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## ROLE OF ICT IN CONSTRUCTIVIST TEACHING- LEARNING

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**ABSTRACT:** Constructivism is a new emerging approach of teaching and learning which is basically student centered approach. This approach is based on the premises that students create their own knowledge with the help of their previous knowledge, understanding, experience and mental cognition. In the present changing scenario of our society, it has been found that the educational paradigm has changed from teachers' centered to students' centered.

In the 21<sup>st</sup> century information society, Information and communication technology have become an important part in all aspects of life. In our educational settings, the role of ICT act as a catalyst in knowledge construction process. ICT always provides a wide platform to student for self- learning. But ICT has some limitations and challenges to play its role in knowledge construction process. By this paper researcher try to explore the concept of constructivist teaching –learning approach and highlights the various roles of ICT in knowledge construction process. This paper also attempt to find some limitations and key challenges of ICT's integration to constructivist teaching –learning.

**Index Terms** - Constructivist teaching- learning, ICT, Knowledge

### **INTRODUCTION:**

In the present modern era, we have seen rapid changes in various dimension of human life, as well as in the living standard of our communities. As our society have changed, peoples' necessity and views of the world are also subject to change. That's why our education system has shifted from teachers' centric to students' centric.

Constructivism is a child centered approach to teaching and learning which is based on the premise that learning is the outcomes of learner's mental construction." In other words, students construct new knowledge world by fitting new information together with what they already know. Constructivist school believes that learning is affected by the context in which an idea is taught as well as by students' beliefs, experiences and attitudes. According to constructivism, learning is a continuous process of new knowledge construction. (Kumar Lalit)

In the changing society, one of the major changes in education can be described as a general shift from teaching to learning. Paradigm shifts in education envisions a new type of learning system that demands ICT integration with pedagogy. And ICT integration has been developing at the global level. ICT has to be infused into pedagogy in such a way that its usages can improve learning. But there are some limitations and challenges by which role of ICT in constructivism become limited.

### **RATIONAL AND SIGNIFICANCE OF THE STUDY:**

In our present school system, traditional teaching is occurred in different schools which are teacher centered and authoritarian. In this type of teaching, teacher fill student's mind with layers of information considered as 'true knowledge' and student are expected to memorize this information and reproduce the same in the examinations. Most of the knowledge that students acquire at school is alien to their individual way of thinking and they fail to use this knowledge in solving day-to-day problem. Students find this kind of information loaded education stressful, boring and meaningless.

In the 21<sup>st</sup> century information society, parents and general people criticize the public schools and its classroom environments, arguing that they are not ready to meet learner's need and demands of the modern society. Some complain about current educational practices, raising questions about the inability of Indian students to perform creative thinking as well as problem solving tasks when compared to other advanced countries.

Now, this is the time to need an educational reform which must start with how student learn and how teachers teach, not with what students learn and what teachers teach. It is important to keep in one's mind that the construction of understanding is a core element in the highly complex process of teaching and learning underpinned by constructivist teaching.

Generally, it has been seen that in the present changing scenario, Information and communication technologies have made dynamic changes in our society. In last three decades, technology has dramatically changed every area of society and, every aspect of social and cultural lives. Tinio (2002), states the potentials of ICTs in increasing access and improving relevance and quality of education in developing countries. It is important to keep in mind that, ICT is playing a vital role in education. ICT has to be involved in pedagogy in such a way that its usage influenced learning of students positively. Therefore, we need to confirm the effectiveness of ICT in pedagogy especially in constructivist teaching- learning and to ascertain the limitations and key challenges of ICTs integration to constructivist teaching- learning.

### **OBJECTIVES OF THE STUDY:**

The specific objectives of the study are to:

- Explore the Constructivist teaching- learning approach.
- Ascertain the roles of ICT in Constructivist teaching- learning.
- Determine the limitations and key challenges of ICTs integration to Constructivist teaching- learning.

### **METHODOLOGY OF THE STUDY:**

This research is a descriptive study and qualitative in nature. This research study is conducted on the basis of secondary sources of data. Secondary data has been collected from several books, research articles published in journals and online resources etc.

### **OPERATIONAL DEFINITION OF KTERMS :-**

#### **Information and Communication Technology (ICT) –**

The term 'ICT' in education, Researcher means that all communication technologies like computer, internet, software, social network, video conferencing etc. are used to handle, create, disseminate, communicate and manage various information, facts for teaching- learning purpose which leave impacts on students' learning.

#### **Constructivist teaching- learning-**

The term 'Constructivist teaching- learning', Researcher means that a student-centered approach in which learners construct their own knowledge by actively participating in the learning process on the basis of their pre- existing knowledge, information and experiences i.e. with what they already know.

### **CONSTRUCTIVIST TEACHING- LEARNING APPROACH:**

Constructivist teaching is based on constructivist learning theory. Constructivist learning theory beliefs that all knowledge is constructed on the basis of prior knowledge, understandings and experiences. Children are not a blank slate and knowledge cannot be imparted without their knowledge making sense according to his or her current conceptions. Whenever children reach to school, they already have some their previous knowledge and personal understanding. Therefore, children learn best when they are allowed to construct new knowledge world with the help of their personal understanding, experiencing things and reflecting on those experiences.

In the constructivist teaching, the teachers are facilitator and their role is to prompt and facilitate learning process. In constructivist teaching, the teacher avoids to provide most direct instruction and always attempts to promote student's learning process through their questions and activities to discover, discuss, appreciate and verbalize the new knowledge. (Gray Audrey) The teacher as a facilitator has to create proper environment in the class so that the students are motivated, challenged and think deeply to arrive at his own conclusion. Thus, the teacher's main focus should be on guiding students by asking questions and implementing various activities that will lead them to develop their own conclusions on the particular topic. That's why, an important task for a constructivist teacher is to create a "learning environment" which facilitates students thinking and motivates them to explore. (Khan Shazli)

The theoretical framework of constructivist teaching holds that learning always builds upon that knowledge which is already known by students. Because all type of learning gets filtered through pre-existing knowledge. The accreditation of constructivist teaching is – learning is more effective when a student is actively engaged in the learning process rather than attempting to receive knowledge passively. (Wikipedia) Constructivist teaching fosters critical thinking and creates motivated and independent learners. Basically, constructivist theory beliefs that people construct their own understanding and knowledge of the world through pre-existing knowledge, understanding, experiencing things and its reflection on those experiences. (Giesen Janet)

In the changing educational scenario, curricula and teaching methods are also changed. We found that curricula are changing from the transmission curriculum to a transactional curriculum. In a transmission curriculum, a teacher transmits information to students who passively listen and acquire facts. In a transactional curriculum, students are actively involved in their learning to reach new ideas, understandings.

On the basis of significances of this approach, NCERT emphasized on constructivism in National Curriculum Framework (NCF)-2005. NCF-2005 recommends a paradigm shift from rote memory to learning by understanding. Considering the changing needs of the learners and society, NCF-2005 emphasized to accept "Learner centered approach" i.e., "Constructivist approach" to achieve required target of our education.

### **CONSTRUCTIVISM AND ICT:**

There is a wide consensus in education that learning is the result of transmission of knowledge. In the present era, it has been seen that pedagogical strategies employed in ICT based learning are linked to Constructivism paradigm.

According to Constructivism, knowledge is considered to be socially and individually constructed. In constructivist learning, learners are not passive receiver of knowledge but are always active participant in the creation of knowledge and meaning. So, the focus of the teaching- learning should be always to prepare such environment in which knowledge are not transformed, rather students will be able to construct new knowledge.

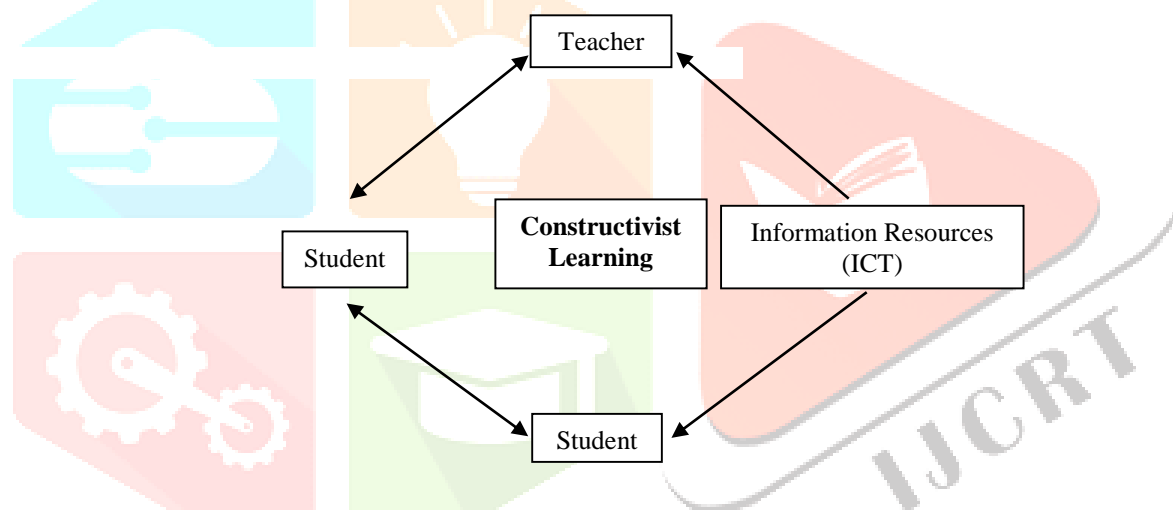
Due to such educational demand of our society, ICT is an useful medium which can help to promote constructivist innovations in teaching- learning process. ICT is the best possible visualization medium of constructivist learning theory. It helps the learners to learn with the absence of the teachers. The ICT based learning programs and activities are underpinned by constructivist learning approach. It allows active participation of learners in learning process by helping learner to adopt new situation, to explore new information, knowledge and to practice new experiences. By learning computer programming, students learn how to think and learn for themselves i.e way of knowledge construction.

### **ROLE OF ICT IN CONSTRUCTIVIST TEACHING- LEARNING:**

A shift from teacher centered education to learner centered education in which learners guide his own learning, is needed to enable students to acquire new 21<sup>st</sup> century knowledge, skills and technologies. ICT is one of the technologies which have penetrated every area of education and constitutes a shift from teacher centered to student centered pedagogy. It has been observed that ICT is influencing the learning of students. ICT decreases memorization and rote learning while increases learning with longer retention and increased performance. It is important to keep in mind that ICT alone does not produce learning; rather it is a tool that can be used in many ways to enhance construction of knowledge.

For Constructivist learning, it is essential that there should be more opportunities for student participation in learning process, more team work, more self-study, self-evaluation as well as peer evaluation, and less examination-oriented teaching-learning. ICT encourages small group activities of learners by which it promotes interaction and cooperation among students. It is felt that ICTs can assist in promoting constructivist learning. It also increases critical thinking for learners.

Hypertext and the Internet have provided learners with huge quantities of information to explore new knowledge. ICT in the form of various program activities and devices such as i-pads, tablets, mobile, flat screen etc. allow for greater engagement with more fun and play. The information found by learners on the Internet becomes knowledge only when it is interpreted and processed by the human brain. This can be facilitated through a constructivist approach where the teacher provides guidance and motivation to self-learning. Word processing applications, presentation software and Internet all provide tools for students to help in project work. In social constructivist approach, use of electronic mail and computer-mediated communication (CMC) provide opportunities for collaborative learning-based teaching. Due to the integration of ICT, the relationship of teacher and student in constructivist learning has changed, which is shown below-



Now it is cleared that, ICT is an eminent tool to assist in promoting Constructivist teaching- learning. ICT provide different information resources to teachers and students in construction of knowledge. In Constructivist teaching- learning, ICT not only supply information rather make the learning easier and faster. Moreover, it develops self-study habit in students which is important in knowledge construction process.

In the light of above discussion, role of ICT can be understood in the following heads-

- ICT as a medium for teaching and learning. This refers to ICT as a tool for teaching and learning itself, the medium through which teachers can teach and learners can learn. It appears in many different forms such as drill and practice exercises, in simulations and educational networks.
- ICT as an 'assisting tool'. ICT is used as a tool when students do self-study.
- ICT encourages activities in small groups of learners, also pace of these activities are determined by learners.
- ICT encourages interaction and cooperation among students and teachers.
- ICT enhances integrative learning that is transforming theories to practice.
- ICT provide greater opportunity for teacher-to-teacher and student-to-student communication and collaboration.
- ICT provide additional resources to assist constructivist learning.
- ICT provide teachers with new sources of information and knowledge to promote constructivist teaching effectively.
- ICT create greater enthusiasm for Constructivist learning amongst students.

### **LIMITATIONS OF ICT USE:**

ICT as a modern technology that simplifies and facilitates human activities is not only lucrative in many respects, but also has many limitations. Actually, many conditions are considered as limitations of ICT use in Constructivist teaching-learning. The limitations can be categorized as teacher related, student related, and technology related. And all of them potentially limit the benefits of ICT to Constructivist teaching- learning.

Teachers' attitude plays an eminent role in teaching- learning process. Furthermore, teachers' attitude towards use of ICT is vital; many observations reveal that teachers do not have clarity about how far technology can be beneficial for the facilitation and enhancement of learning. Generally, some teachers may have positive attitudes to the information technology, but desist from using it in teaching process due to low computer self-efficacy and tendency to consider themselves not qualified to teach with technology. Moreover, as identified by Brosnan (2001), attitude, motivation, computer anxiety, and computer self-efficacy are factors affecting teachers' use of technology in their teaching. Teacher resistance and lack of enthusiasm to use ICT in education may also be another limitation.

On the other hand, the limitation of ICT use in education is related to student behavior. Students tend to misuse the technology for leisure time activities and have less time to learn and study due to misuse the technology for leisure time activities. The various literature in the area, identify the following limitations of ICT use in education as related to student behavior: -

- Computers limit students' imaginations,
- Over-dependency on ICT limits student's critical thinking and analytical skills,
- Students often have only a superficial understanding of the information they download,
- Information provided by internet has less reliability than other authentic resource,
- Students may be easily distracted from their learning and may visit unwanted sites,
- Students tend to neglect learning resources like library other than the computer and internet,
- Students tend to focus on superficial presentations and copying from the internet,
- Students have less opportunity to use oral skill and hand writing skill,
- Use of ICT may be difficult for weaker students. There are some difficulties to use of ICT, because they may have

major problems with working independently and always need more support from the teacher. (Mikre Fisseha)

Another limitation of ICT use in education is technology related in which the high cost of the technology and its maintenance, high cost of spare parts, virus attack of software and the computer, interruptions of internet connections, and poor supply of electric power are major technology related limitations of ICT use in education.

### **CHALLENGES OF ICTs INTEGRATION IN CONSTRUCTIVIST TEACHING- LEARNING:**

The integration of ICTs in education systems may face various challenges with respect to planning, infrastructure, learning content and language, capacity building and financing. The key challenges of ICTs integration in constructivist teaching- learning can be understood in the following points mentioned bellow-

- ❖ There is a big lack of well qualified professional of ICT.
- ❖ ICT devices are more expensive.
- ❖ Syllabus is out of date with respect to the evolution of technologies.
- ❖ There is shortage of well-developed infrastructure like shortage of electricity supply and telephone lines, lack of appropriate rooms and buildings, lack of different types of ICTs, etc.
- ❖ Generally English is the dominant language in most of educational software, while English proficiency is not high in every areas of our country. This is one impeding factor in the integration of ICT to constructivist teaching- learning.
- ❖ Financing is another great challenge. ICTs in education programs require large capital investment but there is less investment in this segment.
- ❖ Poor implementation of government policy in our country.

Overcoming the mentioned challenges may help constructivist teaching- learning and promote to make learning easier and faster.

### **CONCLUSION**

The present paper has tried to develop different ideas about role of ICT in constructivist teaching- learning. At the last, this paper concludes that-

- In the present scenario, Information communication technologies are influencing all aspects of life including education. They are promoting learning style, learning environment, pedagogy, handling and exchanging of information, teaching-learning approaches and so on.
- Education is one of the important area in which the impacts of ICT is significant. ICTs are making major differences in the ways, teacher are teaching and the ways, students are learning. ICT-enhanced learning environment which facilitates learning pattern to make more active, collaborative, creative, integrative, and evaluative. In other words, ICT is becoming more appropriate in the realization and implementation of the emerging pedagogy of constructivism that gives greater responsibility of learning for students.
- Constructivist teaching- learning approach is a student centered approach in which students are actively involved in knowledge generation process on the basis of their mental cognition.
- In the context of present global competitive era, it is important to keep in your mind that knowledge constructed through constructivist learning play vital role in facing these competitive situations. This teaching- learning approach make student more active, curious, creative and so on. Due to this there is a no. of good habits developed in students like self-study, critical thinking, judgment power, knowledge searching etc. That's why; students' role in teaching- learning process is changed from passive listener to active knowledge creator.



- Now a day's ICT has become one of the potential tool which promotes constructivist teaching- learning. ICT provides information, facts and knowledge which assists to develop constructivist learning habit in students.

Moreover, there are some limitations and challenges of ICTs integration in constructivism, rather than ICT influence constructivist teaching- learning approach positively.

### **RECOMMENDATIONS:**

Adopting Constructivist teaching- learning approach has become an eminent demand of present competitive time. That's why; NCF-2005 also recommends accepting constructivist teaching for betterment of our education. Furthermore, ICTs integration in this approach makes learning faster, affective, easier and more stable. So, it is too important to keep more attention to integrate ICTs in constructivism in the following context-

- ❖ Government should step out for implementing constructivist teaching- learning not only on paper work, rather in field work.
- ❖ Government should invest more in ICTs development.
- ❖ Infrastructure for ICT should be developed.
- ❖ Government should train more qualified teachers to use ICT in constructivist teaching- learning.
- ❖ Government should manage ICT devices and software at low price as possible that everyone could be access ICT.
- ❖ Syllabus of courses should be changed in such a manner that evolution of ICT can be possible in constructivist teaching- learning.
- ❖ Education policy makers, educators and other concerned should recognize and evaluate the roles of ICT in constructivist teaching- learning in order to effective functioning of this technology in teaching- learning process.
- ❖ School management should develop physical and human resources to assist the use of ICT in constructivist teaching- learning.
- ❖ Teachers should always provide constructivist learning environment to students and to motivate them to construct their knowledge with the use of ICT.
- ❖ Society and parents should also develop an environment wherein learners are motivated to inculcate the constructive learning through ICT use.

Now, it can be said that ICT with constructivism is a very useful new trend in education. And it is very important to overcome the limitations and challenges ahead ICTs integration in education, so as to role of ICTs in constructivist teaching- learning can be potentially increased. Researcher may conclude that ICTs enhance the quality of education in several ways by using learners' motivation and active engagement. ICTs are transformational tools which can promote the shift to a learner centered environment.

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