CONSTRUCTIVISM: A PARADIGM FOR TEACHING AND LEARNING

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Abstract: Constructivism represents one of the big ideas in education. Its implications for how teachers teach and learn to teach are enormous. If our efforts in reforming education for all students are to succeed, then we must focus on students. To date, a focus on student-centered learning may well be the most important contribution of constructivism. This article, therefore, discusses constructivism learning theory as a paradigm for teaching and learning. Constructivism is a learning theory found in psychology which explains how people might acquire knowledge and learn. It therefore has direct application to education. The theory suggests that humans construct knowledge and meaning from their experiences. Conceptual understanding of the theory was discussed as well as basic characteristics of constructivists learning environment. Seven pedagogical goals of constructivist learning environments and six benefits of constructivism were outlined in this article. Significant differences between traditional classroom and constructivist classroom were spelt out in a tabular form. Furthermore, principles of constructivism and several implications of constructivism for teaching and learning were reviewed. The study, therefore, concluded that teachers need to reflect on their practice in order to apply these ideas to their work and that constructivist teachers encourage students to constantly assess how the activity is helping them gain understanding.

Keywords: Constructivism, Learning theory, Paradigm, Teaching and Learning.

I.INTRODUCTION:

Education involves the process of the development and learning of the child on multiple dimensions, facilitated by the teacher, who is guided by a curriculum. Effective education is a process where the teacher, children and the schools involved and participated actively. An important restriction of education is that teachers cannot simply transmit knowledge to students, but students need to actively construct knowledge in their own minds. That is, they discover and transform information, check new information against old, and revise rules when they do not longer apply. This constructivist view of learning considers the learner as an active agent in the process of knowledge acquisition. Constructivist conceptions of learning have their historical roots in the work of Dewey (192 9), Bruner (1961), Vygotsky (1962), and Piaget (1980). Bednar, Cunningham, Duffy, and Perry (1992) and von Glasersfeld (1995) have proposed several implications of constructivist theory for instructional developers stressing that learning outcomes should focus on the

knowledge construction process and that learning goals should be determined from authentic tasks with specific objectives.

Similarly, **Von Glasersfeld (1995)** states that learning is not a stimulus-response phenomenon, but a process that requires self-regulation and the development of conceptual structures through reflection and abstraction. It is important to note, in this respect, that constructivism is embodied in numerous ways and that these different views share important overlaps, but also c obtain major differences. Constructivism is an approach to teaching and learning based on the premise that cognition (learning) is the result of "mental construction." In other words, students learn by fitting new information together with what they already know. Constructivists believe that learning is affected by the context in which an idea is taught as well as by students' beliefs and attitudes. Constructivism is a learning theory found in psychology which explains how people might acquire knowledge and learn. It therefore has direct application to education. The theory suggests that humans construct knowledge and meaning from their experiences. Constructivism is not a specific pedagogy. Piaget's theory of Constructivist learning has had wide ranging impact on learning theories and teaching methods in education and is an underlying theme of many education reform movements. Research support for constructivist teaching techniques has been mixed, with some research supporting these techniques and other research contradicting those results.

Driscoll (2000) explains that constructivist theory asserts that knowledge can only exist within the human mind, and that it does not have to match any real world reality. Learners will be constantly trying to derive their own personal mental model of the real world from their perceptions of that world. As they perceive each new experience, learners will continually update their own mental models to reflect the new information, and will, therefore, construct their own interpretation of reality.

According to **Jonassen (1994)**, constructivism is also often misconstrued as a learning theory that compels students to "reinvent the wheel." In fact, constructivism taps into and triggers the student's innate curiosity about the world and how things work. Students do not reinvent the wheel but, rather, attempt to understand how it turns, how it functions. They become engaged by applying their existing knowledge and real-world experience, learning to hypothesize, testing their theories, and ultimately drawing conclusions from their findings.

II. CONSTRUCTIVIST LEARNING THEORY:

As earlier indicated, Jean Piaget and Lev Semionovich Vygotsky are widely recognized as the most influential developmental psychologists in the 20th Century. Their study of cognitive development has provided the foundation for constructivist learning theory. Constructivists" theory believes that people develop their knowledge through active participation during learning. However, Piaget (1970, 1977) tells us that cognitive development is a product of the mind achieved through observation and experimentation, whereas Vygotsky (1978) views cognitive

development as a social process, achieved through interactions with other knowledgeable members of the culture. Piaget refers to his work as „cognitive" constructivism. Piaget's theory comprises two major elements: „ages" and „stages". According to him, these elements help predict what learners can and cannot understand at different ages and stages. Piaget's theory of cognitive development suggests that human beings are unable to automatically understand and utilize information that they have been given, because they need to „construct" their own knowledge through prior personal experiences so as to enable them create mental images. The primary role of the teacher in a constructivist environment, therefore, should be to provide the setting, pose the challenges, and offer the support that will motivate or encourage learners to create their own knowledge through their personal experiences (Lunenburg & Ornsteing, 2008; Rummel, 2008).

CONSTRUCTIVIST THEORIES

COGNITIVE CONSTRUCTIVISM (Jean Piaget)

CONCEPTS
- Schema
- Assimilation
- Accomodation
- Equilibration

PRINCIPLES
- Learning is an active rather than passive process.
- Learning should be whole, authentic and "real" to be effective.

SOCIAL CONSTRUCTIVISM (Lev Vygotsky)

Social Interaction

Psychological Tools
- Language

The More Knowledgeable Other (MKO)

The Zone of Proximal Development (ZPD)

Scaffolding
- Tutoring

Vygotsky refers to his work as „social" constructivism. Vygotsky"s theory is very similar to Piaget"s assumptions about how knowledge is created as well as how people learn, but Vygotsky places more importance on the social context of learning. In Piaget"s theory, the teacher plays a limited role, whereas in Vygotsky"s theory, the teacher plays an important role in learning. Learning activities in constructivist settings are characterized by active engagement, experiential learning, inquiry-based, problem–based learning, and collaboration with others. As a dispenser of knowledge, the teacher's role is to guide, facilitate, coach, provoke, and co-explore in ways that allow the learner to engage in critical and creative thinking, analysis and synthesis of ideas during the learning process as the teacher assumes the role of co-learner who encourage learners to question, challenge, and formulate their own ideas, opinions, and conclusions.

III. NEED OF CONSTRUCTIVISM:
The present article concentrates on providing an alternative pedagogy based on the principles of constructivism theory given by Piaget, Vygotsky and other theoreticians including psychologists and sociologists. If we accept constructivist theory, then we have to give up platonic and all subsequent realistic views of epistemology. We have to recognize that there is no such thing as knowledge "out there", independent of the knower but only knowledge we construct for

ourselves as we learn is the true knowledge. If we believe that knowledge consists of learning about the real world "out there", then the power of organizing and presenting the knowledge is passed on to the teacher who ultimately passes this on to the learner. In the process of disseminating knowledge to learners the teacher may use activities and opportunities to experiment but here the teacher is helping the learner to understand the world but don't ask the learner to construct his/her own world. He understanding of the difference between the world "out there" and the students own world helps a teacher to decide the type of pedagogy he will follow to create a constructivist classroom.

IV. BASIC CHARARCTERISTICS OF CONSTRUCTIVIST LEARNING:

Tam (2000) lists the following four basic characteristics of constructivist learning environments, which must be considered when implementing constructivist instructional strategies:

1) Knowledge will be shared between teachers and students.

 2) Teachers and students will share authority.

3) The teacher's role is one of a facilitator or guide.

 4) Learning groups will consist of small numbers of heterogeneous students.

According to **Audrey Gray**, the characteristics of a constructivist classroom are as follows:

The learners are actively involved

♣ The environment is democratic

♣ The activities are interactive and student-centered

♣ The teacher facilitates a process of learning in which

♣ Students are encouraged to be responsible and autonomous.

V. IMPLICATIONS OF CONSTRUCTIVISM FOR TEACHING AND LEARNING:

 Central to the tenet of constructivism is that learning is an active process. Information may be imposed, but understanding cannot be, for it must come from within. Constructivism requires a teacher to act as a facilitator whose main function is to help students become active participants in their learning and make meaningful connections between prior knowledge, new knowledge, and the processes involved in learning. **Brooks and Brooks (1993)** summarize a large segment of the literature on descriptions of „constructivist teachers". They conceive of a constructivist teacher as someone who will:

♣Encourage and accept student autonomy and initiative;

♣ Use a wide variety of materials, including raw data,

♣ Primary sources, and interactive materials and encourage students to use them; Inquire about students" understandings of concepts

♣ Before sharing his/her own understanding of those concepts; Encourage students to engage in dialogue with the

♣ Teacher and with one another; Encourage student inquiry by asking thoughtful, open-ended

♣ Questions and encourage students to ask questions to each other and seek elaboration of students" initial responses; Engage students in experiences that show contradictions

♣ To initial understandings and then encourage discussion; Provide time for students to construct relationships and

♣ Create metaphors; Assess students" understanding through application and

♣ Performance of open-structured tasks. Hence, from a constructivist perspective, the primary responsibility of the teacher is to create and maintain a collaborative problem-solving environment, where students are allowed to construct their own knowledge, and the teacher acts as a facilitator and guide.

VI. ROLE OF TEACHERS:

In the constructivist classroom, the teacher's role is to prompt and facilitate discussion. Thus, the teacher's main focus should be on guiding students by asking questions that will lead them to develop their own conclusions on the subject.

- encourage and accept student autonomy and initiative;
- use a wide variety of materials, including raw data,
- primary sources, and interactive materials and encourage students to use them;
- inquire about students" understandings of concepts before sharing his/her own understanding of thoseϖ concepts;
- Engage students in experiences that show contradictions to initial understandings and then encourageϖ discussion;
- provide time for students to construct relationships and create metaphors;
- Assess students" understanding through application and performance of open-structured tasks.

Following learning strategies can be used by the teachers to create constructivist learning environment:

- **Use of multimedia/teaching aids**
- **Scaffolding**
- **Case studies**

- **Role playing**
- **Story telling**
- **Group discussions/Group activities**
- **Probing questions**
- **Project based learning**
- **Use of learning strategies for social and emotional learning of students.**

VII.   DIFFERENCE   BETWEEN   TRADITIONAL   CLASSROOM   AND CONSTRUCTIVIST CLASSROOM:

In the constructivist classroom, the focus tends to shift from the teacher to the students. The classroom is no longer a place where the teacher ("expert") pours knowledge into passive students, who wait like empty vessels to be filled. In the constructivist model, the students are urged to b e actively involved in their own process of learning. The teacher functions more as a facilitator who coaches, mediates, prompts, and helps students develop and assess their understanding, and thereby their learning. And, in the constructivist classroom, both teacher and students think of knowledge not as inert factoids to be memorized, but as a dynamic, ever-changing view of the world we live in and the ability to successfully stretch and explore that view. The chart below compares the traditional classroom to the constructivist one. One can see significant differences in basic assumptions about knowledge, students, and learning.

Traditional Classroom	Constructivist Classroom
Curriculum begins with the parts of the whole. Emphasizes basic skills.	Curriculum emphasizes big concepts, beginning with the whole and expanding to include the parts.
Materials are primarily textbooks and workbooks.	Materials include primary sources of material and manipulative materials
Strict adherence to fixed curriculum is highly valued.	Pursuit of student questions and interests is valued.
Assessment is through testing, correct answers.	Assessment includes student works, observations, and points of view, as well as tests. Process is as important as product.
Knowledge is seen as inert	Knowledge is seen as dynamic, ever changing with our experiences
Students work primarily alone.	Students work primarily in groups.
Learning is based on repetition	Learning is interactive, building on what the student already knows.
Teacher's role is directive, rooted in authority.	Teacher's role is interactive, rooted in negotiation.

VIII. PRINCIPLES OF CONSTRUCTIVISM:

Constructivist teaching is based on recent research about the human brain and what is known about how learning occurs. **Caine and Caine (1991)** suggest that brain-compatible teaching is based on 12 principles:

1. The brain is a parallel processor. It simultaneously processes many different types of information, including thoughts, emotions, and cultural knowledge. Effective teaching employs a variety of learning strategies.

2. Learning engages the entire physiology. Teachers can't address just the intellect.

3. The search for meaning is innate. Effective teaching recognizes that meaning is personal and unique, and that students' understandings are based on their own unique experiences.

4. The search for meaning occurs through 'patterning'. Effective teaching connects isolated ideas and information with global concepts and themes.

5. Emotions are critical to patterning. Learning is influenced by emotions, feelings, and attitudes. 6. The brain processes parts and wholes simultaneously. People have difficulty learning when either parts or wholes are overlooked.

7. Learning involves both focused attention and peripheral perception . Learning is influenced by the environment, culture, and climate.

8. Learning always involves conscious and unconscious processes. Students need time to process 'how' as well as 'what' they've learned.

9. We have at least two different types of memory: a spatial memory system, and a set of systems for rote learning. Teaching that heavily emphasizes rote learning does not promote spatial, experienced learning and can inhibit understanding.

10. We understand and remember best when facts and skills are embedded in natural, spatial memory. Experiential learning is most effective.

11. Learning is enhanced by challenge and inhibited by threat. The classroom climate should be challenging but not threatening to students.

12. Each brain is unique. Teaching must be multifaceted to allow students to express preferences.

IX. BENEFITS OF CONSTRUCTIVISM:

1. Children learn more, and enjoy learning more when they are actively involved, rather than passive listeners.

2. Education works best when it concentrates on thinking and understanding, rather than on rote memorization. Constructivism concentrates on learning how to think and understand.

3. Constructivist learning is transferable. In constructivist classrooms, students create organizing principles that they can take with them to other learning settings.

4. Constructivism gives students ownership of what they learn, since learning is based on students' questions and explorations, and often the students have a hand in designing the assessments as well.

5. By grounding learning activities in an authentic, real-world context, constructivism stimulates and engages students. Students in constructivist classrooms learn to question things and to apply their natural curiosity to the world.

6. Constructivism promotes social and communication skills by creating a classroom environment that emphasizes collaboration and exchange of ideas. Students must learn how to articulate their ideas clearly as well as to collaborate on tasks effectively by sharing in group projects. Students must therefore exchange ideas and so must learn to "negotiate" with others and to evaluate their contributions in a socially acceptable manner. This is essential to success in the real world, since they will always be exposed to a variety of experiences in which they will have to cooperate and navigate among the ideas of others.

7. Constructivist assessment engages the students' initiatives and personal investments in their journals, research reports, physical models, and artistic representations. Engaging the creative instincts develops students' abilities to express knowledge through a variety of ways. The students are also more likely to retain and transfer the new knowledge to real life.

X. CONCLUSION:

The focus of education needs to be shifted from placing content in students' knowledge building. If the focus of studying could be turned from filling one's mind to producing knowledge products, students wouldn't need to concentrate on memorization and cramming for examinations. These knowledge products could be in form of essays, term papers, project reports, research papers, videos, posters, slides, portfolios, or whatever products that students might create. In classroom instruction there is a need of integration of formal, theoretical, practical and self-regulative knowledge.

However, in a traditional type of curriculum these different types of knowledge have been treated separately. One of the most important challenges to pedagogy is developing curricula and teaching methods so that true integration of formal, theoretical knowledge and more informal, practical, and self-regulative knowledge may be achieved. The aspect of assessment cannot be left untouched while talking of constructivism as constructivist learning requires an entirely different approach to assessment, an approach that is qualitative in nature. Authentic assessment based on real-life tasks and performance assessment requiring students to complete certain learning assignments represent this type of assessment. The emphasis is on students' learning process and on their meaning making as much as (or even more than) on the final

product. Constructivist teachers encourage students to constantly assess how the activity is helping them gain understanding. By questioning themselves and their strategies, students in the constructivist classroom ideally become "expert learners." This gives them ever-broadening tools to keep learning. With a well-planned classroom environment, the students learn **HOW TO LEARN**.

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