International Journal of Instruction *July 2012 ● Vol.5, No.2*
e-ISSN: 1308-1470 ● www.e-iji.net *p-ISSN: 1694-609X*

AN EPISTEMOLOGICAL GLANCE AT THE CONSTRUCTIVIST APPROACH: CONSTRUCTIVIST LEARNING IN DEWEY, PIAGET, AND MONTESSORI

Emel Ültanır
Prof., Mersin University, Educational Faculty, Educational Sciences, Turkey
emelultanir@yahoo.de

What people gain through sensation and cognition make up the individuals' experiences and knowledge. Individuals benefit from previous experiences when resolving problems. Knowledge is constructed from the meanings one attributes to nature and the environment. In theories, it means that constructers depend on observation and when directly translated, the theory has the meaning of observation. In other words, we construct our own reality with those belonging to our social circle. For us, there is the world and we can't disregard that; however, the relationship between us and the outside world is a joining as materialistic and structural as in a social environment. In this article, while the foundation of constructivism is being thoroughly analysed, Vico's ideas in the 18th century and the neurobiological studies of scientific knowledge have been utilized. In light of constructivist learning, Dewey's opinion on "Experience and Education", Piaget's cognitive schema theory in "cognitive development", and Montessori's ideas on "Decentring the Teacher" have been examined. Finally, the ideas of the three names on constructivist learning have been interpreted.

Key Words: *constructivism, knowledge in constructivism, some constructivist approachers, learning*

INTRODUCTION

Constructivism is an epistemology, a learning or meaning-making theory that offers an explanation of the nature of knowledge and how human beings learns. The real understanding is only constructed based on learners' previous experience and background knowledge. It maintains that individuals create or construct their own new understandings or knowledge through the interaction of what they already believe and the ideas, events, and activities with which they come into contact. The teacher is a guide, facilitator, and co-explorer who encourage learners to question, challenge and formulate their own ideas, opinions and conclusions (Ciot, 2009; Cannelle & Reif, 1994; Ismat, 1998;

Richardson, 1997). The main aim of this article is to examine the development of the constructivist theory of knowledge through history and later to emphasize the opinions of John Dewey, Jean Piaget and Maria Montessori's on constructivist learning, names who are among those who founded this particular theory.

What is Constructivism

The situation in which individuals perceive, interpret, and explain the same object differently despite the sensation can be approached to the constructivist approach. The meaning of constructivism varies according to one's perspective and position. Constructivism, to begin with, is not a social or educational theory; it is both a scientific and meta theory which defines the possibility and limitations of daily life theories in the formation of humanity. Constructivists are observers in a way observing reality being formed in daily life or in science. Some of the approaches on this particular issue can be found below: (Jones & Brader-Araje*, 2002)*.

"It is assumed that learners have to construct their own knowledge--individually and collectively. Each learner has a tool kit of concepts and skills with which he or she must construct knowledge to solve problems presented by the environment. The role of the community-- other learners and teacher-- is to provide the setting, pose the challenges, and offer the support that will encourage mathematical construction." (Davis, Maher, Noddings, 1990 p.3).

"Constructivism is not a theory about teaching…it is a theory about knowledge and learning… the theory defines knowledge as temporary, developmental, socially and culturally mediated, and thus, non-objective." (Brooks & Brooks, 1993 p vii)

"The central principles of this approach are that learners can only make sense of new situations in terms of their existing understanding. Learning involves an active process in which learners construct meaning by linking new ideas with their existing knowledge." (Naylor & Keogh, 1999, p.93)

> *"(C)onstructivists of different persuasion (hold a) commitment to the idea that the development of understanding requires active engagement on the part of the learner."* (Jenkins, 2000, p. 601).

One of the common threads of constructivism that runs across all these definitions is the idea that development of understanding requires the learner to actively engage in meaning-making. According to Glassersfeld (1995) "knowledge is not passively received but built up by the cognizing subject". Thus, constructivists shift the focus from knowledge as a product to knowing as

a process. The common core of constructivist theory is that we do not find knowledge, we construct it (Boghossion, 2006). From this point of view, the task of the educator is not to dispense knowledge but to provide students with opportunities and incentives to build it up (von Glassersfeld, 2005).

Following the definitions above, it is understood that the constructivism concept is a theory of knowledge and learning in which the individual generates his or her own knowledge, constructs knowledge in the process of tackling problems; the current meanings of learners connected with new ideas and for this reason as stated by von Glassersfeld knowledge as a process is a product of knowing.

Semantic Analysis of the Constructivist Theory of Knowledge

The foundation of the constructivist theory in teaching philosophy goes back to the idea of *`the only way of "knowing" a thing is to have made it`* by philosopher Giambattista Vico in the 18th century. The thesis of "De antiquissima Italorum sapientia" (1710) by Vico transmits the idea of *"thinking is not proofing; it is the writer's metaphysical"* on to the reader. As the idea of *"what is claimed in real life is real"* is not found satisfying by Vico, it was stated that*, God is the artificer of Nature, man the god of artifacts knowing is to know how to make, one knows a thing only when one can tell what components it consists of. Therefore, God alone can know the real world because he knows how and what he has created in it. In contrast, the human knower can know only what has constructed* .

In theories, it means that constructers depend on observation and when directly translated, the theory has the meaning of observation (Siebert, 2002). Therefore, a careful observer structures the problem and how to comprehend it himself or herself. This opinion states that each comprehension attempt of an individual creates a world of its own (Maturana & Varele, 1987). This way the individual begins to think that it is not possible to understand what reality is for sure, it is what he or she perceives. Our sensory organs (our cognition) and memory do not create unreal images. Instead, they create reality that aims for successful acts. Our experiences are for our own visual spectrum rather than space of the world. For this reason, we do not see the "colours" of the world; we see our own chromatic space and our own domain (Maturana & Varela, 1987). For instance, when we say 'the sky is blue', we mean 'the sky looks blue to us'.

Constructivist theorists believe that knowledge is a reflection of a representation, a portrait, or an objective world. Maturana & Varele, (1990) claim that "*The brain defines the world, it doesn't reflect it. Intelligence can be considered as an entrance capacity into the shared world.* When looking from

this perspective, cognitive constructivism is social constructivism at the same time. In other words, we construct our own reality with those belonging to our social circle. For us, there is the world and we cannot disregard that; however, the relationship between us and the outside world is a joining as materialistic and structural as in a social environment. Today's constructivists have the tendency to prove their points by utilizing unique and scientific models as opposed to traditional methods. For instance, in Hebb's neurophysiology theory, at a certain level of physiological analysis, there is no other fact other than the firing of simple neurons (Hebb, 1958).

According to von Foerster, sensory receptors (i.e., visual, auditory, tactual, etc.) send physically indistinguishable `stimuluses' to the cortex and that, therefore, the "sensory modalities" can be distinguished only by keeping track of the part of the body from which the responses come, and not on the basis of environmental features. In this regard, Foerster claims, "my nervous system does not, indeed, cannot, tell me what is out there, My nervous system cannot tell me anything because it is 'me': I am the activity of my nervous system, all my nervous system talks about is its own state of sensory-motor activity" (von Foerster, 1993). It is understood from the opinions of Hebb and Foerster that contemporary neurophysiological models may be compatible with constructivist theory of knowing. Glasserdfeld (1989), on the other hand, argues that contemporary neuro-psychio models may be compatible with the theory of constructivism.

Brain communication proceeds through interaction and joining of the content of the individuals' memory and knowledge. To exemplify this, when the phone rings, we have various hypotheses as to who the caller might be and why he may be calling. Also, when talking to someone, creating an internal monologue, we often complete that person's sentences. By doing so, we put the new idea that comes to our mind in connection with the communication association space of our brain. Therefore, what we hear is identified with what others say. Başar and Roth (1996) explain this with the idea that "cognitive activity of the brain is constructed through resonance of the efficiency of the neurons.

In neuro-biological and neuro-physiological studies, scientists define the world as it is in reality and face a modelling formed out of observation questions. In a sense, scientists see only as much as the research tools allow them to. Constructivism, on the other hand, uses the term 'reality' in an abstential and relative manner.

Jean Piaget and John Dewey are the two main contemporaries who developed the precise idea of what constructivism consists of. It can be said that constructivism has an interdisciplinary viewpoint making a distinction with

psychological, sociological, philosophical and critical educational theories. Constructivism, by recreating the learning and teaching theories of the past and present, has later been transformed into a role in which the intensive power of the teacher has been lifted, illuminating the learner as a significant part of the learning process.

REVIEW OF LITERATURE

A Child's Learning According to Selected Constructivist Approaches

Progressive Education versus Traditional Education (John Dewey 1859-1952)

Dewey was a major force for progressive education in the United States. He provided the philosophical impetus for the new developments who followed, such as Jean Piaget, Lev Vigotsky, Carl Rogers, and Abraham Maslow. While each of these individuals had their own perspective on human development, they shared a common belief with Dewey's progressive approach of education, the purpose of which, in regards to education, is facilitate the naturally developing tendencies and potential of the child (Matthews, W. J. 2003).

Epistemologically, according to Dewey, knowledge is never a representation of the reality. The relationship between knowledge and reality is a result of individual and social experiences. Knowing is not for humans to find and record reality, but rather is a process of them being a part of the reality. Therefore, knowledge is not external and objective reality but a process that includes the action itself. Making inferences out of experiences constructs the wrong and right about the world. Enriched experiences change people's perception of right (Bulut, 2006).

Dewey in his work entitled "Experience and Education" talks about his experiences gained at progressive schools. According to him, the history of the theory of education has been shaped by two opposing ideas. The first is that education is an internal development based on the student's natural talent. The opposing idea, on the other hand, argues that education is a process of external building, independent from talent or abilities. This process is one in which tendencies are lifted and replaced by the process of habits gained with the help of external interventions. Ideas that form the traditional education approach, however, are as follows (Dewey, 1998):

- *The subject and content of education*; is comprised of skills and knowledge useful in the past. The primary function of the school is to transfer these to a new generation.
- *Standards and rules of behavior;* the purpose of moral education is to develop habits which conform to these rules and standards.

- *The general form of school organization;* refers to the relationships between students with themselves and with their teachers. These are rules established for the classroom, curriculums, exams, advancement and class organization. Here, as it is seen, the traditional goal of education is to successfully provide students with a sense of responsibility and prepare students for life by providing students with supplementary information and acquired skills. The general attitudes of students should be well behaved, respectful and obedient. The transfer of knowledge and skills and additionally rules of behavior should be conducted through teachers. Traditional organizations rely on enforcement from both above and outside influences. Developing students should be forced to take small steps towards adapting to adult standards, topics and methods. In this sense, learning, books and the knowledge placed in the minds of older students begins to take hold.

Principles seen in progressive schools however are as follows: "Building the idea of individualist development instead of the idea of top-down forcing; embracing behavioral freedom (democracy) as opposed to practice external discipline; practicing active education instead of passive learning from teachers and texts; embracing the thought of learning to use skills and techniques as a means to achieve one's goal instead of isolated learning by practise; taking advantage of the current opportunities and benefiting from these in the best way possible, thus becoming acquainted with an ever changing world (societal needs), rather than focusing on stationary goals while preparing for a distant future" (Dewey, 1998; p. 22-23).

According to Dewey (1998), real education is achieved via experience, however not all experience is equally educational. In fact an experience may not be truly educational at all. Therefore, "experience and education" cannot be directly matched. The experiences which prevent the acquisition of alternative experiences may be counter-productive. This situation will limit the possibility of acquiring richer experiences in the future. Some experiences become so disjointed with one another that it becomes impossible to establish any link. Traditional schools can provide certain experiences for students; however, these experiences are mistakenly or wrongly connected to others. The principle of continual experiences is that every experience should acquire something from those that have come before it and in some way should change the attributes of those that follow it. In order for an instructor to see which direction an experience will lead, it is necessary for them to use it from the proper angle (Dewey, 1998). In addition to Dewey's thoughts, models and concepts which encourage critical thinking have been developed. With this goal in mind, Dewey has attached importance to the model of self-directed learning.

Self-Direction in Learning

Some of the most important developments in adult education over the past four decades have been in the area of self-directed learning. Although it emerged as a major topic during the 1970s and 1980s, the idea of self-directed learning-that is adults assuming control of their learning-is old as history (Merriam & Brockett, 1997). Kulich (1970) provides examples of self-directed learning in such historical figures as Socrates, Alexander the Great, Caesar, and Descartes.

There has been much discussion about what constitutes self-directed learning. Knowles (1975) determined self-directed learning in the context of the systematic process of designing such activities. The term refers to a process in which individuals take the lead "in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate strategies, and evaluating learning outcomes" (p.18). The need for self direction especially in 21st century classroom is underlined by the need for more of learner centred and less teacher dominated learning environment.

According to Dewey, active participation and self-direction by students are imperative and learner's experience and worldview are critical to problem-solving education. Dewey (1961) insists that the "contents of the child's experience" is more important than the "subject-matter of the curriculum" (p. 342). Dewey's belief in the learner's experience is tantamount to his belief in the need to foster self-direction as a way to self-realization of the learner, a way of recognizing the voice, dignity and highself concept of learner.

Jean Piaget and Developmental Psychology (1896-1980)

A brief version of his life story exemplifies this: his PhD was in biology, and his specialty was how organisms adapted to their environment. Piaget, was a well-known French Swiss developmental psychologist and theorists. Initially, he built his theories observing his own children as they learned and played together. He was not at all an educator, and he only wrote one book on teaching and pedagogy. His basic research problem was epistemological and philosophical: *What is the nature of knowledge? How does it grow and develop?* The nature of knowledge should, according to Piaget, be studied empirically where it actually is constructed and develops. This can be done either through the historical development of knowledge or may be studied in growth and development of an individual (Sjoberg, 2007). Piaget's main focus of constructivism has to do with the individual and how the individual constructs knowledge. Piaget's theory of cognitive constructivism proposes that

humans cannot be given information, which they immediately understand and use; instead humans must construct their own knowledge (Piaget, 1952).

A Theoretical Model of Cognitive Development (Scheme Theory)

Piaget (1977) designated, "My main purpose is to continually research biological adaptation mechanisms. These are the epistemological interpretations and analysis of higher adaptation format that can be clearly seen in scientific thinking". Despite following a completely biological approach, Piaget was a leader in this knowledge theory which was completely compatible with physicists. According to him, "Essential functions of the mind are formed by developing a foundation consisting of understanding and innovation and constructing reality" (Piaget, 1971, p. 27).

In 1937, Piaget published a book entitled, *La construction du reer chez I'enfant* (The Construction of reality in the Child) The core of this theory was summarized as follows in a conversation with Jean-Claude Bringuier: "I think that all structures are constructed and the basic picture of this formation and is that neither the structures developed nor those in the outside world are perceived as they are or organized in a person's mind" (quated Siebert, H. 2002, p.123).

The Concept of Adaptation

Piaget (1953, 1969) states that the development of a person's intelligence is forged through adaptation and organization. Adaptation is the process of assimilation and accommodation. According to Piaget (1953), assimilation is when children bring new knowledge to their own schemas and accommodation is when children have to change their schemas to "accommodate" the new information or knowledge. This adjustment process occurs when learning as one is processing new information to fit into what is already is one's memory (Powell, & Kalina, 2009).

In Piaget's contribution to constructivist theory, during a child's process of cognitive development they rely upon their perceptions. Piaget's basis of perception is composed of cognitive configuration and how knowledge is developed in a person. According to Piaget, a child's view of the world and decisions about reality is different than an adult's (Ülgen, 1997). Piaget thought that four main periods of development exist during the evolution of a child's mind. These are as follows:

i) Sensorimotor Stage: (from ages zero to two), in this stage children begin to discover their environment through their own senses and physical activity. For Piaget, a baby's cognitive development begins with a stage called "circular

reactions" during the first two years. Concepts of space and time, object permanence and causality as well as their relationship with one another are formed. Piaget presented an approximate model to demonstrate how these concepts are structured (Piaget 1937).

ii) Pre-operational Stage: (two to seven years old); in this stage there is "*symbolic function*". Images in children's minds can be created and they start symbolically depicting one thing as another. During this stage, language development is fast. Another sub-stage of "*intuitive thought*" is where children are able to describe, through classification, objects or thoughts and see relationships between them.

iii) Concrete Operational Stage (seven to eleven years old), children begin to replace intuitive thought with their own logical reasoning.

iv) Formal Operational Stage (eleven years old to adulthood) will start using higher levels of thinking or abstract ideas to solve problems. These stages mostly on the general aspects of the development of knowledge. He was not so much interested in education, let alone teaching or conditions for good and effective learning.

Piaget's opinions may help understand how the interaction between a child's learning and the world works if we look at his stages as a change from one level to another gradually as opposed to suddenly. Piaget's stages of development are all about the ability to learn at different ages in childhood based on logical development. His theory on assimilation and accommodation all have to do with the children's ability to construct cognitively or individually their new knowledge within their stages and resolve conflicts (Piaget, 1952). Recognizing that this process occurs within each individual student at a different rate helps the teacher facilitate constructivist learning. Piaget's cognitive constructivism theory incorporates the importance of understanding what each individual to get knowledge and learn at his or her own pace (Powell, & Kalina, 2009).

Maria Montessori (1870-1952)

Maria Montessori, the first woman admitted to practice medicine in Italy, is best known today for the educational program and thousands of schools worldwide employing it that bear her name. She developed the program through her work with children afflicted with various health disorders (Montessori, 1912). The success of her interactive curriculum led her to question the traditional classroom model of students immobilized at desk, trying and retrying rote task. Montessori's educational vision challenged this model, emphasizing instead

opportunities for student movement and interaction in a structured environment that supports children's natural curiosity. Careful planning of the environment facilitated both academic lessons and exercises in daily living, which included social skills, concern for health and hygiene and self-discipline (Hedeen, 2005).

In Montessori, the educational process is based on "self direction". In this environment, specially trained teachers accompany the child in a careful and respectful manner. Educators know that every child has sensitivity for a particular learning content at different sensitive phases. In a way appropriate to the individual's level of development and by sustaining a continuous learning process, an encouraging atmosphere is provided. A crucial aspect of the Montessori pedagogy is independent work. A child chooses what he wants to do as well as how long and with whom he wants to work. In being able to freely decide, a child develops the discipline that exists within. The Montessori pedagogy encourages creative problem solving skills. It encourages individual creativity when solving problems, teaches independence, and supports the development of self-control with the teacher assuming the role of a "facilitator". (Montessori, 1997).

Decentring the Teacher

It is not uncommon to hear a teacher or trainer speak of her or his role as a "facilitator". This concept represents a sharing of the power and responsibility in the room for when the instructor consciously removes herself/ himself from the "centre" of the room, students are empowered to exercise their volition and engage in learning activities that meet their interests. The great sign of success for a teacher is to be able to say, 'The children are now working as if I didn't exist' (Montessori, 1995, p.283). The decentralization of education removes the teacher privileged role of a teacher within a classroom and is compatible with the idea that the teacher is not an absolute authority on the course material. Instead, authority is shared so that students may engage and critique the education they are undertaking (Montessori, 1912, p.104-105).

Many of the outstanding aspects of her work: an environment conducive to both self-directed individual learning and cooperative group learning; the decentring of the teacher; and sequential, progressive skill development. Active participation in the classroom deserves special attention too, as Montessori has written: "The task of the educator lies in seeing that the child does not confound good with immobility and evil with activity (1912, p.93). The teacher is responsible for preparing the material and establishing the relationship between the children and their environment. The task of the teacher is to make the child the centre of learning. Within the specially prepared environment students are motivated and prepared for the cultural influences (Bunnag, Daugnvan, 2000).

As Montessori sought to support students' development of social and physical alongside those of traditional education (language, discipline), she created a curriculum to move from fundamental skills to more advanced ones (Hedeen, 2005, 189). The Montessori school environment is arranged according to subject area -- cooking, cleaning, gardening, art, caring for animals, library corner, etc. -- children always free to move around the room instead of staying at desks. There is no limit to how long a child can work on something she has chosen. At any one time in a day all subjects -- practical work, math, language, science, history, geography, art, music, etc. -- will be being studied, at all levels, by children of mixed ages learning from each other, facilitated by careful observation, individual lessons, record keeping, and help of the teacher (Montessori International Montessori Index).

The Constructivist Learning Environment of Dewey, Piaget and Montessori

A point stressed in the constructivist paradigm is that the learner occupies the top position rather than the teacher. The learner gains by interaction with his or her own environment, and in doing so understands his/her own characteristics and perspectives. The learner constructs his own designs and finds his own solutions to problems and behaves autonomous and independent. According to constructivists, learning is a result of individual meta construction.

For constructivists, learners are not passive receptors of knowledge provided by instructor. Instead, students construct meanings for concepts. As a result learning is best undertaken in 'real world contexts in which students may acquire and test concepts. The administration of constructivist class is democratic. Within a democratic class environment, the sharing of responsibility and decision making is emphasized. In general terms the implementation of a democratic classroom and a constructivist learning environment can be thus defined. (McNeil 1986; Dewey, 1961 and Rovai, 2003):

- *Instructional emphasis:* Knowledge construction an environment, which supports active and collaborative learning.
- *Classroom activities:* Learner centered, Socratic, authentic, individual and group work
- *Instructor roles:* Focuses on the student in learning, collaborator, facilitator, encourager, community builder,
- *Student roles:* Active, collaborator, constructor of knowledge, self monitoring.

We can see examples of this approach in the article used for children in a Montessori classroom environment "self-directed individual learning and cooperative group learning; the decentring of the teacher; and sequential, progressive skill development". It is important to indicate that some commonalities exist between our perspective on the nature of learning and the influence of John Dewey, Jean Piaget and Maria Montessori on the constructivist framework. According to Dewey (1938, 1966) the understanding of knowledge is composed of situations experienced in life. Furthermore, these situations are formed as a group of learners who configure knowledge thoroughly by settling in a social context, and as in classrooms, with the help of students being able to use materials effectively. Students can't learn by memorization; they can only learn by "directed living". As an obvious implication of Dewey's theory, students should be able to apply the concepts they are attempting to learn within meaningful activities.

John Dewey stressed the idea that the child own experience must be acknowledged as the heart of both the content and the process of education. Rejecting the division between the classroom and the "real world", he famously calls into question the idea that education is a form of preparation, in so far as preparation is characterized as a relation between some external and end that is judged to be worthwhile, and an activity whose value is entirely derivative upon serving that end. In Deweyan interpretation schools and classrooms must be real, genuine and meaningful for students, not by corresponding to something external which has these qualities, but by qualifying as forms of life in their own right. On this subject, Dewey's opinions are as follows: We always live at the time we live and not some other time, and only by extracting at each present time the full meaning of each present experience are we prepared for doing the same thing in the future. This is the only preparation which in the long run amounts to anything (Dewey, 1938, p.51).

Dewey emphasizes that the students have a "lived experience" of the real world, which ideally includes on a single continuum, her experience in the classroom as well as that beyond it. According to Dewey, the meaningfulness of a student's authentic experiences is part of what he means, where the meaning in question is constructed, not given, and transitional, not fixed. For Montessori, a student chooses what he wants to be involved with as well as how long and with whom. Freedom of decision immerses students within the discipline inherent within themselves. Montessori pedagogy encourages problem solving skills, and teaches independence. With his approach on the development of self-control, his ideas resemble those of Dewey stating that a child's own life and experiences are important in education as well as his encountering a real world environment in the classroom.

Piaget (1977) claims that learning occurs through the construction of meaning rather than through passive reception. According to Piaget, when a student encounters new information, he performs the functions of assimilation and adaptation. He compares this information with knowledge already existing in his mind. If the old information does not comply with the new, he reconfigures his mind with regards to the new information. When examined from this point of view, cognitive development is a product of continuous effort. A student's thinking skills develops with an increase in knowledge and intellectual ability. As a result, as new information that is newly acquired is created, it is affected by knowledge previously learned. (Maclin, Maclin and Solso, 2007).

According to Piaget (1973), the basis of learning is discovery. *"Understanding is the process of discovery or re-construction by re-discovery. In this regard, training as an individual and future individual creativity is important in the construction of knowledge."* According to Piaget, students should discover relationships and ideas through autonomous activities which catch their attention, conducted within the confines of classroom rules. It should be accepted that knowledge is achieved through the effective restructuring of the individual over time and not as "a passive copy of reality". According to him, "to copy an object is not to know it, instead knowing is establishing transformation systems on the object" (Piaget, 1971).

According to Dewey, education is connected to action. Knowledge and ideas are born through meaningful and important experiences for the learner. These situations, like the class used for mastery of the material, occur in social environments and in this fashion knowledge along with the community of learners is developed (Dewey, 2004).

CONCLUSION

In this article it has been moved towards understanding what the constructivist approach is, the epistemological basis the approach relies on, and how knowledge within the constructivist understanding is acquired. Later, the necessary theorists and practitioners of constructivism including Dewey, Piaget and Montessori as well as their perspectives and most striking thoughts and practices were examined.

In the production of knowledge within the constructivist approach, the building of a person's knowledge is emphasized. The knowledge that people have is related to their social and cultural content, as well as the media's recommended stage of life and life situations. In this way, knowledge is relative, temporary and dependent upon observation. Moreover, cognitive knowledge cannot be learned receptively but is a mixture of personal experience, emotions and

intuition. Learning requirements are born of a complex life and the rate of technical and social change. Lifelong learning is indispensible and can't be resisted.

It is stated that previously existing knowledge is understood to be a map of what can be done in light of one's experience instead of an indication of what existed. Constructivist theory necessitates a considerable change to general education practices. A sharpening of the distinction between teaching and learning, skill acquisition, patterns of action and understanding etc. will help to make the distinction. This then helps to enhance the illumination of the stated goals that teachers seek to reach. Despite there not being and question of the value of "Learning through memorization" and "repetition" in educational practice, it is naïve to expect them to create understanding. From a behavioural perspective, it is thought that the appropriate task of a teacher in the development of behaviour responses is to provide stimulation and reinforcement.

As a result, it can be said that some aspects of the pedagogy of Dewey, Piaget and Montessori share some commonality in regards to the knowledge learning process of a child. Each of them agrees that the acquisition of knowledge and learning is about constructing meaning as opposed to passive reception. An individual's process of developing new knowledge is affected by previously acquired knowledge. Maria Montessori and Dewey recommended new classroom models to replace traditional classrooms. According to Montessori, "emphasizing instead opportunities for student movement and interaction in a structured environment that supports children's natural curiosity". In addition, Montessori and Dewey suggest that learning is achieved through self directed learning. The teachers' task is to facilitate the child's learning and act as a guide. Decentring the teacher authority is shared so that students may engage and critique the education they are undertaking. Dewey refuses to acknowledge a difference between the democratic classroom and the real world. So emphasis on the students his/her experience in the classroom as well as "lived experience" of the real world.

REFERENCES

Basar, E., & Roth, G. (1996). *Ordnung aus dem Chaos: Kooperative Gehirnprozesse bei kognitiven Leistungen*. In: Küppers, G. (ed). *Chaos und Ordnung*. Stuttgart, 290-322.

Boghossion, P. (2006). Behaviorism, Constructivism, and Socratic Pedagogy., *Educational Philosophy and Theory,* 38, 4.

Brooks, J., & Brooks, M. (1993). *The case for the constructivist classrooms*. Alexandria, Va: ASCD.

Bulut, İ. (2006). *Yeni İlköğretim birinci kademe programlarının uygulamadaki etkililiğinin değerlendirilmesi*. Yayımlanmamış Doktora Tezi. Fırat Üniversitesi Sosyal Bilimler Enstitüsü Eğitim Bilimleri Ana Bilim Dalı.

Bunnag, D., (2000). Classroom Adaptation: A Case of study of a Montessori School. Issues in early childhood education: Curriculum, Teacher Education & Dissemination of Information, Proceedings of the Lilian Katez Symposium (Champaign, IL, PS 030-740.

Cannela, G. S., & Reif, J. C. (1994). Individual constructivist teacher education: Teachers as empowered learners. *Teacher Education Quarterly*.21 (3), 27-38. EJ 498 429.

Ciot, M. G. (2009). A Constructivist Approach to Educational Action's Structure. *Bulletin UASVM Horticulture*, 66 (2). Electronic ISSN 1843-5394.

Davis, R., Maher, C., & Noddings, N. (1990). *Introduction: Constructivist views on the teaching and learning of mathematics.* In R. Davis, C. Maher, & N. Noddings (Eds.) Constructivist views on the teaching and learning of mathematics (pp.7-18). Reston, Va: National Council of Teachers of Mathematics.

Dewey, J. (1938). *Experience and education*.New York: Collier.

Dewey, J. (1961). *John Dewey on education (selected writings)*. London: Macmillan Publishers.

Dewey, John. (1966). *Democracy and Education*. New York: Free Press.

Dewey, J. (1998). *Experience and Education*. The 60th. Anniversary Edition., Lecture Part. Kappa Delta Pi, International Honor Society in Education.

Dewey, J. (2004). *Demokratie und Erziehung. Eine Einleitung die philosophishe Padagogik,* (Hrsg.: Jürgen Oelkers), Beltz Tashenbuch, Weinheim

Foerster, H. von (1993). *Wissen und Gewissen*. Frankfurt: Suhrkamp.

Glasersfeld, E. von (1989) "Cognition, Construction of Knowledge and Teaching". *Synthese,* 80 (1).

Glasersfeld, E. von (1995). *Radical constructivism: A way of knowing and learning.* Washington, DC: Falmer.

Glasersfeld, E. von (2005). Introduction: Aspects of constructivism, in: C.T. Fosnot (ed.), *Constructivism: Theory, Perspectives and Practice (2 nd. ed) (*New York Teachers College, Columbia University).

Golding, C. (2007). Pragmatism, constructivism and Socratic objectivitiy: The pragmatist epistemic aim of Philosophy for Children. Conference Presentation. *Philosophy of Education Society of Australia.*

Hebb, D.O. (1958). *Alice in Wonderland or Psychology among the Biological Sciences*, in Harlow & Woolsey (eds.), Biological and Biochemical Bases of Behavior, University of Wisconsin Press, Madison, pp.451–467.

Hedeen, T. (2005). *Dialogue and Democracy, Community and Capacity: Lessons for Conflict Resolution Education from Montessori, Dewey and Freire*. *Coflict Resolution Quarterly,* 23 (2), 185-202.

Ismat, A. H. (1998). Constructivism in Teacher Education: Considerations for Those Who Would Link Practice to Theory. ERIC Digest, (Internet source, available at< www. ericdigests.org/1999-3/theory.htm>accesed on 22th. Of June 2009>)

Kılıç, G. (2001). "Oluşturmacı Fen Öğretimi**"**. *Kuram ve Uygulamada Eğitim Bilimleri.* İstanbul. Alemdar Ofset. Sayı: 1, sf: 7-22.

Knowles, M.S. (1975). *Self-directed learning*. New York: Association Press.

Kulich, J. (1970). *An historical overwiew of the adult self-learner*. Paper presented at the Northwest Institute Conference on Independent Study: The adult as self-learner. University of British Colombia, Vancouver.

Lipman, M., Sharp, A. M., & Oscanyan, F. (1980). Philosophy in the classroom (2nd.ed) (Philadelphia: Temple University Press.).

Locke, J. (1690). *An essay concerning human understanding*.

Jenkins, E. W. (2000). Constructivism in school science education: Powerful model or the most dangerous intellectual tendency? *Science & Education*, 9, 599-610.

Johnson, T. (1993). Teaching as Translation: The Philosophical Dimention, In: M. Lipman (ed.). *Thinking Children and Education* (Iowa, Kendall/Hunt).

Jones, M.G. & Brader-Araje, L. (2002). Impact of Constructivism on Education: Language, Discourse, and Meaning. *American Communication Journal*, Vol. 5. Issue: 3, Spring.

Maclin, H. O., Maclin M. K. And ve Solso, L. R. (2007). *Cognitive Psychology* (Çev. Ayşe Ayçiçeği-Dinn). İstanbul Kitabevi.

Matthews, W. J. (2003). Constructivism in the Classroom: Epistemology, History, and Empirical Evidence. *Teacher Education Quarterly*, Summer.

Maturana, H. & Varele, F. (1987). *The tree of knowledge: Biological roots of human understanding*. Boston: Shambhala.

Maturana, H. & Varele, F. (1990). *Autopoesis and Cognition: The realization of the living*. Dordrecht: Reidel.

Mc Neil, L. (1986). *Contradictions of control: school structure and school knowledge.* New york: Routhledge.

Merriam, S. B. & Brockett, R. G. (1997). *The Profession and Practice of Adult Education. An Introduction*. Jossey- Bass. A Wiley Imprint. U.S.A.

Montessori, M. (1912). *The Montessori Method*. (A. E. George, trans). New York: Stokes.

Montessori, M.(1995). *The absorbend mind.* New York. Holt and Company. (Original work published , 1949).

Montessori, M. (1997). *Çocuk Eğitimi: Montessori Metodu* (Education for Child: Montessori Method). Çev. Güler Yücel, Özgür Yayınları, İstanbul.

Montessori, M. *Maria Montessori ve Eğitim Sistemi*. (http://montessoriokul.blogspot.com/2019/04/maria-montessori-v egitim-sistemi-html) accesed on 24th. of Nov. 2010.

http://www.montessori. edu-Montessori International Montessori Index. accessed on 24th. of Nov. 2010.

Naylor, S. & Keogh, B. (1999). Constructivism in classroom: Theory into practice. *Journal of Science Teacher Education,* 10, 93-106.

Piaget, J. (1936). *La naissance de I'intelligence chez I'enfant.* Geneva : Delachaux et Niestle.

Piaget, J. (1937). *La construction du reer chez I'enfant.* Geneva : Delachaux et Niestle.

Piaget, J. (1953). *To understand is to invent*. New York: Grossman (French: *Ou va I'education*?, 1948).

Piaget, J., & Inhelder, B. (1969). *The Psychology of the Child*, transl. H Weaver. New York: Basic Books.

Piaget, J. (1971). *Science of education and the psychology of the child*. New York: Viking Press (French: Psychologie et pedagogie, 1969). Sf. 27.

Piaget, J. (1976). *Le comportement, moteur de I'evolution*. Paris : Gallimard. Sf. 18. Piaget, J. (1977). Foreword. In J-C. Bringuier, *Conversations libres avec Jean Piaget*, Paris: Editions Laffont.

Piaget, J. (1980). *Cahier de la foundation archieves Jean Piagets,* Geneve: CIEG.

Powell, K. C. & Kalina, C.J. (2009). Cognitive and Social Constructivism: Developing Tools for an Effective Classroom. *Education*, 130, 2, p (241-250).

Richardson, V. (1997). *Constructivist teaching and teacher education: Theory and practice.* In: V. Richardson (Ed.), Constructivist Teacher Education: Building New Understandings (pp. 3-14). Washington, DC: Falmer Press.

Rovai, A.P. (2003). A constructivist approach to online college learning. *The Internet and Higher Education.* 7 (79-93). Elsevier Inc.

Siebert, H. (2002). "Constructivism". Bron, A., Schemman, M. (Eds). *Social Science Theories in Adult Education Research*. Munster, pp. 109-129.

Splitter, L., & Sharp, A. M. (1995). *Teaching for Better Thinking: The Classroom Community of Inquiry* (Melburne, ACER).

Sjoberg, S. (2007). Constructivism and learning. Invited contribution to Baker, E.; McGraw, B.& Peterson P. (Eds.). *International Encylopedia of education 3rd Edition*, Oxford: Elsevier (in print).

Ülgen, G. (1997). *Eğitim psikolojisi*. İstanbul. Alkım Yayıncılık.

Vico, G. (1710). *De antiquissima Italorum sapientia*. (With Italian translation by F.S.Pomodoro, Stamperia de' Classici Latini, Naples, 1858).