Electronic Pedagogical Practice: The Art and Science of Teaching and Learning On-Line

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ABSTRACT
The author’s experience in designing and teaching an introduction to educational psychology course on-line to 23 undergraduate education majors is discussed in this paper. Due to the curricular content of this course (i.e., the psychology of teaching and learning), critical issues about the similarities and differences of teaching and learning within traditional classrooms and electronic environments can be explored from two perspectives: the teacher’s and the students’. Personal experience, case study, student comments, course surveys and evaluations will be utilized to highlight the relationship between course curriculum and goals, pedagogy, and student learning in this paper.

Keywords
Pedagogy, On-line instruction, Curriculum, Interaction, Sociocultural, Social constructivist

Introduction

It is often suggested that new pedagogical practices are needed within electronic environments to maximize student learning. While this suggestion merits consideration, I find that blanket statements regarding effective pedagogy within electronic environments make me leery. The reason for this concern is the fact that more often than not, electronic pedagogy is discussed in isolation from course curriculum, pedagogical style of the instructor, and the characteristics and assumptions of student learners. Discussions regarding the limitations and advantages of both traditional face-to-face and electronic pedagogy are often reduced to differences in delivery technology (Filipczak, 1995).

The aim of this paper is to discuss and illustrate, via personal experience and case study, electronic pedagogical practices that promoted student learning in an on-line course about teaching and learning. Due to the curricular content of this course (i.e., the psychology of teaching and learning), valuable insights as to the similarities and differences of teaching and learning in traditional and on-line courses are available from the teacher’s and students’ perspectives.

About the Course

In the Spring of 1998, as a graduate student at a large State University in the Midwest, I was asked to teach an undergraduate educational psychology course on-line. While I had face-to-face experience teaching the course and moderate technological skills, it had never occurred to me to teach a course about teaching and learning on-line. I accepted the challenge under the condition that I could design and create the course from scratch. I felt, and still do, that the personality, educational philosophy, and pedagogical style of the instructor are critical to the successful design and teaching of any course, much less a web-based one.

The Introduction to Educational Psychology course is a core education requirement for undergraduate education majors at the University I attended to obtain my graduate degree. Educational psychology is a course that covers a variety of topics including student development (cognitive, emotional, and moral), learning theories, instructional strategies, motivation, classroom management, evaluation, etc. While several sections of this course was offered on-line, it was not a traditional distance learning course since the students enrolled in the course lived on or within a 30 mile radius of campus. The only face-to-face contact with students enrolled in the course occurred during an orientation session the first day of class. However, as I was scheduled to attend a professional conference that Fall, I was not able to attend the orientation for the course (a professor attended in
Therefore, over the course of the semester I never met face-to-face with the 23 students enrolled in my section as a class.

Course Development and Alignment

Effective teachers need to be cognizant of their own theories of learning and student development to effectively design instruction. This is critically important when designing instruction in electronic environments due to the different affordances and constraints within that environment (see Fuller, Norby, Pearce, & Strand, 2000). My own personal philosophy of teaching and learning started to develop, as most of ours do, when I was a student in the public school system. As a K-12 classroom teacher and later as a professor, that philosophy was adjusted and refined. While I appreciate other philosophies and theories of teaching and learning, I am most comfortable with the tenets of the Sociocultural or Social Constructivist Theory (see Bonk & Cunningham, 1998; Sing, 1999; Tam, 2000, Vygotsky, 1978, 1986).

From a sociocultural perspective, all learning is, in essence, social (Vygotsky, 1978, 1986). The role of the teacher in the sociocultural view of learning is not to transfer knowledge to students but to construct social opportunities for students to engage in dialogue “and authentic tasks leading to participation in a community of practice” (Bonk & Cunningham, 1998, p. 26). This is the role of teacher that I am most comfortable.

Being cognizant of your own philosophy of teaching and learning and how that influences curriculum, instruction, and student learning is important in teaching any class. It is also helpful to be aware of your own strengths, weaknesses, and preferences as an instructor when designing an on-line course (see Fuller, Norby, Pearce, & Strand, 2000). For example, at the time I designed and taught this particular on-line course, I had never taken an on-line course and did not have any desire to so. Additionally, I knew very little about creating web pages, much less HTML or Java. I knew that in order for my teaching to be effective, my on-line course had to have a consistent underlying structure. Through trial and error, I created a course web page that contained the course syllabus, activities and evaluation criteria, and week-by-week calendar. This site only provided information to students.

A second site was linked to the course web site (mentioned above) to provide an environment for class interactions. A secure, commercial site was utilized that provided several services for on-line courses: group areas for discussions, student initiated threaded discussions, e-mail, chat rooms, drop boxes, etc.. All course activities (i.e., discussions and assignments) took place within this environment, which was extremely easy to use and manage. We only experienced one minor technical difficulty throughout the semester. The difficulty occurred when using the on-line chat, we found that off-campus connections were slower than on-campus connections making on-line chats awkward.

Therefore, the underlying structure of the course remained the same for students (and myself) throughout the semester. Students could go to the web site for course information and the commercial site to participate in weekly course activities and assignments. Knowing my own strengths and weaknesses as an instructor and creating an environment that would take advantage of those strengths in on-line environments was, I felt, critical in the fundamental design of the course. In the next section of this paper, I would like to discuss how course curriculum and goals, instructional design and strategies, course assignments and activities, and evaluation of student learning also affected the overall effectiveness of this course.

Course curriculum and goals: A great deal of attention has been focused upon the integration of technology in K-12 education. One effective method to produce more technologically prepared educators is through the integration of instructional technology in pre-service education courses. While this may have served a secondary goal for this course, I was not particularly interested in asking students to project how they would integrate technology in their future classrooms. I was interested, however, in how my students viewed the course curriculum through the filter of an electronic environment.

While students have some degree of familiarity with the curriculum of educational psychology, it was interesting to explore, with them, how course curriculum was different or what problems it afforded students and teachers within electronic environments. When students would discuss the advantages and disadvantages of various instructional strategies (i.e., collaborative learning, lecturing, etc.), I would also ask how these were affected by the electronic environment we found ourselves in. In addition, I would also ask them to alternate between the roles of student and future teacher, something that is somewhat challenging in any environment (face-to-face or
electronic). As an instructor, I was able to add a dimension to the regular curricular discourse, thereby extending the curriculum to include critical environmental elements that impact effective teaching and learning.

For example, one topic that is covered in educational psychology is motivation and self-regulation (monitoring your own learning). Students were asked to discuss how their motivation and self-regulation was affected by the on-line environment. One student exclaimed:

“I have learned that self-motivation is something that I really have to work on when I am really busy with a lot of things. It is really easy to say that I will do this stuff tomorrow, and then never do it tomorrow because I do not have a classroom to go to. I think that I will focus more on why I want to learn this stuff, than just getting it over with because it is a requirement for my major.”

This was a very common sentiment from students; that they were having to learn to motivate themselves in different ways for an on-line class since strategies used within regular classroom environments did not work. Students were also asked, if they were a teacher, which environment would be more challenging to motivate students to learn and why and how I, as the course instructor and designer, was or was not contributing to their motivation. In this way, students were not only reflecting about the course curriculum on-line but participating in a type of meta-reflection about the course curriculum.

Other than learning the course curriculum and reflection upon it, I created four separate instructional goals for myself for this on-line educational psychology course. Specifically, my goals for the course were:

- To aid in student development as professional educators.
- To provide opportunities, activities, and projects which encourage active reflection, exploration, and internalization of the theories, principles, strategies, and tactics discussed in on-line discussions and available from the field of educational psychology.
- To design a web-based environment that encourages student participation and provides effective instruction.
- To co-construct (with students) a community of active learners on the web.

**Instructional design and strategies:** In order to achieve most of my goals, I needed to create an environment where students felt free to discuss, to disagree, and to reflect upon course content in a collaborative and “safe” environment. Additionally, I needed to employ instructional strategies that would support that environment.

In the regular classroom, I find that I utilize a wide variety of instructional styles (i.e., lecture, small group work, small group and large group discussion, etc.) so that I could model them for my students. However, I was unsure, and more than a little apprehensive, as to how effectively I could transfer or utilize these strategies within an electronic environment. While there were lecture materials posted within the course web site, teacher-centered instructional strategies seemed inconsistent with my course goals. Therefore, the first challenge that I faced was creating a collaborative, student-centered learning environment consistent with my goals for the course.

I decided to form four semester-long teams of 4 to 6 students for all on-line course activities and discussions. Due to the on-line courseware, I was able to give each team their own space and invited them to take control over that space (students were able to make design modifications to the team space, start discussions, utilize the chat feature for their teams, etc.). While I had utilized collaborative groups within a classroom setting, I had never utilized semester-long teams. It was my hope that the teams would support and encourage learning by providing different perspectives while, at the same time, supporting and promoting a sense of community.

Overall, using a team-based instructional design was very effective for student learning. For example, a female student commented that:

“Discussion topics require thought and details as well as going back and looking at the opinions of others as a way to get new information, take another point of view, and learn from your peers.”

This comment highlights the importance of peer feedback and collaborative learning environments. The four teams developed, over the course of the semester, particular identities and it was interesting to witness the assumption of various roles within the groups and degree of familiarity that developed between the students. At the end of the semester, when students were asked what they would miss most about the class, one student exclaimed, “You guys are like family to me. I’m going to cry now.” Additionally, even though I did not require students to meet face-to-face, some students made special arrangements to do so.
At mid-term, all students were asked to fill out an anonymous survey asking them to evaluate the course thus far. The survey contained questions about how students felt about the teams, their responses are presented in Table 1.

<table>
<thead>
<tr>
<th>I like the teams in our class because learning is more fun when things can be discussed.</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Slightly Agree</th>
<th>Slightly Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like working in my team because I can ask one of my teammates a question and they will explain things on a level I can understand</td>
<td>7%</td>
<td>60%</td>
<td>20%</td>
<td>7%</td>
<td>7%</td>
<td>0</td>
</tr>
<tr>
<td>When we work in teams we exchange ideas.</td>
<td>7%</td>
<td>67%</td>
<td>13%</td>
<td>7%</td>
<td>7%</td>
<td>0</td>
</tr>
<tr>
<td>The teams we use in class make learning educational psychology easier.</td>
<td>13%</td>
<td>60%</td>
<td>20%</td>
<td>7%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Working in teams makes this class more enjoyable.</td>
<td>13%</td>
<td>53%</td>
<td>33%</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
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</table>

Table 1. Mid-Term Evaluation: How students (N=23) felt about their teams

As you can see from student responses, they felt very strongly about their teams and the role of the teams in learning the course content. While the team structure enhanced student learning it also provided a unique instructional tool. Due to the unique nature of the course curriculum, I was able to approach pedagogical problems that arose within the course by soliciting possible solutions from teams.

For example, over the course of the semester each of the four teams participated in two live, on-line debates. The first night, two teams debated upon the pro’s and con’s of including special education students in “regular” classrooms (i.e., inclusion) and the following night the remaining two teams would debate the same topic. The first debate was, in a word, boring. Students simply listed their pro’s and con’s without responding or interacting to each other, in other words, they did not debate. Prior to the next evening’s debate, I asked the members of the two remaining teams to read the transcript of the previous night’s debate. The result was, in a word, nasty. During the second night of the debate, team members overcompensated for the previous night’s courteousness and were very aggressive.

To prepare for the next round of debates on multicultural education, I asked that all students read the transcripts from both debates on inclusion and generate possible solutions to make the future debates more effective. The solutions that students came up with were: (1) nominating team captains to help moderate and (2) conducting team “meetings” to help plan strategies to utilize in the next debate. The second round of the debates on multiculturalism was much more successful. This experience allowed students to participate in an instructional activity that teachers find themselves faced with on a daily basis: generating and testing instructional strategies to achieve curricular and instructional goals. At the same time, this example illustrates how the curriculum and teaching style can afford electronic pedagogical practice to increase student participation and learning.

The utilization of semester-long discussion groups was not without disadvantages. First, some groups were more interactive than other groups. Even though students were randomly assigned to groups, the group dynamic in some teams was more effective (lively) than in others. In fact, one student asked to be moved out of a less active group to a more active one. She told me that she felt that sometimes she felt she was “talking to herself.”

Second, as I have stated, one of my goals was to promote student ownership of the group discussions. I noticed, early in the semester, that if I responded directly to a particular student within the team discussions, that student would cease responding to the peers but respond directly to me. Therefore, I decided that I would direct my comments and feedback to the entire group and minimize direct responses to any one student. I likened it to a face-to-face classroom situation in which it would be nearly impossible for me to comment directly on every student’s response to a discussion topic within a 50 minute class period (see Fuller et al., 2000).

While student evaluations of my availability to answer questions or provide feedback were high (rated 3.80/4.00 final course evaluation), some students commented that they felt they were not receiving individual attention.
This illuminated an interesting student assumption regarding teaching and learning in electronic environments. Students, within a regular classroom setting, are able to see how the teacher’s instructional time is spent. Perhaps by creating small teams (or maybe it is just a byproduct of the environment itself) students were not able to evaluate or gage how my time was divided. While I quickly discussed this with my students, some students still assumed that I was available to them 24/7 and they should be receiving more individualized attention.

**Course assignments and activities:** In order to take advantage of the design and structure of the course, students were required to participate in team-based activities and individual projects and assignments. All students were required to participate in three different assignments over the course of the semester: case-based discussions, course web-based activities, and traditional assignments.

**Case-based discussions.** Every week, each team was presented with a case study about a teaching and/or learning situation that illustrated that week’s required textbook reading. For example, they may have read about a student’s difficulty in learning how to follow directions or a teacher’s difficulty in managing his or her classroom. They were then presented with a series of questions for group discussion that required reflection and application of course material. Students were also given the following directions:

This is not only a posting of your thoughts regarding the case presented to you but an opportunity to share what you have said with your peers. In other words, this is a *discussion*. As such you are expected to read, respond, and comment on what your peers have posted. I would post each case-based discussion on Wednesday and close that discussion on the following Wednesday. Therefore, students had one week to post their discussion. This would curtail students working ahead of the syllabus and assure that students would read most of their peer’s responses. The evaluation of student’s participation in the case-based discussions were largely based on whether or not they posted on time. While I did have a posting policy (no less than 300 words), I rarely had to prompt students to write more. Student mid-term evaluations of the case-based discussions are illustrated in Table 2.

**Course web-based activities:** Every week students were required to participate in a series of web-based activities to help them learn about course materials, introduce them to web-based resources, and help them learn about themselves as future teachers. For example, students may join a discussion board on a topic relevant to their teaching or take a quiz to find out their classroom management profile. Again, there was a one week window (Friday-Friday) that students may participate in these activities and they were simply evaluated on whether or not they completed them on time. While not as popular as the case-based discussions (see Table 2), learning activities were enjoyable to students and did encourage students to think.

**Traditional assignments:** Students were also required to complete traditional assignments. These included individual course papers and projects, as well as the preparation for and participation in two on-line debates (discussed earlier). For each assignment, students were provided with detailed requirements, the grading matrix to be used, and an example of student work through the course web site. Traditional assignments were due at various times throughout the semester.

<table>
<thead>
<tr>
<th>I enjoy doing the case studies (i.e., course discussions).</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Slightly Agree</th>
<th>Slightly Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>20%</td>
<td>40%</td>
<td>20%</td>
<td>20%</td>
<td>0</td>
<td>0</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>The case studies make me understand how educational psychology theories and principles are applicable to real life.</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Slightly Agree</th>
<th>Slightly Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>20%</td>
<td>40%</td>
<td>33%</td>
<td>7%</td>
<td>0</td>
<td>0</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>The case studies used for the course make me think.</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Slightly Agree</th>
<th>Slightly Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
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<tbody>
<tr>
<td>20%</td>
<td>80%</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</table>

<table>
<thead>
<tr>
<th>I enjoy doing to learning activities.</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Slightly Agree</th>
<th>Slightly Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>13%</td>
<td>53%</td>
<td>20%</td>
<td>7%</td>
<td>7%</td>
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*Table 2. Mid-Term Evaluation: How students (N=23) felt about the case-based discussions and learning activities*
The case-based discussions and web-based activities served as an indication of participation in the course and engagement with the course curriculum. I actively sought out student opinion regarding the course activities throughout the semester. At the end of the semester, I asked students which discussion or activity was most effective and least effective in promoting their learning about course material. Some discussions and activities were more effective for some students, while the others disliked the same discussions and activities. This highlighted the different learning styles and preferences of students taking this course. Students were also asked how the activities used in this web-based course would be different if it was taught in a traditional classroom setting. One student responded:

“The one thing that I do think would be different if this were an actual classroom attended in class is that I think we would have more lectures on the material and less opinion-type discussions.”

Overall, I believe that the course assignments and activities were appropriate and effective in promoting the instructional goals for this course. While I felt that some assignments and activities were more or less effective at promoting student learning, some students disagreed.

**Evaluation of student learning:** To be honest, the evaluation of student learning is the one aspect of teaching that I dread. In this on-line course, I was faced with several challenges regarding the evaluation of student learning.

First, I had to struggle to make sure that evaluations of student learning were authentic and fair. Authenticity in assessment refers to the alignment between the course goals, activities, and evaluation practices. On the final course evaluation, students strongly agreed with the statement, “the grading procedures for the course are fair” (rating on final course evaluation 3.83/4.00). When students were asked what they thought of assessment in this course, one student replied:

“I think that in this class we are using authentic assessment procedures because we are required to perform tasks and solve problems that will be similar to real-life situations and performances that will be expected of us. One good thing about the web-course is that there is hardly any teacher bias.”

It became apparent during course discussions on this topic that students felt they were afforded some degree of anonymity when it came to teacher bias in the evaluation process. Student’s feelings of anonymity is a common thread running through much of the literature on on-line teaching and learning. This was a very interesting assumption, given the degree of familiarity between students and myself during on-line discussions. What was interesting here is the paradox that while students thought they were anonymous to some degree, they readily admitted that they knew the personalities, temperament, and learning preferences of their peers and myself.

As I stated earlier, some students assumed that this course was going to be more like an independent study in which they had 24/7 access to the course instructor. It was an interesting assumption that we discussed early in the semester but for some students, these feelings lingered until the end of the semester. Of course, feedback in an electronic environment is limited to delayed, written feedback and students do not have access to direct verbal or visual feedback.

This is not the only disadvantage when it comes to the feedback. Some students depend upon feedback in a regular classroom to give them an indication of how they are doing in class compared to their peers. Therefore, an additional disadvantage student’s face when taking a course in an electronic environment is garnering information regarding social comparisons. In other words, a student’s uncertainty in this class may have stemmed from not knowing how they were doing in relation to other students in the course and in their teams. One student made the following comment at the end of the semester:

“I think that they only hard part was that we did not know how well we are doing as individuals compared to other students in the class. I do like being able to see what I get on certain assignments and talk about them with other students.”

Perhaps the most critical ethical problem I faced with regards to evaluation of student learning occurred near the end of the semester. Successful completion of this course was a requirement for a bachelor’s degree in education as this course covered the critical topic of teaching and learning in classroom environments. Ethically, I had to struggle with the fact that I was, essentially, evaluating students on their knowledge and the effective application
of course content to real-life situations when, I fact, I had never witnessed them doing so in a traditional classroom environment.

I was somewhat comforted in the fact that many students strongly agreed with the comment “I developed the ability to solve actual problems in this field” on final course evaluations (3.80/4.00). I was also comforted by the fact that students had to engage in a field experience within a traditional classroom environment while they were enrolled in this on-line educational psychology course. One student commented on the relationship between the on-line team-based discussions and the field experience:

“Through discussing with everyone, I have been given the opportunity to find out what others would do if faced with the same situation. I think that this has helped me a lot. Even my teacher can see this when I am in front [sic] of a group of students and teaching music, she says I have a much better handle on the classroom, and that I am now starting to take on the role of teacher, instead of student.”

Closing Remarks

In closing, I feel that designing and teaching the on-line educational psychology course was an excellent learning opportunity and unique experience for me. I learned a lot about my own teaching and learning and how they are affected by environmental factors. I strongly feel that the effectiveness of this on-line course was due to the alignment, or compatibility, between my own teaching style, the course curriculum and goals, the instructional design and strategies utilized, the course assignments and activities, and the evaluation of student learning. All of these pedagogical components meshed well in this course and, I believed, increased student learning.

At the end of the semester, when I asked my students if they would take another web-based course, all but one said that they would like to take web-based courses in the future. Surprisingly, many students qualified that statement with “if it was taught like this one.” When one student asked me if I would teach another web-based course, I responded that I would like to teach another web-based course, but not an undergraduate educational psychology course.

Do I feel my students learned? Yes. Do I think that this was the most effective environment in which to teach this course? No. I felt, and still do, that the curriculum of educational psychology is more effectively taught within an environment in which I can utilize all the various instructional strategies that my students may need as teachers in their future classrooms. Other courses may, and do, take advantage of the unique affordances electronic environments present to teachers and learners. However, while comforted by my students comments regarding the relevancy of their learning experience, I did not feel that “teaching teachers how to teach” within an electronic environment was the most effective environment to teach that particular course.

I am often asked by colleagues to explain the advantages and disadvantages of teaching in a traditional classroom setting and in an electronic environment. Drawing upon my experiences as a former K-12 art teacher, I explain that, to me, traditional classroom teaching is three-dimensional (e.g., sculpture) whereas teaching within an electronic environment is two-dimensional (e.g., painting).

An artist creating a sculpture has to deal directly with environmental influences such as light and space. A teacher within a traditional classroom has similar environmental considerations. This environment affords and restrains pedagogy in a particular way. For example, class meetings at scheduled time in a particular physical space ensures temporal alignment and provides visual cues to guide instruction. An instructor may or may not expand upon a topic, provide immediate feedback, or take advantage of “teachable moments” without forethought in a traditional classroom environment. However, due to time constraints, it is improbable for the instructor to “hear” what every student has to say about every curricular topic discussed in class.

An artist creating a painting has to create an environment. A teacher within an electronic environment has the same considerations. Again, this environment affords and restrains pedagogy in a particular way. Creating an environment takes time and careful consideration. Due to time constraints, an instructor designing an electronic course may have very little flexibility altering the course environment after the course has been launched. However, an instructor within an electronic environment does get to “hear” what every student has to say about all topics discussed in class.
In discussions regarding on-line pedagogy we often forget that pedagogy is the art and science of teaching. How does someone compare a sculpture to a painting when each art form is fundamentally different? Is either art form any less capable of evoking an aesthetic experience in the viewer? Each learning environment affords or limits pedagogy in its own way. Effective pedagogical practices cannot be reduced to blanket statements about the environment (i.e., traditional or electronic) but should take into account the factors that are unique to the course curriculum, pedagogical style of the instructor, and the characteristics and assumptions of student learners.

References


