Lessons Learned from Teaching Technology Skills Using a Virtual Internship

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Abstract - Southern Virginia University has mandated that all incoming freshmen have information communication and technology skills in Word, Excel, and PowerPoint as well as learning self-management skills that help them transition to college. While some incoming students do not have these skills, there are increasing numbers who do. What is the best way to teach and insure that students have these skills? This presentation reports on a web based virtual internship designed to ensure that students meet required technology competencies and practice managing their own time to meet deadlines. It also includes modifications we have made over the last three years as we have learned what works and what needs to be improved.

Introduction

Constructivist learning environments designed for on-line delivery can assist students in learning technology skills and provide an authentic context that helps them transfer these skills to the work place.

In this paper I will describe the on-line virtual internship used to provide instruction for a course taught at a small liberal arts university as well as the students' perceptions of the course features.

Description of the on-line virtual internship

Students in the class are asked to imagine they are on a semester internship with North America Printers, Inc. (NAPI). NAPI is a virtual company that specializes in custom printing, layout, and mailing services. By creating the internship with a publishing company, some of the material included in the assignments as content also doubles as instruction for the student.

This semester the students will be working for Jim who is in charge of Public Relations. Jim and the other seven employees can be found in the directory section of the web site where each employee has a video clip that provides the students with the necessary requirements or information they need. When students request information from a virtual employee, the data is sent to that student's school email account.

Assignments

Throughout the internship, students will be responsible to complete three assignments for the company: 1) quarterly newsletter; 2) reward trip flyer; 3) rush job (final exam). The internship requires students to use a word processor to demonstrate skills they may or may not currently possess. If students are knowledgeable with word processing, they may complete the assignments and turn them in to Jim using the NAPI web site interface.

If students do not have the required skills, they will have to learn them using at least one of five ways. Melanie, the secretary, can provide some video delivered help on the most common questions. Step-by-step instructions are available from the help menu in the word processor.

Additionally, they can get help from their friends, lab assistants, or the instructor.

To help students visualize what is expected of them, the company employee (during the video clip) may show them a copy of previous work and invite them to download a copy from the website. Both the previous version of the flier and newsletter are available as a Portable Document Format (PDF) download. The PDF allows students to see how the finished product should look, preserves color information, looks the same on all platforms, and prevents students from copying and pasting into their own work.

As a result of student suggestions during the pilot study, the deadlines for turning in assignments were staggered throughout the semester instead of all tasks due at the end.

The website that supports this virtual internship contains six sections: Home, Introduction, Assignments, Directory, Media, and Journal.

The virtual internship website

The website for the virtual company "North America Printers Inc.," or (NAPI) is located at http://www.naprinters.com. The home section describes the company and what it offers customers. The introduction describes the course design, how assignments are graded, materials students may need, where to get help, and the computer technology required to access the complete web site. The assignments section provides access to three video clips with a transcription of the audio. When one of the three assignments is selected, the virtual boss "Jim" comes on screen via a QuickTime video clip and describes the assignment. In his description he identifies other employees whom students will need to contact for information as well as describing the look and feel of the document they are to produce. He shows them the assignment that was mailed out last year while he explains the specifics of the task. In this same section is a "Turn In" page that gives the deadline and allows students to attach the completed file

and send it to Jim. The directory section of the web site has eight employees represented with QuickTime video clips. When the video is played, the employee either tells the student what Jim wanted them to know or offers to email the necessary information when the student enters their email address and clicks a button. The requested information is emailed to the students' university email account. The media section contains part of the resources (photos and logo) they will need for the assignments. Other materials must be gathered from the Internet. The Portable Document Format (PDF) version of the previous year's mailings, as well as the grading criteria for each activity are also made available. By using a PDF, the look and feel is preserved without allowing students to copy and paste into their own work. The journal section is the last tab and contains the guided journal questions that the students must answer after completing the assignments. These questions guide the students to reflect on their own learning.

Students will work on these activities and communicate with the instructor via email until the last week of class when they meet again for the last word processing assignment that serves as a final exam.

Student perceptions of the course features

Constructivist research suggests that students are more engaged in an activity when they can make connections between what they are learning and the real world. Since it is not possible to put students in the real world for all classes, the literature suggests that the assignments students complete reflect the real world (Reeves, 2002) and that students are assigned a role in a simulated reality (Dickey, 2005) where they are graded on their ability to complete the realistic tasks (Shepard, 2000). To assist them in completing the tasks, students should have an authentic learning environment that provides a realistic context (CTGV, 1990), allows engagement (Dickey, 2005), and fosters personal responsibility. They should also work on

realistic assignments (Lebow & Wagner, 1994) and be given optional task specific help, possible teacher help (Jonassen, 1999), expert examples (Brown et al., 1989) and be allowed to work with peers (Herrington & Herrington, 1997). Students should be allowed to collaborate with each other (Bransford & Vye, 1989) and be given an opportunity to reflect on how they could use this knowledge in the future (Hinett, 2005). Finally they need to be assessed using appropriate criteria (Shepard, 2000) in a timely manner based on products they produce (Jonassen, 1999).

Next I consider how student perceptions from this course can inform instructional designers about improving the design of constructivist learning environments and offer suggestions for improving the design of future virtual internships.

Participants' roles

While a few students felt role-playing just got in the way of completing the assigned task, the perception of most study participants was that being assigned a role to play within the virtual internship made the class more fun, interesting, and realistic. Most enjoyed interacting with the virtual employees through video and email as it made them feel more like they were in an actual internship. As with realistic assignments, having a role allowed students to feel like they were interacting with co-workers in the workplace using technology (email and video chat) that they would use in the real world. Constructivist research and theory suggest that students are more engaged in an activity when they make connections between what they are learning and the real world (Brewster, 2000; Schlechty, 1997).

Pacing and format of the course

The perception of study participants on pacing and format was mixed, depending on their ability to learn independently, their current skill level, and their ability to manage their own time. Initially, most students liked the idea of working at their own pace, but when some of them found they couldn't manage their time efficiently, they expressed a desire for more teacher imposed structure. One of the big attractions for a self-paced course was not being required to attend a class when students felt they already knew the material.

In a revised internship, a pretest could be given and students who scored above a cut-off score could be allowed to complete the course entirely on-line.

Those students below the cut-off score would be required to attend a certain number of classes where the instructor could provide face-to-face instruction.

Providing reminders

The perception of study participants was that they would like more reminders to help them meet deadlines and remember to attend optional training courses. They felt this was particularly important if a course was on-line and there were no formal classes. There were some who felt that a few reminders were more realistic and that if they missed something it was their own fault; others felt that in the real world a boss would constantly check on their work (i.e. by providing reminders).

In a revised internship frequent email reminders could be provided. This departure from total realism, with the provision of structured reminders of schedules and completion dates (often not provided in the "real world" once work is begun), can help support students who are developing both self management skills and the knowledge and skills in the content area being addressed.

Realistic assignments

Study participants felt that having realistic assignments was important because it added a new, realistic dimension to a typical classroom project. The tasks they completed had an added level of importance as students perceived these skills as useful in their future employment, having seen these skills in use by parents or friends in their work. Many students could envision themselves performing these tasks for a future employer. For those students who had already had experience working, it opened up new ways of completing tasks.

These findings suggest the assignments were successful in matching, as nearly as possible, the real-world responsibilities of professionals in practice (Brown et al., 1989; CTGV, 1990; Jonassen, 1994; Young, 1993).

In a revised internship, the instructor could locate and provide real examples from business, industry, government, and education. This would help students who are doubtful about the authenticity of the assignment or unfamiliar with the tasks performed in the real world to recognize that the class assignments are realistic.

Expert examples

The perception of study participants was that having expert examples to which they could compare their work was essential for them to be able to complete the assigned task. They felt it was even more important because the class was self-paced and much of the instruction was online. Expert examples helped students visualize written expectations, shortened the time needed to complete an assignment, and reassured students that what they were producing was consistent with teacher expectations. This supports the theory of Collins et al. (1989) and research findings by Brown et al., (1989) that suggest that students benefit from evaluating their own performance and comparing it to the performance of an expert.

In a revised internship, examples of previous student work featuring commonly made mistakes could be provided along with a description of the mistake and how it affected the final grade.

Teacher help

The perceptions of study participants was that the teacher should be more available and provide classroom instruction for students who lacked basic skills and were uncom-

fortable learning on their own. For students who were comfortable learning on their own or who possessed most of the required skills, not having the teacher immediately available in class each week was not a problem. The desire to have a teacher available supports the theoretical literature (Collins et al., 1989; Honebein et al., 1993). A few study participants suggested that class attendance be required in order to address students' instructional needs on specific topics.

In a revised internship, a pretest could be administered to all students to determine their initial skill level. Those students below a cut-off score would be required to attend hands-on training sessions. This suggestion would not account for students who lacked the required skills at the start of the course but who could and would prefer learning independently.

On-line help

The perception of study participants was that on-line help was essential to support students who needed assistance completing the assigned tasks. Help should be detailed and cover all the topics required for the class. Some felt that having the help come from a virtual co-worker made the experience more realistic. There was no clear format preferred by students; some liked video, others preferred to read the instructions, and some wanted handouts. The virtual secretary, "Melanie", provided the on-line instruction for this internship, and students who needed help would watch or read her instructions. Of the students who did use this form of help, most felt the help she provided was good, but the breadth of topics and the depth of the instructions needed to be improved, especially since there was no required classroom instruction.

In a revised internship, step-by-step job aids or screen capture movies (where the instructor's computer screen and voice are captured while performing a task) could be provided for topics on which students consistently have difficulty. Additionally, the format for the employee videos should be changed from QuickTime to Flash, as Flash has broader browser support.

Timely feedback

The perception of study participants was that feedback needed to be detailed and received soon after an assignment was due. Detailed feedback would help students avoid making the same mistake again and let them know areas that needed improvement. Students also wanted some indication that they had successfully turned in an assignment (similar to the feeling they get by handing a paper to a professor in class).

Wiggins (1990) has suggested that points be awarded to sub-parts of an overall assignment. The literature in instructional coaching suggests that a good teacher should analyze learner performance and provide feedback along with motivational messages (Jonassen, 1999). During this course, the instructor sent an email to all students with a single score for the assignment, but this score was sent a couple of weeks after the assignment was due. Moreover, specific feedback on each of the assignment criteria (e.g. 3 of 5 for correctly inserting pictures with borders) was not provided.

In a revised internship, an automated email could be sent to the student once an assignment had been turned in, indicating that the document made it successfully to "Jim," the virtual boss. This response would help students feel comfortable with electronic submission of assignments. Additionally, the instructor could set up his grade book in a spreadsheet with each of the assignment criteria and then merge it to multiple custom email messages. This would provide detailed feedback to students on how they performed on every aspect of an assignment.

Working with peers

The perception of study participants was that being allowed to work with peers of their choosing was superior to other forms of assistance for several reasons. They believed that a friend could answer a question faster, and that by helping others they learned the material better. They felt that understanding was enhanced when they could work together, and they liked having a friend look over their work prior to submission. They strongly preferred choosing whom they worked with rather than being assigned to a group. Some believed that forced group assignments could lead to unfair distributions of the workload, echoing Herrington and Herrington (1997) who assert that students who choose their group tend to maximize collaboration and enjoy the experience more.

Reflection

The perception of study participants was that these skills would be useful now and in the future. They gave examples of how they could use a skill during the same semester in another class, how they could have used a skill to simplify a previously performed task, and how they thought they could use a skill in a future job. This belief supports the theoretical literature which suggests that providing an authentic context and authentic task allows students to reflect on how knowledge applies outside the classroom experience (Hinett, 2005).

In a revised internship, a 750 word reflective journal could still be required to give students the chance to respond to targeted questions about what they learned and how they could use these skills in the future.

Performance evaluation

The perception of study participants was that being evaluated on their ability to complete an actual task was the most realistic and effective way to be graded. All the study participants felt that the required technology skills were best evaluated by having students complete realistic assignments and that other forms of testing (multiple choice, true-false, etc.) would be inappropriate. Students believed that clear expectations should be provided for each assignment in order for them to understand what

was expected and to be able to successfully complete the task. Many students took pride in creating materials that looked professional and felt confident they would be able to meet the challenges in a real job. This belief is supported by the theoretical literature that suggests evaluation of students should be based on the products they produce (Scanlon & Ford, 1998).

Evaluating portfolios or products can be more work for the teacher than grading examinations, and since work is done outside of the classroom, students could potentially cheat (e.g. have a friend do the work). To overcome this problem, students in the virtual internship were given a practical timed final exam in the classroom where they were required to demonstrate a set of skills and the instructor could make sure they did their own work. Student performance on the final exam was highly correlated with performance on the assignments completed on their own (r(43) = 0.88).

Overall student perceptions of constructivist-inspired instruction

After the class was finished, students were asked to describe how they felt about their involvement in a virtual internship and what they thought were the advantages and disadvantages of the experience. The general belief of students was that they enjoyed the virtual internship and were excited to have taken a class that had a unique approach. Study participants indicated support for working on realistic assignments in a setting that resembled the real world, but were mixed on the usefulness of being assigned a role as virtual employees. In addition, their observations supported grading on their ability to complete a realistic task and having expert examples available. Student responses suggested that a virtual internship should provide more instructor help and additional detailed topics in the on-line help section.

Not all aspects of the virtual internship worked equally well for all study participants. While some students flourished in a self-paced learning environment and enjoyed working with peers of their choice, those with less ability to manage their own time expressed a desire to have more email reminders from the instructor about deadlines and optional training. Participants who engaged in the virtual internship and were willing to put in the time necessary to complete the assignments properly and figure out how to do things they did not already know, felt the skills they gained would stay with them longer as a result of the effort they made. They were able to construct the knowledge and skills they needed by thinking it through on their own and/or working with friends, thus supporting the importance of independent learning.

And thus we see that while there are still changes that can be made to this virtual internship to better meet the students' needs, a virtual internship can be an effective method of delivering technology instruction in a setting that promotes authentic learning by providing real-world activities, opportunities to learn from peers and experts, and a chance for students to manage their own learning.

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Dr. Cheney received his master's degree from Utah State University in Instructional Technology and worked as a civilian for the United States Air Force doing interactive computer-based firefighter training. He and his family then moved to Provo, Utah where he worked at Brigham Young University for five years in the Instructional Technology Center. While there, he was involved in authoring multimedia, digitizing video, training faculty in instructional technology, and QTVR. He then moved with his family to Buena Vista, VA where he joined the faculty at Southern Virginia University. While there he taught multi-media design courses, served as the Director of Media and Instructional Technology, and completed a Ph.D. from the University of Virginia. Ten years later he returned to Utah where he is now an Assistant Professor at Utah Valley University teaching courses in their Digital Media department.

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