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Evaluation Summary:
The Digital Classroom Project
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Full Report: http://ccnmtl.columbia.edu/projects/evaluations/digclass.pdf
Summary: http://ccnmtl.columbia.edu/projects/evaluations/digclass_summary.pdf (this document)

Project Description: Background & Purpose

In the fall of 2001 CCNMTL, in partnership with the School of General Studies, opened the Experimental Digital Classroom (EDC) for working with faculty to explore using new technologies in their courses. In line with the Center's philosophy of the role of new media in teaching and learning, the EDC was designed to maximize the pedagogical usefulness of new technology rather than just its availability.

The EDC was intended to be an alternative to the typical technology-enabled classroom. Such classrooms rely on projection-based systems, which produce rigid learning environments, facilitating presentation to large groups, but inhospitable to teacher or learner interaction, with each other or with digital materials. Technology itself becomes the central focus as instructors attend to operating equipment and students gaze at projected images. The interface between instructor and technology in these classrooms prohibits the variable use of either digital resources or physical space.

CCNMTL decided to build a different sort of technology-enabled classroom, one that was interactive and adaptable to various teaching goals and learning styles. The purpose in doing so was to refocus faculty and student attention on teaching and learning, respectively, while experimenting with assorted digital resources and tools.

Description of the Digital Classroom Project

Description of the Environment
The EDC is located in 308 Lewisohn Hall and seats a maximum of 24 students. It is outfitted with front and rear whiteboards/chalkboards, a wireless Internet access point, wired Ethernet ports, electrical outlets for laptops, and color-coded furniture that can be easily arranged into several pre-set layouts.

The key feature of the EDC is the SmartBoard, a 67" touch-screen, networked computer display. The SmartBoard can project images from a networked computer, DVD player, or VCR.

The SmartBoard's functionality surpasses that of the conventional projection-and-podium computer system. The touch-sensitive screen makes controlling and manipulating the computer like writing on a blackboard. SmartBoard pens and eraser tools allow users to annotate and highlight projected images much like a sportscaster diagrams a replay. In addition, the SmartBoard is housed in a cabinet that can be moved around the room as needed.

The SmartBoard's interface is intuitive and easy to master, thus eliminating the need for extensive training in order

to use it. This, and its flexibility, allow both students and instructors to concentrate on the content of the class rather than its mode of delivery.

Academic Implementation of the Project
Nine courses, primarily in the humanities, were taught in the EDC in the fall of 2001. They were variously selected by the Registrar's Office, and jointly by the School of General Studies and CCNMTL.

Instructors were provided with a short training on the overall design of the room and the SmartBoard in particular. Tutorials were installed in the SmartBoard to further familiarize instructors with its features. Each instructor was given a folder on the SmartBoard desktop in which to store annotated images, class notes and other digital course materials. Finally, a web page was created that describes the purposes and features of the EDC. It is accessible from the Center's web site.

The Center is currently devising a strategy for selecting additional courses to be taught in the EDC. The aim is to find teaching projects that will test the educational potential of the environment.

Overview of the Evaluation Process

This evaluation assesses instructors' and students' teaching and learning experiences within the EDC and their ideas about how its resources may enhance those experiences. More specifically, it addresses students' and instructors' use of different EDC features, including which they use and what for, as well as how this use affected their learning and teaching, respectively.

Data were obtained through faculty and student surveys, faculty interviews, and non-participant observation of classes. Six instructors and 26 students were surveyed, eight instructors were interviewed, and five classes were observed.

The study is limited by the lack of a comparative case. That is, it does not compare the teaching and/or learning experiences of those in the EDC with those in a conventional technology-enabled classroom. This is because most of the instructors had never taught in an electronic environment before and therefore had no basis upon which to draw such a comparison. Neither was an appropriate sample of control groups available at the time.

Findings

Faculty and Student Activities in the Digital Classroom

Use of Resources
The following table shows the percentage of instructors who used the various tools and resources available in the EDC.

Tool	% of Instructors
Online Resources	87.5
SmartBoard Writing Capabilities	62.5
SmartBoard Saving Capabilities	12.5
Other Software	62.5
Audio/Visual (VHS/DVD/web)	75

Whiteboard	100

The particular uses to which these resources were put varied according to the nature and purposes of the course. Text-based courses used online resources like images to illustrate and contextualize readings. They also engaged these materials as primary sources, analyzing them as texts in themselves. They used SmartBoard writing capabilities to highlight and annotate digital materials as they discussed or otherwise worked with them.

Courses that emphasized speaking and listening skills (i.e., language courses) used the EDC's audio/visual tools, especially DVD, to practice expression and comprehension. Instructors noted the higher quality of DVD versus VHS recordings as a significant benefit. DVD was also cited for engaging students and familiarizing them with contemporary cultural issues. SmartBoard writing capabilities were used as they were by text-based courses, to annotate and highlight text. Finally, instructors reported using online resources, primarily images, to illustrate presentations.

Instructors' Experience

Seven of the eight faculty interviewed expressed general satisfaction with the EDC. Their comments vary in terms of the aspects of the experience they found especially important. These differences are likely due to one or more of the following factors: their prior experience in teaching with technology, their technical skill, and the type of course they taught in the EDC.

Some faculty reported that the resources available in the EDC helped them organize their lessons in a way that made better use of their and their students' time. Others said that the environment encouraged spontaneity, resulting in classes that were more "fluid" and student-centered.

Among the aspects that faculty members identified as challenging was gaining confidence in exploring the EDC's resources, especially the SmartBoard. Although they found the SmartBoard easy to operate, they felt they needed additional training in order to best use it in their courses.

Observations of class sessions suggest that the EDC environment promotes a more "performative" style of teaching than the presentation style associated with traditional and projection-based electronic classrooms. Performative teaching involves the use of digital tools to develop activities centered on students' participation in analytical or interpretive activities, rather than simply receiving information.

Students' Experience

The results of the student survey were also generally positive in terms of the experience of working in the EDC.

Compared to that of other classrooms, students found that the EDC environment:

- Promoted [self-] reflection
- Was much more enjoyable and "complete"
- Provided a multidimensional [learning] experience (especially in language courses)
- Made the class more interesting
- Enabled quick access to timely information
- Facilitated integration of meaningful visual resources that illustrated and thus helped in understanding course content.

Students attributed the following learning enhancements to the EDC environment:

- More lively class discussions
- Ready access to native speakers' resources (language courses)
- Ability to highlight and annotate online resources

- Availability of higher-quality audiovisual material.

These comments indicate that the EDC promoted class activities that augmented students' learning. Moreover, they suggest that these activities incorporated digital tools that were genuinely appropriate to their courses' respective purposes.

Recommendations

About Teaching and Learning in the Digital Classroom

The EDC environment enabled instructors to identify new teaching designs. Design refers most basically to intended purposes. Thus, in thinking about new teaching designs, we are also thinking about the way in which the environment allows instructors to reflect on their own teaching. It appears that the environment created by the EDC fostered such reflection, and with it, new ideas about the role of technology in education.

Actions for Further Development of the Digital Classroom Project

Partnerships for Experimentation
CCNMTL's mission of working in partnership with faculty members to develop formative educational projects with new media can be extended through the EDC. This might involve opening the room to a broader diversity of courses, incorporating additional resources, and/or creating similar classrooms in other locations on campus.

Documentation of Experiences
In the course of working with faculty it would be valuable to document the teaching and learning experiences developed in the EDC. This might assist them in making the most fruitful use of its various resources.

Training Sessions and Online Resources
It might be useful to organize training sessions around different knowledge areas, and/or to offer additional training sessions over the course of the semester. The latter could be topical in nature or simply provide a forum for instructors to discuss and otherwise find support in dealing with the difficulties and challenges of their work.

Online resources should also be developed that address instructors' training needs. The tutorials included with the SmartBoard are a starting point in this direction. It may also be worth developing a tutorial that addresses the overall purpose of the EDC. This tutorial could include documented practices to help instructors envision their own teaching designs.

Conclusion

> "But prosthetic technology is not the point, even if it is crucial to what a culture is about. What is the point is the procedure of inquiry, of mind using, which is central to the maintenance of an interpretative community and a democratic culture."
>
> Jerome Bruner, 1998.

This study highlighted how technology, thoughtfully employed, supported transformative teaching and learning experiences.

The development of multi-textual learning experiences, new communication practices, and formative technological skills are examples of educational activities the EDC environment supported and shaped. The process of

experimenting with digital tools yielded teaching and learning enhancements that were recognized by instructors and students alike.

The EDC Project represents a starting point for re-fashioning technology-enabled learning environments toward the pedagogical needs and purposes of their intended inhabitants.

References

Bruner, Jerome., (1997), The Culture of Education, Harvard University Press. Jerome Bruner