

# E-learning Pedagogy: The Theoretical Support

**Dr. Khurram Mustafa**

Department of Computer Science  
Jamia Millia Islamia, New Delhi  
E-mail: [Kmfarooqi@hotmail.com](mailto:Kmfarooqi@hotmail.com)

## Abstract

New technologies, such as web, multimedia etc, are much more promising than those existed earlier. Consequent upon the availability of very good deliverability through these, several dimensions of e-learning can be easily visualised. Six basic dimensions that appear to be essential are content design – the deliverable, media use, client-side processing, servers side processing, site structure and development processes<sup>1</sup>. Certainly the most important one would be the deliverables, in the form of CBI/CBT/CBL/CAI or any other related abbreviations under use in the literature/practice, and it requires to be attended on priority basis. No doubt the deliverables for achievement of learning objectives are to be of educational nature than that of merely presentations – as the case may be in other forms web uses. In such a form of instruction quality education interactions with added facets of technology would need to be effectuated, while minimizing the negative effects of tools. In this paper, it is first intended to explore the basic dimensions with brief explanations. Further the dimension 'content design-the deliverables' is further explored as encompassing pedagogic, socio-psychological and ergonomic needs, in the present context. Author realizes the vast scope of the subject under discussion and the importance of inducement of learning among humans-the natural through web-the unnatural, as a very critical and crucial activity. It is strongly felt that this crucial activity should have a strong theoretical support and hence a search for sound footings has been attempted.

A review of the theoretical framework for a problem is a prerequisite to a comprehensive study. It provides a sound foundation, contextual support and direction during developments. So a review that appears to be immensely needed in the wake of recent developments such as web-based instruction, online varsities etc, before WBI really takes off in a real way and becomes feasible. It is evident from the literature that here have been several classes of theories with regard to learning/instruction that formed the basis for use of

computers in education. The underlying principle, in the earlier attempts at use of computers in teaching-learning process in the development of WBI lessons, can be traced to one of the three prominent class of theories, i.e., behaviourism, cognitivism and systems theory. Recent evolution in the field has been the development of constructivism, a theory specially related to intelligent tutorial systems and expert systems. Use of such theories is restricted not only to 'development and application' but they are also applied in the studies on WBI effectiveness and impact on educational interactions. A brief description and a critical review of each class of theories are presented for reaching fruitful conclusions.

Thereby, initially various theoretical positions, those have been taken by established experts for use of computers in instructional processes, is explored. Such theoretical positions, taken by educational psychology experts, are categorized as behaviorist-connectionist, cognitive-developmental and systems including specially the recent developments on constructivist-constructionism.

Under the first category positions taken by the theorists such as Pavlov, Thorndike and Skinner have been discussed. A contextual exploration yields fruitful guidelines of instructional design that include 'statement of objectives in terms of intended terminal behaviour; assessment of previous knowledge before instruction; placing learner in sequence of instruction where one can achieve the 90% level; using teaching machines to reinforce and strengthen the desired terminal behaviour; and recording learner's progress through a lesson to gain feedback for revision'.

*Secondly, under the next category, the positions taken by theorists including Bruner, Tolman, Piaget and Ausubel and the Gestalt view have been explored. The general conclusions include 'predisposition of learning, i.e., cognitive activation, maintenance and direction; logical*

*content structuring and sequencing with respect to learning tasks and associated levels of learning; reinforcement and pacing and discovery learning, active reception learning and simulations.*

Finally the prevalent Systems theory and constructivist-constructionism stand on learning/instruction has been explored. Their suggestions for instructional design process include provisions for scientific method, self-correction and logical decision-making; complex learning environments that incorporate authentic activity; social negotiation as an integral part to allow insights; examination of information at multiple times for multiple perspectives and emphasized client-centred design.

The analytical review results in the following conclusions: (i) Strong theoretical basis, in the form of learning theories exists for using computers in education vis-à-vis WBI. (ii) Several prescriptions, in spite of some contradictions, can be logically integrated and used in authoring WBI (Web Based Instruction) for a highly conducive higher-order learning environment. (iii) Cognitive-developmental and constructivism-constructionism theories mainly concentrate on the process of learning and hence higher orders of learning implicitly. (iv) 'Highly active reception learning' simulations seems to be a potential approach towards CBI/WBI authoring for higher-order learning, in terms of optimality on associated authoring attributes and few complementary goals.