management skills at different educational stages.
- Benefit from the list of personal knowledge management skills found in the current study, among graduate students.

Future Studies

In light of the findings of the current study, the following studies can be made:

- Conducting a study to identify the impact of the interaction between sharing patterns and adaptation systems with other variables such as motivation for

achievement, cognitive load, creativity and innovation skills, and at different educational stages.

- Conducting a study to investigate the impact of the sequential and parallel sharing pattern with other variables such as motivation for achievement, cognitive load, creativity and innovation skills, and at different educational stages.
- Conducting a comparative study between e-learning-based learning environments and traditional learning environments and their effectiveness in developing personal knowledge management skills, at different educational stages.
- Conduct a descriptive study to monitor the most prominent educational challenges and obstacles facing the use of learning patterns and adaptation systems in the different stages of education, with their causes, and propose appropriate solutions to reduce them.
- Conduct a study on teachers' attitudes towards the use of sharing patterns and learning systems in teaching and learning personal knowledge management.

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