Study of Positivistand Post-Positivist Views Based on Instructional Design Models and Learning Approaches

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Abstract

Instructional design system is preferred for the acquisition of knowledge in the best way and permanent learning. Therefore, several models and approaches were developed in order to achieve the best version of the system. This study determined efficiency levels of these instructional designs based on positivist and post-positivist views in the light of information in the literature considering ARCS, ADDİE, ASSURE, Project-based Learning, Problem-based Learning and Cognitive Apprenticeship. As a result, it was found out that post-positivist view must be used more in order to provide educational success of students. It was also concluded that considering the characteristics of examined models and approaches, education will be more successful when these models and approaches of different views are combined.

Keywords: ARCS, ADDİE, ASSURE, Project, Problem, Cognitive.

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1. Introduction

Instructional design has been one of the most important problems so there are several significant definitions about instructional design concept. According to Merrill, Drake, Lacy and Pratt (1996), instructional design is a technology for the development of learning environments which promote the acquisition of specific knowledge and skill by students. In addition, instructional design meets learning requirements of a specific group based on developing teaching systems. According to Simsek (2009), primary goal of instructional design is presenting an efficient, effective and attractive teaching system which includes all conditions to support learning. Instructional design is a decision process for the planning of teaching (Fer, 2009). Akkoyunlu (2008) defined instructional design as follows: Instructional design is organizing an appropriate learning environment for the learner by analysing states of the learner, defining teaching materials in line with learning and teaching principles and seeking an answer for a specific learning-teaching problem accordingly.

Several instructional design models and learning approaches arose because of the importance of instructional design. Therefore, after ARCS, ADDİE, ASSURE, Project-based Learning, Problem-based Learning and Cognitive Apprenticeship, which were amongst instructional designs supporting positivist and post-positivist views, were mentioned respectively, a general evaluation was stated.

2. Positivism

The primary objective of positivist view is providing acculturation through a single-truth approach with permanent terminal behaviour by preparing the individual to life and society. According to positivism, which supports that acculturation can be achieved through a single method; teacher must have an active role whilst student must be passive. It is possible to observe that teaching through presentation is preferred; students learn the knowledge based on memorizing and as a result they are evaluated by multiple choice exams with a single true answer. All the people who support this view think that education and teaching can be achieved in the school.

We will respectively analyse ARCS, ADDİE and ASSURE models which support this point of view.

A. ARCS Model

Founded by John Keller (1983, 1984, 1987), ARCS Model, which is known as motivation model, consists of attention, relevance, confidence and satisfaction steps. These four elements form the acronym ARCS of Keller's motivation model. Keller (1987a) stated that firstly, the term motivation must be understood well for an increased motivation and secondly a plan must be organized on the strategy to be followed for increased motivation, duration of these strategies and methods to transfer the strategies in class atmosphere.

Keller suggests that the ARCS Motivation Model occurs as a sequential process (Driscoll, 1993). According to Keller (2000), an instructional design process which is appropriate to ARCS Motivation Model mainly consists of 5 steps. These steps are as follows:

a. Understanding and defining elements of people's motivation.
b. Analysing people's characteristics in order to define motivation needs.
c. Defining features of teaching materials which will be used to create motivation.
d. Determining appropriate motivation methods.
e. Implementing and evaluation of the selected motivation methods.

According to Wongwiwatthananukit and Popovich (2000), this model answers the question of what kind of a motivation strategy must be developed in order to grab and continue attention of learners. According to Dede (2003), ARCS Motivation Model, which was developed for arousing and continuing interest of the students to lessons, considers motivation factor in teaching. Hardre (2005) asserts that

ARCS Motivation Model is an important structure in learning and teaching as it is the single motivation model based on instructional design, which has a significant role in increasing teaching efficiency. Fernandez (1999) states that the model is based on the principle of student's focusing on the subject.

After we dealt with thoughts of Keller and other philosophers, we will study 4 basic strategies and their 3 sub-strategies (Keller & Kopp, 1987; Keller & Suzuki, 1988):

1. Attention: Attention is the first step of motivation. It is the strategy to provide continuous interest of the student from the beginning of the lesson to the end. Student's interest to the lesson is increased thanks to this strategy. This strategy includes 3 subcomponents.

a. Perceptual Arousal: Grabs student's attention by creating new, different, uncertain and attractive atmospheres.
b. Inquiry Arousal: Helps learners generate questions or a problem to solve.
c. Variability: Maintains interest by varying elements of instruction.

2. Relevance: Informs students about their learning outcome by correlating students' interests, expectations and needs. When a student asks "Why do İ have to study?" there must be a logical answer which is appropriate to their expectations. Subcomponents of this strategy are as follows:

a. Familiarity: Examples, terms and principles, which are presented in the lesson, are materialized in relation with background and interest of the students.
b. Goal Orientation: Helps utilizing statements which represent objectives of lesson or make the students state them.
c. Motive Matching: Enables use of appropriate instructional strategies to students' motivation profiles.

3. Confidence: Helps students to develop positive thoughts for their success. Students' success expectations are affected by their personal characteristics, focus of supervision (teacher, school administration, family and etc.) and previous experiences. Difficulty of the questions is also a factor which affects success expectation because whilst people who faces a question with high risk and difficulty level are willing to make more effort, success in a simple question is far from creating trust. The components of this strategy are as follows:

a. Expectancy for Success: Students' consciousness about success and how to achieve it.
b. Challenge Setting: Providing appropriate opportunities and possibilities for learners' success.
c. Attribution Moulding: Providing feedbacks to the students who are trying to achieve success in order to support their efforts and skills.

4. Satisfaction: Asserts that students must be internally and externally motivated in order to continue their efforts and endeavours. Subcomponents of the strategy are as follows:

a. Natural Consequences: It asserts that opportunities must be provided for utilizing new knowledge and skills in real or similar atmosphere.
b. Positive Consequences: It defends that reinforcer and feedback are required in order to sustain objective behaviour.
c. Equity: Determines convenience of targets, which are presented for success, and outcomes. (Keller, 1987; Keller, 1987b; Keller & Kopp 1987).

These strategies show that a student can easily be motivated and achieve success with ARCS Model.

B. ADDİE Model

ADDİE Model was firstly implemented in the US army. Gagne, who developed the original model, was honoured as the founder of the model. Gagne stated that the model, which was first used for the performance development in military environments, can be used in other educational institutions when it is well structured (Akt. Cowell et. al., 2006).

ADDİE model is a commonly used model in performance based learning within systematic learning models. (Seels & Glasgow, 1990; Lee et. al, 2002; Morrison, 2003; Cowell et. al., 2006; Allen, 2006; Sugrue, 2002). Additionally, Lee and colleagues states that almost all of the instructional design models are based on ADDİE model whilst Simsek (2009) highlights that ADDİE model constitutes the most known example of core models. The name of ADDİE model is formed by the initials of each step. Process steps and design activities within ADDİE are listed below (Allen, 2006; Ocak et. al. 2011):

1.   Analysis: In the analysis phase, instructional problems are clarified by focusing on the problems which are required for learning by the learners, the instructional goals and objectives are established and the learning environment and learner's specifications are identified. Learning environment, learning duration, lesson content, learning strategies and possible problems are also considered in the analysis phase. Instructional designer presents learning requirements by referring the reason of the learning, the aim of the lesson, limits of the lesson, resources, the progress of the lesson and the evaluation method of the students and etc.

2.   Design: In design phase, instructional designer creates a detailed instruction plan which includes instructional strategies, methods and environment for the solution of the problems which are defined in analysis phase. Current teaching tools and models are reviewed and evaluated for the teaching. Additionally, instructional designer develops and determines learning objectives, evaluation tools and materials by considering factors such as frequency of performance assignments and difficulty level of learning and etc. Briefly, implementation plan for instructional system is organized.

3.   Development: In the development phase, teaching materials are developed both for student and teacher. If environment tools such as video, voice record or slides are chosen in the design phase, they are developed in this phase. İf instructional management system is developed, the system is kept ready to use. Then implementation plan is prepared and reviewed. In this phase, instructional designers approve each unit of teaching and develop them by uniting with teaching materials.

4.   Implementation: In the implementation phase, instructional system, which was designed and developed, is ready to implement. Instructional system is implemented in real atmosphere and feedbacks are given according to real performances of the students. In other words, the level of learning objectives, which were achieved by learners, is determined by instructional materials and evaluation tools that enable performance development.

5.   Evaluation: In the evaluation phase, an evaluation is carried out for the process or outcome. Whether there is a progress in performance development levels or not is evaluated in the evaluation phase of performance-based teaching. If the process does not provide performance development, the process must be revised. In outcome evaluation, learner's performance development levels are compared with learning objective levels.

Main (1992) thinks that ADDİE and ARCS models can be used together for a more effective instructional design in motivational instructional design within performance-based teaching. This model can be preferred by instructional designers for development of technological, cognitive and affective learning apart from face-to-face education in which behaviourist teaching principles are used.

C. ASSURE Model

Developed by Heinrich, Molenda and Russel (1993), this model focuses on defining tasks in order to utilize and select teaching technology. These are the tasks:

1. Analyse Learners: In this step, factors such as students' prior knowledge, experiences and skills are dealt together with economic, cultural and emotional issues in order to provide better learning for the students. In this step the following information about the students must be gathered (Ocak et al., 2011):

a. General Characteristics: Class, age, gender, physical problems, economical status of the students, ethnic group, etc.
b. Entry competencies: Prior knowledge and skills, attitudes and etc.
c. Learning Styles: Verbal, visual, textual, musical and etc.

2. State Objectives: In this step, learning objectives and targets of the lesson must be stated in detail. Therefore, 4 main components must be considered in order to write learning objectives. These are:

a. Audience i.e. learners
b. Target behaviour
c. Conditions to observe the behaviour
d. Standards of the acquired skills

In this step teachers clearly present types of behaviour change and knowledge acquisition they expect from students. Tools which will be used and ways to measure outcomes are completed in this phase. Methods and techniques are explained in detail to enhance success of the students in line with defined teaching objectives (Ocak et al., 2011).

1. Select Media and Materials: After analyse and state objectives steps are completed, the first thing to do is to choose instructional strategies that are appropriate for learners to achieve stated learning objectives. These strategies determine media that best support learner characteristics and stated objectives. Utilized media can include text, pictures, video, voice, computer and etc. Materials and tools are also defined in this step. Materials and tools can include music tapes, photos, computers, printers and etc (Ocak et. al. 2011). According to Levie and Dickie (1973), visual presentation, size, colour, action, language, colour and picture harmony and organization must be taken into consideration within media features. Therefore, media which will be utilized will be helpful for both teacher and student.

2. Utilize Media and Materials: Utilizing media and materials are as important as selecting them. First of all, these technological tools must be used by teachers and observed by the students. Previews or attempts must be recorded. Secondly, the environment must be organized. All auxiliary information, tools and materials, which are required for media and material to be utilized, must be provided in the environment. İf any tool or material is missing, student's motivation will decrease. Finally, students' interest to these media and materials must be enhanced.

3. Require Learner Participation: This step is the most important step of ASSURE method because other steps can change according to Require Learner Participation step. Techniques such as question-answer method, discussion, group work and etc. must be implemented for active participation of the learners. Thus, teacher will activate the student's learning environment. In addition to that, students can become more active using peer assessments and feedbacks. Students can reach the highest level by critical thinking via these materials.

4. Evaluate and Revise: Evaluation is required in order to evaluate effects of media and materials which are utilized. İf the objectives are not achieved, evaluation and revision are required in order to understand if there is a problem about media or material. Generally, students' primary and last test results, performance and etc. are evaluated (Ocak et al., 2011).

In ASSURE model, firstly learner's characteristics are analysed and learners are informed about objectives considering these characteristics and methods, materials and medium are stated. These medium and materials are evaluated in terms of their effects on student's active participation levels. Considering student success, the benefits of medium and materials are evaluated and new suggestions are made.

3. Post-positivism

Post-positivism is the opposite of positivist view. Primary objective of post-positivism is helping a person to realize himself freely, becoming a democratic individual enabling critical thinking, constructing knowledge and having an independent personality. In order to achieve these targets, a learner must have an active role while teacher will serve as a guide. Therefore, there are multiple truths in this approach and in order to present these multiple truths, people must carry out their studies in corporation and individually and truths must also be criticized and discussed. Considering these features, we can comprehend that students are evaluated with open-ended questions and individual and cooperative studies. According to people with post-positivist view, permanent learning depends on the studies outside the school.

We will now deal with Project-based Learning, Problem-based Learning and Cognitive Apprenticeship, which accept post-positivist view.

A. Project-Based Learning

Project-based learning was initiated and expanded by John Dewey's "self-learning" or exploratory learning approach (Sonmez, 2002). Project-based Learning approach is based on progressivism. John Dewey's remodelling method, Klipatrick's project method, Bruner's learning by discovery theory and Thelen's group investigation model can be considered as basis of Project-Based Learning approach (Korkmaz & Kaptan, 2001)

Teaching the students skills such as problem solving, decision making and investigation, Project-based learning approach is a model which motivates learning within the projects (Thomas, 2000).

Project-based learning approach is based on developing ideas, imagination and planning. Learners in groups or individually plan their own learning processes in line with specific objectives developing skills such as exploring, cooperation, taking responsibility, gathering information and organizing gathered information.

Learners investigate, solve problems, relate the subject with other lessons, interact with content, endeavour, work in cooperation and take responsibility (Yurtluk, 2005).

When researches on project-based learning are reviewed, it is observed that they are carried out with constructivist learning approach and cooperative learning method (Au & Carroll, 1997; Meyer & Turner, 1997).

Korkmaz and Kaptan (2002) stated that the following steps must be followed when learners are thought how to carry out individual or group projects:

1. State topic and Subtopics, Organize Groups: Learners can define a framework by searching resources and suggest questions for the projects. They categorize questions by creating extraordinary problems. They support creation of project groups.

2. Groups Organize Project Plans: Group members plan the project together. They decide on the questions such as where and how to visit, what they will learn when they visit the places. They choose

their resources by planning their subject and define their roles and distribute plans. In other words, they share tasks.

3. Project Implementation: Group members analyse data and information. They search answers for the questions, collect and organize data, interview with contact people.

4. Presentation Planning: They decide on the basic points of the presentation and prepare material for the presentation after the type of the presentation is planned.

5. Presentation: Presentations are carried out in the class or other places and feedback is provided to the class.

6. Evaluation: Students share feedbacks about project and comment on the issue with teachers and other students.

It is seen that with this instructional design students can share tasks, search information, present the project and evaluate what they learned as a result, in order to construct knowledge by themselves or with their classmates and gathering appropriate knowledge about the assigned project. Whilst, in traditional teaching method teachers are responsible from all of the mentioned tasks, in this learning approach, students take responsibility of their learning. İn other words, the role of the teacher as a guide is clear in this method.

B. Problem-Based Learning

Problem-based learning can also be called "problem first learning" approach (Spencer & Jordan, 1999; Akt. Ozvaris & Demirel, 2002). Problem-based learning represents a learning situation based on experience which requires effective participation of people in terms of their skills and mental abilities. (Saban, 2004).Problem-based Learning can be thought of as a combination of Dewey's developing problem, Piaget's constructivist and Bruner's discovery learning theories (Taskesenligil, Senocak & Sozbilir, 2008).

Underlining that encouraging learners to participate lessons, Margetson (1994) stated that problem-based learning approach increased cooperation of the learners enabling detailed learning, thinking, criticizing and stating their decisions.

Problem-based learning is a learner-centred approach which requires small groups, assigns organizer and guide roles to teacher, and uses problems as stimuli for learning serving as a tool to develop learners' problem solving skills and providing the new information acquired by self-learning (Deveci, 2003).

Learning processes according to problem-based learning model are asserted in different ways by several people. Savery and Duffy's problem-based learning process include the following steps (Hayati, 1998):

1. Responsibilities are assigned to students by defining problems.
2. Students cooperate in groups.
3. Current knowledge about the problem is discussed.
4. Learning subjects are defined.
5. Responsibilities of group members are described.
6. Contact people and written materials on the subject are specified.
7. Ideas or solutions are created to solve the problem.
8. Information is gathered and a solution is offered.
9. Offered solution is discussed together in the class atmosphere.

Students try to solve an existing problem in this learning approach as in project-based teaching. Required data is collected by the students and classmates and solutions to the problems are offered based on the collected data. Teacher must be a good guide and provide feedback by controlling studies of the students in order to enable appropriate progress and successful result of project-based teaching.

C. Cognitive Apprenticeship

Cognitive Apprenticeship is derived from instructional approaches in situated learning model (Ocak, 2013). The term situated cognition asserts that learning must be completed with consultancy of an instructor or an experienced student with cognitive apprenticeship by achieving real activities. This suggestion presents three main results. The first one is acculturation. Acculturation can be defined as people's adopting belief systems or behaviours of the culture or society they interact with. Secondly, knowledge is an integrated part of the context in which it is learned and activity where it developed. Thirdly, there are certain differences in learning and problem solving amongst beginners, specialists and ordinary people (Brown et al., 1989).

Cognitive apprenticeship is defined as acculturation of students in real implementations via activity and social interaction in other words acquiring culture of the environment they are in (Kilic, 2004). Designing learning environments in the schools in accordance with cognitive apprenticeship is amongst the strategies which situated learning theory supports. Cognitive apprenticeship supports learning strategy which enables student's achieving, developing and using cognitive tools via real practices. Learning means structuring knowledge socially and progress with cooperative social interaction both inside and outside the school (Stein, 1998). In apprenticeship method, apprentices acquire knowledge and skills about a certain subject with directions of specialists by carrying out real practices. Students participate in the practice during the process. Students learn by doing and progress from outside of practice area to the centre during apprenticeship.

Cognitive apprenticeship argues that students must experience an apprenticeship period just as master-apprentice relation (Collins, 1990).

The effect of learning adapts the process which is called as cognitive apprenticeship. There are six processes namely modelling, training, supporting, explanation, reflecting and postponing in apprenticeship and cognitive apprenticeship (Acikgoz, 2002).

School lives, teacher's modelling, teaching methods and techniques, instructional projects and tactics have significant roles in students' developing instructional strategies (Acikgoz, 2002).

According to Jones (1987), teachers must clearly state reasons for strategy selections and utilizing phases in order to act as an appropriate model. İf teachers articulate their ideas and methods, they can ease student's modelling process. Teaching strategies of teachers will also serve as learning strategies for the students. Students must be given chance to implement learning strategies.

Cognitive apprenticeship method can be implemented in several corporations as well as schools because in each corporation there is a need for a master or a guide in order to show employees how to solve their problems, which method to use, which tools to benefit from and where to apply. Achieving self-development with the recommendation or experiences of this guide, the apprentice becomes one of the candidates of being a master in the future. Educational institutions must provide internship for students in institutions and organizations in accordance with their departments so that the students can improve themselves and discover details of their professions.

4. Result

We can conclude that ARCS, ADDİE and ASSURE models are included in instructional design in order to enhance learners' motivation and performance. These models also ease the teaching process for the teachers because they can teach lessons easier and achieve their targets thanks to students with high motivation and performance. These models not only help the teachers but also the learners. Learners also acquire knowledge easier with these models and knowledge will be a bit more permanent. These models are more helpful to teachers than students because they are implemented in line with teachers' desires. In fact, what we actually want is including models that help students in instructional system. If students' progress are in line with the values they like, their performances and

motivations will be higher. Otherwise, motivation and performance of a student will seem to increase in a low ratio but it will never reach to maximum level.

Taking all the responsibility in Project-based Learning, Problem-based Learning and Cognitive Apprenticeship, students try to explore ways to reach knowledge by searching and observing. Of course, the students are not alone in this process; they are in cooperation with their classmates and under the guidance of teachers. All of the approaches aim at solving an existing problem. Therefore, achieving a good result depends on using different methods, techniques and tools appropriately and discovering real reasons of current problem.

Positivists and post-positivists have argued about instructional system for a long time. Considering above-mentioned models and approaches, it is clearly obvious that post-positivist view is better than positivist view because exploring and learning an existing problem is easier than learning a defined content. Therefore, more importance must be placed on providing learning by seeing, experiencing and exploring in order to solve problems in our education system.

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