

## NEW TRENDS AND DEVELOPMENTS IN EDUCATIONAL TECHNOLOGY RESEARCH

**Dr. V.S. MANJULA,**

Head, Department of Information System & Network Engineering,  
St. Joseph College of Engineering Technology,  
Dar-Es-Salaam, Tanzania.  
[manjusunil.vs@gmail.com](mailto:manjusunil.vs@gmail.com)

### ABSTRACT

Educational Technology research has moved through several stages of focusing at the beginning on the content to be learned, then on the format of instructional messages and, finally on the interaction between computers and students. A great majority of the theses employed quantitative paradigm, and qualitative studies made about one fourth of the total studies. The present paper reviews the research in technology-based learning environments in order to give both a historical perspective on educational technology research and a view of the current state of this discipline. To conclude that 1) trends in educational technology research were forged by the evolution of learning theories and the technological changes 2) a clear shift from the design of instruction to the design of learning environments can be noticed 3) there is a positive effect of educational technology on learning, but the size of the effect varies considerably 4) learning is much more dependent on the activity of the learner than on the quantity of information and processing opportunities provided by the environment. The most frequently investigated topics were computer-assisted instruction, alternative teaching and learning approaches, web-based learning, difficulties in integrating information technologies into educational practice, Internet-based learning, and distance education.

**KEYWORDS:** Educational Technology, Computer- based Learning, Learning Environments, Research Methods, Virtual Reality.

### 1. INTRODUCTION

Computer technology and the tremendous development of information technologies over the last few years have transformed the way education is conducted. Although computer technology has the potential of a powerful and flexible tool. Previously experiences with the integration of early technologies in schools (e.g., radio, television, early computer-assisted instruction) underline the fact that the mere installing of hardware does not lead to desired results. Thus, the main question research tried to find an answer for, was and still remains whether computer technology is benefit for the learning process and if yes, in which conditions?

The “proper research of educational technology” has represented the subject of a debate for more than a decade. Despite of the accumulated experience in conducting research and publishing

results in specialized journals. There is no consensus regarding methods that are used, or results and interpretations that are given to them claimed that an important part of the research. In the educational technology field is “pseudoscience”, because it fails in meeting the high level of theoretical, conceptual, methodological and/or analytical requests of the paradigm that it is based upon. The purpose of this article is to review the research performed in the educational technology field in order to understand the nature of questions and problems that researchers had to face in this field over the years, and also to place the current research in the context of educational technology research.

## **2.THE EVOLUTION OF RESEARCH IN EDUCATIONAL TECHNOLOGY**

The field of educational technology found its origins in the discovery made by researchers and practitioners of the fact that the instruction can be planned, projected, evaluated and revised before being applied on students. In other words it can be treated as an object on which a set of procedures, (i.e., technologies) can be applied.

Educational technology is, according to the definition of the Association for Educational Communications and Technology (AECT), “The theory and practice of design, development, utilization, management and evaluation of processes and resources for learning”. Another definition is the systematic way of designing, utilization and evaluation of the teaching/learning process, in terms of specific objectives, based on research in human learning and communication fields and on combining human and technical resources.

The research made in the educational technology field, according to moved through four stages or “ages”, each being built on the previous one and each of them being characterized by a specific focus, specific theoretical assumptions and practical implications. In what follows, we will review the „ages” of educational technology research, discussing the key theoretical issues, the research directions and the weakness associated with each of these stages.

## **3.RESEARCH ON THE TEACHING ASPECT OF EDUCATIONAL PSYCHOLOGY & RECENT TECHNOLOGY**

Lu Zhongheng’s experiments in mathematics self learning are based on his research on Skinner’s Principle of programmed learning. He compares the characteristics of the classroom system with those of individual instruction. He draws from the principles of ‘programmed learning’ as well as from the teaching experience of some outstanding teachers and proposes nine psychological principles, of which ‘appropriate pacing’ and ‘immediate knowledge of results’ are examples. On the basis of the learning process, learning goals and the psychological characteristics of learning, Lu has formulated seven principles of guided self-learning among which: the combination of group teaching and individual teaching; the primacy of pupil self-learning with coaching by teachers; the implementation of a classroom model of awakening - studying – practicing - knowing - self-learning, and etc. These form the basic method for teaching and learning as well as the guiding principles of this method. Instruction Educational Psychology and teaching methods in China 13 is geared to the development of pupils’ knowledge and aptitude, as well as to individual differences, so that pupils are interested and motivated. This method is more powerful and more concentrated than traditional methods. Its effectiveness is

particularly clear in terms of retention of material learned, improvement of creative thinking, scholastic achievement, and improvement of self-learning aptitude and transference of learning to other academic subjects.

Research topics include the psychology of teaching, moral psychology and differential psychology. Comprehensive research has also been conducted in the context of general educational reforms. This research mainly concerns research on the teaching aspect of educational psychology, research on moral psychology, research on differential psychology and cognitive research linked to general educational reform. Alternative approaches to teaching and learning were the most intensively investigated topic “web-based learning”.

#### **4.PURPOSE:**

The purpose of this study was to examine topics, methodologies, and results of master’s theses in the field of educational technology. The idea behind such a choice was to assess current trends in terms of the most commonly investigated areas, the dominating methodological preferences. The major issues which are worthy of discussing, and implications of the existing studies for the future research. Toward this purpose, the study focused critically upon topics, objectives, paradigms, models of investigation, samples, data-gathering instruments, statistical techniques, and results of the master’s theses completed during the period of 2000-2007. The main goal was to explore teachers' perception of the inclusion of particular research oriented. Teachers perception is part of a wider research in which all participants – students, teachers and librarians to investigate their information behavior in the context of libraries' e-services.

#### **5.METHODS:**

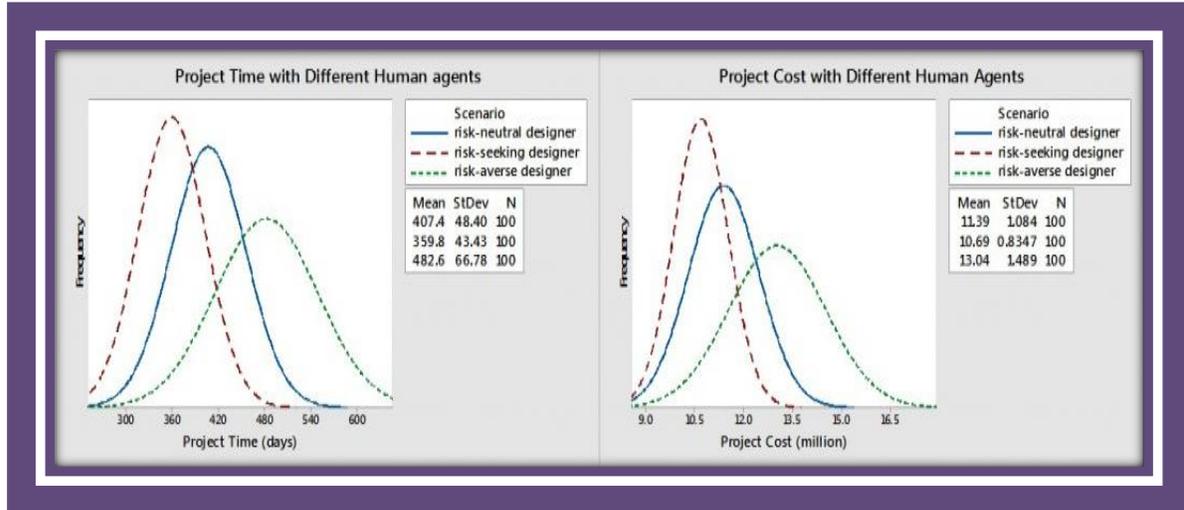
In educational technology is effective if it can be used to teach the same contents with the same learning outcomes as teachers do. The sequence of events are: (1) gaining attention (2) informing the learner about the objective (3) stimulating recall of prerequisite learning (4) presenting the stimulus material (5) providing learning guidance (6) eliciting the performance (7) providing feedback about performance correctness 8) assessing performance (9) enhancing retention and transfer.

#### **6. RESULTS & DISCUSSION:**

The first part of the research results oriented to students perception was presented in paper' e-services into learning management system (LMS): students' perception”. The second part of the research results is presented in this paper which is focused on the teachers’ perception of the effects of such integration i.e. their views on the possible impact on their teaching activities and on students’ learning. Therefore, the research was based on the following questions:

1. How do teachers perceive the possible benefits of integration of libraries' e-services into online courses for their students?
2. How do teachers perceive the impact of integration with computers e-services into online Courses within LMS on their particular teaching activities?
3. How do teachers perceive the possible effects of such integration regarding the role of

academic activities in the university curriculum?



**Figure 1: Time and cost with different designers**

The research on the inclusion of academic libraries' e-services into learning management systems was conducted during winter semester in 2011/2012 academic year. For the purpose of the research six online courses were selected from the learning management system. Online learning has received considerable attention recently. Within technology related areas, educational uses of computers and the Internet have been the most heavily investigated research topic. All the theses were reviewed based on the year, topic, objective, paradigm, design/ model, sampling, instrumentation, statistical analysis, results, and recommendations.

## 7.CONCLUSION:

Current trends in educational technology research were forged by two main factors: a) the evolution of learning theories from behaviorism to cognitive and latter on to constructivism and b) the technological changes, from learning machines to technologies of virtual reality. The evolution of educational technology use in learning was itself influenced by the dominant scientific paradigm and the affordances of the tools created. A clear shift from the design of instruction to the design of learning environments can be noticed. This is not just a shift from content-focused to learner - focused instruction, but also an acknowledgement that learning outcomes are owned by the learners and the technology should empower them to reach their idiosyncratic learning goals.

There is a positive effect of educational technology on learning, without any doubt, but the size of the effect varies considerably. The variance is due to factors of context, aptitudes of the learner and the characteristics of technology. Therefore, if one wants to evaluate the impact of a particular educational technology, the valid question to ask is the following: what technology used in what context, interacting with what characteristics of the learner? Any evaluation is inevitably local, because learning is a local, contextual, concrete phenomenon, not an abstract process. We should emphasize that learning is much more dependent on the activity of the learner than on the quantity of information and processing opportunities provided by the environment.

Consequently, educational technology is seen as a major tool to create adequate learning environments where enhanced situated cognition takes place. Another related change centers around the approach of learning as a developmental and internalizing process that occurs first in the social, interpersonal domain, and only then becomes intrapersonal.

According to Fleming, the principles presented as guidelines to instructional design should be stated in a language and format that translates readily to practice. These principles are expected to inform the creative processes of the designer, increasing the probability of wise decisions without guaranteeing them. Thus, he emphasized that, although the principles are based on large bodies of research, testing prototype designs is essential, followed by redesign and retesting as needed. Recent research has indicated that virtual reality has the potential to immerse the learner in various situations, visualize information. In other words helps the students understand concepts and processes that the virtual environment represents.

## REFERENCES

1. **Barab, S. A., Kenneth E. H., Squire, K., Barnett, M., Schmidt, R., Karrigan, K., and Yamagata-Lynch and Johnson, C. (2000)**, Virtual solar system project: learning through a technology-rich, inquiry-based, participatory learning environments. *Journal of Science Education and Technology*, 9 (1), 7–26.
2. **Blumenfeld, P. C., Marx, R. W., Soloway, E., & Krajcik, J. (1996)**, Learning with peers: From small group cooperation to collaborative communities. *Educational Researcher*, 25(8), 37–40.
3. **Brown, A. L. (1992)**, Design experiments: Theoretical and methodological challenges increasing complex interventions in classroom settings. *Journal of the Learning Sciences*, 2(2), 141-178.
4. **Brown, J.S., Collins, A. & Duguid, P. (1989)**, Situated cognition and the culture of learning. *Educational Researcher*, 18 (1), 32-42.
5. **Cafarella, E. P. (2000)**, Doctoral dissertation research in educational technology: the themes and trends from 1977 through 1998. *Educational Media and Technology Yearbook*, 25, 14–25.
6. **Clark, R. E. (1983)**, Reconsidering research on learning from media. *Review of Educational Research*, 53(4), 445–459.
7. **Clark, R. E. (1985)**, Evidence for confounding in computer-based instruction studies: analyzing the metaanalyses. *Educational Communication and Technology Journal*, 3(4), 249–262.
8. **Clark, R. E., & Snow, R. E. (1975)**, Alternative designs for instructional technology research. *Audiovisual Communication Review*, 23(4), 373–394. Cognition and Technology Group at Vanderbilt University (1990). Anchored instruction and its relationship to situated cognition. *Educational Researcher*, 19 (6), 2-10.

9. **Cronbach, L. & Snow, R. (1977)**, Aptitude and Instructional Methods, Irvington, New York.  
de Jong, T. & van Joolingen, W.R. (1998) Scientific discovery learning with computersimulations of conceptual domains. *Review of Educational Research*, 68, 179–201.
10. **Hannafin, M.J., Hannafin, K.M., Hooper, S.R., Rieber, L.P. & Kini, A. (1996)**, Research on and research with emerging technologies. In D. Jonassen (Ed.), *Handbook of Research on Educational Communication and Technology* (pp. 378–402).
11. **Keating, T., Barnett, M., Sasha, A. B., & Hay, K. E. (2002)**, The virtual solar system project: Developing conceptual understanding of astronomical concepts through building three-dimensional computational models. *Journal of Science Education and Technology*, 11, 261–275.

