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Adaptive Learning Environment according to Learning Style For Enhancing Security and Safety skills among Educable Mentally Retarded Students

A Thesis Submitted in Partial Fulfillment of the Requirements for the M.A Degree in Education

(Educational Technology)

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Summary

This summary handles the problem, objectives, delimitations, hypotheses, procedures, and results of the study. It also presents recommendations and suggestions for further study in light of the results study.

Introduction

E-learning has become a tangible reality used by all educational systems and institutions at all levels, all over the world, due to its characteristics and possibilities for learning to occur at any time and any place, meeting the requirements of learners and tailoring learning to suit their characteristics, needs and learning methods.

However, despite the advantages offered by web-based learning through e-learning environments and their effectiveness in the educational process; the provision of educational content and resources is done in the same way for all learners, which is not commensurate with their actual needs, or their previous knowledge. Therefore, it is necessary to provide an adaptive system that allows providing pathways consistent with the personal differences between learners, and the needs of each of them, which called for emphasizing the importance of designing adaptive learning environments that take into account the different needs of learners and their different ways of thinking and teaching.

Adaptive learning is one of the learning methods in which learning is presented according to the different patterns, styles and characteristics of learners and according to the learning method of each learner, whether it is a traditional or electronic method, taking into account individual differences.

One of the most important foundations on which adaptive learning environments are built is the learning method. It is one of the basic variables that must be taken into account when designing e-learning environments in general and when designing adaptive e-learning environments in particular, in order to take into account individual differences between learners in order to obtain flexible and dynamic learning that corresponds to their different styles.

And due to the different learning styles of mentally handicapped group who are able to learn (visually and auditory), the current study adopted Fleming's VARK learning styles model. This model was chosen based on its use of learners' preferences in designing procedures and educational settings, and due to its suitability to the study sample, but the current study was delimited to the use of the learning method (audio and visual). The users of the first method depend on the sense of hearing in their learning or training and the users of the second method rely on the sense of sight in their learning or training from others.

The mentally disabled category represents the most special groups in need of health, psychological, social and educational care, as the mentally disabled child needs to be trained and taught some skills that help him to rely on himself, and protect him from the dangers and abuse he may be exposed to.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) stresses the importance of developing skills related to security and safety, as they are necessary tools for education and thinking. They represent one of the essential aspects in preparing students with mental disabilities to interact with society and to perform their social and professional roles well. Therefore, the mentally handicapped students who are able to learn must be protected from the many dangers that may face them, provide them with security and safety, and surround

them with a safe environment, by providing them with the concepts of security and safety.

The current study came as an attempt by the studyer to develop security and safety skills by using an adaptive learning environment according to learning methods in order to take into account their individual differences.

Problem of the Study

The problem of the current study represented in the weakness of security and safety skills of learnable mentally handicapped students, which required their development through designing an adaptive program according to the (audio-visual) learning style for learnable mentally handicapped students.

Based on the foregoing, the current study attempted to answer the following main question:

What is the effect of an adaptive learning environment according to the (audio-visual) learning style on developing safety and security skills of mentally handicapped students who are able to learn?

From this main question, the following sub-questions are derived:

- What is the image of the adaptive environment according to the (audio-visual) learning style for developing the safety and security skills of the mentally handicapped students who are able to learn?
- What is the effect of the adaptive learning environment according to the (audio-visual) learning style on developing the cognitive aspect of safety and security skills for the mentally disabled students who are able to learn?
- What is the effect of the adaptive learning environment according to the (audio-visual) learning style on developing the performance aspect of safety

and security skills for the mentally handicapped students who are able to learn?

Aims of the study

The current study aimed to: develop security and safety skills for students with mental disabilities who are able to learn, and to identify the impact of the adaptive learning environment according to the (audio-visual) learning style by revealing:

- The effect of the adaptive learning environment according to the (audio-visual) learning style on developing the cognitive aspect of safety and security skills for the mentally handicapped students who are able to learn.
- The effect of the adaptive learning environment according to the (audio-visual) learning style on developing the performance aspect of safety and security skills for learnable mentally handicapped students.

Importance of the study

The current study may help:

- assisting teachers in applying modern teaching and learning theories through an adaptive e-learning environment that takes into account learning styles; in order to help the learner to learn more effectively, shedding light on the sources of dangers that mentally handicapped students are exposed to at (home - school - street).
- Presenting a new model for building and organizing adaptive content in adaptive learning environments, drawing the attention of intellectual education curricula planners to the importance of including security and safety behaviors and concepts at (home - school - street) within the curriculum of this category, which reduces their exposure to many dangers.

- Providing educational technology specialists and e-learning designers with criteria for designing an adaptive environment based on the (audio-visual) learning style to benefit from them when designing such environments, building a new mechanism for adapting the learning system, in line with learning analytics and a learning style, learners and their preferences, providing scientific study results related to content design, in addition to providing a set of standard guidelines that can be taken into account when designing and producing these environments.
- directing the attention of those in charge of education to the need to pay attention to the individual differences among learners, directing the attention of those in charge of educating the mentally handicapped to the importance of activating the wishful programs in their preparation programs, and imparting them through various educational means in order to adapt to life.
- Increasing learners' motivation towards teaching and learning through adaptive e-learning environments based on their real needs and experiences.

Delimitations of the study

The current search was delimited to:

- A sample of students with mental disabilities who are able to learn, School of Intellectual Education in Fayoum Governorate, during the second semester of the academic year 2020/2021 AD.
- The adaptive learning environment according to the (audio-visual) learning style.
- The appropriate security and safety skills for the target group at (home - school - street).
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Hypotheses of the study

The current study sought to test the following hypotheses:

1. There are no statistically significant differences at the level of significance ($\alpha \geq 0.05$) between the mean scores of the students of the first experimental group (adaptive learning environment according to the auditory learning style) and the second experimental group (adaptive learning environment according to the visual learning style) in the post application of the cognitive achievement test for skills Security and safety of learnable mentally handicapped students.
2. There are no statistically significant differences at the level of significance ($\alpha \geq 0.05$) between the mean scores of the students of the first experimental group (the adaptive learning environment according to the auditory learning style) and the second experimental group (the adaptive learning environment according to the visual learning style) in the post application of the attitude test of security skills and safety for learnable mentally handicapped students.

Methodology of the study

The current study adopted the descriptive approach and the semi-experimental approach:

- The analytical descriptive approach: It is applied for reviewing literature and previous studies that contributed to developing the theoretical framework for the study topic.
- Semi-experimental approach for identifying the impact of the independent variable represented in the adaptive learning environment according to the learning style on the dependent variable, the safety and security skills of the mentally handicapped students who are able to learn.

Tools of the study

The current study relied on the following tools:

- First: Experimental processing subject: the adaptive learning environment according to the (audio-visual) learning style.

Measurement tools:

- A cognitive achievement test to measure the cognitive aspect of security and safety skills (prepared by the studyer)
- The pictorial situational test for security and safety skills (prepared by the studyer)

Procedures of the study

The search was carried out according to the following steps:

1. Reviewing the literature and previous studies related to the variables of the current study in order to develop the theoretical framework of the study, which is related to the following axes (adaptive learning environments, learning style (audio-visual), safety and security skills, mentally handicapped students who are able to learn), and to benefit from them in the current study.
2. Preparing a list of criteria necessary to build an adaptive learning environment according to the (audio-visual) learning style for learnable mentally handicapped students, presenting them to a group of specialists, and making the necessary adjustments to reach the final picture of the list.
3. Preparing a list of skills necessary for the development of security and safety, and controlling it by presenting it to a group of experts and arbitrators to express their opinion, then implementing the modifications thereafter according to the suggestions submitted.

4. Preparing a list of educational goals to be achieved to produce scientific content.
5. Preparing the content in light of the previous objectives and ensuring its safety from the scientific point of view and its suitability for the students of the study sample.
6. Designing and producing the experimental processing material, the adaptive learning environment, according to the (audio-visual) learning style.
7. Adjusting the experimental treatment material by presenting it to a group of experts and arbitrators to express their opinion on it, and making the necessary adjustments.
8. Building the achievement test for the skills to be developed and controlling it in terms of validity and reliability, and calculating the test time.
9. Building the pictorial situational test for security and safety skills and controlling it in terms of validity and reliability.
10. Conducting the pilot study for the experimental treatment material to find out the technical or design errors of the experimental treatment material, and to identify the most important difficulties that the studyer or the sample members face when conducting the basic experiment and making the appropriate adjustments.
11. Conducting the basic study experiment, through:
    a. Applying the achievement test, and evaluating the students' performance in the pre-pictorial situational test.
    b. The application of the experimental treatment material, through which students are classified according to the learning style (audio/visual).
    c. Applying the achievement test, the performance test, and evaluating the students' performance in the post-pictorial situational test.
12. Data processing statistically and analyzing it to reach the results.

13. Presentation and discussion of the results in the light of the theoretical framework and the results of previous studies.
14. Formulating recommendations and suggesting future studies and study in light of the current study results.

Results of the study

The study reached the following results:

- There is no statistically significant difference at the level of significance (0.05) between the mean scores of the students of the first experimental group (adaptive learning environment according to the auditory learning style) and the second experimental group (adaptive learning environment according to the visual learning style) in the post application of the cognitive achievement test for skills Security and safety of learnable mentally handicapped students.
- There is no statistically significant difference at the level of significance (0.05) between the mean scores of the students of the first experimental group (the adaptive learning environment according to the auditory learning style) and the second experimental group (the adaptive learning environment according to the visual learning style) in the post application of the pictorial situational test of security skills and safety for learnable mentally handicapped students.

Recommendations of the study

In light of the study results, the studyer recommends the following:

1. Benefiting from the adaptive environment designing criteria that have been reached in designing adaptive learning environments for people with mental disabilities who are able to learn.

2. Expanding the use of adaptive learning environments and employing them in the educational process for their abilities to meet the needs of students and their compatibility with their characteristics, as well as their effectiveness in achieving different learning outcomes.
3. Raising awareness of the designers of adaptive learning environments to the need to take into account the learning style of learners when designing these environments.
4. Adopting the different foundations and theories of learning when designing adaptive e-learning environments.
5. Increasing the trend towards using adaptive electronic learning environments instead of normal electronic environments in the educational process because of their good impact on achievement and skill performance.
6. Increasing the interest in using adaptive e-learning environments in the different stages of education, and with various courses.

Suggestions of the study

In light of the results obtained; the studyer suggests conducting the following study and studies:

1. Conducting similar study to this study to design and produce adaptive e-learning environments according to the learning methods used in the current study for different courses, and measure the extent of their impact on other dependent variables.
2. Studying the relationship between other types of e-learning environment adaptation, such as interface-based adaptation, group adaptation, and adaptive assessment.
3. Conducting evaluation study to evaluate adaptive learning environments published on the Internet.

4. Studying the development of adaptive e-learning systems based on various approaches to educational design.
5. Comparison between more than one model of learning styles and different interaction methods within the adaptive e-learning environment and their effectiveness on other dependent variables.
6. Conducting more study to show the effect of different types of content adaptation on some related variables such as self-regulation, usability and students' attitudes towards the environment.
7. Designing adaptive mobile learning environments according to learning styles on the achievement and skill side of postgraduate students specializing in educational technology.
8. Measuring the impact of the adaptive learning environment according to the learning style that was relied on in the current study on some different outcomes such as achievement motivation, self-regulation, and attitude towards the learning environment
9. Designing adaptive learning environments based on adaptive support according to the learning style.