Creating a New Context for Activity in Blended Learning Environments: Engaging the Twitchy Fingers

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Abstract. Millennial students are used to environments that bring the information to them. iPads, iPods and Web 2.0 technologies that give today's professors the tools to interact at many levels with students. Students want to be able to do things after class time and between *World of Warcraft* games. This paper provides a case study of melding technology and pedagogy with learning theory to get students engaged in the learning in computer classrooms. Students way of interacting with information has changed, the way we deliver and support this exchange needs to as well. This paper will include a look at how students interact with technology and defines the types of learning objects and opportunities provided by the technology. Two levels of students were examined, middle school Hispanic computer skills learners and undergraduate students in a project management class. This paper reports on observations made during these classes.

1 Introduction

In the summer of 2011 DyKnow™ was used in a computer class for middle-school level students of the Hispanic Outreach Program. The software was part of a grant that was given to the program along with tablet notebooks. The goal was to increase student interaction with learning. This population traditionally does not have access to computers and education past high school is not encouraged in the home. The Outreach program states, "The King's College Hispanic Outreach Program's focus is to create an organized framework for the purpose of building strong relationships between the Latino Community and King's College, as well as assist in addressing the needs of the Latino community and their families." (1) Engaging students in the learning environment was crucial.

The interest and use of this technology by the middle-school students encouraged the introduction of the software to a college classroom. Goals of these two "pilot studies" were; to observe student interaction with the software, observe access to the notebooks outside of class time, and to see if students were more involved with the learning during class time.

Middle-school level students used the software during class time only while the college level students were able to hold class both in the class and remotely with the software. All students were able to access the "notebooks" and recorded lessons from the DyKnow server during the term of the instruction. The terms were three weeks for the summer middle-school students and one semester for the college students.

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2 Learning Contexts

The well designed instructional environment employs technologies that enable students to interact with the learning experience in ways that are relevant and enhance learning. Supporting software programs provide for a storage and retrieval area of pertinent course information. This allows the student to review and interact with the materials again over time.

This also changes the context of the learning experience. In this case, the context moves from human-to-human interaction to one of computer-mediated action that includes not only the computer as tool and human as actor but includes the larger "world" of the class. The students are no longer interacting only with the computer, but with each other in a goal-directed activity of learning. Kaptelinin states, "According to activity theory, the hierarchical organization of human computer interaction is determined by its emeddedness into the hierarchical structure of human activity that mediates the user's interaction with reality" (2). Further he states, "Meaningful, goal-directed activities constitute the context for both mental processes and external actions."

In an article from Edutopia, Mac Prensky quotes students from one of his panels on what education should be, "There is so much difference between how students think and how teachers think," offered a female student in Florida. A young man commented, "You think of technology as a tool. We think of it as a foundation -- it's at the basis of everything we do" (3). This feeling calls for a change in pedagogy and a call for using technology in the context of the classroom.

Blended learning environments use traditional classroom interaction along with web-based interactions. This allows the classroom to extend beyond the time and place of a traditional classroom. This paper looks at once such technology that can be used to design participatory learning experiences and to extend the learning interaction time for students. The technology is DyKnow. DyKnow is a classroom management software technology that enables collaboration and active participation in the learning. This technology allows students to review the actual class experience through the web anytime, anywhere.

DyKnow provides web storage of class notes and "notebooks" created by the students and the teacher in a fashion similar to old fashioned note taking. During class time students each have a view on their individual computer screen that is guided by the instructor. Outside of class students can access their saved "notebooks" to review their own notes and those made by the instructor. The instructor may also choose to record the session so students can hear the discussion when doing a review.

Many of today's classrooms come equipped with either wireless connection for students to access the net or computers for students to use during class time. Unless the context in the classroom is designed for learning students are often found twitching their fingers and going to places like Facebook and email during class time. The irresistible tug of technology leaves them disinterested in the lecture/note taking portion of class. However, if there is a purpose for their fingers to be active in the class the instructor can now work more efficiently at engaging the learner.

3 What Were We Looking For?

Both classes used to examine the DyKnow technology were taught in classrooms with computers at each student seat. One mission of using this software was to engage the students in the actual activity and content of the courses. There is a lot of research being conducted on the millennial student and how she learns due to the influence and omnipresence of technology in her life. Having the DyKnow software available for student use in the classroom it was hoped that students would engage more directly and in collaboration with the learning.

Many students do not take notes in class anymore; they come in as very passive learners expecting to be entertained. By providing a dynamic workspace on the classroom computers with the DyKnow technology students were able to take notes in a manner consistent with their daily practice of texting or utilizing a computer. This afforded a working space that used computer technology along with active participation in things like note taking and thinking-sharing.

The following sections discuss the instructor observations and student feedback of these studies.

3.1 Limitations to the Studies

While the observations and student feedback regarding this method of interaction were promising the small sample size was not sufficient to make generalizations to a larger population. It was encouraging enough however to proceed with introduction of the pedagogy to colleagues and develop future research methods to better analyze learning outcomes. Larger groups and the inclusion of a control group for further study would be optimal. Additionally subsequent semesters afforded a look at using this technology with visually impaired students.

4 Active Learning with Technology as Part of Blended Learning

4.1 Active Learning

Berque, Byers and Myers talk about a "pedagogical technique that is sometimes referred to as the upside down classroom" (4) in this classroom students come prepared to be active and learn outside the classroom as well as during class.

"Learning is a willful, intentional, active, conscious, constructive practice that included reciprocal intention-action-reflection activities" (4).

4.2 Blended Learning

Blended learning is described as "a hybrid of classroom and online learning that includes some of the conveniences of online courses without the complete loss of face-to-face contact" (5). Blended learning environments can be designed along a continuum of pedagogy and technology inclusion.

Today's technologies allow more opportunities for students to access live classes and retrieve information on course concepts at their own pace and on demand. Models for the development of open learning environments (7) provide a structure for the

practical application of technology in creating accessible learning environments that are learner-centered in nature.

Moller, Prestra, et al (8), talk about organic knowledge building, which focuses on the individual learner within a learning environment in relation to asynchronous learning environments.

5 Key Differences between Studies

5.1 Reason for Learning Is Different

"Learning is a willful, intentional, active, conscious, constructive practice that included reciprocal intention-action-reflection activities" (9). The introduction of DyKnow software to the classroom gave students a focused action plane in which to engage with course content and develop constructive practice with other students engaged in the same activities.

The ability to review course content at will from anywhere permitted students to interact longer and more frequently with the material. This ability reinforced the learning. Students remembered more and in the case of the middle school children improved English language skills such as spelling and writing.

5.2 Teacher Satisfaction Using Active Learning

The level of excitement due to the interaction made lesson planning and class interaction more satisfying. One day former students of the program, now in college, came in to work with the middle school students. These students were able to work with DyKnow on the layout activity for the newsletter that was created.

It is imperative, as with any change, that there is buy-in by the stakeholders. If using this active learning approach in traditional and blended learning environments increases teacher satisfaction it will be adapted more readily.

(Dyknow white paper states)By breaking the teacher-centered discussion into small chunks, active learning strategies rely on fostering student engagement (10). This paper which discusses best practices for active learning also points out, "an additional benefit of many active learning is the immediate feedback they provide to teachers". By using the polling feature of DyKnow the teacher can ask immediately for feedback on any item in the lesson. This allows for teaching moments or areas of further research.

6 Main Advantages Learned from These Studies

6.1 Engaging the Twitchy Fingers – Computer Mediated Activity

Students were able to take notes along with the lecture right on the screen where the activity or learning was taking place. They could highlight, tap notes, chat and share screens with the teacher and the class at large. This activity enhanced their focus on the lesson material while engaging their action toward the goal of learning. Their energy was harnessed in learning activities and not just computer browsing.

6.2 Peer Sharing of Questions, Comments, Notes, etc

One of the features of DyKnow™ is that it allows for peer sharing of questions, comments and notes via the interactive interface. Additionally, when an interactive white board is used with the class the teacher's annotations are visible to the students and their individual panels can be viewed on screen and on the whiteboard.

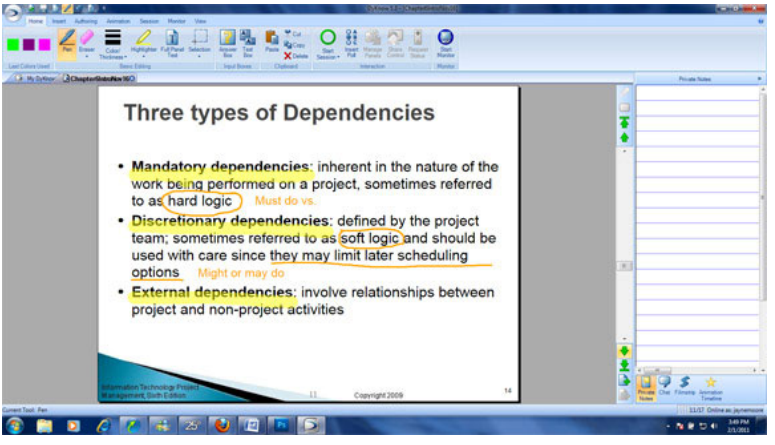

Fig. 1. Screen Shot of Teacher Presentation Notes Using DyKnow

The example shown here is the screen from the teacher's station. The markings are from the teacher and can be viewed in each student's notebook on their screens. This is then saved to the student notebooks which can be reviewed later.

Each student panel can be viewed and gathered by the instructor and then shared with the class or marked with feedback and returned to the student.

7 Twitchy Fingers and the Millennial Learner

Ipods, iPads and computer games have given rise to students who engage the world through their fingertips. These students text each other during class and are used to accessing information at their fingers. Touch screens and keypads have put fingers in constant motion all day long this leads to the twitchy fingers syndrome. This affects student behavior while sitting in the classroom, particularly a computer classroom.

In order to engage the learner it is necessary to engage their twitchy fingers in some goal-directed action or learning activity.

Millennial students are used to environments that bring the information to them. iPads, iPods and Web 2.0 technologies give today's professors the tools to interact at many levels with students during the semester and perhaps even longer. Learning does not have to stop when the proverbial class bell rings. Students want to be able to do things after class time and between *World of Warcraft* games. Creating learning

environments that allow the student to review the class, access personal notes and review relevant materials can actually elicit better learning habits among this learning group.

8 Scaffolding Learning with DyKnow Interface

Land and Hannafin make the point that, "…a lack of external support is mistaken for student-centered learning despite the absence of needed scaffolding" (11). DyKnow and active learning contexts indeed scaffold the learning as they provide teacher supported, material supported and peer-supported tools to enable the learner to approach the learning with the appropriate scaffolds via the materials and peer interaction that is guided by the instructor.

Each of these experiences and tools provides multiple interactions with the learning at several levels over time.

9 Future Research

Due to the successful feedback from students and the excitement generated in the classroom for the instructor the licensing grant for the use of DyKnow™ at the college was extended. A closer look will be taken with regard to learning outcomes. Additionally, we will be able to use this again with middle and high school students over the summer. The interest shown this method by students allows us to now focus on learning outcomes and motivation to learn with computer mediated tools.

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