



Faculty of Women

For Arts, science and Education

Instructional Technology and Information Dept.

**Developing a "Personal Learning Environment" on the Web in the light of
Needs and Standards, and Its Effect on Usability and Developing Instructional
Technology Students' Self-regulated Learning Skills**

A Thesis Submitted in Fulfillment of the Requirements of the Ph. D. Degree in
Education
(Instructional Technology Specialization)

**Submitted by
Ayman Gabr Mahmoud Ahmed**

Supervised by

Prof. Dr. Mohammed Atia Khamis

Professor & Chairman of
Instructional Technology
& Information Dept. Faculty of Women,
Ain shams University

Dr. Nadir Said Ali Shemy

Associate Prof. of Instructional
Technology
Faculty of Specific Education,
Fayoum University

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ABSTRACT

Introduction:

Over the past five years the emergence of interactive social media has influenced the development of learning environments. The Virtual Learning Environment has come to maturity, but has been seen by learning technologists as not capturing the spirit and possibilities that the new media have to offer to enhance the learning process. They are controlled by educational.

Each learner is unique and will have a unique learning experience. This has instigated the research and development of a different type of learning environment, a Personal Learning Environment (PLE) that is in controlled by the learner. The needs, requirements and experience of each learner using a PLE will be different, which makes the planning and development of a PLE that serves as an aid to each possible learner a challenge. An added problem is the openness of the environment and the large number of different dimensions that can be designed and developed. Moreover, PLEs are so new that research in their development has been limited so far.

In order to align with the rapid change of the new knowledge intensive era, a new vision for learning is required. Learning is fundamentally personal, social, distributed, ubiquitous, flexible, dynamic, and complex in nature. Thus, a fundamental shift is needed toward a more personalized, social, open, dynamic, emergent and knowledge-pull model for learning, as opposed to the one-size-fits-all, centralized, static, top-down, and knowledge-push models of traditional learning solutions (Chatti et al., 2007).

The appearance of the Web 2.0 paradigm introduced a more collaborative and user-centred approach to web development with the emergence of social networking and information sharing. Users have become proactive and the web has become a service provider with the popularization of Service-Oriented Architectures (SOA). Web widgets consume these services as small standalone web applications. This led to new ideas in the E-Learning community to promote flexibility and personalization of virtual learning environments especially for adaptation to specific needs and preferences. The way widgets are conceived promotes the granularity of web applications, which in terms of E-Learning means a more adaptable, flexible learning environment. The aim of this research is developing a PIE to support adaptability and personalization, and meet the particular needs of students, and develop self regulation and usability.

The Research Problem:

The research problem is stated in The following statement:
"There is a need to develop a "personal learning environment" in the light of the instructional needs and standards, and their impact on Instructional Technology students' self-regulation and Usability"

The research problem was defined in the following main question:
What is the effect of developing a "personal learning environment" in the light of the needs and standards and their impact on Instructional Technology students' self-regulation and Usability?

This main question has been broken down in terms of the following sub- questions:

- ١- What are the educational needs of instructional technology students when studying the "computer science" (Basic &Logo) course?
 - ٢- What are the design criteria needed to design the personal learning environment in the light of the educational needs?
 - ٣- What are the competencies of the the "computer science" (Basic &Logo) course in the light of the educational needs?
 - ٤- What is the Instructional Design Model needed to be applied when develop the personal learning environment in light of the instructional and technical standards?
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- ٥- What is the form of the personal learning environment developed in the light of the educational and technical needs?
 - ٦- What is the effect of the personal learning environments developed in the light of the educational and technical needs on cognitive achievement, gain, and the skills of the "computer science" (Basic &Logo) course?
 - ٧- What is the effect of the personal learning environments developed in the light of the educational and technical needs on self regulation and usability?

Research objectives:

The study hoped to achieve the following objectives:

- ١- Determining the educational needs of instructional technology students.
- ٢- Determining the design criteria needed to design the personal learning environment in the light of the educational needs.
- ٣- Determining the educational needs of instructional technology students when studying the "computer science" (Basic &Logo) course.
- ٤- Determining the personal learning environment system in the the light of the educational and technical needs, and Mohamed Khamis (ISD) model?
- ٨- Determining the effect of the personal learning environment on cognitive achievement, gain, the skills of the "computer science" (Basic &Logo) course, self regulation and usability.

The Research Importance:

This research is considered important in the following aspects:

- ١- It is considered one of the firsts Arabic researches that is concerned with developing the personal learning environment system in the light of the educational and technical needs.
- ٢- Help educational researchers in general, and Instructional Technology researchers in particular, to build their knowledge and skills on their own pacing instead of receiving information negatively.
- ٣- Taking advantage of the developed environment and the content in other different courses.
- ٤- Using the developed personal learning environment as a course management system web based.

Research Sample:

The research sample included ٨٨ students from the second year students of the Instructional Technology Dept., Faculty of Specific Education, Fayoum University in the academic year ٢٠١٤/٢٠١٥. The sample was divided into two equal groups: the first experimental group studied using the developed personal learning environment in the light of the educational and technical needs, and the second group studied using the ready developed personal learning environment.

Research Delimitations:

The research was delimited to:

- ١- Second year students, Instructional Technology Dept., Faculty of Specific Education, Fayoum University.
- ٢- The cognitive and the practical skills of the "computer science" (BASIC & Logo) course.

Research Method:

This research is a developmental research, as the researcher has used the technological method in developing instructional systems in terms of implementing Mohamed Khamis's (ISD) model (٢٠٠٧). This method includes the analytical descriptive method in the study and analysis stage, and the designing stage, and it applies the experimental method in the evaluation stage, and in measuring the effect of the personal learning environment.

Research variables:

- ١- The independent variable: "Developing a personal learning environment" in the light of the educational and technical standards.
- ٢- The dependent variables:

١- Cognitive Achievement.

٢- Basic and Logo Skills.

٣- Self-regulation.

٤- Usability.

The experimental design:

The researcher employed the experimental design based on two experimental groups.

The experimental group	١ st group	٢ nd group
Kind of personal learning environment	A personal learning environment developed in the light of the instructional needs and standards.	A ready developed personal learning environment (symbaloo).

Research Tools:

The researcher has developed the following research tools:

- An achievement pre/post-test.
- A self-evaluation self-regulation measurement.
- Product evaluation rubrics.
- Usability measurement.

Research Hypotheses:

The statistical hypotheses of t -ê ð- are formulated so as to answer the study's questions as follows:

- ١- There is no significant difference at level (٠,٠٥) between the means scores of the two experimental groups in the achievement pretest.
- ٢- There is no significant difference at level (٠,٠٥) between the means scores of the two experimental groups in the achievement posttest.
- ٣- There is no significant difference at level (٠,٠٥) between the means scores of the two experimental groups in the gain in achievement.

- ξ- There is no significant difference at level (0,00) between the means scores of the two experimental groups of the products evaluation rubric.
- ο- There is no significant difference at level (0,00) between the means scores of the two experimental groups in the self-regulation measurement.
- ϒ- There is no significant difference at level (0,00) between the means scores of the two experimental groups in the usability measurement.

Research Procedures:

This research has been carried out according to the following steps:

- Applying the Stages of Mohamed Khamiss (ISD) model as follows:

1- The Analysis stage: is composed of the following:

- Reviewing and analyzing the studies which discussed personal learning environments, self regulation, and usability.
- Determining the students characteristics and needs.
- Studying the learning resources and determining the learning obstacles.
- Determining the students instructional needs and designing standards and specifications.

2- The Designing stage: is composed of the following:

- Determining the learning objectives, analyzing and arranging them.
- Determining the content elements.
- Developing the pre\post-test of achievement and the other research tools.
- Selecting the suitable learning experiences, grouping and learning methods.
- Designing the learning message and the learning events.
- Designing the learning strategy.

3- The Production stage: is composed of the following:

- Producing the personal learning environment.

4- The Evaluation stage: is composed of the following::

a) Formative Evaluation:

It was concerned with applying the two personal learning environments on a pilot sample and making the necessary changes.

b) Summative Evaluation:

It was concerned with applying the two personal learning environments on the research sample.

-Collecting the data, analyzing and discussing it using the suitable statistical procedures.

- Deriving conclusions and recommendations.

Research Results:

- ١- The ١st hypothesis was accepted, since there is no significant difference at level (α, β) between the t -scores of the two experimental groups in the achievement pretest.
- ٢- The ٢nd hypothesis was not accepted, since there is significant difference at level (α, β) between the means scores of the two experimental groups in the achievement posttest.
- ٣- The ٣rd hypothesis was not accepted, since there is significant difference at level (α, β) between the means scores of the two experimental groups in the gain in achievement.
- ٤- The ٤th hypothesis was accepted, since there is no significant difference at level (α, β) between the means scores of the two experimental groups in the products evaluation rubrics.
- ٥- The ٥th hypothesis was accepted, since there is no significant difference at level (α, β) between the means scores of the two experimental groups in the self-regulation measurement.
- ٦- The ٦th hypothesis was accepted, since there is no significant difference at level (α, β) between the means scores of the two experimental groups in the usability measurement.