THE NATURE OF LEARNING THEORIES AND THEIR EFFECTS ON DISTANCE EDUCATION PRACTICES IN TURKEY

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Paradigm Changes in Science and Society

Paradigm Change in the First Enlightenment Age

In the 18th century, important developments occured in the field of science and philosophy in Europe by the effect of the idea that had given priority to "reasoning". This was called the "First Enlightenment Age" (Alatlı, 2000). This was the age which had its origins in the idea of Aristo and continued with the inventions of Coppernic, Kepler, Galilei and Newton. The rational idea of the Enlightenment was against all the ideas which were supernatural. Because of this, the reality was the one that existed in nature. In this age, science and technology developed as a result of reasoning. With the "Principa" in 1687, Newton invented a scientific method which was truly universal in its scope. Observation and experiment became the most prominent elements of scientific thought (Alatlı, 2000). Therefore, the idea of determining the truth according to observations was adopted.

In Newtonian approach, every matter could be infinitely subdivided into smaller and smaller pieces without change. These matter pieces had a definite place and velocity. So, the future situation of these matter pieces could be determined definitely (Kuhn, 1982). In Newton's perspective, there is no uncertainty in the world; something is either black or white; there isn't any color of gray. Something is either true or false. Similarly, life is a system that works due to some certain rules. Every event occurs as a result of some other events. So, humans can understand how the process in the world and universe works if these rules are discovered. The view of Newton physics perceives the world as a "machine", so it is defined as "mechanic view" (Alatlı, 2000).

In this context, Newtonian view affected not only physics rules but also the other fields of science such as social sciences; fields of law, literature, art, economy, music and education. In addition to this, Industrial Revolution in Europe constituted the physical basis of the Enlightenment process and a new economic philosophy was introduced in industry. It was called "Fordizm" which was derived from Henry Ford's approach to the mass production for mass consumption of automobiles early in the 20th century (Simonson, et al., 2003). In Fordist approach, there is standardized production of goods in large quantities. Rationalization, mechanization, division of labor, and centralized administration are some of the elements of the Fordist production process.

Due to these developments, people began to live in different social and economic conditions. They began to view the world in a different way. As a consequence, the basis of modern life was founded. These developments started by Renaissance and Reform movements, reached to the top by Enlightenment and they had been a basis for the process of "modernity" (Alatlı, 2000). Having its roots in the 16th century, modernism was a cultural movement in various fields of life which was affected by the ideas of the First Enlightenment Age philosophers. It was a trend of thought that affirmed the power of human beings to create, improve, and reshape their environment, with the aid of scientific knowledge, technology and practical experimentation (Kahraman, 2004).

Paradigm Change in the Second Enlightenment Age

At the beginning of the 20th century, Albert Einstein introduced his "Theory of Relativity" and "Quantum Physics". These theories showed that the rules of Newtonian physics could not be applied to the electrons because it was not possible to determine the place and velocity of these electrons in a certain time (Kuhn, 1982). According to these theories, Newton's assertion that the time interval between events is absolute and observer-independent failed in the real world. This was a profound paradigm shift. Since all physical systems reside in space and time, this shift shook the foundations of natural philosophy (Stachel, 2005). This was called the "Second Enlightenment Age" (Alatlı, 2000).

Contrary to the Newtonian view, nothing is certain and there is not only one truth in the world according to the theories of Einstein. Moreover, something can be both true and false. In other words, there are colors of gray. Subjectivity and probability are the characteristics of this perspective. There is a holistic approach rather than breaking the systems into small pieces (Alatlı, 2000).

In 1920s, with the developments in Quantum Physics and Relativity Theory of Einstein, the "mechanic view" of the First Enlightenment Age began to weaken. Parallel to these developments, it was argued that modernity caused an industrialization and mechanization mentality that ignored the human subjectivity. Moreover, it was claimed that modernism caused the humans to have a determined existence and personality rather than having critical thinking and questioning skills (Kahraman, 2004). As a result of this, social relationships changed and

the concept of "post-modernism" was introduced. According to Agger (1992), postmodernism is a theory of cultural, intellectual, and societal discontinuity that rejects the linearism of the Enlightenment notions of progress. As such, postmodern culture seems to encompass various ways of social organization in which new forms of language, cultural assumptions and meanings, social movements, and power relations can emerge (Balboa & Miguel, 1997). In this changing environment, the needs and demands of society began to change.

With diversification of demand and rapid developments in communication and information technology, social and economic relationships among various agents changed and the Fordist rationale in production became inappropriate. In other words, rapid changes in society resulted in diverse market needs and the Fordist model was unable to adapt to the needs of a fast-changing society. So, a different industrial approach, which was called post-Fordism, was adopted in production. In post-Fordist approach, the products are "tailored" according to the needs of the customers; therefore, there is flexibility in production of goods. The production is no more organized according to the serial model, but more like as groups of islands. The work is divided among teams of production rather than single workers as in Fordism. In other words, post-Fordist production focuses on process rather than the product. It is the shift from the old mass-production to a new, more flexible and tailored one.

The Reflection of Paradigm Changes on Learning Theories

Objectivist View

The reflection of the "First Enlightenment Age" on learning theories was the emergence of behaviorism in the early part of the 20th century. As observation and experiment were the most prominent elements of Newtonian view, Behaviorism focused on "observable" and "measurable" changes in behaviors. Behaviorist researchers such as Pavlov, Watson, Thorndike and Skinner believed in the stimulus-response pattern of conditioned behavior. Thorndike (1913) stated that learning was the formation of a connection between stimulus and response. So, the cause-effect relationship in Newtonian view displayed itself as stimulus-response mechanism in behaviorism. As a consequence, the function of reward-punishment mechanism was explored in various psychological and educational practices.

As mentioned above, In Newton physics, matter could be indefinitely subdivided into smaller and smaller pieces. Similar to this, in behaviorism, teaching materials were divided into smaller units and they were being presented via small units. Programs were designed to shape a student's responses using a small lock-step approach with a high level of redundancy. Programmed instruction emphasized an operant approach to learning which had the concept of reinforcement at its heart. Operant psychologists of the time argued that learning tasks should be analyzed and broken down into small enough steps so that the probability of a successful response was ensured (Cohen, 1985; Mory, 2004). Using principles from the Law of Effect from Thorndike and the application of reinforcement on learners, Skinner proposed that a solution to instructional problems lied in the use of strategically designed classroom materials that would take learners through information in a step-by-step fashion, shaping behavior and strengthening desired responses (Mory, 2004).

As early as the 1920's people began to find limitations in the behaviorist approach to understand learning. Behaviorists were unwilling to acknowledge the existence of the mind or the act of knowing because these are not observable. Using overt behavior as a starting point, people began to realize that there is something happening inside the organism that should be considered, since it seemed to affect the overt behavior. Thus, the cognitive model of learning was born (Mergel, 1998).

Cognitive science was a shift from behavioristic practices which emphasized external behavior, to a concern with the internal mental processes of the mind and how they could be utilized in promoting effective learning. It based on the thought process behind the behavior. According to cognitivism, changes in behavior are observed, and used as indicators as to what is happening inside the learner's mind (Jonassen, 1991; Cooper, 1993; Mergel, 1998).

Behaviorism and cognitivism are called "objectivist" learning theories in which the reality is seen as external to the knower. Parallel to the rationalist view of the First Enlightenment Age, objectivists believe that knowledge and truth exist outside the mind of the individual and are, therefore, objective. In this perspective, learners may be told about the world and be expected to replicate its content and structure in their thinking (Jonassen, 1991; Mergel, 1998).

Constructivist View

The reflection of the "Second Enlightenment Age" on learning theories was the emergence of constructivism which claims that reality is more in the mind of the knower, that the knower constructs a reality, or at least interprets it, based upon his or her apperceptions. The subjectivity in the idea of Einstein's Quantum and Relativity Theories is observed in constructivism. The emphasis in objectivism is on the object of our knowing, whereas constructivism is concerned with how we construct knowledge. In other words, objectivist theories

emphasize on the product whereas constructivism emphasizes process. Constructivists believe that knowledge and truth are constructed by the learner and do not exist outside of his mind (Duffy & Jonassen, 1992). Therefore, according to constructivists, learners construct their own knowledge by actively participating in the learning process. In constructivist approach to learning, there is a holistic design of courses rather than dividing the learning material into pieces and presenting them via small units. Individuals actively construct knowledge by working to solve realistic problems usually in collaboration with others (Duffy, Lowyck & Jonassen, 1993).

The Effects of Learning Theories in the Design and Implementation of Distance Education Practices

Traditional Distance Education Practices

Objective learning theories affected the traditional distance education practices. For instance, Peters (1988) proposed that distance education could be analyzed by comparison with the industrial production of goods. He stated that conventional, oral, group-based education was a pre-industrial form of education, implying that distance teaching could not have existed before the industrial era (Simonson, et al., 2003). Similarly, Evans (1992) described distance education as part of any nation's educational fabric. Thus, distance education was examined by the researchers in the context of "Fordism."

The Fordist approach to distance education is based in behaviorist learning theory in which knowledge is delivered to the learner. Fordist distance education involves mass production to mass consumption. Courses are developed by a small core of skilled workers and delivered centrally (Simonson, et al., 2003).

Evans (1995) states that distance education can be regarded as both a product and a process of modernity. Its administrative systems, distribution networks, and print production processes are characteristics of modern societies with developed mass production, consumption, and management. Therefore, the Fordist strategy for distance education suggests a fully centralized, single-mode, national distance education system using economies of scale by offering courses to a mass market, thereby justifying a greater investment in more expensive course materials (Simonson, et al., 2003).

The reflection of Fordist production on distance education practices was the emergence of large scale distance teaching universities which aimed a mass production to mass consumption. In 1969, UK Open University was founded which was the paradigm case of the Fordist model of distance education (Evans & Nations, 1993). Most people consider that the UK Open University was the pioneer of modern, university level distance education on a large scale. It was the model that inspired most of the world's other mega-universities which have been distance teaching universities enrolling over 100,000 students (Daniel, 1998).

New Distance Education Practices

New technologies, globalization and new ideas about student learning challenged the traditional approaches to the practice of distance education. Advances in technology have promoted key changes in distance education and changed the learners' needs. As a result of these changes, there has been a shift from mass to "boutique" education (Evans, 1992) which takes the characteristics of diverse learners into account. This new environment requires a flexible structure in which ideas are readily tried and shared. It is claimed that in distance education, post-Fordist systems would be able to rapidly respond to the needs of the learners (Simonson, et al., 2003).

Post-fordism is directly related to constructivism. The constructivist approach to learning in which individuals give meaning to the world through experience underlies the post-Fordist position. The post-Fordist approach to distance education focuses on the consumer rather than the product. Administration can be characterized as decentralized, democratic and participatory and the division of labor is informal and flexible (Simonson, et al., 2003).

In the context of constructivist ideas and post-Fordism, in higher distance education, programs have been developing that focus on individual needs of learners. Learner-centered, interactive and collaborative practices are being experienced in addition to the traditional distance education practices. In these new learning environments, learners are given the opportunity for having the control of their own learning process. In addition to these, by the integration of Internet to educational settings, traditional forms of distance education have been transforming and the Internet has become the new medium for distance education. McIsaac and Gunawardena (2001) state that the explosion of information technologies has brought learners together by erasing the boundaries of time and place for both site-based and distance learners. For instance, synchronous and asynchronous technologies allow learners to interact with various agents and study in challenging collaborative environments.

The Effects of Learning Theories in the Design and Implementation of Distance Education Practices in Turkey

Traditional Distance Education Practices in Turkey

The reflection of behaviorist view and Fordist production on distance education practices in Turkey was the foundation of Open Education Faculty in Anadolu University in 1982. Anadolu University was founded as a traditional university in 1958 and currently, both traditional and distance education is provided by the university. It has been providing higher education opportunities through distance education to those who could not otherwise continue their education. Anadolu University is the only university in Turkey, which offers distance education programs, commonly referred to as 'open education'. It is a large scale distance teaching university which is among the "mega universities" in the world (Daniel, 1998). Currently, the Distance Education System of Anadolu University has more than 1 million students which constitute 40% of the learners in higher education system in Turkey (http://www.anadolu.edu.tr).

Anadolu University, with its distance education model, offers educational opportunities to Turkish citizens living not only in Turkey but also in the Turkish Republic of Northern Cyprus and Western European countries. The University aims to increase the education level of Turkish citizens by meeting the demand for higher education. It also provides educational opportunities to learners with physical, hearing and visually impaired disabilities and people in prisons (http://www.anadolu.edu.tr).

Instructional approach in the University's distance programs varies. The majority is primarily traditional distance programs: print-based, mass-education type requiring self-study. Students are expected to study their textbooks at their own pace and to take scheduled centralized exams. Self-study is supported by several services including TV broadcasts aired by a state channel throughout the country (TRT4), video and radio programs distributed on cassettes, CDs or DVDs, academic counseling, administrative bureaus, e-learning and mobile phone services. The rationale behind this sort of an instructional approach is to provide a higher education opportunity to as many students as possible in cost effective ways (Anadolu University EUA Self-Evaluation Report, 2008).

New Distance Education Practices in Turkey

The reflection of constructivism and post-Fordist approach on distance education practices in Turkey has been the emergence of learner-centered, interactive and collaborative practices in several universities. By the integration of Internet to the higher education practices, there has been a shift from traditional distance education practices to new Internet-based learning environments. Many online programs have been created in Turkey in the last decade. Started in 2000, İstanbul Bilgi University e-MBA has been the first online graduate degree program in "Business Administration" in Turkey. This is an interactive program that provides flexibility by eliminating the obstacles of time and place. It is designed specifically to meet the contemporary needs of the business world in the strategic arena (http://www.bilgiemba.net).

Middle East Technical University has been offering "Informatics Online" which is an online master of science program since 2000. Collaboration among students and instructors is carried out by using both asynchronous and syncronous tools. Web-based material enriched with interactive animations, simulations and exercises forms the basic course content (http://www.metu.edu.tr).

In Anadolu University, in addition to the traditional form of distance education practices, there are also many online programs. The Information Management Associated Degree Program of Anadolu University, for example, is a completely online program which can be considered as an example of the shift from traditional distance education to Internet-based distance learning (Mutlu and Aydin, 2004). It has been giving learners an opportunity of studying in a collaborative learning environment since 2001. Anadolu University has also been offering e-MBA since 2004 by the collaboration of Anadolu University and Empire State College, State University of New York (SUNY). This program provides highly interactive courses involving regular online participation by both faculty and students. Instructors in this program utilize a wide and innovative mix of textbooks, problems, tests, research and discussion papers, online discussions and debates, case analyses, role playing and skill building in their courses. Other Web-based master level programs offered by Anadolu University are e-accomodation and Training Program for the Teachers of the Children with Developmental Deficiencies. There is also online undergraduate Pre-service Teaching and blended English Language Teaching Program.

In addition to these, the above mentioned universities also offer several e-learning programs other than higher distance education programs. One of them is the Ford e-Learning Project of Anadolu University which was created in 2006. It was a "tailor-made" multi-media program for working professionals in the company Ford-Turkey which was supported by the uniquely designed materials to be integrated into a well structured Internet-based learning infrastructure in which online assessments/evaluations, synchronous/asynchronous tutorship and the supplementary logistical services were made available (Barkan and Ozdamar, 2007). In other words, it was a

program that took the learners' needs and learners' styles into account. Although it is not among the "higher" education practices, it can be regarded as a pioneering example of post-Fordist design for the future higher distance education practices.

Sakarya University and Mersin University are the other leading universities which offer higher distance education practices in Turkey. In both universities, there are online associate degree programs. Sakarya University also offers e-MBA master program. In addition to these programs, many conventional universities have been opening distance education centers in order to support face-to-face courses by e-learning environments and carrying out pilot studies for higher distance education (http://www.sakarya.edu.tr). A few example of these are Bogazici University, Ankara University and Istanbul Technical University.

Conclusion

Science, technology, society, economics, politics and theories of learning are all in transition. Newton paradigm affected various fields of science, society and education For instance, the roots of modernism and Fordist trend in industry were found in the First Enlightenment Age displaying the characteristics of Newton paradigm. The effect of this period was the emergence of behaviorism and cognitivism which were called as objectivist learning theories in which the reality was seen as external to the knower. At the beginning of the 20th century, Einstein's Quantum and Relativity Theory had been a profound paradigm shift which started the Second Enlightenment Age. Post-modernism and post-Fordism had been the new concepts in this age. The reflection of this age on learning theories was the emergence of constructivism which assumed that knowledge and truth were constructed by the learner and did not exist outside of his mind.

Paradigm changes in science, technology, society, economics, politics and learning theories impacted the status of distance education around the world. Behaviorism constituted the basic principles of Fordist approach to distance education. The Fordist strategy for distance education suggested a fully centralized, single-mode, national distance education system using economies of scale by offering courses to a mass market. Constructivism and post-Fordist approach suggested creating programs that focus on individual needs of learners. Post-Fordism is directly linked to constructivism which suggests learner-centered interactive and collaborative learning environments. In addition to these, online environments have been an appropriate medium for the application of constructivist principles to learning in higher distance education practices.

Parallel to the developments in the field of distance education in the world, the reflection of behaviorist paradigm and Fordist approach on distance education practices in Turkey was the foundation of Open Education System of Anadolu University in 1982. Currently, Anadolu University is among the mega universities in the world with a number of more than 1 million students. The reflection of constructivist and post-Fordist approach has been the creation of learner-centered, interactive and collaborative programs that focus on individual needs of learners. In addition to these, by the integration of Internet to the higher education practices, there has been a shift from traditional distance education practices to new Internet-based learning environments. Several universities in Turkey have been offering online associate, undergraduate and master degree programs. A few of them are Anadolu University, Bilgi University, Middle East Technical University, Sakarya University and Mersin University. In addition to these mentioned universities, many conventional universities have been opening distance education centers in order to support face-to-face courses by e-learning environments and carrying out pilot studies for higher distance education such as Bogazici University, Ankara University and Istanbul Technical University.

Consequently, today both traditional and new forms of distance education practices are offered in higher education in Turkey. To predict the next paradigm change and create challenging distance education programs in the 21st century, it can be concluded that it is necessary for distance educators to understand and analyze the past by examining the transition among various fields of science, society and education since we must know backward to think forward (Balboa and Miguel,1997).

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