RESEARCH ARTICLE

JOELL
Veda Publications

CONSTRUCTIVISM AND ITS ROLE IN EDUCATIONAL TECHNOLOGY

Dr Shibu Simon

(Professor and Head, Faculty of English, National Defence Academy (NDA),Pune – 411 023)

ABSTRACT

Today, teaching and learning have moved from instructivism to constructivism. Constructivism demands more effective use of Information and Communication Technology. But in order to achieve this, certain strategic changes have to be brought about in the style adopted in the usage of Information and Communication Technology (ICT) at present. This paper attempts to suggest strategies and changes to be made in the field of Education where ICT is incorporated.

Keywords*: Instruction, Communication, technology, Constructivism*

INTRODUCTION

The *NCF* (NCERT's National Curriculum Framework *2005*) *Position Paper*[1] prepared by 'National Focus Group' defines Educational Technology (ET) as "the efficient organisation of any learning system adapting or adopting methods, processes, and products to serve identified educational goals" ("Summary" V). Januszewski and Molenda quote the words of Mc Luhan and Fiore from their book *The Medium Is the Message* (1967) on new technologies:

Technology is reshaping and restructuring patterns of social inter-dependence and every aspect of our personal life. It is forcing us to reconsider and re-evaluate practically every thought, every action and every institution formerly taken for granted. Everything is changing - you, your family, your neighbourhood, your education, your job, your government, your relation to others. And they're changing dramatically (Januszewski and Molenda, *Educational Technology* I8).

Information and Communication Technology (ICT) has brought in a convergence of the media along with the possibilities of multi-centric participation in the content generation and dissemination process. This has implications not only for the quality of the interchange but also for drastic upheavals of centre-dominated mindsets that have inhibited qualitative improvement. Modern ET has its potential in schools, in the teaching of subjects, in examinations, in research, in systematic reforms, and, above all, in teacher education, overcoming the conventional problems of scale and reach through online anytime, anywhere (*NCF* V).

It is difficult to define the concept of 'technology' in a single sentence. Even the historical process which reflects the interface between man and his perception of the environment can be called 'technology'. According to Hooper and Reilber (1998), "Technology, by definition, applies current knowledge for some useful purpose. Therefore, technology uses evolving knowledge to adapt and improve the system to which the knowledge applies"

("Teaching with Technology" 154). Schumacher in his article "Technology with a Human Face" speaks about the importance of Science and Technology in education. To him, "Modern world has been shaped by its metaphysics, which has shaped its education, which in turn has brought forth its science and technology" (1). It is irrefutable that modern world has been shaped by technology and education and both are inter-connected in an ICT age.

The most talked about learning perspective of the past decade has been labelled constructivism. The label itself is most closely identified with the self-educated philosopher, logician, linguist and cognitive theorist Ernst Von Glassersfeld (1984) as he attempted to construct an epistemology, a theory of knowing, in which the "experiential world is constituted and structured by the knower's own ways and means of perceiving and conceiving, and in this elementary sense it is always and irrevocably subjective" (qtd. in Januszweski and Molenda 32).

While introducing constructivism to the ET audience in North America, Bednar et.al (1991) did not refer to Von Glassersfeld as a source for a 'new epistemology'. Duffy and Jonassen (1992) used 'constructivism' as an umbrella term for a wide range of ideas drawn primarily from recent developments in Cognitive Psychology. Piaget and Vygotsky are also usually cited as formative influences on the development of this perspective. Vygotsky observed that children's mental abilities are developed through their social interactions with their parents and other adults. Because of the importance of social and cultural influences in his theory, it is termed a socio-cultural approach to learning and the branch that follows this theory is often termed 'social constructivism' (32).

An analysis of 'constructivist didactics' by Terhart (2003) attempted to find out which elements of constructivist didactic theory are dependent on a new paradigm. Terhart concluded that constructivist didactics really does not have any genuine new ideas to offer to the praxis of teaching; rather it recommends the well-known teaching methods and arrangement of Self-Directed Learning (SDL), Discovery Learning (DL), Practical Learning (PL), and Cooperative Learning (CL) in groups (Terhart, "Constructivism and Teaching" 42).

Whereas Drisscoll (2005) concludes that "there is no single constructivist theory of instruction" (386), Terhart cites that 'knowledge is constructed by learners as they attempt to make sense of their experiences" (387). Drisscoll's social negotiation (derived from Vygotsky) is represented in collaborative learning which supported Computer Supported Collaborative Learning (CSCL). The description of EL includes that students are explorers, teachers' cognitive apprentices, producers of knowledge and directors and managers of their own learning. Teachers are facilitators, guides, and co-learners; they seek professional growth, design curriculum, and conduct research.

APPLICATION OF THEORIES OF LEARNING IN ICT AND ELT

Today, teaching and learning have moved from instructivism to constructivism. Constructivism demands more effective use of Information and Communication Technology. But in order to achieve this, certain strategic changes have to be brought about in the style adopted in the usage of ICT at present. Sivarajan, Shanavas and Aboobacker (42) suggest the following changes to be made in the field of Education where ICT is incorporated:

(i) the existing practice of using ICT to deliver and control instruction has to be modified to support the learner's creation of knowledge, investigation and thinking,

(ii) schools have to move away from the over-emphasis now being given to linear and programmed instruction to non-linear and hypertext views of learning,

(iii) ICT has considerable potential to catch the tentative nature of knowledge in constructivism, as the use of ICT involves drafting and re-drafting, editing and selecting, making connections and reflecting,

(iv) ICT can provide for situated learning, metacognition, higher order thinking and a social basis for learning,

(v) ICT helps breaking the subject boundaries and provides for the development of project-based, real-world ('authentic') learning and authentic assessment, and

(vi) ICT provides for student-centred learning and intrinsic motivation.

The effective use of ICT is to access, adapt, and create knowledge. Moreover, ICT provides various resources such as physical, digital, human and social.

The figure below shows the effective use of ICT in Education:

Fig. Effective use of ICT in Education

Neither the teacher nor the text book is the repository of all knowledge; the Internet is an embodiment of, and medium for, the practice of constructivism. This is because it is an expanding store of accessible information and it requires students to evaluate and select relevant information and to select their own pathways for learning. Student-centred learning is a natural consequence of Internet usage and is therefore a significant feature of ICT usage in Education.

Robinson, Molenda and Rezabek in their article titled "Facilitating Learning" (Januszweski and Molenda, *Educational Technology*) claim that different theories of learning can naturally lead to instructional theories that offer guidance for different sorts of learning goals. The theories do not necessarily contradict each other; rather, some explain certain phenomena better than others (38). Ertmer and Newby (68-69) suggest one such fairly simple formula for combining the theoretical perspectives discussed here:

Employ the behaviourist perspective in situations in which learners have lower levels of task knowledge and for learning goals requiring lower cognitive processing. Use the cognitivist perspective for middle levels of task knowledge and cognitive processing; and consider the constructivist perspective for situations in which learners have a

higher level of prior knowledge and are working on higher level tasks, such as complex problem solving in ill-structured domains.

Since late 1990's, an umbrella under which the different perspectives, especially cognitivist and constructivist, converge is called learner-centred education. This concept gained wide credibility when it was endorsed by the APA Board of Educational Affairs[2] (1995) in the form of 14 principles (http://www.apa.org/ed/lcp14.html) and these principles addressed cognitive and metacognitive, affective and motivational, developmental, social, and individual differences factors. They were 'learner-centred' principles which played a major role in shaping the discussion about how to facilitate learning early in the 21st century (Januszweski and Molenda 38).

NOTES

[1] National Curriculum Framework (NCF) - 2005 Position Paper: It is a remarkable process of social deliberation initiated by NCERT to focus public attention on what should be taught to our school children and how. The members of 'National Focus Group on Educational Technology' presented their deliberations and these were published by NCERT as a position paper on ET in December 2006.

[2] APA Board of Educational Affairs (1995): In December 1995, the American Psychological Association's Board of Educational Affairs circulated a draft of its 'Learner-centred Psychological Principles: A Framework for School Redesign and Reform'. The revision was prepared by a work group of the American Psychological Association's Board of Educational Affairs [BEA]. The document was met with both praise and criticism (http://www.apa.org/ed/Icp14.html).

WORKS CITED

[1] Association for Educational Communications and Technology (AECT). *The Definition of Educational Technology*. Washington DC: Author, 1977. *Google Book Search.* Web. 15 Dec. 2009.

[2] Bednar, A. K., Cunningham, D., and Duffy, T. M. "Theory into Practice: How Do We Link?" Ed. Anglin. *Instructional Technology: Past, Present and Future.* Denver, Co: Libraries Unlimited. 1991. 88-101. *Google Book Search.* Web. 23 April. 2009.

[3] British Council. *English 2000 Project: English in the World: The English 2000 Global Report*. London: British Council, 2000. Web. 17 Oct. 2008.

[4] Bruner, Jerome S. *The Process of Education.* Cambridge MA: Harvard UP, 1960. *Google Book Search*. Web. 12 March. 2009.

- - - . *Toward a Theory of Instruction*. Cambridge MA: Harvard UP, 1966. Web. 15 May. 2010. <http://www.instructionaldesign.org/theories/constructivist.html>.

[5] *Course Book of Class XI Part I English*. SCERT Trivandrum: 2005.

[6] Crystal, David. *English as a Global Language*. Cambridge: Cambridge UP, 1997.

[7] Dale, E. *Audio-Visual Methods in Teaching*. New York: Dryden Press, 1946. Web. 12 March. 2009.

[8] "Definition of ICT". Web. 12 August. 2008. <http://www.techterms.com /definition/ict. >

[9] Drisscoll, M. P. *Psychology of Learning for Instruction*. 3rd ed. Boston: Allyn and Bacon, 2005. Web. 29 April. 2009.

[10] Duffy, T.M., and D. H. Jonassen, ed. *Constructivism and the Technology of Instruction: A Conversation.* Hillsdale NJ: Lawrence Erlbaum Associates, 1992. Web. 15 May. 2009.

[11] Ertmer, P.A., and Newby T. J. "Behaviorism, Cognitivism, Constructivism: Comparing Critical Features from an Instructional Design Perspective." *Performance Improvement Quarterly* 6.4 (1993): 50 - 72. Web. 18 May. 2009.

[12] Galbraith, J.K. *The New Industrial State*. Boston: Houghton Mifflin, 1967. Web. 24 March. 2009.

[13] Glassersfeld, Von E. "An Introduction to Radical Constructivism." *The Invented Reality.* Ed. Watswick. New York: WW Norton, 1984. 17 – 40. Web. 12 May. 2009.

[14] Graddol, David. *The Future of English*. London: British Council, 2000.

- - - . *English: History, Diversity and Change*. London: Routledge Open University, 1996. Web. 3 July. 2009.

[15] Hooper, S., and L. P. Rielber. "Teaching with Technology." Ed. A. C. Ornstein, *Teaching: Theory into Practice*. Needham Heights MA: Allyn and Bacon. 1998, 154 -170. Web. 7 Nov. 2009.

[16] "Infocommunnications". Google Search. Web. 24 Sept.2009. http://*en.wikipedia.org*/wiki/Infocommunications.

[17] " Information Technology" File modified on 5 March. 2008. *Microsoft Word* file'. Web. 10 March. 2009. http://*en.wikipedia.org*/wiki/Information-technology.>.

[18] *Information Technology: An Info Guide.* Osmania University: Hyderabad, 2000.

[19] Information and Communication Technology. File modified on 5 March 2008. *Microsoft Word* file. Web. 8 Aug. 2009. <http://*en.wikipedia.org*/wiki/Information and communication technology>.

[20] Januszewski, Alan, and Michael Molenda. *Educational Technology*. Newyork: Lawrence Erlbaum Associates, 2008.

[21] Krashen, S. *Principles and Practice in Second Language Acquisition*. Oxford: Pergamon Press, 1982. Web. 19 May. 2010.

[22] Loveless, Avrill. *The Role of IT.* London: International, 1995. *Google Book Search*. Web. 3 Dec. 2008.

-------- . *The Role of ICT*. London: International, 2003. *Google Book Search*. Web. 3 Dec. 2008.

[23] Loveless, Avrill, and Viv Ellis. *ICT, Pedagogy and the Curriculum*. London: Routledge, 2001.

[24] McLuhan, M., Q. Fiore. *The Medium is the Message*. New York: Bantum Books, 1967. Web. 23 April. 2009.

[25] *NCF* (*National Curriculum Framework 2005*): Position Paper of National Focus Group on Educational Technology. NCERT, Dec. 2006.

[26] Paužaitė, Živilė, and Kęstutis, Kriščiūnas. "The Concepts of Information and Knowledge Societies: Affinities and Distinctions". *European Integration Studies.* 2007. No 1. Web. 14 Sept. 2009. <http://www.ktu.lt/lt/mokslas/zurnalai/eis/01/Pauzaite_Krisciunas_2007_50-56p.pdf>

[27] Prasad, Janardan, and Vijay Kumari Kaushik. *Advanced Educational Technology*. New Delhi: Kanishka, 2006.

[28] Sagar, Krishna. *Digital Technology in Education.* Delhi: Authors, 2005.

[29] S.B (Sourcebook for Higher Secondary Teachers Class XI Part I- English), SCERT, Tvm. 2005.

[30] Schumacher, E. F. "Technology with a Human Face." *Small is Beautiful*: *Economics*, 1973.

[31] Shuchi, Grover. "Efficient Technology Usage in Classrooms." *Education World*. June (2007): 22 - 40.

[32] Sivarajan, K, K., Shanavas, and Baby Suman Aboobacker. *Information and Communication Technology and Communicative English*. 2nd ed. Calicut University: Premier Press, Calicut. 2007.

[33] Skinner, B. F. "The Science of Learning and the Art of Teaching". *Harvard Educational Review* 24 (1954): 86 - 97. *Google Book Search*. Web. 13 May. 2009.

[34] Smith, David Gordan, and Eric Baber. *Teaching English with Information Technology*. London: Modern, 2005.

[35] Stevenson, Dennis. "ICT in Education". Google Book Search. Web. 19 Sept. 2008. <http://rubble.ultralab.angl;ia.ac.uk/Stevenson/ ICTUKIndex.html

[36] Teeler, Dede, and Peta Gray. *How to Use the Internet in ELT.* Ed. Jeremy Harmer. New Delhi: Dorling, 2000.

[37] Terhart, E. "Constructivism and Teaching: A New Paradigm in General Didactics?" *Journal of Curriculum Studies* 35.1 (2003): 25 - 44. Google Book Search. Web. 12 March. 2009.

WEBSITES

[1] en.wikipedia.org
[2] rubble.ultralab.angl; ia.ac.uk
[3] www.apa.org
[4] www.google.com/book
[5] www.instructionaldesign.org
[6] www.ktu.lt