

2000

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Recommended Citation

Hill, Timothy R.; Chidambaram, Laku; and Griggs, Ken, "Emerging Learning Technologies, Pedagogies and Marketplace Issues: Minitrack Introduction" (2000). *AMCIS 2000 Proceedings*. 57.

<http://aisel.aisnet.org/amcis2000/57>

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Emerging Learning Technologies, Pedagogies and Marketplace Issues: Minitrack Introduction

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Introduction

Most agree that a technology-induced "sea change" is underway in education, promising to fundamentally alter the way we teach and learn. The AMCIS 2000 minitrack "Emerging Learning Technologies, Pedagogies and Marketplace Issues" was conceived as a forum for discussing the latest developments spurring the transformation, the three sub-categories respectively reflecting the tools, the techniques and the stakeholder motivations likely to impact them.

In this brief introductory paper, we outline a number of (emerging) research issues around the learning "revolution," highlighting examples of related research and providing a set of relevant resources and publication venues. Our outline is by no means comprehensive but merely intended as a broadly representative impression, designed to evoke stimulating and wide-ranging discussion.

Technologies

In addressing the newly emerging technologies (tools) likely to impact teaching and learning, a few basic categories arise: communications, multimedia, intelligence and knowledge, objects and agents.

The forthcoming world of pervasive networking and its promise of wireless broadband appliances is due to revolutionize our daily lives in many ways with learning high on the list. Projecting into the not-too-distant future, one can imagine an MIS instructor, in flight to a conference, striking up a conversation with a CIO in the next seat and then "calling all my available students wherever you are" to a spontaneous, group chat via multiple feed video. Admittedly such technology remains in the future, but the predicted arrival gets closer as Qualcomm and JDS Uniphase continue to demonstrate phenomenal advances, previously thought unlikely, if not impossible.

In the meantime, research continues using recently available technologies. In "Web-based Collateral Support for Traditional Learning: A Field Experiment," Hill and Chidambaram report empirical observations in use of a streaming audio system that provides class session replays via The Web. Then, in "Classroom Session Replays via Web-based Streaming Audio: Assessing Learning Effects of Audio Search and Streaming Glossary Capabilities," the same authors describe the use of audio mining, through voice recognition technology, to enhance the system with keyword audio access and glossary capabilities.

In the area of intelligence and knowledge management, interesting applications to education have been plentiful for years, ie. "Coach: A Teaching Agent that Learns" []. Recently, the development of web-based "bots" has capitalized on this work and in "Intelligent Agents for Online Learning", Thaiupathump, et al. Discuss the use of knowbots (or Knowledge Robots).

Combining intelligence and knowledge management techniques with multimedia, one can envision lifelike "tutors" that could build lessons on demand from web-based knowledge, assembling objects suited to one's learning style and preferences and presenting them in an interactive mode that reacts and adjusts to the interaction.

Pedagogies

Much has been made of the changes in pedagogy precipitated by the technology, and suggestions range from the "studio" approach as described by Denning [] in application to programming rather than art, to the Virtual Classroom concept where students are dispersed in space and perhaps time, ie. "A Virtual Classroom Approach to Learning Circuit Analysis" by Oakley. []

Visions of the new era characterize the faculty member as a facilitator or "guide on the side," rather than a "sage on the stage." Indeed it has been suggested, to the alarm of traditional faculty, that the instructor function might, one day, be fully automated by capturing the voice, image and knowledge of the world's best teacher of whatever topic.

(See the "Great Courses on Tape" at The Teaching Company: <http://www.teachco.com/default.htm>)

Yet it is hard to imagine students, especially undergraduates, reaching traditional levels of satisfaction without the "shepherding" function of a proactive instructor and the intangible benefits of "shared experience." Indeed "student-centered studies" such as "Students' Frustrations with a Web-Based Distance Education Course" by Hara and Kling [] suggest that the news isn't all good when it comes to entirely web-based courses. Perhaps the trick will be in finding the right blend of automation and human involvement. But as we experiment with new pedagogy, we must keep in mind that learning effectiveness is only one of the two frequently cited and, some suggest, diametrically opposed goals of technology-supported learning. Reducing costs is the other.

Marketplace Issues

In "Business Designs for The New University" [], Denning suggests a number of marketplace conditions driving the academic community to reconsider their "business model" in terms of technology supported learning, including:

- Rising level of industry requests for professional education after the bachelor's degree.
- Rising competition from private companies offering courseware, seminars and other educational services.
- Rise of education brokerages.
- Certification of certain professionals, such as software engineers and network engineers.
- Distance education and virtual universities.
- Accreditation of virtual degree and certificate programs.

and more. Inarguably, the marketplace will have it's way and, as a result of the enabling technologies, the stakes are getting high. Indeed, Noble [] suggests the technology supported learning trend is, in fact, a regressive movement toward standardization and mass-production driven by commercial interests.

Evidence of the growing interest of the marketplace is The Center for Academic Transformation. (<http://www.center.rpi.edu/>). Here a large grant funds The Pew Learning and Technology Program. In a monograph summarizing a symposia they sponsored [], Carol A. Twigg says, "The faculty must be able and willing to

incorporate existing curricular materials into the project in order to focus work on redesign issues rather than on materials creation." Creation of the content is just too expensive for faculty to engage in. But, once we eliminate the human element, one could argue, only the content would remain and the publishers, in owning the content, would be left alone in control.

Founded as part of a National Science Foundation-funded project hosted by Apple, the Educational Object Economy (see <http://www.eoe.org/FMPro?-db=portals.fp3&-format=default.htm&-script=UpdateFrontPage&-Findall>) aims to develop and disseminate a learning-community model and intellectual property innovations, protecting and encouraging the role of faculty in the new era. Koning-Bastiaan [] describes the theory and it's realization in the form of MERLOT, the Multimedia Educational Repository for Learning and Online Teaching (<http://www.merlot.org>). MERLOT provides a searchable library of learning objects, created by and for faculty, that can be assembled as desired. Recently there has been an initiative to develop a peer review process for MERLOT, modeled after that of research journals, to ensure the quality of the modules and enhance the value of faculty contributions in terms of tenure and promotion, etc.

Written by Carol Twigg and Bob Heterick, The Learning MarketSpace is a monthly electronic newsletter that provides leading-edge assessment of and future-oriented thinking about issues and developments concerning the nexus of higher education and information technology. <http://www.center.rpi.edu/LForum/LdfLM.html>

Research Resources and Publishing Venues

<http://www.aln.org/alnweb/journal/jaln.htm>

Educause - "transforming education through information technologies"
<http://www.educause.edu/>

Reference technology specific:

International Journal of Expert Systems: Research and Applications: Special Issue on Intelligent Educational/Learning Systems of the 21st Century (forthcoming)
(<http://www.elsevier.com/inca/publications/store/6/2/0/1/8/3/620183.pub.htm#top>)

Discipline-specific related to technology:

IEEE Transactions on Education

Global IS Education site (<http://gise.org/>) for the study of Education and Training for the Informing Sciences globally

Journal of Information Systems Education
(<http://over.to/JISE/> .

For example "Corporate Multimedia and the MIS Course" by Watts and Smith.

Conclusions

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