The problem of feedback in online education (reading facial features as a model)

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Abstract

Technological development has contributed to the development of the field of education by providing a large variety of electronic tools and media that are invested in the educational learning process by all actors in this field to be able to communicate pedagogically and implement the educational process according to the contemporary and advanced standards, including distance education. Distance education has thus become a prominent feature in all international universities, and one of the basic development indicators that measure the extent of the development of the educational system and the university institution, and determine the degree of its impact locally and globally, as well as the level of competitiveness that the university can achieve. in all stages of its development, distance education combined modern technologies, pedagogical and psychological sciences, considering that the latter represents the specialized field of educational activity and the educational process as a whole. The rapprochement between the two disciplines began gradually, as the pedagogues researched various technological means to facilitate education for both the teacher and the learner, in order to achieve the quality of its outputs. Computer science specialists search for the foundations, rules, and mental, psychological, and educational laws on which the teaching and learning process is built, which is itself the core of pedagogy process according to contemporary and advanced standards, including distance education.

During this interaction between these two areas, several studies have created databases to analyze the vocal, mental, emotional and behavioral features associated with the learning process, whether as a cause or as a result of learning behavior. Then everyone realized that there was no escape from integration in research and exchange of experiences. Computer systems of human systems then became focused on the human dynamics associated with the implementation of central computer systems. Researchers have transformed emotional facial features into algorithms that facilitate reading the learner's emotion and identifying his feelings accompanying the learning process. The problem raised in this topic is the following questions:

1- what is the use of studying the emotions of the learner in distance learning ?

2- Can the feedback technique based on studying the facial features of the learner mitigate negative emotions during learning?

3- Can the feedback technique based on studying the facial features of the learner extend the learning period in relation to staying in front of the computer for a longer period of time.

This topic has been covered by four topics, namely:

The first topic: the conceptual framework.

The second topic : the importance of distance education and its development stages.

The third topic: feedback and emotions in distance education.

The fourth topic: feedback technique based on an emotional database (study model).

Below is a breakdown of these investigations.

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First topic: in this topic we examined the concepts of the study with highlighting the importance of the subject as this study aims to illuminate some points regarding the education process that has become subject in these circumstances to the hypothetical pattern and distance teaching. The objectives are as follows :

1-Highlighting the importance of distance education, which has become a necessity imposed by the conditions of scientific development and global openness, as currently imposed by the crisis of the new coronary epidemic Covid-19.

2- Highlighting the importance of reading and analyzing the emotional features of the distance learner and understanding the associated moods, needs, interests and inclinations, because learning is an emotional and a mental activity at the same time, and the emotional and mood side greatly affects the quality of learning.

3- Introducing the feedback technique based on the emotional data of the learner as one of the latest techniques in distance education, which allows the teacher or the machine to intervene in a timely manner to give alternatives and solutions appropriate to the student's emotional state in order to increase his attention, increase his motivation, and increase the percentage of positive interaction, and it includes ensuring the continuity and quality of learning.

This topic also deals with the definition of the research variables, as follows:

- The concept of education: It is the set of activities that the teacher undertakes to provide the learners with knowledge, skills, behaviors, values and attitudes, in institutions designated for them, according to specific curricula, in order to achieve specific goals also related to the individual and society. It should be noted here that the activity of education varies from formal education to virtual education. This means that the person in charge of the education has other tasks and roles that were not present in the attendance education, such as teaching via electronic media, using the devices, and electronic planning for lessons, activities, and calendars.

- The concept of learning: it is a complex and compound, mental and emotional activity that the learner undertakes that allows him to acquire a total of knowledge, values, ideas, directions and skills. The learner does not see that he is inferred from the behavior and the change that is developing on him, so he assumed that it was a positive trend. It is according to Foucambert, a continuous process in time interacting with the sociocultural environment in which the individual lives, and that education is only an aid to the learning process.

-The concept of distance education: distance education is that activity that the professor performs via a computer, using various communication tools in order to carry out his teaching tasks by offering courses via electronic networks, providing guidance and direction mechanisms, organizing tests as well as managing and evaluating resources and processes, all this without a direct presence of students, that is, in a virtual world. Thus, distance education in this subject is e-learning.

-The concept of feedback: It is to inform the student of the result of his learning and provide him with information continuously, to help him know his actual level and enable him to improve, amend or maintain it. It is therefore the corrective verb inherent in the educational process; This is from the side of the professor, but from the side of the student, it is the echo that results from the learning process, which appears in the different responses of the learner, including answering questions and exercises, requesting the transition from an educational unit to another at a higher level using some of the effects and images available in the electronic

system. The learner also shows emotional responses that carry very important messages useful in evaluating the educational process remotely, by analyzing the features of the emotional face as is the case in our topic, and this feedback on the emotional database or E m A d system, which we will try to explain in the next element From the intervention.

second topic: the importance of distance education.

This topic shows the importance and characteristics of any distance education benefits for each of the parties to the deductive process, and they are as follows:

a- For the student: The primary goal of the educational process is the learner himself and bringing him to the full development of the personality in all its aspects: mental, psychological, linguistic and social, and achieving psychological and social harmony; Note that this growth can only be achieved through good learning, and this is what distance education offers him. It is sufficient for the learner to own a computer because it is the primary resource in the learning process. The characteristics of the learner can be summarized as follows:

- Developing the skills of using new technologies in communication and learning.
- Ease of access to information as the world has become an open book for everyone thanks to the Internet, which provides students with an immense and unprecedented amount of knowledge and its sources, such as electronic broadcasting, platforms and databases, encyclopedias, and free and paid educational sites, with no time and space limitations. This allowed the learner to obtain an infinite amount of knowledge in a short time without much effort.
- Encouraging interaction between students and their professors, as the knowledge is no longer ready in front of the learner, but seeks it gradually under the guidance of the teacher or machine until he reaches it, and this is the constructive pedagogy.
- The acquisition of completely new methods in the learning process that uses the skill of research and depth, the skill of self-evaluation and above that he has approval either from the professor or the system.
- Encouraging the student to research and dive deeper into it thanks to the existing suspense factor of websites, software and applications, the use of colors, movement and three-dimensional.
- Providing the learner with positive psychological attitudes towards school and learning.

b- For the professor:

-The non-mobility of the professor allows saving time and effort.
- The non-mobility of the professor eliminates the problem of the scarcity of teachers and gives them the opportunity to excel because they will be active on a wider scale and more effectively, as they will focus on the good design of lessons starting from defining goals accurately.
- Reaching a large number of students at the same time without effort such as local and international platforms.
- Providing various forms of feedback, we will talk about in the feedback component.

c- for the educational system:

- Keeping pace with scientific and technological development across the world, and generalizing the smart character to educational institutions.
- The greatest benefit to governments from distance education is the provision of capital that is spent on papers, textbooks, pens, and all the traditional facilities of the educational institution.

- Facilitating the renewal of the training of professors, administrators and workers, with the aim of keeping pace with scientific, technological and pedagogical development and acquiring new skills that qualify them to carry out the new tasks that the profession imposes.
-Apply the rules of local and global competitiveness and taking into account the standards of university classification and ranking.

We also dealt with in this topic a glimpse of the development of distance education, where in the second half of the twentieth century, the need to extend the age of education became increasing, and with the spread of education democracy as a human right, education has become compulsory in its elementary stages and is open at the secondary and university levels. In the sixties of the last century, the Open University appeared in the United Kingdom and Teluq in Quebec-Canada, in order to allow young people to learn in the place and time they choose; This gave the opportunity to form other groups such as workers and women staying at home. Thanks to the remote broadcast system for training programs. Since that period, education has become an area of economic competition, in which huge capital is invested in order to improve the quality of learning, which in turn works to develop the economy of nations.

In view of the breadth of this topic, we will focus on the most important milestones in the course of developing e-learning, as follows:

-The stage of correspondence education: It is a very old system, dating back to the year 1728, where Caleb Phillips proposed to give lessons in the United States through publications in newspapers. Teaching takes place on paper media: books, and publications.

-The stage of audiovisual education: It is also called radio and television education, which focuses on tangible and not only verbal learning.

-he stage of automated media: was characterized by the emergence of computers and the use of multimedia, such as floppy and CD-ROM, letters, fax, and others. At this stage the Internet appeared, but with traditional means. At this stage, behavioral and cognitive pedagogy continued, with the knowledge given ready for the learner.

-The internet stage: In the late nineties of the twentieth century, the electronics and multimedia technology trade and electronic security developed, and it became very easy to manage the educational process via the Internet, which is the third generation of e-learning that is from the university a virtual world largely simulates with the traditional university reality. It is then the stage of complete openness. In it, the learner became taught everywhere and across the world at the same time, in an interactive way; Within his reach are all means and mechanisms leading to knowledge. This stage in programming and teaching knowledge depends on the pedagogical "social constructivism" and the relational pedagogy.

We also reviewed in this topic the most important challenges facing distance education, and we summarized them as follows:

- Create an electronic educational environment by providing departments equipped with all technologies for education and distance learning and linking them to the Internet, and put them at the disposal of the professor and the student.
- Helping students to own at least a computer and connect to the Internet in their homes, to ensure that lessons and exams are not delayed and transferred, and that they obtain graduation certificates.

- Get used to the default attendance for both the teacher and the student; This requires a level of awareness and responsibility.
- The development of critical thinking, because the vast abundance of knowledge and information requires the ability to sort and criticize as it represents different idiologies and different ideological orientations, at a time when that was not permitted for the student, not even for the professor.
- One of the basic rules of distance education is individualism towards cooperation, information and research sharing, which are not used in our Arab universities.
- Control of the interaction process technologically and psychologically, as the student is not accustomed to participating in accessing the information and the professor is not accustomed to the student's criticism and opposition to him.
- Production in the Arabic language, as one of the most important challenges that await those involved in distance education is production in the Arabic language, whether in terms of software, applications or databases.
-The problem of feedback and the lack of student interaction, controlled by a set of factors, including poor student skills in controlling electronic work, or poor Internet flow. Among the most important factors that hinder the student's interaction with teachers and lessons is his psychological state and mood. In this approach, we wanted, through our topic, to present this problem and draw the attention of you who are interested in e-learning to the necessity of establishing a database with each educational program, describing the emotional state of the student on the one hand, and setting up a set of mechanisms for motivation and stimulation on the other hand, in order to increase interaction Positive and quality assurance of learning.

Third topic: feedback and emotions in distance education

Feedback has a major role in the conduct of the educational process, and it appears in these characteristics:
- Reinforcement feature: positive reinforcement for each correct performance and for every attempt in the required direction. Bruner stresses that the stimuli may be internal, linked to the student's emotional side and personal desire to succeed and obtain good results.
- The motivation feature: stimulating the learner's enthusiasm, drawing his attention, and suspending it, with the aim of continuing and having fun in learning.
-The guiding feature: directing learning behavior towards the performance related to the learner's goals without wasting time and effort.

On the importance of emotions in feedback, it affects the learner's learning of knowledge, skills, values, directions and ideas; This is because the mental aspect in a person is driven by his emotions, and moods, and determines his learning paths. A positive mood, for example, activates the ability to solve problems and stimulates creative thinking; While the sad mood is related to logical and deep analytical thinking; As for the excitement of extreme anger and extreme joy, it distracts the mental processes and disturbs the learning process.

There is no doubt that the emotional or emotional state of the learner affects the patterns of his interaction, and is reflected on the features of his face as it expresses his happiness or sadness, his satisfaction or indignation, his enthusiasm or boredom. Researchers designed many models of protocols to read emotional features while learning with great accuracy, because emotions:
- Raise learning behavior.

- Direct the learner towards the target.
- Increase motivation and activity and urges exertion.
- Stimulate creative thinking and achievement.
-Ensure continuity of learning.

Fourth topic: Presenting a sample of studying the emotional features of the learner

Emotional feedback based on Emotional Features is called EmAd: Emotion-based Adaptation and it has two basic stages:

1-The stage of detection of the emotions of the learner: Through which emotional databases are constructed so that all changes are stored on the muscles of the learner's face, specifically through points distributed in the image of the learner's face, such as anger, joy, fear, boredom, surprise, depression, and neutrality emotion. They are projected into different dimensions with emotional connotations. The machine learning model and the statistical models used in facial expression recognition systems are trained and tested using data algorithms. During the learning process:

- A picture of the learner is taken every 5 seconds for a period determined by the person responsible for the education or the electronic system.
- The system determines the points of the facial features.
- It studies the distances between them and then determines the type of emotion that results from this shape.
- If most of the pictures taken of the student show positive emotions, the learner will be allowed to continue learning, but in the opposite case, the system will go to the second stage, which is the stage of instructions and directions, and adjustment of the teaching tools.

2-Stage of recommendations or solutions: It is the process of modification and guidance carried out by the teacher or the system to motivate the learner to continue his learning and it contains recommendations and pedagogical and other psychological solutions.

A- Pedagogical recommendations:

- Modifying the content (in the form or content, or in both the form and the content), adding other educational methods, adapting the content to the needs and preferences of the learner.
- Re-planning lessons and translating them into pictures, cuts, curves and other forms of mental representation in learning.
- Adapt the content to the learning features, be it audio, visual, emotional or sensory.
- Adapting the educational content and integrating knowledge in its sociocultural context, so that he does not feel cultural alienation, there for, accepts information easily.

B- Psychological recommendations:

- Strengthening confidence in the learner's self through positive reinforcement and compliments.
- Instruct the learner to overcome negative feelings.
- Taking time out to train the learner on deep breathing exercises and relaxation due to its many benefits in stimulating the brain to learn, and reduce stress and negative emotions.
-Complimenting the learner's efforts and results that he achieved, even if it is small, in order to keep him interested and continue his learning.

The Results

The results of this model confirmed and answered to us carefully the questions that we set out on our topic, as follows:

1-Emotions play an essential role in e-learning.

2-The proposed solutions reduced the passive emotions of the learner, as the following form shows that the members of the sample showed negative emotional features, and once they applied the proposed psychological and pedagogical solutions, their psychological condition improved and the percentage of positive emotions increased, even if at a limited rate. If this indicates something, it indicates the efficacy of this technique, especially if researchers developed it more.

3-The proposed pedagogical and psychological solutions allowed the students to learn for a relatively longer period: The results of the study that we adopted as a model in our subject indicated that the time period during which learning took for the members of the sample increased from 1 minute to 13 minutes, and this in itself is a good indication of the effectiveness The system established by the researchers in this study, as shown in the following figure.

Recommendations

In view of the importance of the topic and its great benefit to all users of distance education, especially students and professors, and since this type of studies is still recent, and studies in it are still modest, especially with regard to inter-studies, we recommend the following:

1- Conducting more studies on e-learning based on the learner's emotions statement.

2- Serious cooperation, but rather integration, between psycho-pedagogical disciplines and computer science majors.

3- Create more databases to store emotional information, prepare protocols for analysis and interpret this data.

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