

Making the Connection: Reinforcing Hands-on Learning Through Hands-on Writing

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Summary

Traditionally, the goal of experiential learning is to allow students to learn through hands-on experience. Recently, suitable assessment and evaluation techniques of students in online learning environments have garnered a great deal of attention as to best practices in experiential learning based courses. This study analyzes assessment and evaluation of student learning in an undergraduate-level Pocket PC course, centred on experiential learning in an online learning environment. This study will (1) identify hands-on activities that can be implemented in an experiential learning environment; (2) examine the effectiveness of assessment tools; and (3) examine student perceptions of course activities.

Keywords

Experiential learning, assessment, distance education

Introduction

Experiential learning offers students opportunities to learn through hands-on practice. As classic followers of Dewey's experiential learning theory (Dewey, 1938), which purports that everything occurs within a social environment, our role as educators is to organize the knowledge, content and experiences into material that can be facilitated into quality learning experiences. According to Dewey's theory (1938), upon completion of the experiential-based course, students should have gained the knowledge and the ability to apply the information learned to different situations outside the learning environment. Additionally, experiential learning can apply to any kind of learning through experience. It is often utilized in education to refer to a structured learning sequence which is guided by a cyclical model of experiential learning. Occasionally, unintentional learning occurs during the instructional process creating a 'learning through experience' form of learning (Kolb, 1984).

This study proposed to create rich learning experiences for students enrolled in an online environment and even more complex, incorporating an authentic hands-on experience in combination with real-world research. Our goal was for students to be able to perform tasks at a basic level of competency and to understand how the technology is currently be used in various professional settings. Additionally, we felt it was imperative that students be able to make the connection between being a purveyor of technology from a theoretical approach. The focus of this study was to determine whether the instructors could provide students in an online learning environment with a similar experience and evaluation process as those students in the traditional, face-to-face classroom. We were not comparing face-to-face instruction versus online instruction; rather the researchers were trying to duplicate assessment techniques to measure the technical proficiency of the students and evaluating the strength of the assessment tools for the online course.

Purpose of the Study

Increasingly, institutions of higher education are offering more online programs and courses via the World Wide Web. With the accumulation of traditional, face-to-face courses being moved online, the need to create a social environment where students can learn by “doing” has become progressively more important. By incorporating experiential learning techniques into the online course curriculum, we hope to provide students with opportunities generally not afforded in previous online classes. Specifically, those courses that incorporate students gaining a technical proficiency using a technology tool, such as the pocket pc. The purpose of this study was to evaluate the effectiveness of students’ skills and abilities after being given hands-on activities to master in an online environment. Furthermore the study addressed the various methods to evaluate and assess students’ technical proficiency after being provided with the hands-on activities. This study will seek to (1) identify the types of hands-on activities that can be used to create an experiential learning environment in an online classroom; (2) examine the effectiveness of various evaluation and assessment tools; and (3) study student perceptions of experiential-based course activities. This information should prove valuable to educators as they strive to develop experiential learning environments amongst their online courses.

Review of Literature

Experiential learning theory defines learning as “the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience” (Kolb, 1984, p. 41). Experiential learning is comprised of three components: knowledge, activity and reflection (Kolb, 1984; Rogers, 1994). It can be characterized as a “direct encounter with the phenomena being studied rather than merely thinking about the encounter, or only considering the possibility of doing something about it” (Borzak, 1981, p. 9 quoted in Brookfield). Dewey acknowledged that students are individuals with differing circumstances and needs. Education by

experience can facilitate individualized instruction that meets the needs of individual students. Experiential education gives students the freedom to interact with the content being learned (Grady, 2003, p. 8). We see many of the traits of experiential learning theory woven throughout the adult education curriculum. However, to date, there has not been a great deal of literature describing how experiential learning theories can be integrated into the assessment and evaluation of students gaining technological skills in the online learning environment.

Goal of Experiential Online Assessment

We believe that there is a critical link between student assessment and instructional effectiveness. According to Bloom (1956), student assessment provides an opportunity for students to demonstrate what they know (cognitive skills), or tasks they are able to perform (psychomotor skills). To best serve learning, assessment must be integrated with curriculum and instruction to test the stated objectives. Accordingly, there are numerous documented methods to evaluate student achievement in an online course. Instructors can provide quizzes, examinations, research papers, homework assignments, collaborative/teamwork, discussion board interactions, and a variety of other evaluative tools (cognitive skills). Each of these assessment methods can be read by the instructor and interpreted as to whether it met the critical standards outlined, and then appropriate feedback provided. This theoretical viewpoint leads us to question how an instructor can evaluate a student's technical proficiency in an online environment. In a traditional class setting the professor could assign a variety of hands-on activities and walk throughout the classroom to evaluate how the students are grasping the content. Tests may be given where a product (document) may be produced and the professor can assess if the document was created correctly. In an online environment, the instructor and students are physically separated, therefore, the dynamics of evaluating and assessing whether the students are mastering the technology or simply producing the correct end result is complicated. Our experience teaching the Pocket PC course has demonstrated that students have been able to replicate finished results without following the proper procedures or even using the required technology.

For example, Pocket Excel® is a scaled-down version of the full desktop Microsoft Excel® product, however, it has limited features even though it is powerful enough to do almost all needed functions while the user is away from a desktop computer. Users are not able to display vertical text, graphs, tables, backgrounds or pivot points. Users ActiveSync® to keep Pocket Excel documents synchronized with Excel documents with their desktop PC. During synchronization, ActiveSync converts file formats between Pocket Excel and Microsoft Excel. If you drop an Excel file (.xls) into the My_PPC My Documents folder on the desktop PC and synchronize, the file is automatically converted to a .pxl (Pocket Excel) when it arrives on the Pocket PC. The same is true in reverse. When students create Excel documents on their Pocket PC and sync with the desktop, the file is automatically converted to an .xls document. Once this conversion process takes place and the document forwarded to the instructor for grading, there is no way for the instructor to determine whether the document was

created on desktop Excel or Pocket Excel. In this study we evaluated the use and incorporation of screen capture, audio and video technology to evaluate student achievement. Screen capture is the ability to capture a "snapshot" of the window you are working in on the computer. The audio and video assessment tool was used to capture students working on documents simultaneously as they were produced. The students were able to use a program called SOTI Pocket Controller (www.soti.net). This software program allows users to sync a standard Pocket PC with a desktop or laptop computer and view the enlarged, Pocket PC screen on the corresponding desktop or laptop. This technique allowed the researchers to capture screenshots, as well as video, of assignments being completed in "real-time". The goal of implementing this software as an assessment tool allowed us to capture the students' successful completion of the hands-on activities. The students were able to capture and save the "snapshots" and videos for download so that we could assess and evaluate their ability to maneuver and use various features of the Pocket PC .

Goal of Real World Research

The goal of writing is effective communication. Research is the systematic process of collecting and analyzing information to increase our understanding of a phenomenon under study. It is the function of the researcher's ability to contribute to the understanding of the phenomenon and to communicate that understanding to others (Leedy & Ormrod, 2005). Conducting real-world research allows the researcher to investigate a situation in the actual context where it occurs, rather than a laboratory (Robson, 2002). In the Pocket PC course, students were required to write a research paper concerning how the technology was currently being used and how it could be used in the future in an office, hospital, higher education or K-12 setting. This exercise teaches students to appreciate practical applications and everyday usage of the technology tools in real world settings outside of the educational environment. The application of knowledge based theory to real world uses reinforces the concepts that were taught during the duration of the course.

Integration – Experiential Exercise

Students enroll in the Pocket PC course to become familiar with a variety of tools and software available for those in education, business and industry. The material covered in the course provides students with the basic manipulation of the device and software programs available with the Pocket PC. Some topics included: (1) setting up custom settings, (2) email, (3) Pocket Internet Explorer (PIE), (4) e-books, (5) creating .pdf files (6) Pocket Word, (7) Pocket Excel, and many others. The Pocket PC course was designed to incorporate both hands-on activities and reflective practice to assess student outcomes. By integrating a multitude of assignments and hands-on competencies the instructors were able to assess mastery of cognitive and psychomotor skills. To assess whether students were able to meet course competencies, instructors required students to utilize the Pocket Controller software to create (1) snapshots and (2) audio & video. Additionally, students were required

to develop critical thinking skills through reflective practice upon completion of each assignment. By combining these assessment tools, the instructors were able to physically evaluate each student's level of achievement.

Method

This study was designed to provide students in a technology-based course, an enhanced learning experience by determining the most valuable method for delivering experiential learning coursework and understanding current and future usage. The Pocket PC course is an elective available to students in the Business, Career & Technical Education Department at a research intensive university in the North Carolina system.

In the spring of 2005, students were assigned by an academic advisor through standard registration procedures to either a section of the course that meets face-to-face, on-campus or online course, off campus, for the course beginning during the first summer session. Twenty-four students were enrolled in the online section and 13 students were enrolled in the on-campus section. Demographics for each section of the course were consistent with all departmental courses and were homogenous in nature. For the purpose of consistency, each class received the same instruction and the same evaluation methods, which evaluated the students' degree of skills attained working with the technology rather than comparing face-to-face vs. online teaching methods utilized. We believed that this would demonstrate the affects of experiential learning on the students' academic performance. In addition to addressing experiential learning in an online learning environment, a new method for assessing student success was introduced to evaluate the level of student achievement.

Prior to the start of the summer session, learning materials were designed and developed to elicit hands-on exploration of the Pocket PC. The goal was for each student to become proficient to a standard core of competencies to ensure rigorous academic performance using software with the technology tools.

Two weeks before the beginning of the first summer session, students registered in the online section of the course were required to fill out and return an Agreement & Terms form stating that they would be responsible for the safety, care and condition of the Pocket PC throughout the term. Once the form was received by the instructor, a Dell Axim x50 was mailed out to the student. Additionally, each student enrolled in the online section of the course was required to have a web cam and purchase the Pocket Controller software.

The online course was delivered over a 10 week period. Students enrolled in the course were sent Dell Axim x50 Pocket PC's. Students were not provided with a textbook since all materials were instructor generated. However, students were required to purchase a \$29.99 software program, SOTi Pocket

Controller. The software program provides a variety of tools that will help any pocket pc user to complete a variety of tasks. In the pocket pc course the SOTi software aided in the completion of a variety of student assignments. The assignments included both hands-on activities but also a reflection component for each task. At the conclusion of the term, students completed a final which was comprised of completing 8 tasks out of 10 that students could videotape using SOTi Pocket Controller. The SOTi Pocket Controller provides users with the ability to create a skin image and remotely control and manage their device from their desktop/notebook computer (see figure 4.1). The skin can take on many forms. Students are able to choose from a variety of skins available. These skins range from artistic design to those which resemble the exact look of the Pocket PC. The students enrolled in the online course were required to choose the skin image that represents the Dell Axim x50. With all pocket pc's, you are able to "sync" your desktop, laptop or tablet computer with your pocket pc. This allows for transfer of material and updating of files and folders from one device to the other. This process provides you with the ability to view everything on your pocket pc on your computer, allowing students to capture both screen captures (snapshots) and video (see figure 4.2). This function is what we were able to incorporate into the assessment component to make assignments and final more interactive. It also provided the instructor with the ability to visually assess student achievement and proficiency of their technology skills.

Figure 4.1 Snapshot View



Figure 4.2 Desktop Views



Both the on-campus and online course were comprised of the same activities and assignments. Some topics included: (1) setting up custom settings, (2) email, (3) Pocket Internet Explorer (PIE), (4) e-books, (5) creating .pdf files (6) Pocket Word, (7) Pocket Excel, and many others. After completing each assignment and reflection, students were required to complete a final. The final consisted of an evaluation of students videos for the online students and an observation/evaluation of competency for students who were in the on-campus class. The assessment that was created was designed to assess if students mastered course competencies in terms of completing specific tasks using the pocket pc.

To evaluate the competencies the instructors created a list of skills that could be assessed both on-campus and with online students. The rubric addressed skills that could be mastered based on course curriculum taught. During the last week of class both sections of the course were evaluated to determine whether they met described competencies. In the on-campus section of the course, during the final class period, the instructor sat down with each student along with a copy of the evaluation rubric. Each student was asked to perform the required tasks and then the instructor recorded whether they were able to do it on the rubric. Through verbal and visual cues, the instructor was able to determine whether the student actually knew how to perform the skill or whether they were completing it by 'trial and error'.

In comparison, the online students were provided with the same final assignment. However, the students taking the online course were allotted a certain amount of time to complete the required tasks by video capturing the steps they took to complete the task. The students then sent the video via digital drop box to the professor to evaluate. The rubric was used to assess whether the students were able to master the competencies.

In the fall of 2005 and spring 2006, the research paper component was added to the course to add the real-world research element. Students were required to write a 5-7 pages, APA style research paper on the usage of Pocket PC's in any chosen field which interested them. For example, K-12 educational settings (administrative or classroom based), higher education institutions, health care facilities, corporate training and development, just to name a few. They were to write the paper from the

perspective that the audience is unfamiliar with the Pocket PC. They were given the following headings to include:

1. Introduction (include historical perspective);
2. Current usage;
3. Future usage;
4. Technical specifications; and
5. Summary/Conclusion.

Students were encouraged to include screenshots and interviews with current users within the real-world setting.

Results

In the following subsections, results are reviewed and discussed.

In the on-campus version of the course, all 13 students were able to complete all the required tasks with a varying degree of competency. The instructor measured whether the students could either complete or fail to complete each task. We were not measuring how long it took for the students to complete the tasks, but were more interested in how the students were able to complete the task and if they had mastered the ability to operate the pocket pc. There were three students in the on-campus course that, although they demonstrated a lack of proficiency on several tasks, were able to complete them through trial and error after an extended period of time.

In the online section of the pocket pc course 24 students were evaluated using the rubric. The students were evaluated on the same criteria as the on-campus students. However, for the online students, mastery of knowledge was evaluated based upon the video captures that the students took and sent to professor. Each student was asked to complete the final within a one-week period of time, as opposed to the one-day in-class observation for on-campus students. Therefore, the students were given one week to video tape mastery of knowledge of course components. The students then placed the material into the digital drop box within Blackboard (due to size of files) to be graded. File size ranged from an average of 6KB to 1MB of data. Students sent each component separately. Each file was assessed individually and then compiled with the other components to provide a final grade. Students were provided with specific comments and feedback based upon the videos they created. Suggestions for completion and suggestions for integration into life and business sector were also provided. It is the belief of both professors that to fully master the material one must adapt a mobile lifestyle where the integration of the pocket pc is in full use.

Students in the online course showed great success in mastering the competencies. However, it should be noted that because they were allowed to complete the final without constant professor supervision, this provided students with the ability to create video files more than once, therefore giving students the ability to refine the final product. During this process, no method was developed for the online section to be evaluated on refining the videos. Therefore, although they were able to be properly assessed using hands-on assessment techniques, they were also provided with the opportunity to repeat tasks until each component was mastered. Students in the online class were eventually able to master each task, which was the key objective for the course. Only three out of twenty four students had difficulty mastering some of the components. In one instance, the difficulty involved syncing the pocket pc to send an email message. With the two other students, problems arose creating the .pdf files. Students eventually were able to master material once feedback and further directions were provided by the professor.

Student Perceptions of Course Content

On-campus Students

- Brule: I enjoyed this class very much. The Dell Axim was an interesting piece of equipment to work with. It had so many amazing features.
- Preston: The hands-on approach was the only way this material could be presented and practice helps in developing the skill. With my lack of general computer background knowledge, I could have used more repetition of step by step procedure for the activities. Although, I don't feel competent in all areas that we used the Pocket PC, I feel I will be able to do what would be expected in the high school course requiring the PDA should I find myself in the classroom again. I had a great experience and I would definitely do this again.
- Cumming: I believe the greatest feature of Pocket PC Technology is its completely wireless. This feature allows for greater flexibility, mobility, and overall convenience. Regardless for what reason the Pocket PC is purchased, it can be used in every aspect of your life. Initially, I planned to use the technology for schoolwork, maybe to even organize some of my appointments for work and school, but over the course of the class, I incorporated the Pocket PC into everything I did!

Online Students:

- Crocker: I love the final! Its fun! It refreshed what I have already learned.
- Inslow: I think this final is a great idea. . to show what we learned!! :-)

- Hearney: I think there is opportunity for sharing video demonstrations, lectures, etc. using the Pocket PC video applications. I liked using Pocket TV, but I thought the recording function in Pocket PC Controller was the most impressive and useful video function for me. This would be great for recording demonstrations of what we are supposed to do for assignments/lessons required in this class. The written instructions are ok, but there is nothing like seeing the activity in action to help me understand what I'm supposed to be doing.
- Mac: The benefits I can think of for viewing videos on a pocket PC is that they are not as bulky as some laptops and you can cover the screen with your hand if you need to (like a picture appeared that you were not expecting like in Office Space). Opportunities for integrating Pocket PC video applications into the curriculum would probably include workloads or assignments in great detail. Just like the article we read and had a discussion on I think the Pocket PC would make a great addition to anyone's curriculum. Where I now work they are actually trying to get Pocket PC's for the pilots to plan there flights and GPS and keep flight records.
- Miller: The format of this class was extremely beneficial in my learning and reaching the objectives; particularly the "hands-on" assessment. I would recommend this class to everyone in the department.

Student Perceptions of Final Paper

- Deaton: Pocket PC's are an amazing and useful tool that educational facilities must use. After researching the use of Pocket PC's in classroom instruction, it is evident that for the students of this day and age to stay up to date with technology, educators must implement these devices in schools. I didn't realize this until I had to research the subject. I think this was the best assignment I have done in school.
- Michaelson: Before writing this paper, I thought these were just expensive, electronic calendars and a waste of money. Now I see that there are many uses of the Pocket PC in the Army. I had no idea that there were actual practical purposes for these things. Writing this paper has changed my view point and opinion. I am going to get one for graduation.
- Williamson: The timing for this course worked out well for me in one respect – I had just started a new job as the IT Manager for a small aviation (air taxi) company, and I used this research paper as a tool to learn my new job. We actually use handheld devices in a manner similar to that illustrated in this paper. Still, I feel that I learned a lot, and that the new job helped with the course while the course also helped with the new job.

- Keely: At the beginning of the semester I had a difficult time coming up with a topic for my final paper. After spending time with my son's pediatrician and watching everyone in the office use theirs, I realized that people were really using these things. I made an appointment to talk to the people in the office and they explained that now they couldn't live without one. This assignment really changed my opinion about the Pocket PC and now I feel like I'm one of those people that can't live without it. I really enjoyed this assignment and feel like it is the best part of the class because it showed how doctors and nurses really use them to keep patient information at their finger tips.
- Miller: Although no one stops learning about any kind of computer in this age, the multitude of software available for its use, or how to fix a variety of glitches that may occur, I feel writing this paper has equipped me with the knowledge and resources to help others learn about and use Pocket PCs in higher education. I hate writing research papers, but this one was actually interesting.

Conclusion: Structuring Successful Experiential Learning Online Assessment

The evolution of the pocket pc course since its first delivery in an on-campus setting has evolved into a course that has provided students both on and off campus with the ability to relate to a "mobile lifestyle". Countless students have taken this course over the past few years and have commented on its ability to transcend traditional curriculum in providing access and mobility to travel and hectic schedules. Our ability to provide new ways of learning and assessing student achievement has proved to be beneficial for online instruction. According to the Illinois online network "Assessment should reflect the online medium in which the course is taught, and traditional testing procedures may not be practical in an online environment" (ION, 2006). We have seen first hand how tests taken in traditional classroom settings do not apply to online courses. In particular when the material taught is experiential in nature. Hands-on assignments, activities, and exams need to be congruent with the online environment utilizing different teaching methods and instructional strategies. For this reason, we developed the online snapshots and video capture procedures to assess how students master course competencies. This project has proved beneficial in its ability to fully assess each component of learning the Pocket PC. Combining the technology strategies along with the real world research and reflections, we were able to measure and assess student learning and achievement. This model of assessment allowed students to use critical thinking skills to complete assignments while permitting us to evaluate whether they met the stated course objectives.

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