



Behaviorism, Cognitivism, and Constructivism as the Theoretical Bases for Instructional Design

Abd-AL-Hameed Mustafa Mahmoud Jabsheh.

Lecturer, Department of English Language, Palestine Technical University- Kadoorie (PTUK) \ Tulkarm Campus- Palestine.

Email: ptc2004w@hotmail.com; a.aljabsheh@ptuk.edu.ps

<https://orcid.org/0000-0002-7395-1734>

Abstract

The aim of this study was to investigate the theoretical basis upon which the instructional design process was built ; to achieve the aim of the study, a qualitative analytical approach was followed, and the available related literature was subjected to a semi- chronological scrutiny; findings of this study indicate that three learning theories have had central effects on orienting the process of instructional design: behaviorism , cognitivism , and constructivism have indirectly established the boundaries of instructional design by directly setting the scope of applicability of the instructional practices ; the three theories of learning behaviorism, cognitivism, and constructivism have enabled a deep understanding of how learning happens which, in turn, has sprouted up as various instructional practices and considerations; as a result, this study has concluded that instructional design will not be successful nor fruitful unless teachers and designers consider these instructional practices and considerations that are grounded to the educational maxims of these learning theories. Findings of this study has also confirmed the feasibility and sustainability of instructional design in the sense that it guarantees achieving educational goals and objectives in less time, less effort, and less cost. Accordingly, this study has recommended a set of recommendations in this regard.

Key words: instructional design, behaviorism, cognitivism, constructivism , digital technology, sustainability.

1) Introduction

Educational literature has confirmed that the actualization of the whole educational process is dependent on instructional design and planning; without instructional design, the teaching and

learning processes will be futile and hopeless due to the fact that there will be no symmetry nor integration within all elements of the educational processes; the absence of this symmetry , within the elements of the educational process, will result in wasting precious time, squandering effort, and maximizing cost that all can be , if managed through the process of instructional design, exploited in other educational or societal sectors. Moreover, it can be said that instructional design can steer the educational process to the desired destination, describe how reaching that destination can be possible, and establish a criteria of how to know whether the process has arrived successfully to its destination, or else not. Instructional design has gained an additional status of importance due to the heavy toll that technology and digitalization have impacted on the educational process nowadays; the variables of the educational process are intensifying so fast because technology is changing the educational concepts and the roles of the elements of the educational process; this means that ,and as stated by Darwazeh (2008), educationalists need a blueprint , functioning as a benchmark , in order to preserve the quality and integrity within the whole educational process which can only be through the process of instructional design. As a result, there is a mere need to understand the orienting theoretical basis for instructional design in order to maximize the benefit and integrity which educational process can get from instructional design, and , in addition, to suggest other paths and alternatives that can be taken to effectively and efficiently achieve the intended goals and objectives. As a result, it can be stated that instructional design will contribute to the sustainable development of any given nation because it-instructional design- functions as a remedy to the setbacks, within the educational system, that hinders the achievement of instructional goals and objectives; Accordingly, it can be stated that in order for the instructional design to be effective and efficient, as an ideal tool for achieving sustainable development and progress for the community , it is supposed to begin with educational systems which will in turn guarantees the progress and sustainable development in community.

2) Statement of the problem:

The sum of the available related literature has confirmed the essentiality of instructional design to the educational process , and, as a result, its central role in achieving progress and development for a given nation ; however , very few research, as far as the researcher have found , has been oriented to investigate the theoretical basis of instructional design ; on the other hand, the available related research, as far as the researcher's knowledge has reached , has been directed on investigating the various models of instructional design , the benefits of instructional design on the educational process , the instructional design as a process and as system , and instructional design as a tool to achieve sustainable educational development for the future. Accordingly, this study,



and while totally acknowledging the importance of investigating the various models of instructional design and their potentiality in orchestrating the domains and elements of the educational process, it stresses the primacy of investigating the theoretical basis upon which instructional design was built so as to equip the instructional designer with a wider scope of adequacy to produce a well-referenced design that can guarantee achieving what it is supposed to achieve.

3) The significance of this review:

One facet of the significance of this study is stemmed from the fact that it enables an additional layers of understanding to the theoretical and philosophical bases upon which the process of instructional design has been connected to ; in this sense, this study retrospectively presented how the three learning theories (constructivism, cognitivism, and constructivism) have dictated instructional practices and considerations , and , then , how instructional design has accordingly been oriented and shaped, in a unified consistent account, with reference to these instructional practices. Another facet of the significance of this study is its ability to offer, as proposed by its objective, a deeper understanding in regard to the anchors to which instructional practices and instructional design have been tied; this deep understanding can sharpen the adequacies and skills of the instructional designer who is supposed to be able to analyze what Gagne (1977) has classified as the “external and internal conditions” that are contiguous with instructional and learning processes.

4) Literature Review

The aim of this section, of the available literature review, is to present a purview of the three central learning theories such as behaviorism, cognitivism, and constructivism; the sum of the available literature, in this regard, presents definitions, maxims, and the related educational philosophies of three theories; the three learning theories (behaviorism, cognitivism, and constructivism), as revealed by the section of the available related literature review, have shaped the educationalists’ understanding towards the process of how human learning happens , and how learning can be explained and how can learning be orchestrated to achieve the intended goals and objectives:

4.1) Behaviorism:

The following sum of the available related literatures focuses on presenting behavioristic themes that have explained how learning occurs, variables of the learning situation, and how learning can be

maximized , and how the hindrances to learning can be minimized, of course, in accordance with behaviorism :

Good & Brophy (1990 , cited Mergel , 1998) assures that “The theory of behaviorism concentrates on the study of overt behaviors that can be observed and measured. It views the mind as a "black box" in the sense that response to stimulus can be observed quantitatively, totally ignoring the possibility of thought processes occurring in the mind. Some key players in the development of the behaviorist theory were Pavlov, Watson, Thorndike and Skinner.” Tam (2000) stresses the fact that “In a learning environment, there is always some stimulus or goal for learning.” Ertmer & Newby (1993) confirms that “ The learner is characterized as being reactive to conditions in the environment as opposed to taking an active role in discovering the environment.” Merriam and Caffarella (1999, cited in McLeod, 2003) “ identify three assumptions all behaviorists such as Mager, Skinner, Thorndike, and Watson share about the learning process: First, observable behavior rather than internal thought processes is the focus of study; in particular, learning is manifested by a change in behavior. Second, the environment shapes behavior; what one learns is determined by the elements in the environment, not by the individual learner. And third, the principles of contiguity (how close in time two events must be for a bond to be formed) and reinforcement (any means of increasing likelihood that an event will be repeated) are central to explaining the learning process.” Al-Jarrah , Mansor , Talafhah & Al-Jarrah (2019) summarized the teaching – learning process in accordance with behaviorism and state that “In a traditional classroom, students wait for the teacher to present the correct information, which is then reinforced by a textbook. Actual learning is accomplished through practice, repetition, and reinforcement of correct answers. Content is broken down into behavioral objectives to be met, skills to be mastered, and tests to be evaluated. Educators concentrate on how to teach and what to evaluate. As a result, students strive only to complete the activity quickly or correctly with little thought of the tasks significance. The teacher measures observable behavior rather than conceptual change or understanding. Lectures, objectives, textbooks, tests, and grades reinforce this approach. The result is that students memorize a variety of terms but often cannot apply them to problems or outside experiences because they do not truly understand them.” Krishnamoorthy, Prelatha, David & Manikam (2021) concludes that “ Behaviorism studies individual’s observable and measurable behaviors that are repeated until they become automatic in which it creates measurable learning outcomes, uses tangible rewards and guide students in mastering a set of predictable skills or behaviors.” Mergel (1998) confirms that “Behaviorism based on observable changes in behavior. Behaviorism focuses on a new behavioral pattern being repeated until it becomes automatic.” Mergel (1998)also explains the strengths and weaknesses of behaviorism : “Weakness - the learner may find themselves in a situation where the stimulus for the correct response does not occur, therefore the learner cannot respond. - A worker who has been conditioned to respond to a certain



cue at work stops production when an anomaly occurs because they do not understand the system. Strength - the learner is focused on a clear goal and can respond automatically to the cues of that goal.” To sum up, behaviorism, in a classical sense, and as far as the researcher has found, can be considered as the starting point for the emergence and development of other theories of learning, especially, cognitivism and constructivism; these two theories, as stated by the available literature, have retrospectively continued from points where behaviorism has failed to explain various aspects of human learning such as the cognitive element and the discovery aspect of human learning. The following subsections present a distilled view both cognitivism and constructivism:

4.2 Cognitivism

Yilmaz (2011, cited in Spencer, Ferens, Young Ferreira, Gibson, Osborne , Clarke Shortley & Rawson ,2018) concludes that “Cognitivism sprung from the acknowledgment that there was a gap in the behaviorist theory of learning, in that behaviorism did not consider or observe the thoughts that led to human behaviors.” Yilmaz (2011, cited in Spencer, Ferens, Young Ferreira, Gibson, Osborne , Clarke Shortley & Rawson ,2018) also adds that “Cognitivists became more concerned with the how and why in learning as opposed to learner’s observable actions. In other words, cognitivists began studying the “mental processes” involved in learning.” Ertmer & Newby(2013 , cited in Spencer, Ferens, Young Ferreira, Gibson, Osborne , Clarke Shortley & Rawson (2018) assures that “cognitivism puts the focus on cognitive processes “such as thinking, problem solving, language, concept formation, and information.” Schwartz (2001) more explains that “cognitivism describes and focuses on what occurs in the brain between the stimulus and response .Cognitivism also focuses on deeper forms of learning than behaviorism.” To say more, Pandey (2017, Spencer , Ferens , Young Ferreira , Gibson, Osborne, Clarke Shortley & Rawson, 2018) states that “Cognitivism gives more significance to the mind and is primarily concerned with changes in cognitive behavior. This theory looks at the thought process behind the actions that students take.” Blanton (1998, cited McLeod , 2003) confirms that “ One assumption of cognitivism is that an existing knowledge structure must be present in order to compare and process new information for learning. This existing knowledge structure is referred to as schema. Schema is activated and utilized for the benefit of learning when a learner is “made aware of his background knowledge and exposed to strategiesto ‘bridge’ from pre-requisite skills to learning objectives” To assure this idea, Guey Cheng & Shibata (2010) explains that “ Cognitivism (or constructivism) mainly deals with the cognitive processes involved in learning, inclusive of induction, deduction, rule finding, law discovering, and pattern recognition among others. Unlike behaviorism, cognitive perspective has to do with schemata development (rather than knowledge accumulation or collection), and gaining understanding is of prime importance in the course of discovery, which is what Bruner’s (1966)



discovery learning model suggests.” Guey Talley & Huang (2011) state that “cognitivism both support the practice of analyzing a task and breaking it down into manageable chunks, establishing objectives, and measuring performance based on those objectives.” In line with these considerations of cognitivism, Isman (2011) adds that “Cognitivism is interested in motivation, intellectual learning process (short term memory, retrieve and long term memory), experiences and contents. This new model is interested in how to store the information into long-term memory.” Schunk (2012) also confirms, “Cognitive theories assign a prominent role to memory. Information processing theories equate learning with *encoding*, or storing knowledge in memory in an organized, meaningful fashion. Information is retrieved from memory in response to relevant cues that activate the appropriate memory structures. Forgetting is the inability to retrieve information from memory caused by interference, memory loss, or inadequate cues to access information. Memory is critical for learning, and how information is learned determines how it is stored in and retrieved from memory.” Schunk (2012) further explains that “Cognitive theories explain learning with such factors as information processing, memory networks, and student perceptions and interpretations of classroom factors (teachers, peers, materials, organization). Schunk (2012) adds that “From a cognitive perspective, learning is an internal mental phenomenon inferred from what people say and do. A central theme is the mental processing of information: Its construction, acquisition, organization, coding, and rehearsal, storage in memory, and retrieval or non-retrieval from memory.” Schunk (2012) further elaborates that “Cognitive theories emphasize the role of learners’ thoughts, beliefs, attitudes, and values. Learners who doubt their capabilities to learn may not properly attend to the task or may work halfheartedly on it, which retards learning. Such learner thoughts as “Why is this important?” or “How well am I doing?” can affect learning.” Schunk (2012) also concludes that “Cognitive theories acknowledge the role of environmental conditions as influences on learning. Teachers’ explanations and demonstrations of concepts serve as environmental inputs for students. Student practice of skills, combined with corrective feedback as needed, promotes learning. Cognitive theories contend that instructional factors alone do not fully account for students’ learning.” In this regard, Pintrich, Cross, Kozma & McKeachie (1986, cited in Schunk, 2012) confirms that “What students do with information—how they attend to, rehearse, transform, code, store, and retrieve it—is critically important. The ways that learners process information determine what, when, and how they learn, as well as what use they will make of the learning.”

To sum up, cognitivism, as revealed by the previous section, has gone beyond the behaviorist mechanical response to a cognitive-based response that is propelled by the learner's understanding of the learning task and how her or his previous knowledge can be activated and exploited to a meaningful forms of learning; however, cognitivism, as far as the researcher has found, has not foregrounded the

impact of social context that can sharpen ,shape, directs, or, even, hinders the learner's cognitive context; as a result , constructivism sprouted a theory which calls for the importance interaction between the cognitive and social contexts to creativity in learning:

4.3 Constructivism:

Constructivism, depending on the available literature, has hailed the cognitive context, of the constructivism, normally does not function away from social context, but, on the contrary, the interaction between the two contexts yields more space for students venture and creativity; accordingly , this section presents an overview of the available studies on constructivism:

Rice & Wilson (1999); Tam (2000); Taylor (2004) ; Booth (2011); Pandey (2017, cited in Spencer , Ferens , Young Ferreira , Gibson , Osborne , Clarke Shortley & Rawson, 2018) : Constructivism is defined as a social-based teaching approach that encourages students to construct knowledge from the surrounding social context throughout a process of investigation; students are supposed to actively construct their own knowledge because the cognitive mechanism of their minds mediates input from the outside world through an active mental work and not a passive reception of teaching. This mediation and the active mental work enables students to construct knowledge through connecting prior experiences to further new concepts that they elicit from a social learning context. Because constructivism considers knowledge as a construction, and not as a possession, learners, in a constructive point of view, learn through socially interacting and working with others, like peers and teachers, to apply their accumulated knowledge to the solve problems in an instigative method and approach ; in other words, constructivism is based on constructing knowledge by making interconnection between learner's previous experience and that knowledge he/ she receives form a social interaction; this cognitive link between previous knowledge and the latest knowledge , from a constructivist point of view, enables the learner to transcend this cognitive link to proliferate various layers of meaning and different extended perspectives of understanding to same entity. The process of constructing meaning is confined to the personal context as described by (Piaget): Phillips (2000, cited in Abuzahra, Farrah & Zalloum, 2016) explains that "Piaget, the founder of the constructivism, argues in his theory that humans can generate their knowledge and meaning by interaction between their own experiences and ideas. When an individual is exposed to new experience , he/ she filters the concepts through a mental structural process (Schemata) which correlates an individual's previous knowledge, perspectives or beliefs with new concepts he gets. Piaget (1973) theorizes that understanding is produced by discovery. Unless an individual understands he/she will mainly depend on repetition. So, learner would lose innovation and productivity. Piaget was first who introduced that children are

permanently testing their understanding of the world. He believed that children don't own logic thinking as the adults do."

Moreover, the process of transcending the cognitive link between previous and the new knowledge is also decided by a social context represented by peers, teachers, and an authentic environments as explained by Vygotsky:

Rice & Wilson 1999, cited in Abuzahra , Farrah & Zalloum, 2016) state that " Vygotsky's sociocultural theory possibly gives the most credence at the children's cultural background and their interactions with peers which probably has its significance on the child's overall cognitive development (ZPD). He believes that cultural and social perspectives have an influence on the child's mental development. Vygotsky presented the concept of the zone of proximal development which mainly focuses on the difference of child's capability of accomplishment in isolation than that which can be accomplished with assistance. To illustrate more, a child has better ability to solve and dissect complicated structures at a particular age of mental development if he gets an assistant from teachers, peers or parents than that he can do separately."

As a result, and as far as the researcher has opined , it can be stated that constructivism and cognitivism are in agreement in regard to the importance of the previous cognitive schema as the starting point to establish a cognitive understanding of the learning experience; this can be achieved through linking previous experience to the new one , and, then enables the learner , through exploiting both the cognitive and social contexts , to deduce and invent more layers of the same learning experience ; both constructivism and cognitivism diverge in their perspectives to knowledge : while cognitivism considers learning as a process of understanding and owning , constructivism considers learning as the active process transcending cognitive understanding into a process of constructing meaning through investigating , inquiry , and interactivity with the social and cognitive contexts. Accordingly, it is possible to include what (Booth, 2011) has concluded in this regard: "Constructivists believe that learning is individualistic and subject to ability and preference. Constructivism states that both the learner and the context are important to learning processes and outcomes, and, as learners, we all construct our own knowledge based on personal perceptions and experiences." These maxims, of constructivism, can further be understood by considering the classification of Al-Jarrah, Mansor , Talafhah & Al-Jarrah (2019) Who " Identified two processes in cognitive development namely assimilation and accommodation: Assimilation is the process of incorporation of new knowledge into the existing knowledge. Also, assimilation is using an existing schema to deal with a new object or situation. Assimilation is how humans perceive and adapt to new information. It is the process of fitting new information into pre-existing cognitive schemas. Accommodation is the process of taking new

information in one's environment and altering pre-existing schemas in order to fit in the new information."

Depending on the above mentioned reviews of the available related literature, it can be deduced that the philosophical spheres of cognitivism, and constructivism, started from the points where behaviorism, as it has still been thought, had not been able to offer convincing explanations in regard to human learning; this, however, confirmed, in the researcher's opinion, the importance of behaviorism, as a starting point from which other theories of learning have developed, and, on the other hand, revealed the interactive relationship within the three theories behaviorism, cognitivism, and constructivism.

5) Instructional design

The aim of this section of the literature review is meant to reveal the essentiality of learning theories to the process of instructional design: instructional design must take into consideration the various teachings of the theories of learning, especially behaviorism, cognitivism, and constructivism, as far as this study is concerned, as blueprints in order to yield an effective instructional design; the aim of this section of the literature review is also to cast more understanding of how each theory of learning, especially behaviorism, cognitivism, and constructivism, as far as this study is concerned, has oriented instructional design followed by a brief summary of those orienting paths:

5.1. Instructional Design and the theories of learning:

McLeod (2003) concludes that "An understanding and incorporation of learning theory is needed when designing instruction because it adds focus and direction to the process. Instructional designers should address their goals and intentions of designing instruction in order to best incorporate learning theory within their programs. This requires considering the learner's needs and characteristics, content and context, the strengths and weaknesses of the learning theory considering the scope of the instruction as well as the designer's own intentions, preferences, and expectations." McLeod (2003) also added that "Each theoretical perspective offers benefits to designers but the perspectives must be taken into context depending upon the situation, performance goal(s), and learners. And since the context in which the learning takes place can be dynamic and multi-dimensional, some combination of the three learning theories and perhaps others should be considered and incorporated into the instructional design process to provide optimal learning." Guey Cheng & Shibata (2010) states that "one can teach anyone anything if the methodology is appropriate." Tam (2000) confirm that "Instructional design and development must be based upon some theory of learning and/or cognition; effective design is possible only if the developer has developed reflexive awareness of the theoretical basis underlying the design."

5.1 Behaviorism and Instructional design

Paul Saettler (1990, cited in Edgar, 2012) classifies “ six areas of impact of behaviorism on educational technology in America: the behavioral objectives movement, the teaching machine phase, the programmed instruction movement, individualized instructional approaches, computer-assisted learning, and the systems approach to instruction. The behavioral objectives movement stated that learning objectives should be used and specified in quantifiable and terminal behaviors. The teaching machine phase was advocated by B. F. Skinner and used reinforcement to increase learning (operant conditioning). The programmed instruction movement was also advocated by B. F. Skinner, which outlined instruction based on learning theory. Individualized instructional approaches were concerned with individual learning, which was self-paced to the learner. Three individualized instructional approaches to learning most often used were the mastery, computer-assisted, and systems approach. Mastery learning was the major objective because it was theorized that individuals can self-direct their learning. Computer-assisted learning was based on the use of technology through hardware/software and student learning. It was based on drill and practice but declined in use because it was seen as costly, lacking of technical support, and not integrated. The systems approach to instruction was based on flowcharts and sequencing of events. This system was rooted in military and business models and required continuous evaluations and/or modifications.” Ertmer & Newby (1993) Many of the basic assumptions and characteristics of behaviorism are embedded in current instructional design practices. Behaviorism was used as the basis for designing many of the early audio-visual materials and gave rise to many related teaching strategies, such as Skinner's teaching machines and programmed texts. More recent examples include principles utilized within computer-assisted instruction (CAI) and mastery learning.” Merriam and Caffarella(1999, Cited in McLeod, 2003) indicates that “ behavior ~~try~~ based instructional design is heavily instructor dependent with high demands on resources in order to adapt to changes and needs, which can be costly and time-consuming. Through behavioral conditioning research, Skinner realized there is a burden on the instructor to maintain reinforcement. “Behavior that is not reinforced is likely to become less frequent and may even disappear” Duval, Hodgins, Rehak & Robson (2003) explains that “The primary focus of the behavioral perspective is on behavior and the influence of the external environment in shaping the individual’s behavior. As such, the primary responsibility of the instructional expert is to identify and sequence the contingencies that will help students learn. Teachers should then state the objectives of the instruction as learners’ behaviors. Learning is inferred from behavior, so it is important to identify the goal behavior, this involves breaking that goal behavior into a set of simple behaviors and arranging them in a sequence of frames that will help students progress toward the goal.” McLeod (2003) assures that “The strength of instructional design grounded in behaviorism is that when there are specific goals to be met, the learner

is focused clearly upon achieving those goals whenever there are cues to prompt the learner's behavior. However, since behaviorism is stimulus — response based, instructional design is dependent on the workplace or classroom having and main- training the appropriate stimuli to continue the intended behavior. Thus, if a certain incentive is not present or does not occur, then the expected and desired performance may not take place.” McLeod (2003) further explains that “One of the key areas where behaviorism impacts instructional design is in the development of instructional objectives. Morrison, Ross and Kemp (2001, p. 91) define an instructional objective written from a behavioral perspective as “a precise statement that answers the question, ‘What behavior can the learner demonstrate to indicate that he or she has mastered the knowledge or skills specified in the instruction?’” Writing “precise” instructional objectives can be challenging but offers instructional designers clear, measurable goals to which to guide their instructional design. Mager (1984) determined that performance, conditions, and criterion are the elements of instructional objectives. From a behavioral viewpoint, the conditions element of writing instructional objectives can represent the stimulus/environment and the ~~performance~~ element can represent the response while the criterion element is considered the acceptable level of behavior expected.” Krishnamoorthy, Prelatha, David & Manikam (2021) concludes that “Behaviorism has momentarily influenced the field of Instructional Design. Behaviorism is the doctrine that regards psychology as a scientific study of behavior and explains learning as a system of behavioral responses to physical stimuli. Many researchers are interested in the effects of reinforcement, practice and external motivation and a network of associations and learned behaviors. Educators that use behaviorist framework pre-plan a curriculum by breaking a content area into a hierarchy ranging from simple to more complex. Assumptions are made that observation, listening to explanations from teachers who communicate clearly, or engaging in experiences, activities or practice sessions with feedback will result in learning and that proficient skills will quantify to produce the whole or more encompassing concept (Bloom 1956, Gagne 1965).”

To sum up, the following points represent a summary of the impact of behaviorism on instructional design:

- The importance of structuring the learning environment.[Central]
- The importance of the measurable goals and behavioral objectives: the learner is focused on them.
- The importance of an Instructor.
- The importance of reinforcement. [External Motivation]
- The importance of drilling.
- Enrichment of stimuli to get the desired measurable response.
- Programmed learning on a trial –error basis.

- The content is broken into chunks reflected by behavioral objectives.
- Direct learning and Mastery learning.

5.2 Cognitivism and Instructional design:

Mergel, B. (1998) states that “The cognitive scientist would analyze a task, break it down into smaller steps or chunks and use that information to develop instruction that moves from simple to complex building on prior schema. Morrison, Ross and Kemp (2001) point out that such behavioral objectives objective normally becomes “the end rather than the means for instruction.” , but cognitive- focused instructional objectives overcome this problem by “first stating a general objective to communicate the intent.” As “cognitive objectives are well suited for describing higher levels of learning.” Duval, Hodgins, Rehak & Robson (2003) assures that “While the behavioral perspective has an external focus, the cognitivist one has an internal one. Learning is described as a change in knowledge stored in memory. As a consequence, the instructional expert is challenged with organizing new information for presentation, carefully linking new information to previous knowledge and using a variety of techniques to guide and support the mental processes of the student. The constructivist perspective describes learning as a change in the meaning constructed from experiences. Learning is constructed by the complex interplay among students’ existing knowledge, the social context and the problem to be solved. The instructional designer should be able to pose good problems, create group learning activities and guide the process of knowledge construction.” Duval, Hodgins, Rehak & Robson (2003) has found that “Behaviorism and cognitivism both support the practice of analyzing a task and breaking it down into manageable chunks, establishing objectives and measuring performance based on those objectives. While behaviorism is highly prescriptive in nature, constructivism calls for no pre-specified content; the learners and no rigid assessments determine the instructional direction. Bearing in mind that each particular theory will be more useful depending on the context, an eclectic approach is recommendable, such as Reigeluth’s Elaboration Theory that organizes instruction in increasing order of complexity and moves from prerequisite learning to learner control The learner can be introduced to the main concepts of a course and then move on to more of a self-directed study that is meaningful to him and his particular context, in line with a more constructivist view. McLeod, G. (2003) points out that “A major weakness of cognitivism lies in its strength. Whereas schemas help to make learning more meaningful, a learner is markedly at a disadvantage whenever relevant schemas or prerequisite knowledge do not exist. To account for this, a designer will need to ensure that the instruction is appropriate for all skill levels and experiences. Designing such instruction could be costly and time-consuming. One additional weakness of cognitivism is similar to behaviorism in the fact that there are only finite, pre-



determined goals. Having pre-determined goals may be in fact desirable for an organization since it offers clear direction and purpose but such a fixed set of expectations can limit the potential of the learning. Learners and instructors may become satisfied with obtaining minimum competencies or carry the attitude that “if it’s not broke, then don’t fix it!” when the learning experience could actually be designed better.” McLeod, G. (2003) adds that “Implications of cognitivism on the design of instruction are prominent throughout the task analysis and learner analysis phases of instructional design models. Cognitivists believe learners develop learning through receiving, storing and retrieving information. With this notion, it is imperative for instructional designers to thoroughly analyze and consider the appropriate tasks needed in order for learners to effectively and efficiently process the information received. Likewise, designers must consider the relevant learner characteristics that will promote or impede the cognitive processing of information. Blanton (1998) further elaborates that the implications of cognitive learning theory on instructional design should bear in mind that “the [instructional] goals should include learner needs and interest, reflect the concerns of society, and make every effort to insure that goals are focused at least toward the present and, hopefully, toward the future needs of the learner.” McLeod (2003) further explains that “Unlike behaviorism, which is environment-focused, cognitivism directs instructional designers to consider the learner as the focus of the design process. This does not inhibit the design of instruction in any way but merely shifts the focus of the design. In fact, a cognitivism learning perspective facilitates instructional design since it is grounded upon an objective view of knowledge transfer.” McLeod (2003) further concludes that “from the work of the cognitivist, Ausubel that “learning is meaningful only when it can be related to concepts that already exist in a person’s cognitive structure. Rote learning (behaviorism-based), on the other hand, does not become linked to a person’s cognitive structure and hence is easily forgotten.” Guey, Cheng & Shibata (2010) explains that “To facilitate students’ understanding (meaningful learning), teachers may present advanced organizers to the students at the beginning of instruction, as suggested by David Ausubel (1978). An advanced organizer is an instructional device in which what has been learned is combined with what is yet to be learned. Such meaningful learning can be inspiring to those teachers who do the most talking in a given instructional setting.” Isman (2011) concludes that “To store the information into long term memory, instructional activities are designed in the model. The cognitivist view of instructional design is construct new knowledge with their own experiences. Learner should learn how to think and how to learn to solve their learning problems. The role of instructor is to design meaningful experiences in learning environments. Designed meaningful experiences should motivate students to construct new knowledge in their long term memory. The role of students is to join discussions and collaboration activities.” Schunk (2012) confirms that “Teachers need to consider students’ thought processes in their lesson planning.”



To sum up, the following points represent a summary of the impact of cognitivism on instructional design:

- Hierarchy in presenting learning material: General –to- specific; simple-to- complex; bottom-to-top.
- Previous knowledge: must be there within the cognitive repertoire of the learner or else be established.
- Meaningful learning: happens when the new schema is linked the previous one.
- Subsumption theory: a learner absorbs new information by tying it to existing concepts and ideas that they have already acquired.
- Expository learning (deductive): teachers present material in a carefully organized, sequenced, and finished form.
- Cognitive objectives that describe higher levels of thinking.
- The importance of memory and attention.[organizing the content]
- Previous knowledge.
- Meaningful learning environment that goes with the cognitive system of the learner.
- Intrinsic factors [motivation, readiness, etc.] of the learner [analyzing the characteristics of the learner].
- Learner’s needs, interests, and community needs.

5.3 Constructivism and Instructional Design

Mergel (1998) confirms that “behaviorism is suitable to certain basic learning situations, whereas “quantum” constructivism is better suited to advanced learning situations.” Cobb & Bowers (1999) explain that “Constructivism highlights the interaction of persons and situations in the acquisition and refinement of skills and knowledge. Constructivism contrasts with conditioning theories that stress the influence of the environment on the person as well as with information processing theories that place the locus of learning within the mind with little attention to the context in which it occurs.” Isman, A. (2011) states that “constructivist view of instructional design is learning by doing. In other words, active learning is the hearth of constructivists’ instructional design process. For this reason, constructivists are interested in active process during learning activities. Learners should be active and use cognitive activity to construct new knowledge. During cognitive activity, learning environment is playing a key role to construct new knowledge. Learning environment must represent real life activities. In this environment, what is learned and how it is learned should be design together because how it is learned



depends on what is learned.” Abuzahra , Farrah & Zalloum (2016) conclude that constructivism is a “teaching and learning approach that is based on students' active participation in problem-solving and critical.” Spencer, Ferens ,Young Ferreira , Gibson , Osborne , Clarke Shortley & Rawson (2018) concludes that “Constructivism acknowledges learning as being a much more personal and social experience than the previous two learning theories.” Rossner-Merrill, Parker, Mamchur and Chu’s (1998, cited in McLeod, 2003) assure that “ Content can be presented from multiple perspectives using case studies, learners can develop and articulate new and individual representations of information, and active knowledge construction is promoted over passive transmission of information.” Krishnamoorthy, Prelatha, David & Manikam (2021) states that “In constructivism, the learner is in control over his or her own learning, owing to pose good problems, create group learning activities and guide the process of knowledge construction.” Schunk (2012) has found that “ Constructivism also has influenced educational thinking about curriculum and instruction. It underlies the emphasis on the integrated curriculum in which students study a topic from multiple perspectives. For example, in studying hot-air balloons, students might read about them, write about them, learn new vocabulary words, visit one (hands on experience), study the scientific principles involved, draw pictures of them, and learn songs about them.”Schunk (2012) also adds that “ Another constructivist assumption is that teachers should not teach in the traditional sense of delivering instruction to a group of students. Rather, they should structure situations such that learners become actively involved with content through manipulation of materials and social interaction. Activities include observing phenomena, collecting data, generating and testing hypotheses, and working collaboratively with others. Classes visit sites outside of the classroom. Teachers from different disciplines plan the curriculum together.” Schunk (2012) also concludes that “ The most straightforward recommendations are to involve students actively in their learning and to provide experiences that challenge their thinking and force them to rearrange their beliefs.”

Gagnon and Collay (2006, cited in Abuzahra, Farrah & Zalloum, 2016) describes that “constructivist approach which consists of six elements that must be considered while preparing a lesson plan. The elements focus on constructive activities that allow students to develop critical thinking towards the content learning material rather than teacher’s demonstrative behavior in the classroom.” McLeod, G. (2003) explains that “Instructional design considerations within a framework of constructivism begin with taking into account the learner’s prior knowledge, understandings, and interests. Boethel and Dimock (2000, p. 17) state, “Teachers must understand what learners bring to the learning situation and begin there in helping students build new knowledge.” Therefore, like cognitivism, constructivism begins with a thorough learner analysis and determination of appropriate tasks to promote constructivist learning.”Ertmer and Newby (1993, cited in Tam, 2000) elaborates that “according to the constructivist

perspective, learning is determined by the complex interplay among learners' existing knowledge, the social context, and the problem to be solved. Instruction, then refers to providing learners with a collaborative situation in which they have both the means and the opportunity to construct 'new and situationally-specific understandings by assembling prior knowledge from diverse sources.'

Tam (2000) concludes that "Constructivist instruction asks learners to use their knowledge to solve problems that are meaningful and realistically complex. The problems provide the context for the learners to apply their knowledge and to take ownership of their learning. Good problems are required to stimulate the exploration and reflection necessary for knowledge construction."

As Chung (1991, cited in Tam, 2000) assures that " a constructivist learning environment is characterized by (1) shared knowledge among teachers and students; (2) shared authority and responsibility among teachers and students; (3) the teacher's new role as guide in instruction; and (4) heterogeneous and small groupings of students."

Tam (2000) concludes that "Constructivist designers tend to avoid the breaking down of context into component parts as traditional instructional designers do, but are in favor of environments in which knowledge, skills, and complexity exist naturally. Hence, instead of adopting a linear and 'building-blocks' approach to instructional design, constructivist designers need to develop procedures for situations in which the instructional context plays a dominant part, and the instructional goals evolve as learning progresses." Willis (1995, cited in Tam, 2000) " offers an alternative model to the traditional Objective-Rational ID model. Willis termed it the Constructivist-Interpretivist Instructional Design Model, which has the following characteristics:

1. The design process is recursive, non-linear, and sometimes chaotic.
2. Planning is organic, developmental, reflective, and collaborative.
3. Objectives emerge from design and development work.
4. General ID experts do not exist.
5. Instruction emphasizes learning in meaningful contexts (the goal is personal understanding within meaningful contexts).
6. Formative evaluation is critical.
7. Subjective data may be the most valuable."

To sum up, the following points represent a summary of the impact of constructivism on instructional design:

- The design process is recursive, non-linear, and sometimes chaotic.
- Planning is organic, developmental, reflective, and collaborative.
- Objectives [no pre-stated objectives]-emerge from the design and the development of work.

- Instruction emphasizes learning in meaningful contexts [the goal is personal understanding within meaningful contexts].
- Formative evaluation is critical.
- The design of instruction should be subjective [learner-constructed], and not centrally objective.

6. Conclusions and recommendations:

In line with the objective of this study, and in reference to the available related literature, this study concludes that it is essential for the instructional designer to functionally anchor his design to the outcomes and findings of these three theories, namely, behaviorism, cognitivism, and constructivism; this study concludes that the three theories have completely agreed, though in different angles of vision, on the importance of considering the variables of the learning environment for the process of instructional design; this study concludes that objective-based instructional design, either behavioral objectives or learning objectives, should be considered as an important benchmark to shape the instructional design and as a tool to evaluate the whole process. This study concludes, based on the findings of three mentioned learning theories, that the instructional designer must consider balanced approach between a teacher-centered instructional design and a learner-centered one towards the roles of both the teacher and learner within the learning continuum; this study concludes, in accordance with the findings of the three mentioned learning theories, that the instructional designer must pay much attention to content of the learning material that needs a strict and calculated organization that goes with previously set goals and objectives, and, on the other hand, the cognitive variables of the learner; this study concludes that instructional designer must consider the previous knowledge of the learner, and describe methods to activate this previous knowledge or how to reinforce it; this study also concludes that it is important for the instructional designer to describe attention-grapping strategies, and methods of reinforcing the learner's memory.

Based on the findings of the three learning theories: behaviorism, cognitivism, and constructivism, and in accordance with conclusions of its conclusions, this study recommends that instructional designers must carefully analyze the external and internal conditions, of the elements of the educational process, which will enable those who are concerned in getting a comprehensive understanding towards the applicability of the instructional design, spotting the requirements and needs for an instructional design to be as flexible and practical as possible, and to predict setbacks and problems that would hinder the applicability of the instructional design; this study recommends that instructional designers must consider the finding of behaviorism, cognitivism, and constructivism, as mentioned above, in order to design reliable evaluation tools that can guarantee sustainability in education; this study recommends further research to investigate the effect of integrating digital technology on instructional design; this study also recommends that more research is needed to investigate the effect of other theories of learning on the instructional design.

7. References

- [1] Abuzahra, N., Farrah, M. A. H., & Zalloum, S. (2016). Using cartoon in language classroom from a constructivist point of view. *Arab World English Journal (AWEJ) Special Issue on CALL*, (3).
- [2] Al-Jarrah, T. M., Mansor, N., Talafhah, R. H., & Al-Jarrah, J. M. (2019). The application of metacognition, cognitivism, and constructivism in teaching writing skills. *European Journal of Foreign Language Teaching*. Alexandria, VA: American Society for Curriculum Development.
- [3] Booth, C. (2011). *Reflective teaching, effective learning: Instructional literacy for library educators*. American Library Association.
- [4] Brooks, J. G. and Brooks, M. G. (1993). In search of understanding: the case for constructivist classrooms,
- [5] Chung, J. (1991). Collaborative learning strategies: The design of instructional environments for the emerging new school. *Educational Technology*, 31 (6), 15-22.
- [6] Cobb, P., & Bowers, J. (1999). Cognitive and situated learning perspectives in theory and practice. *Educational researcher*, 28(2), 4-15.
- [7] Darwazeh, A. (2008). Adequacy and Consistency in Instructional Planning Processes as a Means for Evaluating and Developing Teacher's performance. *An-Najah University Journal for Research-B (Humanities)*, 22(2), 643-667.
- [8] Duffy, T. M. and Jonassen, D. H. (1991). New implications for instructional technology? *Educational*
- [9] Duval, E., Hodgins, W., Rehak, D., & Robson, R. (2003). Learning Objects 2003 Symposium: Lessons Learned, Questions Asked. In *Proceedings, Learning Objects 2003 Symposium*, Honolulu, HI, Association for the Advancement of Computing in Education, ISBN (pp. 380094-49).
- [10] Edgar, D. W. (2012). Learning theories and historical events affecting instructional design in education: Recitation literacy toward extraction literacy practices. *Sage Open*, 2(4), 2158244012462707.
- [11] Ertmer, P. A. and Newby, T. J. (1993). Behaviorism, cognitivism, and constructivism: comparing critical features from an instructional design perspective. *Performance Improvement Quarterly*, 6 (4), 50-72.
- [12] Ertmer, P. A., & Newby, T. J. (2013). Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly*, 26, 43– 71.
- [13] Gagnon, G. W., & Collay, M. (2005). *Constructivist learning design: Key questions for teaching to standards*. Corwin Press.
- [14] Guey, C. C., Cheng, Y. Y., & Shibata, S. (2010). A triarchal instruction model: integration of principles from Behaviorism, Cognitivism, and Humanism. *Procedia-Social and Behavioral Sciences*, 9, 105-118.
- [15] Guey, C. C., Talley, P. C., & Huang, L. J. (2011). A Translation Instruction Model from Behaviorism, Cognitivism, Social Constructivism and Humanism.
- [16] Isman, A. (2011). Instructional Design in Education: New Model. *Turkish Online Journal of Educational Technology-TOJET*, 10(1), 136-142.
- [17] Krishnamoorthy, R. R., Prelatha, R., David, T. K., & Manikam, M. K. (2021). THE IMPLEMENTATION OF BEHAVIORISM, CONSTRUCTIVISM AND INFORMATION

- PROCESSING THEORY IN INSTRUCTIONAL DESIGN PRACTICE ACTIVITIES–A REVIEW. *International Journal of Education and Pedagogy*, 3(2), 37-44.
- [18] Matthews, W. J. (2003). Constructivism in the classroom: Epistemology, history, and empirical evidence. *Teacher Education Quarterly*, 30(3), 51-64.
- [19] McLeod, G. (2003). Learning theory and instructional design. *learning matters*, 2(3), 35-43.
- [20] Mergel, B. (1998). *Instructional design and learning theory*.
- [21] Newby, T. J., Stepich, D. A., Lehman, J. D. and Russell, J. D. (1996). *Instructional technology for teaching and learning: designing instruction, integrating computers, and using media*,
- [22] Pandey, A. (2017, October 10). 3 traditional learning theories and how they can be used in eLearning. Retrieved from <https://www.eidesign.net/three-traditional-learning-theories/>
- [23] Phillips, D. C. (2000). Constructivism in Education: Opinions and Second Opinions on Controversial Issues. *Ninety-Ninth Yearbook of the National Society for the Study of Education*. University of Chicago Press, Order Dept., 11030 South Langley Avenue, Chicago, IL 60628.
- [24] Rice, M. L. and Wilson, E. K. (1999). How technology aids constructivism in the social studies classroom, <http://global.umi.com/pqdweb>.
- [25] Rice, M. L., & Wilson, E. K. (1999). How technology aids constructivism in the social studies classroom. *The Social Studies*, 90(1), 28-33.
- [26] Rossner-Merrill, V., Parker, D., Mamchur, C., & Chu, S. (1998). Using constructivist instructional design featured in two online courses: Notes from the field. *Education Media International*, 35(4), 282-288.
- [27] Runes, D. D. (1962). *Dict. of philosophy*, 15th ed., Paterson, NJ: Littlefield, Adams & Co.
- [28] Schunk, D. H. (2012). *Learning theories an educational perspective*. Pearson Education, Inc.
- [29] Schwartz, M. H. (2001). Teaching Law by Design: How Learning Theory and Instructional Design Can Infrom and Reform Law Teaching. *SAn diego L. rev.*, 38, 347.
- [30] Spencer, R., Ferens, M., Young Ferreira, H., Gibson, T., Osborne, D., Clarke Shortley, N., ... & Rawson, C. (2018). *Instruction and Pedagogy for Youth in Public Libraries*.
- [31] Tam, M. (2000). Constructivism, instructional design, and technology: Implications for transforming distance learning. *Journal of Educational Technology & Society*, 3(2), 50-60.
- [32] Tam, M. (2000). Knowledge-as-possession to knowledge-as-construction
- [33] Taylor, L. (2004). Educational theories and instructional design models. Their place in simulation. *Nursing Education and Research, Southern Health*, 1-6. *Technology*, 31 (3), 7-12.
- [34] Vygotsky, L. S. (1986). *Language and thought*, Cambridge, Mass.: MIT Press.
- [35] Wilson, B. G. (1997). Reflections on constructivism and instructional design. *Instructional development paradigms*, 63-80.
- [36] Yilmaz, K. (2011). The cognitive perspective on learning: Its theoretical underpinnings and implications for classroom practices. *Clearing House*, 84 (5), 204-212. [Original source: <https://studycrumb.com/alphabetizer>]