The Application of Behavioral and Constructivist Theories in Educational Technology

Ali Mahmoud Buhamad[1]

[1] College of Basic Education, The Public Authority for Applied Education and Training, Kuwait

Correspondence: Ali Mahmoud Buhamad, College of Basic Education, The Public Authority for Applied Education and Training, Kuwait.

Abstract

The educational technology designer should know about the learning theories to analyze the needs and design the contents in terms of the target that aimed to reach from learning operations. Educational technology is known as a process that includes many factors, which will provide a good simulation for the students. This research study used a basic qualitative study because it interprets an educational field experience. This is the type of research most commonly used in the fields of education, health, and social work because it is interpretative research. The participants in this study were two college instructors and 10 college students who volunteered to participate in this study. All participants have teaching experience and work in the same school. This study concludes that mixing instructional technology with behavioral theory provides an opportunity to stimulate students through psychological conditions by direct experiences and activities inside the classroom. Mixing instructional technology with constructivist theory allows educators to focus on how students can explore and discover class content and new experiences by explaining their mistakes, ideas, and experiences and the basics of the content.

Keywords: behavioral, constructivist, learning, theories, education, Kuwait, technology, desinge.

1. Introduction

When educational technology was first introduced, it was by using visual materials such as pictures, films, and slides, which is known as the visual instruction movement. Then, educators redefined educational technology as a tool that helps solve instructional problems. After that, experts in the education field thought that education technology could control the learning process by designing the content of the needed knowledge.

The meaning of educational technology moved to a broader field, where experts defined it as an organized system that includes designing, performance, and the evaluations of all these parts in terms of learning objectives (Reiser, 2012). The learning theories influenced the instructional technology field, and these theories have had a strong impact on the learning process, and the impact would affect the design practices.

In these cases, the designer should know about the learning theories to analyze the needs and design the contents in terms of the target. Therefore, educational technology is known as a process that includes many factors like teacher, designer, students, content, instructional technology tools, classroom, evaluation, and learning environment that will provide a good simulation for the students. So, it is an application for theory and practice (Reiser, 2012). Instructional technology provides educators with an opportunity to mix instructional technology tools with behavioral and constructivist theories to find out how this strategy will affect the teaching process in a positive way.

Through the academic performance as an instructor during the last four years, I noted there are some educational issues that influence the future teachers who are students at the college of basic education in Kuwait. Some students felt bored with some classes that are just repeating the knowledge by using uninteresting methods such as traditional methods of teaching (Walmsley & Muniz, 2003). It is the instructor's responsibility to select the developing environment that is needed and to select the best strategy to teach the course (Shanmugasundaram et al., 2006). The essence of the instructor's, teacher's, and educator's job is finding a way to give access to learners to build, understand, and discover the classroom content (Kim, 2014). One solution that educators used to do is solving the educational problem from a psychological perspective. Some of the psychological studies recommended applying or increasing the activities inside the classroom to decrease the disruptive behavior of the

student (Little & Akin-Little, 2008). Educators recommended applying the behavioral theory as an approach to solving educational matters. They believe in applying this method and stimulating the student through direct experiences from the teacher and the activities inside the classroom (Standridge, 2002). This way confirms that human behavior is the action of the people that can be directly observed. So, it works with actions that appear but does not work with actions that do not appear with such thoughts or emotions (Standridge, 2002). It is more important to find methods that deal with thought as an access to better understanding.

When educators started to use technology in their field, it passed through a lot of descriptions (Reiser, 2012). The meaning of educational technology progressed to a broader field and became known as a planned system that includes designing, performance, and the evaluation of all these parts in terms of learning objectives (Reiser, 2012).

Changing the method and applying some educational technology tools can solve the educational issues and make equal the differences between the individual, which gives the learner access to the instructional content. So, instructional technology is known simply as a strategy of learning through the difficulty of assistive devices (Hune, 2004). Applying educational technology tools and mixing them with teaching methods provides an ideal plan for individualizing instruction for students who need modified instruction applied to their understanding for different areas of their academic interest (Hune, 2004). Some educators are familiar with the several forms of software and hardware that may explain and support their knowledge content in their classrooms. Therefore, learners with educational technology tools can develop their ability to understand without requiring memorization of the content or knowledge (Hune, 2004). At the same time, educators who used and applied educational technology tools achieved their education target better than educators who did not use that educational approach (Can & Dana, 2012).

The students are not interested in the content of knowledge with traditional methods of teaching, and the students are not able to imagine the details about something that is not available any more. By applying learning theories with some educational technology tools, the students with special needs could understand class content better than normal students by using a memorization strategy (Techarueangrong et al., 2013). Moreover, some educators trust working with an educational technology approach to make students get the meaning of the content clearly, openly, and simply; therefore, that will reflect positively on our education output (Sadik, 2011). Any educational technology tools that are selected should have a specific purpose, and they need to care about viewers' backgrounds and their own previous experience in order to deliver the needed knowledge (Holm, 2008). Therefore, learners select and expand the knowledge from their own views depending on the cognitive information in educational technology tools (Culatta, n.d.). More researches are needed to show the important role of applying learning theories blended with educational technology tools in an educational field. Also, more research is needed to confirm how this blend can solve educational problems by applying educational technology approaches.

The problem that led to this study is that some conceptual and practicum contents are hard to explain and interact with. This study explains how instructors could apply learning theories with educational technology tools to create active teaching methods. Will educational technology fit for conceptual classes and practicum classes? Can educators increase student understanding by applying an educational technology strategy? Which learning theories work the best with an educational technology approach? The guiding research question for this study is as follows: "How are behaviorism and constructivism theories applied to an educational technology strategy for complex content for college of basic education students?"

2. Methodology

2.1 Qualitative Tradition

This research study used a basic qualitative study because it matches the characteristics set by Merriam (2009). A basic qualitative study interprets an educational field experience. This is the type of research most often used in the fields of education, health, and social work because it is interpretative research (Merriam, 2009). This approach allows the researcher to understand the inclusion of description, clarification, and understanding of the phenomenon; identification of patterns and themes; and delineation of an occurring process in the chosen phenomenon (Merriam, 2009). This type of research intends to explain how individuals interpret their experience, build their world, and attribute to the experience (Merriam, 2009). This basic qualitative study is focused on how learning theories with educational technology tools work together to make hard content easier and create active teaching methods more interactive.

2.2 Theoretical Framework

My goal is to encourage instructors to apply learning theories that are mixed with an educational technology approach in their lessons to make the learning process more interesting for both teachers and students and to also provide preliminary evidence and generate a hypothesis about the relationship between applying educational technology and academic achievement. By using this mix, it provides the assimilation of that individual's reality from their perspective. This research includes the collection of data from instructors and students in the College of Basic Education in Kuwait. These participants provide descriptive information about their experience with conceptual and practicum classes, which affects how they interacted with educational technology tools. The abundance of technology used in today's classrooms makes the teaching setting powerful and effective. Teaching facilities are a possible necessary assessment tool and can become a powerful way to change technique and routine (Horejsi, 2007).

This study was planned to increase the awareness of teachers, educators, and instructors by explaining the power of using some new teaching methods by applying learning theories with an educational technology approach and informing them about changing their teaching styles. In addition, this study was planned to make the learner more active with technology to help them get a real detail of something that may not be available anymore or may be difficult to reach. Also, this study was designed to visualize a tough concept and collect evidence about how technology can save teachers' time and effort. The information gathered was all subjective and related to each participant's experiences in their particular classrooms when technologies were applied.

2.3 Personal Stance

I work as an educational technology associate professor at the college of basic education. This job made me believe that educational technology is an effective method and important in the transfer of information. If you want to teach a child in their first year, you should use some teaching methods to get their attention. The same goes for adult learning. Even the first human language used some technology—that is, drawings on walls—as a communicative instrument. Some educators trust in technology and change their teaching styles to make students get the meaning of the content clearly, openly, and simply; therefore, that will reflect positively on our educational output (Sadik, 2011).

As a qualitative researcher, I try to understand and explain the importance of using different methods of teaching that are better than the traditional methods of teaching, apply some technology tools to keep students' attention, and work with their senses to keep the knowledge in their long-term memory. I also want to be able to define and understand the best way to use learning theories that would meet the teachers' and students' needs. The exploration of this topic is based on the constructionist theoretical approach. This approach can give meaning to and interpret the human experience in the real world (Crotty, 1998).

2.4 Participants and Setting

I chose a college of basic education to apply my study because I am working there; therefore, I have some relation with the school staff and students, which made it easy for me to contact them. The participants in this study were two college instructors and 10 college students who volunteered to participate in this study. They are a random sampling of college instructors at the school I did my study at. All participants have teaching experience and work in the same school. I used homogeneous participants as a sampling method in this study to simplify the data and facilitate group interviewing because all of my participants are from the same school (Creswell, 2013).

2.5 Data Collection & Analysis

The methods of collecting data in the basic qualitative research were observation, interview, and document analysis, and this was used for the applied field of practice (Merriam, 2009). The student's personal interviews were face to face and included written questions. The observation method was watching the teachers and students and how they interact with and without the educational technology strategy during the class period, which is about 90 minutes. The students were interested in completing the interview because they understood the importance of gathering evidence about inserting technology in educational settings. After getting permission from each instructor to start collecting the data I needed, I asked the instructors to give me access to their classes regularly to observe the difficulties inside the classrooms before applying the educational technology strategy.

2.6 Interviews & Observations

I scheduled appointments to observe how the class performed with and without technology tools. I asked students several questions about the content they found difficult; then I asked them about difficult content from their perspective to transfer that knowledge through technology tools.

Two learning theories were applied to examine the gain of student understanding of the properties of crystalline metals and introduction of photography to show the leverage of this educational technology tool in addition to know more about the students' interest in changing the teaching methods. Also, these were applied to address my hypothesis that I would like to generate about the power of using educational technology tools.

Interviews were one method that was used to collect data (Merriam, 2009). Each instructor was interviewed twice. The first interview was before applying the educational technology strategy and the second interview after applying it. Each interview took about 15 minutes. The participants were encouraged to provide their own perspective and their experiences with using an interesting method of teaching for them and for their students. The interview procedure (see Appendix A) was made with open-ended questions to lead the interview, and some subsequent questions were asked based on the participants' responses to increase the research experience. Both interviews (before and after) were audio recorded and transcribed separately. I organized my data into groups, and I used the coding process, which means each group is given a meaningful code to represent it (Creswell, 2013). By using an analytic strategy, I sketched idea, wrote note, summarized my note, identified codes, organized the group code, and organized the group, analytic framework in literature, then I wrote a point of view to display the data (Creswell, 2013). No names were shown in the interview data and each participant was given a unique ID.

Observations were used as a second way of collecting data in this study. They were used to observe the application of the educational technology tools and the level of the students' understanding and their interaction with an Educational Technology mixed learning theories strategy. During the observation, I started taking notes about the use of PowerPoint and projectors inside the classroom and the student reactions when they received new knowledge through visualization. The observation data was recorded by type of class (science and photography), and numeric identifiers were used for each class. All data was stored on my OneDrive on the PAAET website and on my flash drive, so nobody has access to the data. All data files were deleted after the study.

3. Findings

3.1 The Behavioral Theory in Educational Technology

With educational technology as an approach or as a tool, it is a behaviorism approach by stimulating students through psychological conditions because through the educational technology tools the educator can stimulate learners by direct experiences and activities inside the class; therefore, by using educational technology the educator has interesting methods of learning, in addition to presenting the knowledge (Standridge, 2002).

So, educational technology supports good behavior and changes bad behavior. Also, it helps encourage students to learn more and more by the condition stimulus. The result of psychologists B.F. Skinner's research shows that both humans and animals would do the same action if they got the same favorable outcome, and they would prevent the action that led them to the unfavorable result (Standridge, 2002).

The purpose of using educational technology is that it has a lot of functions that help the educator make a link between the knowledge and the symbol or the content. Cognition is a relationship between the learners and the properties of their own environment by transfer of learning (Barab et al., 2000). This method made the instructor deliver the knowledge to the student and store the knowledge and the experiences in a long-term memory section in the student's brain, especially if the teacher makes the students really want to learn.

According to Orey (2010), the human abilities in the long-term memory are unlimited, but the reason for forgetting the content is failure to review. Through educational technology, the instructor was able to make the lesson interesting to the students with sound effects, pictures, or good design. All of these options provided an encouraging environment to explain the lecture. The behavioral approach is working to support the good behavior by linking discrete stimuli and responses (Hoadley & Haneghan, 2012). At the same time, educational technology has this function to link stimuli and responses.

So, mixing the instructional technology with behavioral theory provided perfect tools that achieve the target of the responses of stimuli. The using of educational technology made the designer find a solution for the individual differences among the students so he could create a tool for each group of students; therefore, they encouraged the students to did it on their own. For that, the content or the knowledge will be meaningful for them. Mixing the behavioral theory with educational technology helped to create an approach for facilitating the content and helped create a rich environment to practice the knowledge (Barab et al., 2000). Then, instructors were providing a positive opportunity to have a productive interaction inside the class, and that will reflect on the students building their understanding, increasing their experiences, and having new skills or developing their previous ones (Barab et al., 2000).

3.2 How to Apply the Behavioral Theory with Educational Technology

I observed a geology class where the instructor who teaches a class titled The Properties of Crystalline Metals used the following teaching strategy. The instructor started the lesson with a review of the class title (The Properties of Crystalline Metals).

The following tools of educational technology were used:

- Some pictures of crystalline metals.
- An instructional video showing how halite is established.
- Model of the spatial structure of the crystal.
- Electronic tables to determine and compare the differences between the properties of the crystals.
- A PowerPoint presentation to support knowledge by simulation.

Teacher starts to explain the content by using the direct experiences of the teacher mixed with instructional videos and electronic tables to determine and compare the differences between the properties of the crystals.

The instructor gave an opportunity for the students to change some number in electronic tables to see the result of this effect, supported by pictures to explain the factors that affect crystalline metals. She repeats this experience more than one time by using videos, pictures, models, and electronic tables. Also, when the students try to test the properties of the crystals through mixing some factors together, PowerPoint slides help the students to be sure about the answer or to encourage them by using the PowerPoint functions and effects (Gaskin, n.d.). Therefore, the human will repeat the action that helps them get the outcomes, and they will avoid the bad result (Standridge, 2002).

3.3 The Constructivist Theory

The constructivist theory ensures there is an independent personality of the student that helps to transfer the experiences from outside and inside (Driscoll, 2005). It is focused on helping the learner with concepts and understanding the relationships between phenomena allowance received through routine and to make the learner acquire the topics of procedural processes before symbolic construction. Also, this theory aims to increase human knowledge, focus on internal factors that affect learning, raise the social interactions in the classroom or laboratory or field, and highlight the importance of the students and their active role in knowledge discovery and construction.

It determines the instructor's duties, stimulates the students to search for knowledge by themselves, and have instructors and students discuss the content together. Therefore, the duties of the educator will be limited to observing them and transferring the difficult content if they need more explanation or support. At the same time the teacher has to provide a chance to practice what they already learned because that helps them to fix the experience in their mind (Culatta, n.d.).

3.4 The Application of Constructivist Theory in Educational Technology

When the instructor uses this approach, the instructor works with the previous knowledge of the students and the surrounding environment, which are playing an important role in impacting the learning process because the learning environment is an interactive environment between the student, tools, and content. While the learners grow, they need to obtain new ways to represent their actions in their own environments (Driscoll, 2005). The mixing of the constructivist approach with educational technology helps the teacher focus on how the student can explain their mistakes, ideas, and experiences to themselves.

So, this strategy leads the student through their skills and knowledge to get more information through the basics of the content. Through using educational technology with a constructivist approach, the teacher needs to observe the process of building with each and every one of their students alone to see how each of them is building knowledge. It helps the learner form information and helps them create their own perspective in a way that appeals to each of them.

This recognition helps the teacher design the knowledge that helps the student get the experiences from their previous knowledge by using new material (Driscoll, 2005). The constructivist approach encourages students to get what they want from the content if it carries meaning for them; therefore, both the teacher and the student will get the target of the learning operation and increase the student's motivation. The educator has to know how the knowledge is received and stored in the student's mind (Driscoll, 2005).

The learning process should work through real situations, and it should be through the development of the learner in real learning environments that are prepared and processed so that it is based on strong evidence that reflects a

sense of learners connecting to the real world. The constructivist approach with educational technology creates a wealthy resource environment for the learner that is approachable with the use of technology; therefore, it is providing a multimedia environment to discover more about the content (Barab et al., 2000). It is essential that the teacher knows how each learner builds the knowledge to know if it is helpful to get a new experience or not and to provide proper support.

This is done to provide the teacher with some revealing questions that show the previous experiences of the students and structures that are either related to the subject or not. This requires the teacher to implement some activities through the use of educational technology tools, such as a questionnaire that tells the educator about the level of learners and the extent of their previous experience. The learning technology environment gives a context for the learner to create wealthy understanding of complex content (Barab et al., 2000).

3.5 How to Apply the Constructivist Theory with Educational Technology

A photography instructor was asked to use the constructivist theory to deliver the knowledge to his students. The teacher started with a question to analyze and understand the student's previous knowledge about photography.

The following tools of educational technology were used:

- Some of his high-quality pictures as examples.
- A funny story supported by an instructional video to get their attention.
- Bringing a real camera with all necessary equipment to the classroom to practice with.
- A PowerPoint presentation to support the knowledge by simulation.

After providing the basic knowledge about photography, discussion with the class, and practice in a real environment, each student showed their photos by projector to discuss them as a group to evaluate them and give feedback. Then, the instructor created for them a constructivist environment to give them more clarification and more opportunity to discover more about the photography they want to create by using PowerPoint slides that include the content and more pictures, video, and text.

The PowerPoint file has a lot of big words, and each one has a link to a website that is related to the objective to facilitate the content for the students to get more information if they would like. Also, some of the pictures that were shown in the PowerPoint file will lead the learner to discover more about photography. The last PowerPoint slides include some self-assessments that help to fix the experience in the students' minds.

4. Conclusion

This study explored two of the most common learning theories: the behavioral and constructivist theories. In fact, there is no specific theory of behaviorism but a set of theories involved in dependence on experimentation and objectivity. Although each quality that distinguishes one from the other gives some importance for connecting the link between motivation and the response is the known theory classic conditioning based on learning where the existence of the new association between motivation and response become an exciting new alternative to the old. Pavlov's famous experiment that links dog saliva and the sound of the bell to provide food to the dog several times works and depends on observation and measuring human behavior (Standridge, 2002). The target of this approach is to encourage the human to get the knowledge through their behavior. Also, it emphasizes that there is a change in human behavior by using the stimulus response to link the action with what the human already did.

The behavioral approach is applied to stimulate the student through direct experience from the teacher and the activities inside the classroom (Standridge, 2002). The behavioral theory confirms the human behavior, which is the action of the people that can be directly observed. It works with actions that appear not actions that do not appear, such as thoughts or emotions (Standridge, 2002).

B.F. Skinner believed people's actions could be understood if we understood their environment, which is a relationship between behavior and place (Driscoll, 2005). Skinner determined there are two types of behavior: behavior response and procedural behavior. The difference between them is that response behavior is associated with external action unlike procedural behavior, but it may be related to some stimuli that is able to provoke this behavior. For that, Skinner's classification between the two types of learning behavior responses produces a natural link between stimuli and specific responses that occur naturally, such as pupil stenosis with exposure to sunlight or drooling when you taste food, and most human behavioral responses are the procedural type.

The most common method of learning or to change the behaviors of humans is the principle of reward and punishment, which is to strengthen the desired behavior and punish the inappropriate one. Even humans reach for desired behaviors as a daily habit and try to prevent bad ones.

The behaviorists think they can hold all behaviors that are unlearned to control and manage them and provide good ones. Also, they can change the unacceptable behavior with the acceptable one by using the rewarded response and punishments strategy to support the positive behavior and prevent the negative one (Standridge, 2002). Skinner thinks that the learning system is essentially changing a behavior process permanently through observation for a long period of time (Driscoll, 2005).

The instructor was able to use some of the instructional technology tools to work with the repetition skills in order to make the lesson a daily habit. The behaviorism theory would work with parents who have a newborn baby who would like to teach them new skills or change their bad behavior to good behavior.

For example, the British baby automatically will speak English because he practices his English all the time in a good environment of English, and he will repeat the English skills over and over. Skinner thinks habits develop by unique operant learning experiences (Standridge, 2002). The behavioral approach works to increase student motivation to go with one response related to the psychological condition to achieve the action (Driscoll, 2005).

The constructivist theory is one of the learning theories that works if the instructor wants to teach and improve the students' skills through a reality environment. A person builds their information in a way that is internally influenced by the surrounding environment, the community, and each language learner through their own way in understanding the information and not necessarily as the teacher wants.

The students have to get the knowledge and the experiences in their environment (Driscoll, 2012). This theory is a good opportunity to create an environment for the student to discover more than the content. Also, it gives a real opportunity to discuss more than one perspective to achieve the growth of conceptualization through participation of the situation or concept in response to the views. The education system should allow collaborating with others to view multiple points of view that help the individual reach a response. With the constructivist approach, the educator can explain the basic factors of the lesson, and then the students will have an opportunity to get more and more knowledge, which works with the ideas and the experiences of the learner to improve their skills through real environments to give them an opportunity to practice the needed experiences (Driscoll, 2012). The purpose of constructivism as an approach is to have the learning process be an environment that provides fair content for all students.

At the same time, the constructivist approach is to give them a chance to practice through their perspectives and then solve their individual difficulties among them. The constructivist theory does not only deliver the content because learning at this point has not started, but learning starts after that because it is what happens after the arrival of the information to the learner who explains it again from self-knowledge and their understanding.

The learning operation is a cumulative process that the learners build by themselves via an internal representation of the information used. So, the learners construct their own ideas or concepts based on previous experience. The learners choose and develop the knowledge from their own perspective depending on their cognitive structure (Culatta, n.d.). Each learner has their own interpretation, and in constructivist learning, there is no more than one person involved in the interpretation of one and the same way of the reality that surrounds each of them.

In conclusion, the application of educational technology can manage the importance of factors of the learning process like teacher, designer, students, content, instructional technology tools, classroom, evaluation, and learning environment that create a good simulation in the learning operation by mixing instructional technology tools with behavioral and constructivist theories.

Mixing instructional technology with behavioral theory provides an opportunity to stimulate students through psychological conditions by direct experiences and activities inside the class and to work with the functions of educational technology tools that connect the knowledge and the symbol or the content. Then this approach achieves the target of the responses of stimuli.

Mixing instructional technology with constructivist theory allows the educators to focus on how the student can explore and discover class content and new experiences by explaining their mistakes, ideas, and experiences to themselves and by explaining the basics of the content for them. This approach provides real situations through real learning environments that are prepared and processed. The technology environment gives a context for the learner to create factors as a result and in-depth understanding of complex content Based on strong evidence that reflects a sense of learners in the real world.

There should be further discussion of new research using the theory and applications of behavioral and constructivist theory in modern educational technology and strategies.

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Appendix A

The Interview Questions

* Introductory questions:

- How are you this morning?

- Do you like teaching college students?

- What do you like best about your job?

I. What content area do your students have the most difficulty in?

II. II. Does your content need to be memorized?

III. When are you planning this lesson?

IV. Summary.

V. Thank you! I will keep in touch with you by email.

VI. Tell me about your teaching style.

VII. What did you do to make your students more interested in the content?

VIII. How do you think changing your teaching method could help your students understand the content better?

IX. How do you use learning theories with your teaching strategy?

X. How did your students respond to the lesson?

XI. How did using educational technology with learning theories influence your students?

XII. Summary.

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