A proposed perspective for designing a 3D Virtual Learning Environment Based on Artificial Intelligence for Teaching English Language for Medical Students at the University of Bisha

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Abstract:

*T*his study aimed to design a proposed perspective for designing a three-dimensional (3D) virtual learning environment based on artificial intelligence for teaching English language for the medical students. The researcher conducted a study on the faculty staff at the Faculty of Medicine at the University of Bisha. The researcher used a questionnaire for exploring the educational and technological requirements of the 3D virtual learning environments based on artificial intelligence.

Introduction

This era witnessed many revolutionary developments and challenges. It is the age of information, communication and technology revolution. Its all characteristics require a type of individuals who have many basic and necessary skills for dealing and adapting with its giving and challenges. There is no doubt that preparing such a type of individuals were identified by the experiences, courses and instructional activities provided by the educational institutions. In addition, searching for suitable styles and techniques through which these experiences can be provided in a way that contributes to develop imagination, thinking and creativity rather than those focusing on the culture of memory, and maximizes lecturing and memorization. The new educational technology with all its potentials introduces new interesting techniques for constructive teaching.

Information and educational technology provided us with new technologies for preparing artificial computerized learning environment. These sometimes outperform the natural

environments such as simulation and virtual reality from which virtual communities are one of its products (Alhesan and Alabeid, 2009: 191).

Virtual reality occurred as a unique field of computer applications during the 1980's. Therefore, this technology is still at its early stage of development. Till now, the studies related to this technology are very few especially those related to educational applications. In addition, the novelty of this kind of technology made the researchers and educators exert a great effort for building a theory or a conceptual basis concerning this technology and its potentials (Berge & Clark, 2005: 10).

Rahhouma (2011) emphasizes that, through virtual communities, learners can acquire experiences they cannot learn in reality because of different factors such as danger, high cost, unavailability of enough devices or lack of time. This technology is based on blending reality and imagination by creating artificial imaginative environments capable of representing the reality so that they allow the individual to interact with them. In these virtual communities, the third dimension, or materialization, has played an important role in this technology since more than one sense is used to make the one using it completely engaged as if he is a part in the real environment itself.

On the other hand, intelligent educational technology relies on using and implementing theories and concepts of Artificial Intelligence and the Cognitive Sciences. Mixing Artificial Intelligence and the Cognitive Sciences in turn leads to designing and producing a new kind of educational systems characterized by intelligence and having traits and abilities that approach the behavior of the human being. This is because they help students in learning better and faster than the previous generations of traditional educational programs (Salem, 2002: 16).

Salem (2002:181) sees that to talk about the role of artificial intelligence in education, focus should be on the ways that enable us to use it in making intelligent ready-made educational programs. In addition, through the human

experiences, we could use it in making unique systematic methods of learning, reasoning, deductive thinking and reasoning from human experiences.

The current trend seeks to blend and integrate hypermedia with intelligent educational technology systems because their integration allows designing more powerful and effective educational systems, learners' self-management of learning, opportunities for inquiry and problem solving for learners that suit their abilities, including the human teacher (Abdennaser, 2010: 11).

Previous studies:

Previous studies that dealt with using 3D virtual learning environments in education were varied. Yufang & Jun (2010) revealed an increase in the social ability among autistic students in the 3D virtual learning environment. Hassan (2012) showed the effectiveness of 3D virtual learning environment in increasing achievement motivation among the students and that there were positive attitudes towards the 3D virtual learning environment. Almane (2013) and Waheed (2014) showed the effects of utilizing 3D educational environments on developing skills of designing databases.

Results of many studies revealed the effectiveness of utilizing artificial intelligence in education. Khairy (2008) showed a greater effect of the intelligent, cooperative e-learning environment on developing achievement among Educational Technology students in the faculties of specific education. Alaraby (2008) indicated a great effect of teaching problem solving using visual basic through a cooperative learning strategy based on artificial intelligence on creative solutions of problems and cooperative skills for second grades at the Educational Technology Department. Ibrahim (2009) showed the effectiveness of an intelligent educational system for the primary stage child and the existence of a great effect of the system on developing the child's creative thinking. Abdennaser (2010) revealed the effectiveness of utilizing artificial intelligence in designing e-learning websites and systems. Alnaggar (2012)

revealed the effectiveness of implementing intelligent programs in developing the skills of designing e-websites among Information Technology students in the light of total quality standards.

Considered by the above, this study characterized from previous studies by providing a proposed perspective for designing a 3D virtual learning environment based on artificial intelligence according to the learners' reaction. To engage them in a way that facilitates interaction and learning according to their needs for learning the medical language in a concrete way that may not be available in reality. Likewise, providing learners with a virtual teacher based on artificial intelligence will allow answering the learners' questions at any time. For sure, the educational process will be more interactive to change this teacher to a patient that the students can examine to answer the questions in their mind so that the medical English language in the students' mind will be acquired through practice not lecturing.

Thus, reaching a proposed perspective for designing a 3D virtual learning environment based on artificial intelligence for teaching English language for the medical students is considered a new method for the elimination of boredom and making learning the language interesting in the way the constructivist theory called for in a way that eliminates the students' fear of the subject and contributes to solving the problem of lack of faculty staff.

Problem of the study:

Many new studies explained that the students' lack of perception of the medical English language content they learnt may be attributed to the inefficiency of the used teaching style. Sarany and Saheby (2012) proved that the new strategies and methods of teaching have an effective role in teaching the professional English language in the medical English language courses. Abdullah (2013) pointed out the importance of relating the students' needs to the curricula and materials they study, in addition to calling the students' attention to the importance of

identifying their academic needs in learning the medical English language. Furthermore, lack of meeting the students' academic needs in learning the medical English language and not getting the meaning may be a decisive factor, especially in some specializations such as the medical or scientific ones.

Analyzing and following up the students' scores at the preparatory year at the University of Bisha, the low scores of some students in all academic subjects for that year were noticed. This is because of the difficulty of learning the new concepts taught in English, and the students' inability to apply the concepts they learnt in their specialization. To assure this, the researcher conducted an unstructured pilot study to identify the difficulties that face the preparatory year students. A questionnaire was distributed to a group of them who were enrolled in the Faculty of Medicine (n=43 students) at the University of Bisha, Second term of the academic year , 2014/2015. The study revealed the following:

- The medical students had a negative attitude towards learning the subjects in English.
- 90% of the students agreed on the difficulty of remembering the medical concepts in the English language.
- 94% of the students agreed on the difficulty of utilizing those concepts in practice.

The researcher conducted another pilot study directed to the faculty staff at the Faculty of Medicine at the University of Bisha to identify the extent to which they benefit from the potentials and tools of the 3D virtual learning environment in the instructional process. A questionnaire was distributed to a group of the Faculty of Medicine staff members (n= 29 faculty staff) at the University of Bisha by the end of the second term of the academic year 2015. The study revealed that the faculty staff poorly makes use of the potentials and tools available in the 3D virtual learning environments in the instructional process in addition to their poor prior knowledge about the existence of such environments in the internet websites.

Analyzing the review of literature and related studies in the field of the study, the following conclusions were reached:

- All previous studies agreed on the effectiveness of the 3D virtual learning environments in education.
- The traditional educational programs are not suitable for teaching the medical subjects in English as they need varied methods of teaching.
- Scarcity of the Arabic studies and research papers that dealt with linking the 3D virtual learning environments to the intelligent teaching systems and utilizing intelligent teaching systems in teaching the subjects of a special nature such as teaching English for medical students.

Thus, the importance of this study lies in an attempt to introduce a model that links the 3D virtual learning environments because of their many proved effectiveness and advantages in the instructional context in which artificial intelligence is practiced due to its unique characteristics, potentials and abilities.

Considering the aforementioned information, the problem of the study may be formulated in the following main question: What is the proposed perspective for designing a 3D virtual learning environment based on artificial intelligence for teaching English language for the medical students at the University of Bisha?

This question divided into the following sub-questions:
1. What are the educational needs of the 3D virtual learning environments based on artificial intelligence for teaching the English language for the medical students at the University of Bisha from faculty staff's point of view?
2. What are the technological needs of the 3D virtual learning environments for teaching English language for the medical students at the University of Bisha from faculty staff's point of view?

3. What are the technological needs of artificial intelligence for teaching English language for the medical students at the University of Bisha faculty staff's point of view?

4. What is the proposed perspective for utilizing artificial intelligence in 3D virtual learning environments for teaching English language for the medical students at the University of Bisha?

Terms of the study:

The perspective proposed:

The researcher operationally defines it as analyzing the reality of teaching English for the medical students at the University of Bisha reaching a solution for its problems by introducing a proposed perspective for a 3D virtual learning environment based on artificial intelligence.

3D virtual learning environments:

Zeineddin (2010: 2) defines 3D virtual learning environments as 3D environments that simulate the reality and the educational environment, with which users can interact by the computer monitor and the electronic games equipment. The programs allow their users to interact with each other and exchange ideas and experiences regardless of where they are. They also allow them to personify any character they like and any action they cannot do in their real educational environment without any fear or horror.

The researcher defines 3D virtual learning environments operationally in this research as 3D environments based on artificial intelligence that simulate the reality and allow the faculty staff and the students to create their content themselves. They also allow exchanging experiences and ideas among the faculty staff and the students, regardless of where they are by personifying of a 3D virtual character (an Avatar) that allows them to do what they want without fear or shame. They also make available 3D virtual learning platforms that interact according to the learner's psychological needs and the nature of the scientific material used. They allow making a dialogue with

the staff member and they are provided with a database of medical terms.

Artificial intelligence:

Zayed (2005: 150) defines it as the science capabilities of designing tools that perform tasks and require an amount of human intelligence when a human being performs them.

The researcher defines artificial intelligence operationally as one of the information branches that studies developing intelligent technology to be applied through the computer in a way through which the computer has an intelligent behavior in performing the tasks or solving the problems and blending artificial intelligence with the work environment. It allows students' interaction and making use of them. It also allows them to participate, receive immediate feedback and interact dynamically.

Procedures of the study:

Method:

This study depended on the descriptive method.

Population and sample of the study:

Sample of the study included all faculty staff at the Faculty of Medicine at the University of Bisha (n= 29).

Tool of the study:

This study depended on a questionnaire for analyzing the scientific, technological and educational needs for the 3D virtual learning environments based on artificial intelligence. This tool aimed at collecting data and information. It was prepared according to the following procedures:

Formulating the statements of the questionnaire:

To formulate the statements of the questionnaire, the literature related to the different variables of the study was reviewed and formulated in a five – points Lickert scale (strongly agree, agree, not sure, disagree and strongly disagree) to respond to the statements. The tool of the study in its first form consisted

of two dimensions: the educational needs (13 statements), and the technological needs (15 statements). Based on the opinions of the panel of jury members, a separate dimension dealing with artificial intelligence was added, it included 12 statements. Thus, the final version of the questionnaire consisted of three dimensions and a total of 40 statements.

Validity of the questionnaire:

Tool validity considered one of the important criteria for judging the tool's ability to measure what it supposed to measure. The validity of the questionnaire was established through:

a. **Juries validity:** The questionnaire was submitted to a panel of jury members to make sure of the clarity of the statements, their relatedness to the dimension it belongs to, coverage of the statements to their aims, comprehensiveness of the statements and their variety in addition to any remarks concerning additions, omissions and/ or modifications. The researcher modified the questionnaire in light of the panel of juries' opinions.

b. **Internal consistency:** Correlation coefficients between each statement and (1) the dimension to which it belongs and (2) the total score of the questionnaire after omitting the statement's score from the dimension or the total score, considering the rest of the statements as a criterion for the statement, were calculated. In addition, the correlation between the score of each dimension and the total score of the questionnaire were calculated. The results of the internal consistency are shown in Appendix 1. The researcher concluded that all the statements in the questionnaire have statistically significant correlations to the dimension to which it belongs and to the total score of the questionnaire indicating that the questionnaire has a high degree of internal consistency.

c. **Reliability of the questionnaire:** Reliability was estimated using Alpha Kronbakh after administering it to a sample of faculty staff (n= 29). The reliability coefficient

for the first, second and third dimensions were 0.551, 0.486 and 0.471alpha coefficient for the whole questionnaire was 0.906, which is high. Thus, the questionnaire in its final form is applicable.

Results of the study:

In this section, the researcher presents the sample's responses ~~on~~ to the questions of the study, its statistical treatment using descriptive statistics and its methods and, finally, the results, their analysis and interpretation.

The results of the first question: What are the educational needs of the 3D virtual learning environments based on artificial intelligence for teaching English language to the medical students at the University of Bisha from faculty staff's point of view?

The researcher used the mean scores, standard deviations and the general average for the statements in the first dimension of the questionnaire taking numbers 1 to 13 which measure the educational needs of the 3D virtual learning environments based on artificial intelligence for teaching English language to the medical students in Bisha from the faculty staff's point of view. The results were as in table 1.

Results of table 1 indicated that the general mean for the sample's responses was 4.78 which is an indicator that there is a high agreement on the educational needs of the 3D virtual learning environments based on artificial intelligence for teaching English language for the medical students at the University of Bisha from the faculty staff's point of view. The standard deviation of the mean score was .162 which is a value and an indicator of the high homogeneity in the sample's responses about the educational needs of the 3D virtual learning environments based on artificial intelligence for teaching English language to the medical students. The highest need in the first dimension was statement (3) which states "The virtual content of the environment is related to the aims" with a mean score 4.93 which was highly approved. The least needed was statement (2)

which states "The environment is suitable to the intended sample" which came in the 13th rank with a mean score 4.55 and was also highly approved.

Table 1: Mean scores and standard deviations for the sample's responses to the first dimension, the educational needs of the 3D virtual learning environments based on artificial intelligence for teaching English language to the medical students

No. of statement	Statement	Degree of agreement			
		Rank order	Mean	Standard deviation	Response
3	The virtual content of the environment is related to the aims.	1	4.93	0.334	Very high
13	The environment presents a pre-assessment of the learners' prior knowledge and skills.	2	4.92	.279	Very high
1	The environment provides a presentation of the general aim and operational objectives of the material for the students.	3	4.89	.309	Very high
8	The environment takes flexibility and integration of presenting the content into consideration in a way that allows learners to use it in an integrated way in their lessons.	4	4.87	.364	Very high
6	The environment takes into consideration organization of presenting the content hierarchically to make it easy for the students to grasp.	5	4.86	.497	Very high
10	The environment provides a clear, specific and stable strategy of navigation into the content.	6	4.82	.385	Very high
12	The environment allows students' move freely and easily for discovering the structure of the content.	7	4.80	.402	Very high
4	The environment provides tools for presenting educational activities that enable the students to generate ideas and understand the content.	8	4.77	.472	Very high
9	The environment provides suitable, varied and comprehensive questions and exercises.	9	4.74	.488	Very high
7	The environment varies methods of presenting the content (lecture, discussion, etc.)	10	4.73	.471	Very high
11	The environment provides tools for designing activities that achieve the aims of learning.	11	4.68	.467	Very high
5	The environment encourages students' thinking, creativity, discussion and participation in learning.	12	4.60	.572	Very high
2	The environment is suitable for the intended sample.	13	4.55	.632	Very high
General mean			4.78	.162	Very high

The results of the second question: What are the technological needs of the 3D virtual learning environments for teaching English language to the medical students at the University of Bisha from the faculty staff point of view?

The researcher used the means, standard deviations and general mean for the statements in the second dimension "the technological needs of the 3D virtual learning environments" in the questionnaire taking numbers 14 to 28 and measuring the technological needs of the 3D virtual learning environments for teaching English language to the medical students— at the University of Bisha from the faculty staff's point of view. The results were as in table 2.

Results of table 2 indicated that the general mean of the sample's responses was 4.78 which is an indicator of high agreement on the technological needs of the 3D virtual learning environments for teaching English language to the medical students at the University of Bisha from the faculty staff's point of view. The standard deviation of the mean score was .150 which is a value and an indicator of high homogeneity among the sample's responses concerning the technological needs of the 3D virtual learning environments for teaching English language to the medical students.

The highest need in the second dimension "the technological needs of the 3D virtual learning environments" was statement (19) which states "The environment stimulates the student to effectively participate in the events of learning" with a mean score reaching 4.95 and which was highly agreed upon by the sample. On the other hand, the least need in the second dimension was statement 18 which states "The student can download the educational materials (photos, multimedia files, etc.), receiving the 15th rank, with a mean score reaching 4.55 and highly agreed upon by the sample.

Table 2: Mean scores and standard deviations for the sample's responses to the second dimension, the technological needs of the 3D virtual learning environments based on artificial intelligence for teaching English language to the medical students

No. of statement	Statement	Degree of agreement			
		Rank order	Mean	Standard deviation	Response
19	The environment stimulates the student to effectively participate in the events of learning.	1	4.95	.268	Very high
20	The environment allows using different patterns of interaction between the learner and the content (clicking the mouse, moving and objects, modifying object characteristics, using the keyboard for wandering).	2	4.94	.320	Very high
28	Subscription is free.	3	4.91	.294	Very high
25	The environment uses a clear sound.	4	4.91	.359	Very high
26	Cartoons are used in situations in which it is difficult to use the video.	5	4.87	.443	Very high
14	The environment interface is simple and void of complexity.	6	4.81	.490	Very high
23	The environment takes into account ease of movement in all its parts.	7	4.80	.497	Very high
17	The students select the 3D virtual character called Avatar and modify it in the environment.	8	4.80	.475	Very high
16	The environment includes functional search for surveying the information around the topic of learning.	9	4.80	.475	Very high
15	The environment provides ways for documentation and saving (Blog, Take Photos, Record Video and audio)	10	4.75	.583	Very high
27	The student can interact with the virtual creatures.	11	4.67	.573	Very high
24	The texts are written in easy, simple, common, and understandable way.	12	4.66	.612	Very high
21	The environment allows the student's control of sequencing presentation of the content (information, examples, applications and exercises).	13	4.63	.602	Very high
22	The environment allows different ways of navigation.	14	4.62	.568	Very high
18	The student can download the educational materials (photos, multimedia files, etc.)	15	4.55	.665	Very high
	General mean		4.78	.150	Very high

The results of the third question: What are the educational needs of artificial intelligence for teaching English language to the medical students at the University of Bisha from the faculty staff's point of view?

The researcher used the means, standard deviations and general mean for the statements in the third dimension "the technological needs of artificial intelligence" in the questionnaire taking numbers 29 to 40 and measuring the technological needs of the artificial intelligence for teaching English language to the medical students in the University of Bisha from the faculty staff's point of view. The results were as in table 3.

 Results of table 3 indicated that the general mean of the sample's responses was 4.68 which is an indicator of high agreement on the technological needs of artificial intelligence for teaching English language to the medical students at the University of Bisha from the faculty staff's point of view. The standard deviation of the mean score was.187 which is a value and an indicator of high homogeneity among the sample's responses concerning the technological needs of artificial intelligence for teaching English language to the medical students.

The highest need in the third dimension "the technological and of artificial intelligence" was statement (31) which states "The system monitors the student's log in and his educational sessions" with a mean score reaching 4.92 and which was highly agreed upon by the sample. On the other hand, the least need in the third dimension was statement 32 which states "The system monitors the rate of the student's progress and gaining the knowledge step by step", receiving the 12[th]rank, with a mean score reaching 4.43 and highly agreed upon by the sample.

Table 3: Mean scores and standard deviations for the sample's responses to the third dimension, the technological needs of artificial intelligence for teaching English language to the medical students

No. of statement	Statement	Degree of agreement			
		Rank order	Mean	Standard deviation	Response
31	The system monitors the student's log in and his educational sessions.	1	4.92	.347	Very high
36	The system analyzes the kind of errors the student makes identifying the wrong way the student uses in solving problems.	2	4.91	.388	Very high
34	The system analyzes the student's answer using varied kinds of knowledge (knowing the field, knowing the questions and answers, knowing the student and his prior performance, etc.)	3	4.83	.453	Very high
39	The student's form marks the areas the student masters in a subject- matter semantic network or in a rule- based representation.	4	4.83	.429	Very high
35	The system responds more sensitively to the student's incorrect interpretations and his learning problems as they are symptoms to incorrect concepts.	5	4.77	.515	Very high
38	The student's form provides the teacher with a detailed report about the student's level and progress in which it identifies the student's mistakes and their kinds. It also indicates what the student knows and doesn't know.	6	4.73	.471	Very high
37	The system compares the student's knowledge to the knowledge in the expert system.	7	4.60	.642	Very high
40	The system identifies the pattern of learning style suitable for applying the best educational techniques and methods of teaching for this particular student.	8	4.58	.517	Very high
30	The system keeps a record of the student's learning progress.	9	4.55	.561	Very high
29	The student's form is based on the results of educational psychology, fundamentals of education, and cognitive psychology.	10	4.55	.615	Very high
33	The system assesses the student's prior knowledge to identify the best method of teaching and the most suitable subject for the student.		4.52	.666	Very high
32	The system monitors the rate of the student's progress and gaining the knowledge step by step.	12	4.43	.613	Very high
General mean score			4.68	.187	Very high

The results of the fourth question: What is the proposed perspective for designing a 3D virtual learning environment based on artificial intelligence for teaching English language to medical students?

Based on the previous results of this study, the proposed perspective for designing a 3D virtual learning environment based on artificial intelligence for teaching English language to the medical students is as follows:

a.Philosophy and bases of the perspective proposed

This refers to the factors and requirements that should be taken into consideration when implementing the perspective proposed. They are:

1. **The society's philosophy, ideology and characteristics**
   The educational system in any society has its own nature which reflects the society's philosophy and characteristics Therefore, curricula differ from a country to another, even if there are similarities in some subjects. Those responsible for the e-learning sector should be aware of and deeply understand the society's philosophy, goals and ambitions so that curricula would be an honest translation of these ambitions and effective means of achieving them.

2. **Nature and philosophy of school subjects**: There is no doubt that subjects differ in their nature and philosophy and, in turn, aims. Some subjects have a pure theoretical nature while others have a practical one. The nature of the subject, the selected content and the set aims differ according to the age and educational stage for which the curriculum is planned.
   Therefore, the researcher pinpoints that the nature of the subject and its philosophy are among the important bases. There should be an explanation about the nature of the subject and the dimensions of dealing with it in the educational stage for which it is planned. It should also include a description of the limits that should be adhered

to in selecting the content of the subject and ways of its evaluation.

3. **The nature of the learner and his growth characteristics**: This affects all the elements of the curriculum. Judging the quality of education is controlled through 3D virtual learning environments based on artificial intelligence and their integration in the light of how far each element meets these characteristics. It includes a description of the learner elaborating characteristics of his body and physical, mental and recognition abilities in addition to the most important characteristics in emotions, dispositions and attitudes.

4. **The nature of learning through 3D virtual learning environments based on artificial intelligence as a system**: one of the bases is the system perspective of education through 3D virtual learning environments based on artificial intelligence. Therefore, it explains the interaction, overlapping and reciprocal relationships among its elements and components, and how these relations reflect the philosophy of education through 3D virtual learning environments based on artificial intelligence.

b.The aims of the perspective proposed: There are some considerations that should be taken into account:

1. It is important that all plans set for developing a sector or another in the educational sector should be within a systematic thinking. Education is an integrated system in which development cannot be achieved for any of its components without considering the rest of the components. The educational system itself is a part of the whole society's total system that affects and is affected by it. It includes all the areas of life in this society and all the varied powers and cultural factors with which it interacts. Considering e-learning a sub- system and 3D virtual learning environments a sub-system of that sub-system, we can't expect success in developing education through

3D virtual learning environments based on artificial intelligence without success of developing education whether it is in its philosophy, policy, plans or institutions. Add to this development of the societal system.

2. The success of the strategy of e-learning expansion at the University of Bisha is proportional directly to the ability to attract many parties to support the orientation that this sector is based on.

3. The University of Bisha, expanding e-learning, doesn't look at expansion as an aim for its sake. Rather, it focuses on the outputs this sector provides.

4. The future vision for the e-learning progress in the Kingdom of Saudi Arabia, generally, and the University of Bisha , in particular, should be directed to overcome the current difficulties that this sector faces and the obstacles that hinder developing performance based on the results of the field studies.

c.The suggestions of the perspective proposed:

In this respect, the researcher points out the suggestions for development that should be included in the proposed perspective were formulated operationally, as possible, in a way that shows how to be applied. This is to change them from just unspecific statements to applicable ideas in reality. The following are the suggestions presented by the proposed perspective in three dimensions:

First: Facilities and technological background of students and faculty staff: The following should be taken into account:

1. Increasing the efficiency of the internet infrastructure which requires providing access to the rapid speed internet, security and safety on the network, and computer labs for the students.

2. Preparing training programs in the area of 3D virtual learning environments for developing the following skills:
   a. Skills of logging into the 3D virtual learning environments based on artificial intelligence.

b. Navigation inside the 3D virtual learning environments based on artificial intelligence.

c. Self- learning and self-acquisition of concepts. Problem solving and cooperative learning.

d. Communication and dialogue via 3D virtual learning environments based on artificial intelligence.

e. Distant searching through the 3D virtual learning environments based on artificial intelligence.

f. Publishing and increasing the efficiency of the educational materials presented through the virtual learning environments based on artificial intelligence.

Second: Concerning the obstacles of making use of 3D virtual learning environments based on artificial intelligence, the following practical procedures should be followed:

1. The educational system at the University of Bisha:
    a. Preparing the educational institutions to change to learning through3D virtual learning environments based on artificial intelligence.
    b. Getting rid of the educational system bureaucracy.
    c. Establishing a unit in the university to take over these tasks.

2. The student:
    a. Preparing training sessions for preparing the students psychologically for accepting learning through 3D virtual learning environments based on artificial intelligence.
    b. Promoting the students' technological skills and abilities.

3. The instructor:
    a. Counting teaching through 3D virtual learning environments based on artificial intelligence from the faculty staff's educational load which decreases the instructor's overload in addition to financially supporting him.

b. Preparing the faculty staff to design educational situations on the sites of 3D virtual learning environments based on artificial intelligence.

4. The virtual e-learning sector:

   a. Providing financial support from the buildings, facilities and equipment budget.
   b. Providing high level educational and technical experts to support teaching through 3D virtual learning environments based on artificial intelligence and carrying over its tasks.

Third: Considerations for the 3D virtual learning environments based on artificial intelligence. They should:

- Stimulates students' concern and motivation to self-learning.
- Helps meet individual differences among students.
- Guides students to think systematically.
- Allows the student to build the course according to his needs.

This requires building a student's form, faculty staff's form, the expert's form and an interface's from according to styles of artificial intelligence to achieve the previous tasks.

Fourth: The educational and technological requirements for designing a 3D virtual learning environment based on artificial intelligence for teaching English language to the medical students.

A. Providing some qualified specializations for working in developing 3D virtual learning environments based on artificial intelligence. They are:

1. The management team: This includes
   a. Project manager.
   b. Production coordinator.
   c. Students' registration services clerk.
   d. Copyright coordinator.
   e. Marketing coordinator.
2. The academic and educational team. This includes:

a. A person responsible for assessment and evaluation.
b. A psychologist.
c. An editor for formulating the scientific content.
d. A person responsible for implementing discussion through 3D virtual environments.
e. A person responsible for making the scientific content available.
f. A person responsible for counseling and guidance.
g. A sample of the instructors and the students.
h. A person responsible for the library services.
3. Site examination and quality assurance team. This includes:
   a. A person responsible for quality assurance.
   b. A person responsible for conducting pilot studies.
4. Information and/ or program engineering team. This includes:
   a. Information engineer.
   b. Artificial intelligence expert.
   c. An expert in the subject matter.
5. **Design team.** This includes:
   a. Educational designer.
   b. Interaction interface designer.
   c. Drawings and monitors designer.
6. Designing and producing multimedia team. This includes:
   a. Graphics and production of educational diagrams team.
   b. Carton production team.
   c. Photos production team.
   d. Educational video production team.
   e. Sound production engineer.
   f. Filming and editing engineer.
7. Development team. This includes:
   a. A system analyst.
   b. A programmer.
   c. A programmer for databases and web server.

8. Communication and information technology team. This includes:

    a. A person responsible for web management and engineering.

    b. A person responsible for technical and engineering support.

B. The necessity of blending instructional design models (IDM) and software engineering models (SWEM) in developing the intelligent virtual e-learning systems through 3D virtual learning environments.

C. The necessity of evaluating the quality of the intelligent 3D virtual learning environments using the available educational standards and agreeing on the list of suggested criteria in this study for assuring the quality of the intelligent 3D virtual learning environments.

D. The necessity of using tools and programming languages that may be useful in building 3D virtual learning environments based on artificial intelligence for teaching English language to the medical students in order to prepare its stakeholders. Among these languages are:

1. Ready- made specialized programs in site design such as:

- M.S. Front Page
- M.S. Web Expression
- Macromedia Dream Weaver
- Microsoft Office Publisher
- Web Page Maker

2. Internet server programs such as:

- Internet Information Server (IIS)
- Apache (PHP)

3. Programs that are useful in the area of artificial intelligence such as:

- Lisp
- Prolog

- Expert System Shells
- V C++
- M.S. Visual Basic .Net

4. Database management systems such as:

- Oracle
- My SQL
- M.S. SQL Server

5. Drawing programs such as:

- Corel Draw
- Macromedia Fireworks
- Adobe Illustrator
- Adobe Photoshop

6. Sound programs such as:

- Sound Forge
- DFX Audio Enhancer
- Adobe Audition SDK

7. Programs that are implemented at the client's side for programming the interactive pages such as:

- Java Script
- Visual Basic Script
- Java Applet

8. Programs implemented on the server side for programming the interactive page such as:

- ASP(Active Server Pages)
- ASP.net
- PHP (PHP : Hypertext Preprocessor)
- Java

9. Interactive and stable page design programs such as:

- HTML (Hyper Text Markup Language)
- XHTML (Extensible Hyper Text Markup Language)
- XML (Extensible Markup Language)
- DHTML

- CSS (Cascading Style Sheets)

10. 3D drawing programs such as:

- 3D Studio Max
- Maya
- 3D Photo Builder
- Poser
- VRML Virtual Reality Modeling Language

11. Video and animation programs such as:

- Adobe Image ready
- Macromedia Flash
- Adobe Premiere Pro
- Swish

12. Helping programs for site texts' editing such as:

- Microsoft Word
- Word Pad
- Notepad

E. The necessity of evaluating the 3D virtual learning environments based on artificial intelligence using different technological and educational methods through the suggested list of criteria. Some of these methods are:

- Revising language and spelling.
- Revision by external institutions.
- Getting feedback on the site from experts.
- Getting feedback on the site from the faculty staff and the students through questionnaires.
- Experimenting on a group of equipment on different conditions to know their compatibility.
- Experimenting on a group of students and identifying its effect and effectiveness.
- Revising the technical mistakes in sound, animation and image.

- Internal evaluation of the site itself before the students' use.
- Alpha test (the initial test of the product in the lab).
- Beta test (a test by the end users).

F. Designing 3D virtual learning environments based on artificial intelligence in all fields focusing on the fields in which it is difficult to prepare and teach through the internet. These systems have abilities that allow them to do so. Some of these fields are:

- The theoretical and educational fields.
- Fields that require simulation of reality.
- Fields that require educational interaction, such as teaching programming.

Recommendations:

Based on this study, it is recommended that:

- E-learning deanship at the University of Bisha adopts the suggested model for designing 3D virtual learning environments based on artificial intelligence and the criteria it included for quality of this system.
- It is necessary to care for utilizing and designing 3D virtual learning environments based on artificial intelligence in education either by integrating it with the traditional method or depending completely on it.
- Establishing a unit at the University of Bisha for adopting technology of artificial intelligence and programming engineering and utilizing them for producing high level intelligent virtual e-learning systems with a high level of effectiveness, in addition to making these systems available via the mobile. This unit would be called "Intelligent virtual e-learning systems' unit".
- Training those responsible for designing virtual e-learning sites on artificial intelligence technology and engineering programming **(OOSWE).**

Suggestions for further research:

- Conducting similar studies on other subjects and different educational stages.
- Investigating the effectiveness of 3D virtual learning environments based on artificial intelligence in achievement and other variables such as critical thinking.
- The effect of utilizing 3D virtual learning environments based on artificial intelligence on achievement among slow learners and the gifted students.
- Training teachers on utilizing 3D virtual learning environments based on artificial intelligence for developing the practical skills among students in different specializations.
- The effectiveness of utilizing 3D virtual learning environments based on artificial intelligence on developing virtual e-learning systems.

References:

Abdalla, A. (2013).*The needs and attitudes of Science students to ESP: A case study of TAIF University in KHURMA*, Ph.D. Faculty of Education, TAIF University, Saudi Arabia

Abdelnaser, G. (2010). Utilizing artificial intelligence for designing educational internet sites as an approach for developing distant e-learning university teaching. Ph.D. Faculty of Specific Education, Ain Shams University.

Alaraby, Z. M. (2008). The effectiveness of cooperative learning strategy through artificial intelligence in the Programming subject on creative solving of cooperative problems and skills. Ph.D., Faculty of Specific Education, Ain Shams University.

Alghedan, A. (2013). A suggested framework for M-Learning in the higher education institutions. The future of Arab education, 20(82), pp. 9- 58.

Almane, H. (2013). The effect of utilizing virtual worlds in developing skills of designing databases among the second

grade secondary stage female students. M.A. Thesis. Faculty of Education, King Abdulaziz University.

Alhesan, A. M. and Alebeid, A. A. (2009). The Science virtual learning environment in light of total quality criteria. *The 3rd conference for Science Education "The curriculum, teacher and book: an invitation for revision",* the Society of Science Education, Al-Morgan Hotel, Fayed, Ismailia, pp. 34- 67.

Annagar, M. K. (2012). The effectiveness of a program based on artificial intelligence technology in developing the skills of designing educational electronic sites among Educational Technology students in the light of total quality standards. M.A. , Educational Studies Institute, Cairo University.

Ibrahim, N. M (2009). The effectiveness of an intelligent educational system for the primary stage child and its effect on developing creative thinking. *Ph.D.* faculty of Specific Education, Ain Shams University.

Berge, Z. L. &{lark, T.(2005). *Virtual schools: Planning for success.*NY:Teachers College Press.

Fiona, B. & Magnus, M. (2003). The VERTEX project: Designing and populating shared 3D virtual worlds in the primary (elementary) classroom،*Computers & Graphics 27*, pp 353– 359.

Hassan, M. (2011). Criteria of designing and building a 3D virtual learning environment in the virtual worlds. *Journal of Educational Technology: Studies and Research Papers.*67, pp 467- 486.

Khairy, E. B. (2008). The effectiveness of intelligent, cooperative learning of e-courses in developing achievement among Educational Technology students in the faculties of Specific Education. Ph.D. Faculty of Specific Education, Ain Shams University.

Rahouma, A. M. (2011). Developing some virtual communities: New success factors for web socio-techodevelopment. Retrieved: 5/4/2013. Available: http://www.astf.net/

Salem, A. M. (2002). The newest in educational technology. *The Egyptian Alahram Magazine*, 31 Jan. 2002.

Sarani, A. & Leila, S. (2012).*The impact of task-based approach on vocabulary learning in ESP.* English language and literature department, University of Sistan & Baluchestan, Zahedan, Iran.

Yufang, C. & Jun, Y. (2010). Exploring the social competence of students with autism spectrum conditions in a collaborative virtual learning environment – The pilot study. *Science Direct، Computers & Education، 54* (2010). 1068–1077.

Zeineddin, M. M. (2010). Constructivist criteria for the quality of educational virtual reality programs and the 3D environments. *Paper presented at the first seminar in applications of communication and information technology in education and training,* 12-14 April (2010), Faculty of Education, King Saud University.

Zayed, F. S. (2005). The computer note: 1000 questions and answers in computer and information systems. Cairo: The Knowledge House.

Waheed, M. (2014, April). The effect of the difference in introducing the patterns of feedback in virtual realities in developing the skills of designing and producing databases among Al-Azhar Institutes students. Journal of Arab Studies in Education and Psychology, 48 (3), 49-94.