

Analysis of various Barriers to implementation of Web based Technology in education: Literature Review

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Abstract—In recent years, e-learning is in boom. It is the result of technology adoption in education. Slowly traditional teaching styles have to be transformed to technology-based teaching. So Web based learning is the best solution for it. But traditional/ chalk and talk / face to face teaching method is deeply rooted into the nerves of Indian education system. Technology adoption in teaching style is going to face many barriers in adoption. This paper tries to review the relevant literature to find out the various types of barriers in implementation of web based education or web based technology in teaching learning method.

Index Terms— E-learning, Web-based learning, online learning

I. INTRODUCTION

According to Susanna Tsai, E-learning, Web-based learning, online learning, and distance learning are widely used as interchangeable terms. E-learning and Web-based learning that acquire the same meanings and incorporates concepts like e-mail, Web, learning. So this paper reviews literature related to barriers related to E-learning, Web-based learning, online learning, and distance learning so that the researcher can get appropriate direction in finding the actual barriers in the study area. Web based learning also refer to educational processes that utilize information and communications technology to mediate asynchronous as well as synchronous learning and teaching activities.

II. OBJECTIVE

To review and study the problems for implementation of Web Based Technology in Schools.

III. LITERATURE REVIEW

The researcher has to get the direction for his future research. So the relevant literature related to problems or barriers in e learning, online learning, web based learning, distant learning are reviewed. This paper reviews the literature related to problems/ barriers in implementation of web based education. Literature review finds the knowledge gap of the users.

Truman (1995) in her paper concluded that in distance education learning is most important. The most important

barriers are money, equipment, time, student information perceptions and their understanding how the technology itself shapes the information it carries to differentiate junk information from facts.

According to **Galusha (1997)** the main categories of barriers are related to student, faculty and organization. Galusha stated that *Students barriers* include Increase Costs of Education, Lack of motivation to use technology in education, Lack of teacher contact and face to face communication, Lack of student support and services, Students may get frustrated while learning, the lack of experience to incorporate technology in education, Lack of training related to use technology in education. *Teacher barriers* include lack of staff training, the lack of support and the inadequate faculty selection. *Organizational barriers* include infrastructure and technology barriers, Initial startup and maintenance cost and lack of faculty support to use technology.

According to **Berge (1998)** the major barriers in implementing an online teaching include lack of face-to-face communication while teaching, fear of computers replacing faculty/teachers, diffusion of value placed in a traditional learning system, faculty culture, lack of an adequate time-frame to implement online courses, resistant to change and lack of technological assistance. The paper concluded listing most critical barriers as individual's resistance to change, the lack of support for the changing roles of students and teachers and difficulties in assessment of students.

Clark (1999) investigated the factors for overcoming barriers to participation in electronically-mediated communication. The interview schedule covered participants' teaching experience. The researcher realized the strategies to engage students to extent learning, discussion forum to enhance the quality of the discussion among participants and that generating a web-based discussion about the discussion forum appeared to enhance the participation in the discussion forum itself.

Asirvatham and Sandy (2000) explain the possibility to get education through classroom-oriented learning atmosphere. So distance education/ web based education can become a powerful advantage to overcome the limitation. This web technology can provide communication and interaction among students and teachers.

According to Eisinger (2000) challenges to distance learning are the lack of non-verbal cues which creates misunderstanding through the global interaction, different needs and expectations of every learning environment.

Leach and Walker (2000) points out the relationship between student's experience with technology in distance education as the barrier. For distant education all technology concerns must be minimized, and the programs offered must be designed accordingly if a successful online education is to be attained.

Berge (2001) found out Obstacles faced at various stages of capability regarding distance education in institutions of higher education. Berge found out unknown barrier to distance education, technical and interaction problems.

According to **Kuldip Singh (2006)**, Barriers to e-learning responses indicating students regard as a potential barrier to E learning were lack of human contact, lack of participation by facilitator and difficulty of monitoring student's progress, lack of computer skills indicating most of the students have good knowledge of computers.

Dominic Wong (2007) critically reviewed the literature to explore the limitations in e-learning method from various e-learning journals from all over the world. The limitations of e-learning reviewed are the necessity of computer hardware and relevant resources, lack of hardware to support e-learning in organizations, to participate in online learning, both learners and staff need to have access to networked computers. Technological barriers, such as limited bandwidth, problems of video conferencing, non traditional learning may get lost, lack of ICT skills, Difficulty in teaching in an e-learning environment as instructors may not be able to teach well and lacking physical interaction were some of the limitations in e learning review.

Heidi et al. (2002) examine that in distance education the ideal combination of self-paced learning and interactivity is offered. Such learning requires online discussions, email support collaboration and interactive presentation of the students. There has to be a communication between participants and design groups for overcoming barriers to a successful delivery of distance learning courses.

Muilenburg and Berge (2001) pointed out the barriers to distance education in his analysis research. Various factors found are administrative structure, organizational change, technical expertise, social interaction and quality, faculty compensation and time, threat of technology, legal issues, evaluation/effectiveness, access, and student support services.

Pajo (2001) finds different personal and attitude barriers and predicts current use and future intentions to adopt web-based technology. Use of the technology is associated with personal barriers of those who lack competence in skills needed to use web-based delivery in their distance education. These personal barriers may hinder the individual from transferring his/her intentions into behavior.

Cucek (2001) in his research measured student's satisfaction with their classes, perceived access to support services, and differences in the distance education and traditional face-to-face classes. The main problems for successful completion of the courses are responses related to course issues, time issues, personal issues, administrative, and technical issues. Course related barriers are the lack of interaction, course structure and accessing resources. Barriers related with time were the lack of time, personal commitments, and course work that takes too much time. Motivation and self-discipline comprised personal issues.

The lack of expertise made up the technical problems. Finally, administrative problems are related to cost, course availability, obtaining course materials, and administrative support.

Ghadah Essa (2008), According to the author the key barriers to e-learning implementation and adoption of e-learning are related either to organizational issues, technical issues, Cost, Time, Technology, Resistance to change, Language barriers, IT problems and workload. Technical barriers are system crashes, bandwidth and infrastructure upgrading, accessibility, usability, technical support and perceived difficulties in using a system. The organizational barriers include lack of time available for training; cost versus value; lack of appropriate content related to specific needs; language barriers as most of the content is delivered in English; difficulties in measuring e-learning effectiveness; lack of strategic planning and direction, particularly when there is no alignment with business objectives; lack of e-learning awareness; lack of incentives; and finally, lack of management support.

Clare Spratt (2009) examined barriers to learning include: Resistance to change, the perception of no time to learn, No experience of self-learning, Content is not relevant or engaging, Fear of technology.

Kareal (2006) says that there are various barriers namely Personal Barriers, Organizational Barriers, Technological barriers, Content-Suitability Barriers and Instructional Barriers.

Tanja Kohn identified barriers and structured them according to the three dimensions mentioned as (i) infrastructure, technology access, Internet access, maintenance of technology, and usability barrier (ii) Culture dimension contains language barrier, local context barrier, social context barrier, interaction barrier, religious barrier and didactical barrier (iii) Previous knowledge dimension contains the two barriers computer literacy and competence barrier.

The research by **Australian Institute for Social Research (2006)** provided a better understanding of barriers associated with the Digital Divide. The major barriers are Connectivity, Capability and Content. Connectivity refers to infrastructure and affordable access to the Internet, Capability refers to skills, confidence and recognition of value in using the Internet, Content refers to relevant, useful and accessible information and services online.

Surry (2009) investigated through the survey that financial resources, infrastructure, and support are barriers to implementation, perceived lack of time and perceived lack of social interaction and maintenance of academic quality. Administrators should focus on understanding and accounting for faculty concerns related to financial resources and technological infrastructure and issues related to support and training in order to facilitate the implementation of web-based learning.

Christie through his study surveyed teachers using an online learning platform (Web CT) to find the extent teachers use various features available of the learning platform. But the outcome was low as the extent to which teachers employed all the features was very less.

Dawn Birch investigated Pedagogical Barriers to Adoption and Integration of Educational Technology. Birch found

philosophical and pedagogical barriers exist when teachers shift from information-transmission to designing technology-enabled, constructivist learning environments'. Major barrier are Entrenched instructional practices, lack of clarity about the benefits of technology, lack of willingness to take risks, and the need for more rigorous course planning has deterred some academics from changing familiar instructional practices.

Maria Galofre (2008) Virtual learning environments (VLE) are learning spaces that reproduce all the elements. Any e-learning initiative takes into account three dimensions: Pedagogical, technological and organizational. In the pedagogical dimension, learning is more than just providing the learners with contents available, through Internet. The technological dimension defines the available web-based services of the VLE. Finally, the organizational dimension describes the processes that the users of the VLE perform during the learning process. All these three dimensions must be taken into account in VLEs.

According to Fahme DABAJ (2011) distance education programs do not establish a face to face communication between teachers and the students thus creating difficulties. Different delivery systems such as computer mediated communication systems, video tapes, printed material, cassettes and instructional television are used to deliver instructions from tutor to students. Moreover, the universities have the advantage of using World Wide Web to deliver the instruction to nearly any node in the world, regardless of the physical distance and time because of the developments in the Internet and the global network systems, **27 ways to leap over e-learning barriers** : This white paper detects top ten barriers to e-learning stated as: Lack of skills amongst employees to manage own learning, Lack of knowledge about its potential use and implementation, Lack of skills amongst training staff, Reluctance by line managers to encourage new ways of learning , Reluctance by users to learn with new technology, Unreliable ICT infrastructure/low bandwidth / technical restrictions/firewall , Cost of set-up, development and maintenance , Poor past experience , Reluctance by L&D staff to adopt new technology ,Lack of attractive, relevant and high-quality e-learning ,lack of face-to-face contact with teachers may result in a loss of motivation unawareness of the roles as teachers and students.

IV. CONCLUSION

It can be concluded from the literature review that there are various barriers that occur while implementing web based technology in education. The types of barriers as administrative barrier, organizational barrier, motivational barrier, attitude barrier, technical barrier, language barrier, personal barrier ,competency barrier , literacy barrier and communication barriers in establishing and maintaining technology in education. This literature review will show a direction to the researcher in pointing out varied barriers in implementation of web based technology in education in the study area.

REFERENCES

- [1] E-learning Basics, E-learning, online Learning, Web-based Learning, or Distance Learning:, Unveiling the Ambiguity in Current Terminology, By Susanna Tsai and Paulo Machado, InkiTiki Corporation, Island of Kauai, Hawaii, InkiTiki.com
- [2] Truman, Barbara E. (1995). Distance Education in Post Secondary Institutions and Business. Paper presented for an Instructional Technology Graduate Class, University of Central Florida. <http://pegasus.cc.ucf.edu/~btruman/dist-lr.html>
- [3] Galusha, Jill M. (1997), Barriers to Learning in Distance Education, University of Southern Mississippi. <http://www.tcom.ohiou.edu/ouln/Barriers to Learning in Distance Education.htm>
- [4] Clark S., Overcoming barriers to creating online communities, Proceedings of Responding to Diversity (ASCILITE 1999) Queensland University Technology, Brisbane, Australia. Retrieved online November 14, 2006, from <http://www.ascilite.org.au/conferences/brisbane99/papers/clarke.pdf>
- [5] Asirvatham, Sandy, (2000), Beyond the distance barrier, Journal of Property Management v. 65 no5, p. 42-8, <http://www.fmlink.com/ProfResources/Magazines/article.cgi, Journal of Property Management:jpm1100a.htm>
- [6] Eisinger, Jane. (2000). Education Evolution. Association Management v.52 no13, p. 52-9. http://www.hermandek.cz/mark404/articles/acad6_distancededu.htm
- [7] Leach, Karen and Walker Scott (2000). Internet-Based Distance Education: Barriers, Models, and New Research. http://itouch.net/~swalker/smec/internet_based_distance_education.pdf
- [8] Berge, Zane L. et al. (2001). Obstacles faced at various stages of capability regarding distance education in institutions of higher education. TechTrends v.45 no4, p. 40-5. http://www.emoderators.com/barriers/hghred_stgs.shtml
- [9] Kuldip Singh ,E-LEARNING AS AN ENABLER OF EFFECTIVE TEACHING AND LEARNING FOR THE KNOWLEDGE SOCIETY, <http://asiapacific-odl2.oum.edu.my/C33/F417.pdf>, THE 6TH SEA AIR ANNUAL CONFERENCE; Langkawi, September 5 – 7 2006
- [10] Dominic Wong (2007), A Critical Literature Review on e-Learning Limitations, JASA 2, January 2007
- [11] Cucek, Mira (2001). Student Perceptions of their Distance Education Courses. Research Report 2001-04. <http://www2.boisestate.edu/iassess/Reports/RR 2001-04.pdf>
- [12] 27 ways to leap over e-learning barriers, http://www.trainingzone.co.uk/files/siftmediatrainingzone/Barriers_to_elearning_whitepaper.pdf
- [13] <http://www.brightwave.co.uk/practical-guides/27-ways-to-leap-over-e-learning-barriers>
- [14] Ghadah Essa Ali , Rodrigo Magalhaes, Barriers to implementing e-learning: a Kuwaiti case study , International Journal of Training and Development 12:1, 2008
- [15] Overcoming the Barriers to Learning: E-Learning Best Practice, Clare Spratt, Kaplan IT, Inc., 2009, http://www.e-learninglist.co.uk/whitepapers/273_whitepaper_barriestolearning_uk.pdf, 30/11/2012, 11.30pm
- [16] F. Karel , Klema, Aaptivity in e-learning, Current Developments in Technology-Assisted Education (2006), http://www.karlovi.cz/filip/adaptivity_in_e-learning.pdf
- [17] Tanja Kohn, Ronald Maier, Stefan Thalmann, Knowledge Transfer with E-Learning Resources to Developing Countries – Barriers and Adaptive Solutions , http://www.uibk.ac.at/iwi/research/phdprojects/tanjakohn/knowledge_transfer_with_elearning_resources_to_developing_countries_barriers_and_adaptive_solutions.pdf
- [18] The Digital Divide – Barriers to e-learning , FINAL REPORT by The Australian Institute for Social Research, April 2006, http://www.unic.pt/images/stories/publicacoes/barriers_digitaldivide.pdf, 30/11/2012, 1.00pm
- [19] Surry D. W. , Grubb A.G. ,Ensminger D.C. Ouimette J. , Implementation of web-based learning in colleges of education: Barriers and enablers. , Volume 35 Issue (3) Fall / automne, 2009 ,Canadian Journal of Learning and Technology ,
- [20] M. Christie I and R. Garrote Jurado, BARRIERS TO INNOVATION IN ONLINE PEDAGOGY
- [21] Dawn Birch, PEDAGOGICAL MOTIVATIONS AND BARRIERS FOR DEVELOPING MULTI-MODAL DISTANCE EDUCATION COURSES
- [22] Michele D. Dickey, Barriers and enablers in integrating cognitive apprenticeship methods in a Web-based educational technology course for K–12 (primary and secondary) teacher education, *ALT-J, Research in Learning Technology*, Vol. 15, No. 2, June 2007, pp. 119–130
- [23] Identifying Pedagogical, Technological And Organizational Barriers In Virtual Learning Environments, Maria Galofre, *ASSETS'08*, October

- 13–15, 2008, Halifax, Nova Scotia, Canada. ACM 978-1-59593-976-0/08/10. <http://www.uoc.edu>
- [24] Fahme DABAJ, Analysis of Communication Barriers to Distance Education A Review Study , Online Journal of Communication and Media Technologies Volume: 1 – Issue: 1 – January – 2011
- [25] Berge, Zane L. (1998). Barriers to Online Teaching in Post-Secondary Institutions: Can Policy Changes Fix It?. Online Journal of Distance Learning Administration. 1(2). <http://www.westga.edu/~distance/Berge12.html>
- [26] Dimpleby, Richard et al. (1992) “More than words: An Introduction to Communication”. Rutledge, New York. [http://www.amazon.com/exec/obidos/tg/detail/-Online Journal of Communication and Media Technologies Volume: 1 – Issue: 1 – January - 2011 © Online Journal of Communication and Media Technologies 14](http://www.amazon.com/exec/obidos/tg/detail/-Online+Journal+of+Communication+and+Media+Technologies+Volume:+1+-+Issue:+1+-+January+-+2011+©+Online+Journal+of+Communication+and+Media+Technologies+14)
- [27] Eisinger, Jane. (2000). Education Evolution. Association Management v.52 no13, p. 52-9. http://www.hermanek.cz/mark404/articles/acad6_distancedu.htm
- [28] Eric J. Jenner (2001). Public Affairs Engagement and the Digital Divide. Paper presented in Symposium on the Digital Divide. Manship School of Mass Communication, Louisiana State University. http://communication.utexas.edu/college/digital_divide_symposium/papers/jenner.doc
- [29] Everett M. Rogers and Karyn L. Scott (1997). The Diffusion of Innovations Model and Outreach from the National Network of Libraries of Medicine to Native American Communities. <http://nnlm.gov/pnr/eval/rogers.html>
- [30] Galusha, Jill M. (1997). Barriers to Learning in Distance Education. University of Southern Mississippi. [http://www.tcom.ohiou.edu/ouln/Barriers to Learning in Distance Education.htm](http://www.tcom.ohiou.edu/ouln/Barriers+to+Learning+in+Distance+Education.htm)
- [31] İşman, A. et al. (2003). “Communication Barriers in Distance Education”, The Turkish Online Journal of Educational Technology, Volume 2, Issue 4.
- [32] Hara, Noriko (1998). Students’ Perspectives in a Web-Based Distance Education Course. Indiana University. <http://php.ucs.indiana.edu/~nhara/paper/mwera98.htm>
- [33] Leach, Karen and Walker Scott (2000). Internet-Based Distance Education: Barriers, Models, and New Research. http://itouch.net/~swalker/smec/internet_based_distance_education.pdf
- [34] Mulilenburg, Lin and Berge Zane L. (2001). Barriers to Distance Education: A Factor Analytic Study. The American Journal of Distance Education. 15(2): 7-22. http://www.emoderates.com/zberge/fa_ajde_050401.shtml
- [35] Nasseh, Bizhan. (1997). “A Brief History of Distance Education”. <http://www.seniornet.org/edu/art/history.html>
- [36] Pajo, karl (2001). Barriers to the Uptake of Web-based Technology by University Teachers. Journal of Distance education. 16(1). <http://cade.icaap.org/vol16.1/pajoetal.html>
- [37] Perreault, Heidi et al. (2002). Overcoming Barriers to Successful Delivery of Distance Courses. Journal of Education for Business v. 77 no6, p. 313-1.
- [38] Sherry, L. (1996). Issues in Distance Learning. International Journal of Educational Telecommunications, 1 (4), 337-365. <http://carbon.cudenver.edu/~lsherry/pubs/issues.html>



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