# A CONCEPTUAL MODEL FOR EFFECTIVE DISTANCE LEARNING IN HIGHER EDUCATION

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## ABSTRACT

**The present research aims at presenting a conceptual model for effective distance learning in higher education. Findings of this research shows that an understanding of the technological capabilities and learning theories especially constructive theory and independent learning theory and communicative and interaction theory in Distance learning is an efficient factor in the planning of effective Distance learning in higher education. Considering the theoretical foundations of the present research, in the effective distance learning model, the learner is situated at the center of learning environment. For this purpose, the learner needs to be ready for successful learning and the teacher has to be ready to design the teaching- learning activities when they initially enter the environment. In the present model, group and individual active teaching-learning approach, timely feedback, using IT and eight types of interactions have been designed with respect to theoretical foundations and current university missions. From among the issues emphasized in this model, one can refer to the Initial, Formative and Summative evaluations. In an effective distance learning environment, evaluation should be part of the learning process and the feedback resulting from it should be used to improve learning. For validating the specified features, the opinions of Distance learning experts in Payame Noor, Shiraz, Science and Technology and Amirkabir Universities have been used which verified a high percentage of the statistical sample of the above mentioned features.**

**Keywords:** **Distance learning; effective; model; learning theories; Information and Communication Technology.**

## INTRODUCTION

**Learning is the beginning of a need for perfection. It is evident that the more the science and knowledge of human being develop; a change in learning and its mechanisms is more needed. Distance learning is one of the substitution approaches which can be replaced with the face to face or traditional learning and is one of the key factors in the development of higher education (Taylor, 2001). Rapid economical, social and technological changes have affected the nature of life and the individuals' occupations. Individuals should continuously learn and educate for dealing with such changes and these features in the present decade have caused a constant increase in the number of candidates for entering to the higher education (Groff & Mouza, 2008). Therefore, in most countries distance universities have been developed to respond the educational needs (Buford & Harper, 2005, p. 3). Under these circumstances, the view of educational experts and politicians toward the distance learning subject has changed a little. For example, public report of Norway higher education specifies that distance learning, based on new communications technology, will be an important factor in future higher education strategies. Europe Union Research & Industrial Development Commission describes in its report that Europe needs an extensive and flexible structure for electronic learning (Mendenhall, 2001, p. 37).**

**Although globalization, development of information technology and other above mentioned factors have led to rapid changes in higher education, One of the main duties of researchers in this realm, is to present appropriate patterns or models suiting this type of education. Therefore, it seems necessary to present a distance learning model providing theories and distance learning missions thus promoting educational achievement and deep learning among university based on principles. In accordance with the reason mentioned above, researchers decided to conduct research to design a conceptual model of effective distance education in higher education. General goal of this research is to present an effective Distance education model in higher education. In this study, the following questions have been raised and evaluated:**

- **What are the features and characteristics of effective distance learning model in higher education?**
- **Does this model have enough validity from the authorities and experts' point of view?**

## METHOD

**This research is a qualitative study and includes several stages and in each stage, its specific materials and methods have been used. To achieve these goals of the research project, initially a review of literature based on documents, electronic and printed material was conducted in descriptive, analytical and case study methods. Subsequently, the theoretical foundations related to the topic were collected. The proposed model was established in preliminary form accordingly. To investigate the second research, i.e. to validate the pattern specified, the opinions of planners and distance learning experts were collected and analyzed quantitatively and qualitatively. In this stage of the present study, our samples were 15 distance education authorities and experts of Amirkabir, Science and Industry, Payame Noor and Shiraz Universities. The research samples were selected through nonrandom selection based on the principles such as having writing or translation on the ground of distance education, planning and establishing the course, presenting an article and figurative or traditional distance education. Eventually, the required reforms were made and the final model was established.**

## Analyzing Research Findings According to the Raised Questions

**First question: what are the characteristics and features of effective distance learning model?**

1) **The characteristics and features of effective distance education:**

**For specifying the features of effective distance learning, its capabilities should be known well and use a right learning theory. Therefore, distance education theoretical basics, ICT based education, learning theories, and researches related to the advantages and shortcomings of distance education have been evaluated.**

### Distance Education Theoretical Basics of The Present Study

**Distance education is a complicated global phenomenon that is associated with terms, meanings, theoretical concepts and various models. With studying the distance education theories, independence theory of Moore & Wedemeyer and the interaction and communication theory of Moore & Garrison are well relevant to Distance education in this age. Therefore, the learner should take the responsibility of learning and regulate his learning activities for attaining to the goals at the right time and place and have communication and reaction with the elements of academic milieu to improve learning and help make the personalized concept.**

### ICT based Education Concepts

**Using the information and communication technology is a symbol of a new period for distance education (Peters, 2003; Safavi, 2008). Education which is based on information and communication technology contains 6 following features: Telepresence, flexibility, communication, active learning, Collaboration and motivation. Thus, using information and communication technology transforms and changes mental models of distance education, enriches the present educational models more than before and makes new models. These models share the features of education that is based on technology and suggest modern educational and learning approaches in which the learner plays an important role and emphasizes on Self-directed learning, independent, flexibility and communication.**

### Learning Theories

**Regardless of whether learners learn individually or in groups, electronic or with presenting, it is widely known that individuals learn differently. Therefore, knowing learning theories for getting a better understanding of Distance education is necessary. Through studying various schools of thought, cognitive and social constructivist theory can be regarded as the foundation of effective learning. Constructivism teachers are inclined to the educational programming that is based on cooperative and group learning and reinforce active learning in the learner. As mention above active learning, cooperation and working in the group are also the important features of learning through technology. As a result, combining these features in distance education determines effective learning environment that was mentioned in this research.**

### Mission of Higher Education

**The most important mission of higher education from the beginning has been to give information, knowledge and skills to the students (Morss & Murray, 2005, p.5). But higher education is at the beginning of a revolution regarding information and communication power. Today, the universities should educate those who have the ability, grouping, analyzing and combining information, problem solving skills, communication skills, discussions, talks, technological and management skills instead of preserving and saving data to be able to adjust themselves to the rapid social and industrial changes (Miguel & Mc Pherson, 2004, p.78).**



**Therefore the universities in the present age should emphasize on the importance of the promotion of learning and the learner, try to provide an environment which is**

based on the learner and increase the feeling of the learner's responsibility toward learning. What's more, they should reinforce learning high cognitive levels in the learners and prepare an active learning environment. Finally, they should undertake the success of each one of the learners.

## Advantages And Shortcomings Of Distance Education

For determining the features of effective Distance learning-teaching, its advantages should be raised and there should be an attempt for removing its shortcomings. Distance education makes an access to the learning independent from time and place and it has the potential to provide an educational environment which is based on the learner and individual and personal communication (Institute for Higher Education Policy, 20007). On the other hand in the traditional distance education, since the students act independently and learning is individual, they hardly understand learning activities and get along according to a special time table. Although it reduces the anxiety and stress in the students, it decreases their challenge and effort (Cho, 2002). One of the other shortcomings of distance education is that there is not enough class discussion. In the education that the students must participate and their presence in class is obligatory, to show the importance of learning activities, a model of the social expectations is presented which determines the significance and quickness of learning activities. These expectations are mostly disregarded in distance education that decreases the price of completing the course rather than the traditional normal education (American Federation of Teachers, 2000). As a result, in desired distance education, the objectives should be clarified, the quickness of learning should be suitable and group activities should be provided. By using the high capabilities and the right planning for the course, most of the traditional distance education shortcomings will be removed.

## Case Studies

Many organizations have spread out guidance for effective distance education. This guidance is a reflection of various viewpoints in diagnosing effective matters and better distance education operation. In the following table, the features of effective Distance education and the theory makers of them have been presented.

**Table 1**
**The features of effective Distance education and the theory makers of them.**

| Theory Makers | Effective Distance Education Principles |
|---|---|
| Chickering and Gamson (1996)) | Student-faculty interaction, Collaboration, Active learning, Prompt feedback, Time on task, High expectations, Diverse talents and ways of learning, |
| The Sloan-C Framework(2003) | Interaction, Communications and community building, appropriate media, Learner-centered, feedback, flexibility |
| The Institute for Higher Education Policy (2000) | Student-faculty interaction, Student-student interaction, feedback, proper methods of instruction, valid Evaluation and assessment, Student support, proper technology |
| The Quality Assurance Agency for Higher Education(1999) | System design, Programmed design, Programmed delivery, Student development and support, Student communication and representation, Student assessment. |
| University of Massachusetts-Lowell(2003) | Selection of courses and program, Faculty development, support and incentives, Technology and infrastructure; Redesign of student services, Program and course evaluation |
| Boettcher (2007) | Interaction, Learner-centered, Collaboration, Active learning, learner preparation, Time on task, considering the learners' individual differences, |
| Nikolz(2002) | Interaction, Student assessment, communication, quality information, Individualization, flexibility, clear feedback |
| Bransford (2004) | Learner-centered, assessment-centered; knowledge-centered; and community-centered. |

**With regarding the common elements in the effective distance education guidelines and principles, the fundamental learning theories and for improving the present barriers and lacks of current distance education, the following features of distance education should be regarded to improve the learning:**

- **Learner-centered: The learner should be at the center of the learning environment.**
- **Interaction: a key of learning is the exchange of information between the students, professors and students, students and content and participating in learning. For learning effectively with the evaluation of types of interaction and regarding their fundamental schools of thought, 8 types of interaction in planning the learning environment were taken in this study:**
  - **Learner- content: Communication of the learner, content is as a cognition interaction which is associated with the content that leads to the learner and learning constructive-cognitive changes (Moore, 2003, P.20).**
  - **Instructor -learner: Communication of the learner and teacher is an important factor in preserving interest and making the motivation in the learner (Moore, 2003, P.22).**
  - **Learner-learner: The learners' interaction is necessary for making deep learning and constructing knowledge. The relation and sharing the opinions and ideas with other students cause an increase to the learners' motivation and interest (Brown & Voltz, 2005; Anderson, 2003).**
  - **Content-content: In this type of interaction, the content updates automatically through different entrances of receiving data and learning sources constantly develop through the learner's communication with intelligence factors (Moore & Anderson, 2003).**
  - **Learner-content: Educational planning process has a significant role in the communication of the learner and content. This procedure should keep on the course duration and the instructor should be able to communicate content regularly based on the learners' need or updating of the subjects (Tuovinen, 2000).**
  - **Instructor-instructor: This type of communication and interaction form the learning societies of the instructors. Moore & Anderson (2003) know the close instructor coworkers as the first and most important source of information and helpful for encountering the technical and pedagogical problems. These problems occur much more when the instructors do not communicate with each other. As a result, there must be a group of the instructors who can support the instructors.**
  - **Learner-supporter: Technical supporter has a significant role in ICT base education; it supports learners during the learning procedures and solves their technological difficulties.**
  - **Instructor- supporter: The supporter assists the learner in planning and production of electronic courses and removes his technical difficulties during the instruction.**
- **Paying attention to individual differences of the learners: If we define generally the educating as the providing of an area for developing in various dimensions for learners, this is not possible without regarding individual differences and not counting them in education will lead to the traditional model in learning. In planning learning activities, the learners' educating style should be notified and various learning activities and communicative learning sources should be programmed by a multiple presentation to adapt with various learning methods.**

- **Flexibility: In planning a desired learning environment, you should select it independent of time and place and assist the learner to get the learning sources as soon as he cans (Aggarwal and Bento, 2000)**
- **Encouraging active learning: Distance education should support active learning environment and allow the learners to share their ideas actively.**
- **Using capabilities of information and communication technology**
- **Evaluation: Evaluation provides relevant information for further developments and expansion of any program. The evaluation of electronic learner can be divided into 3 parts:**
  - **Beginning evaluation (assessment of learning acquirements): The beginning evaluation must primarily regulate the learning environment based on the learners' features.**
  - **Formative evaluation and immediate feedback: The purpose of formative evaluation is to assess and monitor progress with intentions to make adjustments and improvements to the project (Nguyen & Kira, 2000).**
  - **Summative evaluation: Final evaluation is equal to the total evaluation of effective education that provides a feedback for the whole system. Summative evaluation, on the other hand, focuses on the end results of a project in terms of its success or failure (Thompson & Irele, 2003, P. 572).**

## The Characteristics and Features of Effective Distance Education Model

**The proposed model has been formulated on the basis of studies conducted on different issues related to distance learning and the above- mentions characteristics. The model has been made in accordance with the systemic theory of distance. By definition, a system is a set of connected components which are aimed at achieving a specific goal. The components of this model are as follows:**

### 1- Input:

- **The theoretical framework for the proposed model: The educational framework enters the system as input and is influences the educational process. The basis for the proposed model rests on the following:**
  - **Cognitive and social Constructivism theory and metacognition.**
  - **Independence theory of Moore & Wedemeyer and the interaction and communication theory of Moore & Garrison**
  - **ICT based Education Concepts**

- **The Learner**

  **The model lays emphasis on the learner and fulfillment of his/her requirements. It situates the learner at the center of the learning environment. The model rests on the assumption that there is more variety among learners as compares with their traditional counterparts. To be successful, the learner should be capable of establishing communications and interactions with the teacher, other students and content via technology, flexible learning and access to the learning environment on any place and any time. The learner should follow the learning activities in accordance with the course structure and goals. The learner's motivation and views are also of paramount important in her/ his success (; COLAKOGLU & AKDEMIR, 2010; Watson, 2010; Cutshall, 2002). In this regard, the ideal learner in this model should possess a positive view of distance education and learning. S/h should have the motivation for learning and willing to and able to perform group tasks. In this regard, upon entering the learning environment, students have to be ready for the learning environment. Learner readiness consists of the following:**

- **Establishing the level of previous knowledge Express learning objectives**
- **Expressing expectation from the learner**
- **Presenting the advance organizer to activate the cognitive structure**
- **Teaching the required technologies.**

- **The Instructor**

**In this model the instructor should be actively and tangibly present in the virtual learning environment. For this purpose, s/h should possess the capability and the tendency to establish communications with students and content development via technology. S/h should provide a supporting, warm, welcoming and unofficial atmosphere. For students, clearly expressing learning expectations and goals. The instructor should also design and encourage group and individual active learning, respecting various talents and methods of learning. S/h should provide learning activities at higher cognitive levels encourage students to undertake research. S/h should be willing to make innovations in teaching (McLaughlin, 2002; Gilbert, 2002; White, 2000). One of the assumptions of the present model is to design an active learning environment for students. Supporting students to take an active part in learning require instructors who facilitate learning. The instructor should encourage the learner such that s/h understands and accepts her/his responsibility for learning and information search. The views, readiness level and eagerness of the instructor foe distance learning projects secure the success of the course. Thus, in this model, the distance instructor needs to be ready under the following conditions and they enter the learning environment. This readiness can be achieved by the elearning design and production team:**

- **Teaching how to perform educational design of the course.**
- **Teaching how to produce the electronic content.**
- **Teaching how to manage the class and how to interact.**
- **Teaching the require technology.**

- **Information And Communication Technology**

**Technology- based teaching falls down into two categories: online and offline communications. Online communications of the student with the instructor, other students and other learning materials prepare an environment for him/her that will lead to make him/her feel the community spirit and membership for better. S/h can benefit by the prompt and timely feedback provided by the instructor and the classmates such that s/h can keep abreast of curriculum in coordination with others (Nguyen & Kira, 2000; Watson, 2010). On the other hand, an offline connection also assists students to have access to the curriculum in accordance with their job and family status on any occasion. Using these facilities, students have more time for thinking, participating in discussion, designing questions, responding and performing the assignments. They can apply their acquired knowledge in real situations.**

- **Technology Support And Design Group**

**Technological support and design play an important part in distance learning based on Technology. This assists the learner in the course**

**of learning activities and removes his/her technological difficulties. It assists the teacher in designing and producing electronic courses, removing his/her technical problems during teaching.**

## 2- The Teaching- Learning process

**The teaching – learning process comprises of design and regulation of learning activities and evaluation. Learning activities refer to the set of opportunities which solidify and deepen learner's acquired knowledge in the curriculum (ajorgren& fay, 2002). Teaching- Learning activities and process in this model are based on an educational framework. These include: active learning, interactive learning and flexibility. This will provide feedback to promote the system at all stages of evaluation. In the active process, learners needs to act rather than study. They needs to write, discuss, solve problems and get involves in higher level activities such as analysis, synthesis and evaluation of thoughts.**

**The more time learners spend on active learning, the better the learning will be. In the period of a course, there must be enough time for learners to search for concepts and fundamental and hidden principles to explore their relations with previous experience and knowledge. If students lack the relevant previous experience, introducing the concept and principles will be far more difficult (Stiller & Jedlicka, 2010).**

**Thus, the other issues emphasized in this model are consideration of previous knowledge, preparation of advance organizer and focusing on the learner and the main learning style. In addition, this model aims at creating an active learning environment and learner-centered orientation contemplating eight types of interaction which we discussed in earlier sections. Learners follow different learning styles. Consideration of individual differences is one of the basic aspects in this model. Thus, group and independent activities have been considered for students. Likewise, interactive educational packages have multiple presentations which cover most appropriately the various learning styles. Students are capable of stopping lectures, taking notes, reading comprehension.**

**The ability of online students to self-assess and repeat the educational material, eradicates the course failure rates problem and reducing it significantly. Computer recording and saving allows students to follow the program individually and make progress in this regard. The ability to process responses which is constructs using evaluations and computer-aided education allows students to continuously provide feedback in the course of the program (Grush, 2002). Active learning should also promote learning at the level of metacognition. At this level, the learner is conscious about the learning process. S/h understands the educational goals. S/h can recognize her/his abilities and weakness in the course of attaining the learning goals and is capable of monitoring progress towards these goals. Likewise, evaluation of the learner, in this model, falls down into three parts: initial, formative and summative evaluation.**

## 3- Output

**Effective distance learning outputs in the present model include:**

- **Objective results: educational success**
- **Psychological results: improvement of communicative skills, positive views and satisfaction, time management abilities, development of thinking skills.**

**Question 2: Is the proposed model valid ad viewed by experts and distance learning educational planners?**

**For respond to this question, the preliminary model which was made from a combination of finding from research, opinions, and respond to the first question together which the closed and open question were presents to 15 learning experts and virtual education planners in Payamenoor, Shiraz, Science and Technology and Amirkabir Universities. The questions raised and summary of the discussions are as follow:**

- **Whether the research areas in this study contain the essential qualifications or it is necessary to add other areas to it?**
- **Almost 97% of the authorities know the research areas and aspects of this research sufficient and stated that almost all the areas in the planning of effective distance learning-teaching approach in universities have been presented.**

- **Are the issues raised in the case of the desirable distance learner sufficient or is it necessary to include other items or delete some?**
- **In sum, 92.5% percent of experts considered the characteristics as being sufficient. They considered establishing connections and interactions, flexible learning, responsiveness, active participation, motivation and feedback as effective learner attributes in the model. From among the characteristics mentions in the model, only " ability and the tendency to get involved in group activities revealed a relatively lower agreement level(67%) as compares with other cases. After interview with professor on this topic, it was found that most of them believed that distance learning universities follow to a large extent, the traditional distance learning methods and to encourage group learning the technology and education infrastructure should be prepared at the university level.**

- **Are the issues sufficient for desirable distance teacher characteristics or is it necessary to include or delete some items?**
- **In sum, 94% percent of experts asserted that the characteristics mentioned are inclusive enough. Interviews with professors showed that most of them believed that, presently, considering the bulk of duties of professors. Shortage of time and the fact that most are unfamiliar with modern technologies, the instructor does not need the technical skills for the production of content. Instead, they must cooperative sufficiently with the technicians and educational designers in this regard. Thus, this characteristic was omitted from the list.**
- **Are the characteristics of the learning-teaching process sufficient for the proposed model? Are they enforceable in the distance – learning education?**

**The following table shows the percentages of responses given.**

**Table 2:**
**Percentage of agreement and disagreement of experts on effective distance learning – teaching process characteristics.**

| No | Effective distance learning-teachin characteristics | Percentage o agreement | Percentage o disagreement |
|---|---|---|---|
| Learner preparation | Establishing the level of previou knowledge | 100% | 0 |
| | Express learning objectives | 100% | 0 |
| | Expressing expectation from th learner | 100% | 0 |
| | Presenting the advance organizer t activate the cognitive structure | 87% | 13% |
| | Teaching the required technologies | 92% | 8% |
| Instructor preparation | Teaching how to perform educationa design of the course. | 95% | 5% |
| | Teaching how to produce the electroni content. | 20% | 80% |
| | Teaching how to manage the class an how to interact. | 96% | 4% |
| | Teaching the require technology. | 100% | 0 |
| Learning activity | Learner-centered | 85% | 15% |
| | Interaction | 91.5% | 9.5% |
| | Regarding the individual differences o the learners | 95% | 5% |
| | Flexibility | 100% | 0 |
| | Active learning | 80% | 20% |
| | Using online and offline informatio and communication technology | 100% | 0 |
| | Evaluation | 100% | 0 |

**This table shows that almost 95 percent of experts agreed on making learners ready and about 77.7 percent agreed on making the instructor ready. The only item on which there was no agreement was the education of electronic content development (20%). Thus, subsequent to revision, this characteristic was omitted from the list of items. In addition, they mostly agreed on active/ interactive/ flexible learning tasks using online and offline technologies and considering evaluation as being necessary at all stages and process involved in learning.**

- **Are the characteristics specified for output sufficient? 90 percent of experts considered effective distance education output sufficient.**
- **Do the components of the proposed model follow a logical relation with one another? 100 percent of experts evaluated this relation as being appropriate believing that it is orderly and logical.**
- **Is the systemic approach of the proposed model sufficient and enforceable in distance learning? 90 percent of experts asserted that the systemic approach in distance education design is appropriate.**

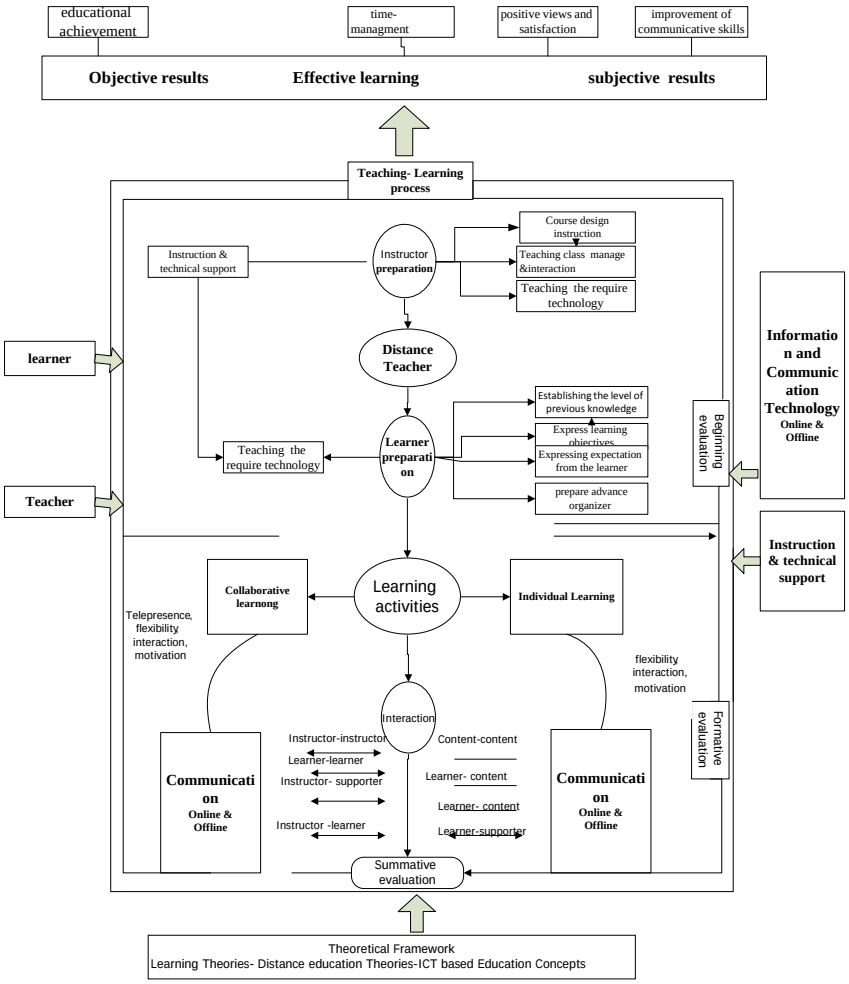


**Figure: 1**
**The effective distance learning model**

## DISCUSSION & CONCLUSION

**Learning principles and theories transforms Distance education model, enriches the present models and creates new ones by the use of capabilities of information and communication technology. It also suggests new learning-teaching approaches in which the learner plays an important role. In this research, the features of effective distance learning-teaching features were identified and became valid by the experts' viewpoints. This model was formed on the basis of the systemic theory of distance education. The main components of the model are input, the teaching-learning process and Output.**

**This model places the learner at the center of the learning environment. Educational practitioners and professors should be committed to make each learner succeed.**

**This is done to create deep and active learning which if from among the priorities of the current century higher education and theoretical educational principles of distance of distance learning and structuralism.**

**Thus, the atmosphere and the environment for the learner-centered should be created and learner responsiveness for self- learning should be enhanced. For this purpose, upon entering the learning environment, learners need to be reedy. In this model, active teaching- learning approaches were designed with using information technology and communication. Online and offline connections provide**

**the opportunity for feedback. Student interacts mutually with others, professors and experts. Most of the research and models designed for distance learning focus to a large extent on active learning approaches (Miguel Batista, 2004; Herrera-Batista & Gonzalez-Martinez, 2006). This has been agreed upon by most experts in the present research. Education must go beyond mere access to information. Interaction with others is of paramount important in the in the gradual development personal understanding of the learner. Interaction with human and non human factors of the environment is from the integral parts of the high quality educational experiences. Thus, considering the theoretical foundations and the present missions of universities eight types of interaction are designed. This is indicative of the significant of creating learning and group learning communities in the world of information age and being supportive of theoretical foundations selected in designing the learning model. For the purpose of effective distance education, it is necessary to allow and accept the individual differences among learners. The proportion between learning styles and teaching methods improves the learning outcome.**

**Therefore, the present model contemplates the inclusion of group and individual activities and educational packages in multiple presentations. From among other issue emphasized in the present model, one can refer to initial, formative and summative evaluation. In the distance learning environment, evaluation should be considered as part of learning process and its feedback should be applies for the purposes of improving learning which is also agreed upon by most of experts.**

**Finally, regarding the present study, considering the followings are recommended for the improvement of learning-teaching procedure in educational distance education planning of the universities: Learner centered, Communication, Flexibility, Encouraging to active learning, Regarding individual differences, Using online and offline information and communication technology, Assessment in all the learning-teaching stages.**

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