Effectiveness of Using Interactive Tools Via Personal Learning Environments on Developing Self-Regulated Skills and Learning Efficiency for Al- Arish Faculty of Education Students

Mahmoud Rizk Mahmoud Elfaramawy

Effectiveness of Using Interactive Tools Via Personal Learning Environments on Developing Self-Regulated Skills and Learning Efficiency for Al- Arish Faculty of Education Students

Mahmoud Rizk Mahmoud Elfaramawy

PhD in Educational Technology, Faculty of Education, Arish University, Egypt

Mahmoud.farmawy@edu.aru.edu.eg

Abstract: The current research aimed at studying the effectiveness of applying different patterns of interaction tools, (synchronous, asynchronous, synchronous and asynchronous together), based on web, to know its effectiveness on personal learning environments in developing Self-Regulated skills, cognitive achievement and learning efficiency. The experimental design with one Group (Pretest - Post-test) has been used, including one independent variable which is the personal learning environment, with three patterns, the first is interaction tools (synchronous), the second; interaction tools (asynchronous), and the third; interaction tools, (synchronous and asynchronous together), then the dependent variables that include: Self-Regulated skills for learning and cognitive achievement and learning efficiency. The main tools for research represented in: measurement for self-Regulated skills for learning. Achievement test. The research sample consisted of (90) students of third year. The sample were distributed in three groups, each group consisted of (30) students. Unidirectional variance analysis (One- Way ANOVA) was used, then using the "Tukey Method" to conduct a multi-dimensional comparisons between equal groups, in the event of a functional difference between the groups, the results proved that the interaction tools (synchronous and asynchronous Together) were better than interaction tools (synchronous) and tools interaction (asynchronous) separately, regarding the development of Self-Regulated skills and cognitive achievement which increases learning efficiency for learners, There is a statistically difference at the level of (≥ 0.05) between the means scores of experimental groups students in developing Self-Regulated skills for learning and cognitive achievement and learning efficiency, due to the main effect of the difference in using interaction tools patterns (synchronous / asynchronous /

synchronous and asynchronous together), through personal learning environments, Available online for students of the third year, faculty of education - El-Arish in the course of using computers in education In favor of group interaction Tools (synchronous and asynchronous Together).

Keywords: Personal Learning Environment - Interaction Tools via Web (Synchronous, Asynchronous) - Tools Web 2.0- Self- Regulated Skills - Learning Efficiency.

Introduction

Web-based learning is a rapidly growing field in education, training, and learning, increasingly becoming a common practice to effectively respond to learners. It provides learners with innovative methods and strategies to meet the needs of a new type of learning that is not limited by spatial and temporal constraints. Additionally, it offers communication tools that facilitate interaction between the learner and the content, supporting engagement and integration of the knowledge structure, which reflects on the learner's understanding of knowledge.

With numerous tools and resources available online, the applications in education have diversified, leading to the emergence of e-learning, distance education, and web-based education. These are among the most well-known applications of the internet, delivering electronic educational content through computer-based media that allows active interaction with the content, instructors, and peers, whether synchronously or asynchronously. This allows learners to complete their learning at their own pace and in the time and place that suit their circumstances and abilities, while also managing their learning through these mediums (Mohamed Mokhtar Al-Muradani, 2012, p. 109).

Web-based e-learning is one of the most significant innovations rapidly growing, as most countries strive to promote this type of learning in their educational institutions. However, the success of e-learning in achieving its goals heavily relies on the level of interactivity it provides in its environment. Learners in an online environment need to interact with instructors, peers, and content in various educational methods, seek help and guidance, or ask questions that require answers, using interaction and communication tools that are essential for transferring the face-to-face communication characteristics found in traditional classrooms to the web-based learning environment (Mohamed Abdelhamid, 2005, pp. 39-40).

The web-based e-learning environment aims to enhance learner interaction with instructors and peers through a network-dependent environment, providing different tools for both learners and instructors. Interaction styles are divided into two main types: 1) **Synchronous interaction**: interaction among learners at the same time,

referred to as (same time - different place), facilitated by various communication tools such as chat rooms (text, audio, or video), video conferences, and instant messaging. 2) **Asynchronous interaction**: interaction among individuals characterized by (different time - different place), allowing learners to access the learning environment at any time and follow the instructor's guidelines to complete their learning without synchronous contact with the instructor. Communication tools for this interaction include bulletin boards, discussion forums, emails, mailing lists, and recorded lectures (Mona Al-Jazzar, 2008, p. 370).

Numerous studies on synchronous and asynchronous interaction tools in e-learning environments have shown that each interaction style has distinctive advantages. Asynchronous interaction tools are known for their flexibility, knowledge building, problem-solving, and allowing individuals to gather data and reflect on their participation while accessing information sources online. Conversely, synchronous interaction tools offer real-time interaction and immediate feedback from instructors or peers, fostering a sense of community and collaboration to achieve their goals, making learning environments more interactive and enhancing social skills among students. The integration of both synchronous and asynchronous tools provides additional benefits, leveraging the strengths of each communication method to create a rich educational environment that increases student motivation and task completion in line with their characteristics and preferences. Such findings have been supported by various studies (Gustavo & Leslie, 2001; Huang & Lee, 2004; Iman Al-Taran, 2009; Abdulaziz Talba, 2011).

However, recent criticisms of e-learning have emerged, highlighting its lack of human presence and interpersonal relationships between teachers and students, as well as among students themselves, due to their physical separation. There has also been concern about the neglect of the human element in the educational process, with discussions about isolation, introversion, lack of participation, and a significant distance from social interaction (Mohamed Amasha, 2010, p. 26).

This led to the emergence of what is known as the second generation of e-learning (E-Learning 2.0), which focuses on supporting the social aspects of the educational process to compensate for the spatial separation between teachers and learners. This is achieved through the use of social software (software that enhances partnership and communication among learners), such as blogs, wikis, learner communities, podcasts, video streaming, and social networks (Egyptian National Center for E-Learning, 2008).

With the advent of the second generation of e-learning, technologies known as Web 2.0 emerged, characterized by a range of websites, services, and applications that offer several features (Hind Al-Khalifa, 2006, pp. 1-2): 1) Providing a high level of interactivity with users. 2) User participation in content creation. 3) The ability to tag content.

Definitions of Web 2.0 have varied. "Karrer" defines Web 2.0 as "the read-write web," which allows users to easily create content and participate in building online content through tools like blogs, sharing videos on YouTube, uploading photos to Flickr, and creating social networks on the internet (Karrer, 2007). "Anderson" describes it as "a new achievement in electronic applications on the internet, based on modern methods for building interactive social environments," consisting of a set of applications dependent on the World Wide Web, characterized by several features that distinguish it from Web 1.0 (Anderson, 2007). "Kennedy and Cropper" explain that it refers to a collection of social tools and technologies that enable users to create, publish, and share content using a variety of applications, such as blogs, wikis, file-sharing services, and social bookmarking, which support the processes of teaching and learning (Kennedy & Cropper, 2010, p. 341).

Numerous studies have confirmed the importance and effectiveness of Web 2.0 applications in the learning and teaching processes. Their results affirm that Web 2.0 applications are important and effective in the educational process, emphasizing that learners are the ones who construct knowledge, and that Web 2.0 applications represent a new trend in web-based learning, with continuously renewed content and ongoing application updates, requiring further research and development (Augar, Raitman &

Zhou, 2004; Grant, 2006; Taraborelli, 2008; Secker, 2008; Wheeler, Yeomans & Wheeler, 2008; Cole, 2009; Heba Osman, 2010; Mustafa Salama, 2011; Abdulaziz Talba, 2011).

This trend towards using social web has made the community a contributor and participant in building human knowledge, transforming internet users from mere consumers who spend most of their time searching and reading what they want, to participants in constructing this knowledge base by sharing ideas, images, videos, and communicating through texts, audio, and video, or adding personal information to maps covering the entire world (Hiam Al-Haik, 2007, p. 23).

This trend has led to the development of Web 2.0 applications and technologies, resulting in the emergence of the concept of Personal Learning Environments (PLEs), which center around leveraging second-generation Web 2.0 applications to serve learners (Hind Al-Khalifa, 2008, p. 9). PLEs create adaptive environments centered on the learner, who controls the entire environment, allowing it to quickly adapt to changing learning conditions. They also provide learners with the personal choice to select the components of their learning environment from social media tools and replace some or all of them according to their needs, receiving appropriate educational support within these learning environments to enable more effective learning opportunities (Attwell, 2007b, pp. 2-4; Dabbach & Kitsantas, 2012, p. 3; Halimi et al., 2014, pp. 166-169).

According to "Lubensky," PLEs can be seen as a means that facilitates individuals' access, aggregation, composition, and interaction with digital resources from their ongoing learning experiences, reinforcing both facilitated learning and lifelong learning (Lubensky, 2006). Meanwhile, "Schaffert and Hilzensauer" refer to them as "a collection of social software applications integrated into a single entity for learners to meet their specific needs during the learning process" (Schaffert & Hilzensauer, 2008, p. 2).

"Milligan et al." define PLEs as "environments that allow learners to use a set of Web 2.0 applications and tools in a single educational setting; they can benefit from a

single set of applications and tools, customizing and adapting them according to their individual learning needs and preferences." They also emphasize "a key technological component is the use of web services," stressing the importance of service orientation and interoperability (Milligan et al., 2006, pp. 507-508).

"Attwell et al." describe them as "the development of a set of Web 2.0 applications and tools that allow personal access to knowledge sources from multiple sources, supporting knowledge creation and building, based on identifying primary needs for knowledge development and determining the possible functions of the desired personal learning environment" (Attwell et al., 2008, p. 82).

"Attwell" suggested that PLEs can be envisioned as individuals organizing their learning processes in various contexts, where informal learning can complement formal education. He added that PLEs play a significant role in enhancing understanding of e-learning, as Web 2.0 technologies elevate informal education for students, making PLEs a promising educational approach for the intentional integration of formal and informal learning spaces (Attwell, 2007, p. 2).

The concept of PLEs emphasizes the importance of interaction for learning; interaction with content as well as social interaction with members of the learning community or network in general, ensuring that learning interactions do not isolate from those familiar to learners today. Thus, most PLEs rely on widely accepted interaction models and practices across the web, such as tagging, links, comments, and communication through instant messages, status updates, and similar means. Activities in PLEs encourage learning through dialogue and practical application based on supporting and guiding the learner. Through PLEs, learners learn how to control the context of their learning environment—managing data, services, resources, and content—building, organizing, and monitoring their learning processes; having the freedom to choose, aggregate, and use tools and communication mechanisms according to their preferences, and the ability to decide what to share or not share, and with whom to share or not share among their learning community, based on their needs and learning

activities to achieve learning goals that enhance and improve their learning (Attwell et al., 2008; Nussbaumer et al., 2013, p. 322; Buchem et al., 2013, pp. 13-14).

Abdulrahman Al-Muharafi pointed out that personal learning environments are characterized by low design and operational costs, ease of use, the ability to store scientific content for repeated access and usage, increased student participation in the educational process, and enhanced communication among them. Students also acquire non-curricular skills such as self-organization, report writing, and communication skills, along with opportunities to access additional resources outside the curriculum through internet links (Abdulrahman Al-Muharafi, 2009, pp. 24-25).

Many studies and research have addressed the impact of using personal learning environments on various learning outcomes, with results varying according to research variables. However, they confirmed the importance of interaction and social communication as a crucial part of an interactive system centered around the learner within the electronic learning environment. Some of these studies include (Niemi et al., 2003; Artino & Stephens, 2006; Valtonen et al., 2007; Johnson & Liber, 2008; Türker & Zingel, 2008; Ivanova & Chatti, 2010-2011; Dabbach & Kitsantas, 2012; Rahimi et al., 2013; 2014; Johnson & Sherlock, 2014; Juarros et al., 2014; Halimi et al., 2014; Rahimi et al., 2015).

Students learn through personal learning environments how to build, organize, and monitor their learning processes. With these environments, learners should not only determine the content and communication mechanisms but also control the learning environment itself. These environments support self-regulated learning and lifelong learning rather than just temporary situational learning; they also help establish a culture of lifelong learning and can continuously adapt to the changing learning interests of learners (Attwell et al., 2008; Nussbaumer et al., 2013, p. 322; Fiedler & Väljataga, 2013, p. 197).

Since learning depends on the learner's personality and the activities they engage in, learning is an active, self-directed process. Thus, it is essential to focus on the self-directed processes and skills that learners engage in during their learning and

knowledge acquisition, as well as the factors that help improve their academic performance. This is what has recently been termed self-regulated learning (Rabi' Rushwan, 2006; Zimmerman, 1990).

Self-regulated learning skills are not inherited personal traits; rather, they are skills that can be acquired and developed through experience, training, self-reflection, and behavioral control. These skills are particularly suitable for university students and higher educational levels, as these students have a greater ability to control their learning processes. The progress and learning of the student depend on their own efforts and activities in developing their knowledge and skills (Pintrich, 1995). Students at this stage have the readiness to develop self-regulated learning skills, but these skills only manifest in their behaviors if the appropriate environments and methods are available to activate them (Ahmed Osman, 2005).

Self-regulated learning holds great value as it plays an important and fundamental role in students' lives, leading to increased achievement in all tasks they undertake, particularly academic tasks. In this context, Mohamed Atiya Khamis highlighted the role of web-based learning environments in personalizing learning, meaning that education through these environments centers around the individual learner and their autonomy, making them the focal point regarding objectives, content, resources, activities, and strategies to meet their needs and adapt accordingly. It is as if this education is tailored specifically for them; the learner here is self-organized because they manage their learning, and in terms of responsibility, they are accountable for their learning (Mohamed Atiya Khamis, 2010, p. 24).

Wilson indicated that web-based learning environments can be among the most suitable for activating self-regulated learning skills if interactive methods and hypermedia that enable learners to choose, interact, read, and watch are available (Wilson, 1997, p. 5).

However, despite the importance of self-regulated learning skills, they have not received sufficient attention in terms of study and research or in the design of environments and the selection of appropriate methods to activate and develop these

skills. Nasra Jaljal stated that despite the abundance of research in the field of e-learning and the use of computers in education, there is still a need for much research on the role of the electronic learning environment in activating self-regulated learning skills (Nasra Jaljal, 2007).

Looking at the reality of web-based learning environments, this reality faces many criticisms and shortcomings. For example, Hassan Salama indicated that students who learned through web-based learning environments were less skilled and proficient in dialogue and the ability to present ideas, both in writing and orally (Hassan Salama, 2006). A study by **Salha Eisan & Wajeeha Al-Ani, 2008** demonstrated that there are problems facing students studying courses online, including anxiety regarding knowledge of web-based educational programs and the absence of an instructional guide to direct them on how to interact with these programs (Salha Eisan & Wajeeha Al-Ani, 2008).

In addition to these studies, there have been recommendations for other studies emphasizing the need to focus on the design of web-based learning environments and the employment of active learning strategies through this environment to facilitate participation, interaction, discussions, and the use of research and inquiry methods, whether synchronously or asynchronously (Mustafa Joudat, 2003; Yasser Shaaban, 2007; Nasreen Al-Hadidi, 2007).

Abdulaziz Talbah believes that web-based learning environments are among the most suitable for activating and developing self-regulated learning skills due to the sensory stimuli, interactive activities, and feedback they provide, enabling learners to manage, monitor, and evaluate their learning processes (Abdulaziz Talbah, 2011, p. 251). Hind Al-Khalifa noted that web-based learning environments consist of a combination of diverse activities and services that can be organized, arranged, added, and modified according to the learner's preferences. This means that web-based learning environments support the self-organization of learning skills, as learners are fully aware of their needs and can determine their learning requirements and control

their learning environment, obtaining the information they desire through sharing and participation in content rather than hoarding it (Hind Al-Khalifa, 2008, p. 11).

A study by Whipp & Chairell addressed self-regulated learning skills through online course studies, aiming to verify the extent to which students benefit from employing online interaction tools to apply self-regulated learning skills (Whipp & Chairell, 2004). Additionally, a study by Catherine & Mark focused on employing social interaction software such as wikis, blogs, podcasts, and YouTube to develop self-regulated learning skills among university students, concluding that students had greater control over their learning processes and were able to generate and exchange information, enhancing their dialogue, collaboration, and participation skills (Catherine & Mark, 2010).

From the above, the importance of e-learning via the web in providing a flexible, interactive personal environment for learners is evident, as well as the importance of utilizing online interaction tools and the need for optimal use of these tools to meet educational needs and train teachers in self-regulated learning skills. Therefore, it is essential to focus on designing a personal learning environment via the web that includes interactive tools, whether synchronous or asynchronous, or a combination of both, to create an active learning environment that allows students to interact, participate, and communicate with each other, meeting their needs and increasing their self-reliance and control over their learning processes, helping each learner to set their learning goals and enabling them to monitor their performance and develop the ability to choose their learning resources based on their needs.

This is also a natural result of the rapid development in the field of e-learning and Web 2.0 applications, which have provided countless design alternatives for benefiting from technological innovations in developing production methods, offering instructional designers a wide range of choices for innovation and creativity in developing the form and content of educational messages delivered through personal learning environments.

From this standpoint, the current research seeks to identify the effectiveness of using personal learning environments with three different types of interaction tools (synchronous / asynchronous / a combination of synchronous and asynchronous) provided via the web, to determine their impact on self-regulated learning skills, knowledge acquisition, and learning efficiency.

Problem Awareness

The sense of the problem arose when the researcher attended a training session titled "New Media Mechanisms," during which applications and technologies of Web 2.0 were presented, along with how to use, integrate, and benefit from them in modern media. The researcher thought about benefiting from integrating these tools into the educational process, and upon reviewing research and studies related to Web 2.0 applications and their development, the researcher arrived at personal learning environments. This led to the motivation to conduct this research and maximize the use of personal learning environments with three different types of interaction tools (synchronous / asynchronous / a combination of synchronous and asynchronous) and to use them according to design and construction criteria to help develop self-regulated learning skills, knowledge acquisition, and enhance learning efficiency for learners.

Research problem

The idea of research emerged for me during the presence of "mechanisms of the new media," training and it has been accessed applications and Web 2.0 technologies and how to use and integrate them in modern media.

the researcher thought to benefit from the integration of these tools in the educational process and when researcher acquainted on the research and studies of Web 2.0 applications and its evolution, the researcher recognized personal learning environments and there was a stimulus to implement this research make use of interaction tools, whether (synchronous / asynchronous / synchronous and asynchronous together) via personal learning environments and use them according to specific standards for designing and constructing them to help to e develop self-Regulated skills and cognitive attainment and increase learners' learning efficiency.

And so the research problem extruded from the following reasons:

- The constant need to develop and improve e-learning environments that lack the presence of humanitarian and human relations between the teacher and the students, the students and each other, and alter it with Personal learning environments that take care of supporting the social aspect of the educational process and to compensate detachable spatial between the teacher and the learners and achieve interaction and proper participation within the educational situation and overcome the multitude criticism of e-learning.

- Raise the university and the stages of higher education students' efficiency because these students have a great ability to control their own learning process, in which student's progress and learning and self-helping and his activities depend on the development of his knowledge and skills, and the students at this stage are ready for self-Regulated skills for learning, but these skills do not stand out in their behavior unless proper environment and styles are available to activate.

- Emphasis on lifelong learning to cope up with the knowledge and information explosion era, via self-Regulated for learning as it focuses on the personality of the learner as an active participant in the learning process.

- In light of the knowledge explosion and the multiplicity of electronic learning resources and the accumulation of knowledge and the diversity of forms of display information, the students need to be trained on the self-Regulated skills for learning to be able to deal with these variables and accomplish assigned tasks with motivation and desire, more than their need for conceptual understanding and saving the information.

- Personal learning environments are a new direction for research, and is one of the most promising applications to provide an important educational service that make electronic access to regulated relationships to make contributions by educational technology in their design is crucial and reliable to achieve the desired goals of the educational process.

We could get a solution for this problem by answering the following main question:

"What is effectiveness of using interactive tools (synchronous / asynchronous / synchronous and asynchronous together) via personal learning environments in the development of Self-Regulated skills and learning efficiency within the faculty of education Al-Arish students?"

There are some sub questions?

1- What are standards of necessary personal learning environment design in developing self-Regulated skills and cognitive achievement and learning efficiency for Al-Arish Faculty of Education students in course of using computer in education?

2- What are specifications of necessary personal learning environment in developing self- Regulated skills and cognitive achievement and learning efficiency for Al-Arish Faculty of Education students in course of using computer in education?

3- What is the effect of pattern difference of using interaction tools (synchronous / asynchronous / synchronous and asynchronous together) via personal learning environments for the development of self- Regulated skills for learning among students of the Faculty of Education Al-Arish?

4- What is the effect of pattern difference of using interaction tools (synchronous / asynchronous / synchronous and asynchronous together) via personal learning environments for the development of achievement among students of Faculty of Education Al-Arish?

5- What is the effect of the pattern difference of using interaction tools (synchronous / asynchronous / synchronous and asynchronous together) via personal learning environments for learning efficiency development among the students of Faculty of Education Al-Arish?

Objectives of the Research

The current research aims at

- Describing the reality of the personal learning environment design.

- Determining the reasons of deficiencies in personal learning environments design that do not include interaction tools (synchronous / asynchronous / synchronous and asynchronous together).

- Designing and building a personal learning environment with different patterns of interaction tools (synchronous / asynchronous / synchronous and asynchronous together) for developing Self- Regulated skills for learning and cognitive achievement and learning efficiency for students of Faculty of Education.

- Recognizing the effectiveness of using interaction tools (synchronous / asynchronous / synchronous and asynchronous together), through the most suitable personal learning environments for learning, and that in terms of its impact on the development of Self- Regulated skills for learning and cognitive achievement and learning efficiency in the third year students of Al-Arish Faculty of Education, in the course using computers in education.

Research importance

The importance of research as follows

- Results of research May help educational electronic designers to design personal learning environments, suitable for colleges of education students, according to their different characteristics, so as to provide them with an integrated base for building and organizing mechanisms for using interaction tools (synchronous / asynchronous / synchronous and asynchronous together) in a typical form, for upgrading and developing learning for that category.

- Search results may enhance the benefit for education colleges from personal learning environments and be put forward as one of the alternatives and solutions for using learning platforms for learners, to treat the problems and understand

difficulties, that they face when studying various courses, and improve their various learning outcomes.

- Providing those in charge of designing and developing personal learning environments with a set of principles and guidelines standards to be taken into account in their design and development, and with regard to the selection of the appropriate pattern of interaction tools to develop Self- Regulated skills and achieve learning aims.

Search limits

The current research has the following limits

- Objective limits: learning content is confined on three educational modules in the course of using computers in education (e-learning environments - e-learning - tools and technologies, e-learning).

- Interaction tools limits: three patterns inside personal learning environment (synchronous, asynchronous, synchronous and asynchronous together)

- Human limits: teaching learning content for the third year students at the Faculty of Education in Al-Arish.

- Time limits: application of the research experience in the second semester 2014/2015 AD.

- Place limits: Al-Arish Faculty of Education, Al-Arish University, North Governorate.

The research sample

The research sample consisted of (90) male and female students of third year students, the Faculty of Education, Al-Arish University, North Sinai Governorate. They were selected randomly and distributed with homogeneous manner on the three experimental groups according to the experimental design of the research.

Research Methodology

This research belongs to the category of researches aimed at causal relationships study between variables and testing them, and thus the current research is using the descriptive approach, because it describes personal learning environments and collect information about them via analysis, explanation, description, designing and developing, Also it uses the experimental approach, Because it is the most appropriate research methods for studying the basic impact of the different patterns of using interaction tools variables (synchronous/ asynchronous/ synchronous and asynchronous together), and in each of the Self-Regulated skills for learning and learning efficiency of the three educational modules, the course of using computers in education for students of the third year , Faculty of Education in Al-Arish, Al-Arish University .

Research variables

First, the independent variables: This research includes an independent variable:

Personal learning environment with three interaction patterns and tools:

- Synchronous interaction tools.

- -Asynchronous interaction tools.

- Interaction tools synchronous and asynchronous together.

Second: The dependent variables: This research includes the following variables, namely

- Self- Regulated Skills for learning.

- Cognitive achievement.

- Learning Efficiency.

Research experimental Design:

In light of the independent variables and patterns; the current research uses the experimental approach with one group (pretest – posttest).

Experimental design research

Groups research	Pre-application of research tools	Processors	Post-application of research tools
Group 1	Achievement test Self-Regulated measure	(ple) Using Synchronous interaction tools	Achievement test Self-Regulated measure
Group 2		(ple) Using Asynchronous interaction tools.	
Group 3		(ple) Using Interaction tools synchronous & asynchronous together	

Research Tools

Experimental Treatments:

1. Personal learning environment Using Synchronous interaction tools.

2. Personal learning environment Using Asynchronous interaction tools.

3. Personal learning environment Using Interaction tools synchronous & asynchronous together.

Measurement tools

- A measure of self-Regulated of learning, (Heba Osman Fouad al-Azab, 2013).

- Achievement test (the researcher).

Research Hypotheses

The current research sought to validate the following hypotheses:

- There is a statistically difference at the level of ≤ 0.05 between the means scores of experimental groups students, in the development of Self- Regulated skills, the main effect is due to using different patterns of interaction tools (synchronous/ asynchronous/ synchronous and asynchronous together), through personal learning environments available online for of the third year

students, Faculty of Education - Al-Arish, course of using computers in education.

− There is a statistically difference at the level of ≤ 0.05 between the mean scores of experimental groups students, with the cognitive achievement, the main effect is due to using different patterns with the interaction tools (synchronous/ asynchronous/ synchronous and asynchronous together), through personal learning environments that are available online for of the third year students, Al-Arish Faculty of Education, course of using computers in education.

− There is a statistically difference at the level of ≤ 0.05 between the mean scores of experimental groups students, in learning efficiency, the main effect is due to using different patterns interaction tools (synchronous/ asynchronous/ synchronous and asynchronous together), through personal learning environments available online for of the third year students, Al-Arish Faculty of Education, course of using computers in education.

Statistical used method

Due to the nature of the research, "One- Way Analysis of Variance" (One - Way ANOVA) method has been used, considering that it is more statistical suitable methods for processing data and in the light of research experimental design Due to the presence of an independent variable, with three levels, and thus it can measure the main impact of this variable levels. Then using the "Tukey Method style" to conduct a multi-dimensional comparison between equal groups in case of statistical differences among the groups. Experiment data have been processed using the "Statistical Packages for Social Sciences SPSS" Then calculate the impact of using the equation η2.

Research procedures

1. Analytical study of the scientific literature, studies and researches related to the subject of research, with the aim of preparing the theoretical framework for research and guiding it to direct its proposals and design its tools, and discuss its results.

2. Determining standards of the personal learning environment design.

3. Designing and developing personal learning environment.

4. Designing and developing educational content for personal learning environment according to the following:

    – Choosing (Muhamad Attia Khamis, 2003) model for educational designing and developing as it is deeper for all procedures for good educational design to any educational content inside electronic learning environment based on web, and some changes has been done to be Compatible with research.

    – Determining the overall objectives of the educational content, provided through personal learning environments, and presenting them to experts in the field of educational technology for approval, and then preparing a list of objectives in its final form after making the proposed amendments in accordance with the views of the jury members.

    – Analysis of the scientific content of the educational units, in the course of using computers in education, provided through personal learning environments, and reformulated to highlight the objectives of the provided educational content, and its adequacy to achieve specific learning goals and how objectives content is linked.

    – Analysis of the educational tasks of the educational content in the course of using of computers in education provided through personal learning environments that will be produced in the light of the educational objectives to determine the sub-components and to be presented to experts in the field of educational technology for approval, and then set up an analysis for educational tasks in its final form, after the proposed amendments, in accordance with the views of jury members.

- Formulating behavioral and procedural and cognitive objectives of cognitive content of education in the course of using computers in education, in the light of identifying key topics derived to get a list of analyzing of basic educational tasks and presenting them to experts in the field of educational technology and course for approval, then preparing a list of goals in the final image after doing proposed adjustments, according to the views of jury members.

- Preparing the scientific content in the light of educational tasks analysis, and a list of goals, and then presenting to the jury members of educational technology for approval in its final shape, after the proposed amendments, in accordance with the views of jury members.

- Designing educational content in the course of using computers in education provided through personal learning environments, and presented to experts in instructional design, then modified and having it in final form.

- Building special scenario of learning environments, in the light of his scientific content in 3 different forms according to the independent experimental variable levels of the study, then presenting to experts in the field of educational technology for approval, and then the preparation of scenario forms in the final image, after the proposed adjustments in accordance with the views of jury members.

- Producing 3 experimental treatment materials (personal learning environments) with 3 levels of interaction tools (synchronous - asynchronous - synchronous and asynchronous together), to be presented to the experts in the field of educational technology for approval, then preparing it in its final form after doing the proposed amendments in accordance with the views of jury members.

- Preparing research tools (Achievement Test) to measure the cognitive side associated with the course of using computers in education, and is

arbitrated for approval, in its final form to make sure of his sincerity and persistence.

- Choosing Self- Regulated skills measure with appropriate characteristics for research sample.

- Conducting exploratory experiment for processing experimental materials, and measurement tools; in order to work out and learn the internal efficiency in the field and its validity for use and application, and to ensure the validity and reliability of measurement tools and to know the problems faced by the researcher or the sample to be avoided during the application of the basic experiment.

5 - Performing basic experiment, according to the following:

- Selection of basic research sample, and dividing it into 3 groups, according to the experimental design of research

- Applying achievement test and the pre-self-Regulated skills measurement for learning in order to ensure equality of the 3 groups of the research, and to sure that there is no knowledge of the educational content, as well as to calculate the degree of gaining in cognitive achievement, and self-Regulated for learning after the application of the experimental treating materials on them.

- The application of personal learning environment with its experimental treatment on the sample according to the experimental design of research.

- The application of pre- measurement tools on sample.

- Accounting earning degrees in knowledge collection, and the efficiency of learning, self-learning organization, and monitoring results.

- Displaying research results, discussing them and interpreting them in the light of the theoretical framework and theories of teaching and learning.

- Applying recommendations of the research in the light of the conclusions reached and proposals for future researches.

Terms of Research

- **Personal Learning Environment:**

procedurally**,** it means "learning environment across the web allows a wide range of tools and Web 2.0 applications, and help students' research sample in their learning and control of the administration in terms of content and communicate and interact with each other and with their teacher to achieve learning objectives."

- **Interaction Tools via Web:**

procedurally, it means those tools provided by Web 2.0 technologies across the Web, which allows students to interact with each other or with the teacher through personal learning environments to discuss in with regard to the educational units in the decision of using computers in education, including through different reaction as follows:

- **Synchronous Interaction:**

procedurally, is that kind of interaction, which offer Web 2.0 technologies across the Web, where the teacher and educated can meet at the same time (different location) are discussing among themselves the modules in different ways, such as sound or image or text.

- **Asynchronous Interaction:**

procedurally, the kind of interaction, which offer Web 2.0 technologies across the Web, does not require meeting the teacher and educated at the same time (the time difference - a difference place) discussing among themselves modules in different ways, such as sound or image or text.

- **Self- Regulated Skills:**

procedurally, "steps and actions have been planned and adapted, so that learners use to regulate their own learning class that will help them acquire the information through personal learning in a particular environment; to accomplish learning objectives and improve learning outcomes."

−   **Learning Efficiency:**

procedurally, "quotient earning degrees in the achievement of learning time." According to the following equation: (James Russell, 1982, p. 122).

Learning efficiency =

$$\frac{\text{the effectiveness of the program (earning degrees in the achievement)}}{\text{/ Time spent in the study of content (learning time)}}$$

Research Results

−   There is a Statistically difference at the level of ≤ 0.05 between the mean scores of experimental groups students, in developing Self- Regulated skills, the main effect is due to using different interaction tools patterns (synchronous/ asynchronous/ synchronous and asynchronous together), via personal learning environments that are available online for the third year students, Al-Arish Faculty of Education, in the course of using computers in education.

−   There is a statistically difference at the level of ≤ 0.05 between the mean scores of experimental groups students, in the Cognitive achievement, the main effect is due to using different interaction tools patterns (synchronous/ asynchronous/ synchronous and asynchronous together), via personal learning environments that are available online for the third year students, Al-Arish Faculty of Education in the course of using computers in education.

−   There is a statistically difference at the level of ≤ 0.05 between the mean scores of experimental groups students, in learning efficiency, the main effect is due to   using different interaction tools patterns (synchronous/ asynchronous/ synchronous and asynchronous together), via personal learning environments that available online for the third year students, Al-Arish Faculty of Education, in the course of using computers in education.

Research Recommendations:

1. Taking advantage of the current research results to applicable level, especially if future researches support these results.

2. Synchronous and asynchronous Interaction tools must be provided into content parts, via personal learning environments to support the cognitive structure of the content, so that it fits the learners' characteristics.

3. Producing synchronous and asynchronous interaction tools must be discriminated and organized within the content, and predicting how they can be supported via the content regions, so that it fits the learners' characteristics.

4. Interaction tools must be submitted within the training offered via personal learning environments, especially the integration between interaction tools synchronous and asynchronous together.

5. Paying attention to the interaction tools design in various forms so as to be simple, uncomplicated, and understandable designs for learners.

6. Taking into account in the design of personal learning environments diversity in the methods of electronic communication and interaction between students and each other, and between them and the teacher as well as educational content.

7. Considering variety of communication methods, electronic interaction among students each other with instructor, and designing personal learning environments according to educational standards to achieve meaningful and various learning outcomes, such as: learning Self- Regulated skills and achievement, and the learning efficiency and other learning outcomes.

The proposed researches:

1. Conducting comparative researches between different interaction design tools provided via personal learning environment for high school students, to reach the most appropriate forms of tools for this category.

2. Conducting similar researches for this study for the university level, dealing with different practical skills, studied by students in other courses, the results of this researches may vary according to the degree of students' interests, motivations and orientation towards the planned course for them.

3. Conducting similar researches for samples from different levels of educational stages, such as pre-university education and linking them to different methods of knowledge, that may have an impact on the researches results, probably there's a different result of these researches from the current research due to the difference in age, experience, culture or how much support and assistance required and quality.

4. The current research was limited to address the impact of the independent variable on one of learning outcomes, cognitive achievement and learning efficiency, so it is possible to measure the impact of this variable on other learning outcomes.

5. The effect of Different active learning methods via personal learning environments on developing Self- Regulated skills and learning efficiency.

6. The Impact of different E-learning strategies via personal learning environments on developing thinking and Self- Regulated learning skills.

7. The impact of gender (male - female) and the size of the electronic interaction groups via personal learning environments on achievement and developing Self- Regulated skills.

8. Studying the relationship between designing personal learning environment variables and Self- Regulated skills to learn.

9. Studying the relationship between interaction and learning patterns using the mobile inside personal learning programs on the time of learning and its average for educational technology students.

10. Studying some of the interface interaction design variables, via personal learning environments on the development of Self- Regulated skills and cognitive achievement.

11. Effectiveness of using personal learning environments in developing visual thinking skills and Self- Regulated for learning.

12. Conducting studies on the comparison of the electronic learning environment via computers and electronic learning environment over the Web in developing Self- Regulated skills and learning efficiency.

References

- Mohamed Makhtar Al-Muradani (2012). Innovations in Educational Technology, Faculty of Education, Al-Arish, Suez Canal University.

- Mohamed Abdel Hamid (2005). Philosophy of E-Learning through Networks. In "Mohamed Abdel Hamid" (Ed.), E-Learning System, Cairo: Dar Al-Kutub.

- Mona Mohamed Al-Jazar (2008). The Impact of Different Interaction Systems in the E-Learning Environment on Some Learning Outcomes for Student Teachers and Their Attitudes Towards Its Use, Future of Arab Education, Cairo, 14(51), 369-410.

- Iman Abdel-Aty Mohamed Al-Taran (2009). A Proposed Program Using Online Interaction Tools and Its Impact on Students of the Faculty of Education in Acquiring Skills in Designing and Producing Educational Software and Their Attitudes Towards These Tools, Doctoral Thesis, Faculty of Education, Mansoura University.

- Abdulaziz Taleb Abdulhamid (2011). The Effect of Interaction Between Synchronous and Asynchronous Electronic Support Patterns in a Web-Based Learning Environment and Learning Styles on Achievement and Developing Skills in Designing and Producing Learning Resources for Students of the Faculty of Education. Studies in Curriculum and Teaching Methods, Mansoura University, (168), 53-97.

- Mohamed Abdo Ragheb Amasha (2010). E-Learning and Social Network Services, Informatics Journal, (27), 24-30. [Electronic version].

Retrieved from [http://informaticsjournal.net/up/articels/1-
pdf](http://informaticsjournal.net/up/articels/1-4.pdf.

- Heba Othman Fouad Al-Azab (2010). The Impact of E-Social Programs on
Developing Some Skills in Dealing with Computer Networks
Among Educational Technology Students, Master's Thesis,
Faculty of Specific Education, Menoufia University.

-Salama Abdel Azim Hussein, Ashwaq Abdel Jalil Ali (2008). Quality in E-
Learning (Theoretical Concepts and Global Experiences).
Alexandria: Dar Al-Jamia Al-Jadida.

-Hind bint Suleiman Al-Khalifa (2006). Utilizing Web 2.0 Technologies in
Serving E-Learning and Training, Fourth Saudi Technical
Conference for Technical and Vocational Training, Riyadh, King
Saud University. [Electronic version]. Retrieved from
[http://informaticsjournal.net/up/articels/1-
4.pdf](http://informaticsjournal.net/up/articels/1-4.pdf.

-Abdulrahman Al-Muharafi (2009). Motivators and Barriers to Using
Personal E-Learning Environments Applied to Accounting
Courses in the Saudi Environment, The Twelfth Scientific
Conference of the Egyptian Society for Educational Technology
in Cooperation with the Faculty of Girls, Ain Shams University,
titled "E-Learning Technology Between Current Challenges and
Future Prospects," Cairo, pp. 1-87.

- Rabie Ahmed Rashwan (2006). Self-Regulated Learning and Achievement
Goals. Cairo: Dar Al-Kutub.

- Ahmed Osman (2005). The Constructivist Model of Some Variables Related to Self-Regulated Learning Strategies Among Secondary School Students, Journal of the Faculty of Education, Zagazig University, No. 51, pp. 73-130.

- Nasra Mohamed Jaljal (2007). The Effect of Training on Self-Regulated Learning Strategies on Self-Esteem, Motivation to Learn, and Academic Performance on Computers Among Computer Science Students in the Faculty of Specific Education, Journal of Psychological and Educational Research, Faculty of Education, Menoufia University, Vol. 22, No. 1, pp. 257-322.

-Salha Abdullah Al-Essayan, Wajeeha Al-Aani (2008). The Reality of Network Learning from the Perspective of Students at the Faculty of Education at Sultan Qaboos University. [Electronic version]. Retrieved from www.abegs.org/sites/Research/DocLib2/2-106.doc.

- Mostafa Joudat Saleh (2003). Building a System for Delivering Educational Courses via the Internet and Its Effect on Students' Attitudes Towards Learning Through Networks, Doctoral Thesis, Faculty of Education, Helwan University.

-Nasreen Abdo Al-Hadidi (2007). The Effectiveness of Web-Based Learning in Developing E-Learning Competencies Among Graduate Students in Education Colleges, Master's Thesis, Faculty of Education, Damietta, Mansoura University.

-James Russell (1982). New Methods in Teaching and Learning, Translated by Ahmed Khairy Kazem, Cairo: Dar Al-Nahda Al-Arabiya.

-Huang, N. P., & Lee, D. W. (2004). A discourse analysis of asynchronous discussion board on students critical thinking. In World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education (Vol. 2004, No. 1, pp. 708-713). Retrieved from http://www.editlib.org/p/11404/proceedings_11404.pdf

- Anderson, P. (2007). What is Web 2.0? : Ideas, Technologies and Implications for Education. JISC, Technology and Standards watch . Retrieved from http://www.jisc.ac.uk/media/documents/techwatch/tsw0701b.pdf

-Judd, T., Kennedy, G & Cropper's. (2010). Using Wikis For Collaborative Learning: Assessing Collaboration through contribution Australasian ,Journal of Education Technology, 26 (3), 341-354

- Augar, N., Raitman, R., & Zhou, W. (2004). Teaching and learning online with wikis. In Beyond the comfort zone: proceedings of the 21st ASCILITE Conference, Perth, 5-8 December (pp. 95-104). ASCILITE. Retrieved from http://dro.deakin.edu.au/eserv/DU%3A30005482/zhou-teachingandlearning-2004.pdf

- Taraborelli, D. (2008). Soft peer review: Social software and distributed scientific evaluation. Retrieved from http://discovery.ucl.ac.uk/8279/1/8279.pdf

- Secker, J. (2008). The adventures of LASSIE: Libraries, distance learners and social software. Serials, 21(2), 112-115. Retrieved from

http://eprints.lse.ac.uk/20339/1/The_adventures_of_LASSIE_(L
SERO).pdf

- Cole, M. (2009). Using Wiki technology to support student engagement:
Lessons from the trenches. Computers & education, 52(1), 141-
146. Retrieved from
http://www.pgce.soton.ac.uk/ict/NewPGCE/PDFs09/Using%20w
iki%20to%20support%20student%20engagement%20lessons%2
0from%20the%20trenches.pdf

- Wheeler, S., YEoMAnS, P., & WHEElER, D. (2008). The good, the bad and
the wiki: Evaluating student-generated content for collaborative
learning. British journal of educational technology, 39(6), 987-
995. Retrieved from
http://web2integration.pbworks.com/f/The%20good%20the%2
0bad%20and%20the%20wiki%20evaluting%20student%20gener
ated%20content%20for%20collabortive%20learning.pdf

- Attwell, G. (2007). Personal Learning Environments-the future of
eLearning?. Elearning papers, 2(1), 1-8. Retrieved from
http://digtechitalia.pbworks.com/w/file/fetch/88358195/Atwell
%202007.pdf

- Dabbagh, N., & Kitsantas, A. (2012). Personal Learning Environments,
social media, and self-regulated learning: A natural formula for
connecting formal and informal learning. The Internet and higher
education, 15(1), 3-8. Retrieved from
http://anitacrawley.net/Articles/DabbaughPLE.pdf

- Lubensky, R. (2006). The present and future of Personal Learning Environments (PLE). Retrieved January, 4, 2010. Retrieved from http://www.deliberations.com.au/2006/12/present-and-future-of personal%20learning.html

- Schaffert, S., & Hilzensauer, W. (2008). On the way towards Personal Learning Environments: Seven crucial aspects. Elearning papers, 9(2). Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.167.4083&rep=rep1&type=pdf

- Milligan, C. D., Beauvoir, P., Johnson, M. W., Sharples, P., Wilson, S., & Liber, O. (2006). Developing a reference model to describe the personal learning environment. In Innovative Approaches for Learning and Knowledge Sharing (pp. 506-511). Springer Berlin Heidelberg. Retrieved from http://goo.gl/lusv0B

- Nussbaumer, A., Kravcik, M., & Albert, D. (2012). Supporting self-reflection in personal learning environments through user feedback. In UMAP Workshops. Retrieved from http://ceur-ws.org/Vol-872/pale2012_paper_7.pdf

-Buchem, I., Attwell, G., & Tur, G. (Eds.) (2013). The PLE Conference 2013. Learning and Diversity in the Cities of the Future. Berlin, Germany, Melbourne: Beuth University of Applied Sciences, Monash University. Retrieved from https://ibuchem.files.wordpress.com/2014/07/pproceedings-ple13.pdf

- Fiedler, S. H., & Väljataga, T. (2013). Personal learning environments: a conceptual landscape revisited. eLearning Papers, 35, 1-16. Retrieved from http://www.openeducationeuropa.eu/sites/default/files/asset/In-depth_35_2.pdf

- Niemi, H., Nevgi, A., & Virtanen, P. I. (2003). Towards self-regulation in web-based learning. Journal of Educational Media, 28(1), 49-71. Retrieved from https://www.edu.helsinki.fi/svy/kvanti/mittavaline/mat/NiemiNevgiVirtanen.pdf

- Artino, A. R., & Stephens, J. M. (2006). Learning online: Motivated to self-regulate. Academic Exchange Quarterly, 10(4), 176-182. Retrieved from http://www.sp.uconn.edu/~aja05001/comps/documents/AEQ_SRL_Manuscript_ARTINO_FinalDraft_revised_withtables.pdf

- Türker, M. A., & Zingel, S. (2008). Formative interfaces for scaffolding self-regulated learning in PLEs. elearning Papers, (9), 6. Retrieved from http://dialnet.unirioja.es/servlet/articulo?codigo=2937479

- Chatti, M. A., Jarke, M., & Specht, M. (2010). The 3P learning model. Journal of Educational Technology & Society, 13(4), 74-85. Retrieved from http://dspace.learningnetworks.org/bitstream/1820/3180/1/Chatti_ETS.pdf

- Rahimi, E., Van den Berg, J., & Veen, W. (2014). A pedagogy-driven framework for integrating Web 2.0 tools into educational practices and building personal learning environments. Journal of Literacy and Technology, 15 (2). Retrieved from http://repository.tudelft.nl/assets/uuid:7fde0c8b-d301-4845-85e2 af236e37f8a3/312979.pdf

- Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. Educational psychologist, 25(1), 3-17. Retrieved from http://www.researchgate.net/profile/Barry_Zimmerman/publication/243775466_Self-Regulated_Learning_and_Academic_Achievement_An_Overview/links/549b67780cf2d6581ab2e355.pdf

- Wilson, J (1997). Self Regulated Learners and Distance Education Theory. Educational Communications and Technology, University of Saskatchewan. Retrieved from http://www.usask.ca/education/coursework/802papers/wilson/wilson.PDF

- Whipp, J. L., & Chiarelli, S. (2004). Self-regulation in a web-based course: A case study. Educational technology research and development, 52(4), 5-21. Retrieved from http://epublications.marquette.edu/cgi/viewcontent.cgi?article=1039&context=edu_fac

- Catherine, M. & Mark , J. (2010). Personalized and self – Regulated Learning in the web 2.0 era: International exemplars of

innovative Pedagogy using social software , Australasian Journal of Educational Technology , Vol.(26). No.(1).pp.28-43.