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ABSTRACT

This paper presents results of research on an intensive online graduate level course in Web-based instruction (WBI) delivered via the same medium. The classes, offered concurrently at the University of Memphis and at Georgia State University, provide students with experiences centered around three areas: being a student in an online environment; being a designer and developer of online learning; and being a critic of WBI materials and resources. The results of analysis of the data collected over three semesters of this course are addressed, and findings are discussed in the areas of: synchronous versus asynchronous interaction; the importance of technical prowess; aids and barriers to the establishment of a learning community; and the affective dimensions of WBI. The paper concludes that careful consideration must be made of learners, the environment, and other issues associated with an educational system. Contains 18 references. (AEF)

A Qualitative Analysis of Situated Web-based Instruction

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Introduction

Few question that the World Wide Web has become a driving force in educational technology these days. From its inception in the early 1990's it has demanded the attention of the field and of the public in general like no other technology before it. Schools, universities, and corporations are scrambling to offer more and more of their instruction and training on the Web (Bannan & Milheim, 1997; Frick, Corry & Bray, 1997). Yet, while there has been some research on Web based training, it is in no way keeping pace with the expansion of the technology itself (Hill, 2000). This paper seeks to partially redress that situation by presenting results of research on an uncommon opportunity -- an intensive graduate level course in Web-based Instruction (WBI) delivered via the same medium. This paper describes the Web based learning environment used in this course. It addresses the results of our analysis of the data collected over three semesters of this course. In particular, we discuss results in such areas as synchronous vs. asynchronous interaction, the importance of technical prowess, aids and barriers to the establishment of a learning community, and the affective dimensions of Web based instruction.

Background

In the spring of 1998 the researchers were afforded the opportunity of offering a course on the topic of Web based instruction in a Web based environment. While we were aware of a number of web-based courses concerning mechanical or technical aspects of web production, we were not familiar with many web-based courses focusing on the theory, foundation, and design of such courses. This recursive opportunity appealed to us and seemed to present an exciting challenge.

When faced with the prospect or requirement of using the Web in education, many people assume that they are being asked to create an online environment that will be a stand-alone, self-sustaining educational product. While this may be the goal of some environments, it need not be the goal of all. Harmon and Jones (1999) suggest five levels of use of the Web common in schools, colleges, and corporations. These levels represent a continuum from basic occasional use to advanced continual use. Table One defines and summarizes each of the levels.

Level Of Web Use	**Description**
Level 0: No Web Use	The default level. Implies no web use at all.
Level 1: Informational	Providing relatively stable information to the student typically consisting of instructor placed items such as the syllabus, course schedules, and contact information. This sort of information is easily created by the instructor or an assistant, requires little or no daily maintenance, and takes up minimal space and bandwidth.
Level 2: Supplemental	Provides course content information for the learner. May consist of the instructor placed course notes and other handouts. A typical example would be a PowerPoint presentation saved as an HTML document and placed on the Web for students to review later.
Level 3: Essential	The student cannot be a productive member of the class without regular web access to the course. At this level the student obtains

	most, if not all of the written course content information from the Web.
Level 4: Communal	Classes meet both face-to-face and on-line. Course content may be provided in an on-line environment or in a traditional classroom environment. Ideally, students generate much of the course content themselves.
Level 5: Immersive	All of the course content and course interactions occur on-line. Does not refer to the more traditional idea of distance learning. Instead, this level should be seen as a sophisticated, constructivistic virtual learning community.

Table 1
Levels of Web Use

We determined that we would attempt to create a level four or five web-course in order to fully explore the concepts involved and take advantage of the affordances of the web for instruction (Ryder & Wilson, 1996a).

The Environment

The goal of the class was to provide students with both a realistic web-based course and experience in designing, developing, using, and evaluating realistic web-based courses. The course was designed to be a multi-site distance education class with half the class in one location, and half the class in another distant location thus creating a realistic distance education environment. This was made possible because we were faculty at two different universities in two different parts of the country. Further, since the topic and the proposed delivery mechanism were the same, the researchers realized that research on situated cognition (Brown, Collins & Duguid, 1989) and anchored instruction (Bransford et al, 1990; Cognition and Technology Group, 1990), might apply to the design of this particular course. Situated cognition suggests that instruction is most effective when it is offered in the context in which the performance that is being learned will actually occur.

Anchored instruction suggests that learners construct richer and more easily transferable mental models and can more easily solve problems in ill structured domains if instruction is centered around, or anchored on, a particular problem or set of problems. The instructors designed this course to take advantage of both ideas and in the summer of 1998 offered it for the first time.

The Class

The environment is a Level 5 (Harmon & Jones, 1999) online graduate class in internet-based learning. The classes are offered concurrently at The University of Memphis and at Georgia State University by the authors. Students register and receive credit from their respective institutions. The course is available only to students enrolled at one of the two universities: it does not offer global open enrollment. The goal of the class is multifaceted. Students study the content area of online learning within an online learning environment. The class is set up to be experiential and to create a learning environment that is driven by the learner, which is to say that it is a constructivist learning environment in an online community (Papert, 1990; Wilson & Ryder, 1996; Greening, 1998). Students study current theories and issues in Web-based Instruction. Readings are assigned and provided online and discussed synchronously, within a chat application, and asynchronously on various forums on an electronic bulletin board. Although both the instructors and students ultimately used many Internet related tools, the main vehicle for course delivery was a software product called WebCT in the first two offerings and a

product called CourseInfo in the third[1]. The experiences provided for the students center around three areas:

1.Being a Student in an On-line Environment

One of the most exciting things about this class is the chance for students to participate in an on-line community learning community. Because the class seeks to prepare future professionals in the field of online learning, we felt strongly that before our students went out and designed these types of environments that they should have the experience of learning in these types of environments. Being involved in an on-line learning community, students are not only able to study, but experience the issues that were read about and discussed. Because the class is cross-site between two universities, students receive the experience of working cross-site. Students study from both faculty and student generated lessons. These lessons employ both traditional and constructivist pedagogies and cover such topics as: graphic design, user interface design, instructional design, and use of WEBCT or CourseInfo. Students participate in class discussions synchronously and asynchronously. Thus, data were collected from student discussions during the course of study.

2. Being a Designer and Developer of On-Line Learning

Students are assigned to cross-site development teams to research and develop a "mini-lesson" on a topic associated with internet-based learning. These groups are created with some intent to "heterogeneously [mix] global and analytic learners" (Jonassen, 1996; p.

[1] We changed host systems merely as an experiment, the results of which are beyond the scope of this paper.

38) and with a secondary intent of matching students with common interests. Everybody in the class takes the lesson, and discusses it on-line. Every student team leads a discussion of their work synchronously in the chatroom, and asynchronously on the bulletin board. Each three person virtual team chooses a topic in web-based learning. While we suggest topics for the students, each group is free to select any topic they can conceive, after clearing it with us. Topics cover a wide range from the technical (HTML and CGI Lessons) to the social, ("The Digital Divide") to the practical ("Copyright Considerations," or "WBI in Middle School Science Classes"). They create lessons based on a study of existing theories and procedures that the rest of the class would reviews and studies. Thus, data was collected through an analysis of student projects.

3. Being a Critic of WBI Materials and Resources

Every student in the class critiques every web-based lesson, thus students have the opportunity to practice providing and accepting constructive criticism. Each student team revises its mini-lesson based on the critiques and responds to the critiques on the discussion board. Thus, data were collected on student reactions to student-generated work as well.

Midway through each semester, classes meet face-to-face once again to discuss progress, reflect, and debrief on the experience thus far. This debriefing session happens once more at the end of each semester.

Students

The first year there were 36 students in two sites. The second offering had 41 students in two sites. Because of scheduling and printing errors in course calendars, the current class has a merciful 14 students in two sites. Prerequisites for the class include:

1. Knowledge of Instructional Design;
2. Basic computer and internet navigation skills;
3. Understanding the nature of the class.

As in most graduate classes in our experience however, actual skill levels in these areas vary considerably. Because the class is offered as an upper level class in a graduate curriculum, the student population is fairly self selecting. Students enter the class from a variety of work backgrounds and interests. There are people from a K-12 perspective, students interested in training and development, and students pursuing academic careers.

Data

Data are generated from three primary sources, the system, the mini-lessons, and face-to-face discussions held at the middle and end of the semester. By far the bulk of the data comes from the course hosting system (WebCT or CourseInfo). All interactions are archived by the system. Because the class is constructivist in nature, analysis of student interactions and course direction is continuous during the offering of the course. After the class is offered, chat logs and bulletin board interactions are analyzed. Because of the richness and sheer volume of data generated, no single analytical method is used for data analysis. While theory is generated a la Strauss' grounded theory (1987) and tested via Patton's (1990) analytic induction, this process is iterative, and rarely can analysis

methods be identified individually or defined cleanly within the analysis. The same is true of statistical measures used in analysis.

The computer-based statistics generate a wealth of summary statistics on use, time, and other measures of student activity. In conjunction with analysis of discussion threads and chat logs, this data provides clear pictures of the environment.

From the outset, we realized that this course presented a prime research opportunity. Consequently, we designed the course to facilitate research and used constant comparative analysis (Strauss, 1987) from the initial design stage through final evaluation. Working as participant observers, the instructors were able to tailor aspects of the course to explore themes that seemed to be emerging as the course progressed. Following the conclusion of the summer 1998 semester, the instructors analyzed the data that had been collected, redesigned the course, and offered it again in the spring 1999 semester. The second course offering was conducted much the same as the first, with the exception that one class came from a large urban university in the midsouth, and the other from the same southeastern university used previously. In both course offerings, data were collected through observation, interview, and artifact analysis. However, in the second course offering, in addition to the participant observation, two covert observers were engaged to gain additional insight. The same process of analysis and revision ensued for the third course offering. In both the second and the third offerings graduate assistants were available at both campuses to assist students who needed technical help.

Findings

Because nearly all interactions between faculty and students, and between student and student are archived automatically by the environment, the amount of data generated from a study of this type is enormous. When the data were parsed, the first two offerings alone generated over 4,000 pages of transcripts. This does not include the mini-lessons, face to face interactions between faculty and students, or private emails or chat messages not collected by the system. Because of the sheer volume of data generated by an individual class, and because the class is offered once a year, analysis is difficult. Searching for a single truth or reality from this study is difficult; finding one is unlikely. Finishing it is not a goal. In this reporting we are focusing on some of the strongest themes to emerge from the data so far, namely: synchronous vs. asynchronous interaction, the importance of technical prowess, the development of a learning community, and a group of sub-themes which, in honor of Tom Reeves, we collectively call the affective dimensions of Web-based Instruction (e.g. Reeves, 1992; Oliver & Reeves, 1996).

Synchronous vs. asynchronous interaction

There has been a continuous debate among students in the courses among the various advantages or disadvantages of synchronous versus asynchronous interaction. In all offerings of the course weekly synchronous interactions were held via a chatroom. These were regularly scheduled for a portion of the time for which the class was originally scheduled. The chats were purposefully limited to about an hour and a half in duration even though the courses were scheduled for approximately three hours. This limitation

was imposed for two main reasons. Students were expected to spend significant asynchronous time working on the course and we did not want the students to feel they had completed their "in-class" time for a week merely by appearing in the chatroom. We also found that an hour and a half of the fast-paced and intense chat environment was about all the instructors and students could take at one time.

Asynchronous interactions took several forms including a bulletin board, email, and tutorial-type lessons. By far the asynchronous interactions made up the bulk of the course. This was not our primary intention but simply evolved as the courses progressed. It is understandable given our constructivistic approach to the course. We attempted in each case to create a community of learners where information and knowledge did not flow in one direction from the faculty to the students, but came from many sources to all participants. With an entire class creating content it is easy to see how the amount of content generated can quickly become quite large.

Despite the fact that the bulk of the interactions were asynchronous, students had an initial tendency to associate participating with the chats with participating in the course. Students felt obligated to be in the chatroom in much the same way they felt obligated to attend a traditional class meeting. Students who had low participation in the bulletin boards never missed a chat and were quite vocal in the chatroom. Interestingly, these students became less vocal as the course progressed and they became less able to follow the discussions since they lacked the background experience and information that came from the bulletin boards.

Many students found the chat room to be a frustrating place, despite the eventual evolution of chat conventions (listed later). Software crashes were frequent and the feelings of fighting to get a word in edge-wise and being in a free-for all never quite vanished. In the first two course offerings students who violated chat conventions were eventually ignored by the rest of the students and in most cases got the message. The need to be polite and respond to every chat message was prevalent initially, but eventually attenuated though never quite vanished.

The importance of technical prowess

Technical skill was not a prerequisite of the class, but to a certain degree, students who were technically stronger participated more actively and enjoyed the class more than those who were not as proficient. While this is not surprising in itself, it was a bit surprising to us how much further these students were able to go with the content than the students who did not have strong technical skills. Technical prowess can be divided into two categories in this reporting of the data: general computing skills and HTML development skills.

Students with very good general computing skills had an advantage during the beginning of the class. Despite a permit registration process and the publishing of prerequisites, some students struggled with basic computing skills. So while they are being asked to go online for a learning experience, many of them were having problems with relatively basic functions of finding and copying files. Obviously students with stable internet

connections at home found it easier to go online for the course. But what was surprising was how difficult it was for students to get online and get active in the class. It appeared to take some students extraordinary amounts of time to get their computers configured and online. And while we felt compelled to help these students, it soon became clear that we had to divest ourselves from long distance trouble shooting of individual problems on individual machines. Students became responsible for the maintenance of their machines and the stability of internet connections. For some students this meant changing ISP's or buying new computers. For others it meant going to a friend's home, office, or to the university's computer lab. Ironically, once students realized that they could complete the class from home, going to the lab was an option that was much resisted.

Students were required to create a personal homepage at the beginning of each course. These homepages included required information on student knowledge, skills and attitudes (see appendix A). The students who self-identified as technically stronger not only took advantage of more advanced web features when creating their lessons (i.e. ranging from extensive use of tables and frames to live video on web-cams) but also were more active in creating the learning community and in identifying resources for the class to use. They seemed better able to immerse themselves in the constructivistic mindset required by the class.

While these student's pages inspired both awe and envy among their student peers, in some cases the pages themselves were not nearly as technically superior as may have been imagined by students. It would appear that having good graphic skills was often

enough to impress some of the students without technical skills. However, good technical skills translated into increased confidence in this class. Increased confidence in turn yielded a greater comfort level. Given the unique nature of the interactions and directions of this class, any increased comfort level could make a difference in the perceptions of the learners.

Technical prowess varied greatly among students in each offering of the class. Although the class was identified as taking place online, some students may have erroneously thought that the course was intended to provide technical training. In fact, while web-construction help sessions were provided, the bulk of the course focused on the theories and models of web-based learning. Interestingly, even those students who identified themselves as technically weakest had no qualms about creating and running a web site themselves by the courses' conclusion, this despite having had no intentional instruction on the mechanics of doing that. Many students who came into the class without sufficient technical skills quickly developed into advanced HTML coders. At least one of them who came into the class with no skills is now a certified web master. But this development of technical skills was a by product of the environment, and not an intended outcome.

Developing a learning community

One of the key goals of the course was for the students to establish a learning community. Learning communities are defined as "collections of autonomous, independent individuals who are bound together by natural will and a set of shared ideas and ideals,

and who are engaged by influencing each other within a learning process" (Kowch, & Schwier, 1997). Wilson & Ryder (1996) note that dynamic learning communities are "groups of people, who form a learning community generally characterized by distributed control, commitment to generation and sharing of new knowledge, flexible and negotiated learning activities, autonomous community members, high levels of dialogue, interaction, and collaboration (p. 801).

The weekly chats gave everyone a sense of community. This may have been their most valuable function, since the amount of information they conveyed was dwarfed by the information on the bulletin board. Frequent crashes led to a major theme of the study, frustration. Almost without exception, students in the courses felt a high degree of frustration at one time or another. This frustration was almost inevitably caused by failures or perceived failures of the hardware and software components of the class. Ironically, these crashes contributed to the evolving sense of community as the students commiserated with each other. The first two classes used WebCT as a vehicle and the third used CourseInfo. These programs appear to promote a particular pedagogy, mostly one that is traditional and instructivistic. The way they were used in these classes may have placed additional strain on the programs that caused them to crash frequently. Students also felt that the programs limited what they could do in designing their lessons. Many students chose to host their lessons on their own servers to avoid these limitations.

Graduate study has its own history and social and expectations. For most students, the idea of taking responsibility for the environment was unique. Students also had trouble

with the constructivist nature of the courses. Some students felt threatened by being forced to take responsibility for their own learning as the course began. To help students begin to see how taking responsibility for their learning could manifest itself, we provided them with activities to help them understand the way the class might work. One example of this is illustrated in **Vignette One**.

Vignette 1: ***Emoticons are too damn hard to type.***
In one early activity during chats, students are sent intentionally provocative statements via the private message function. Everyone is encouraged to speak up and contribute. The professors do this intentionally to make the chat move at breakneck speeds. This makes it hard to read; hard to keep up; hard to process. The point is to have participants realize that chatting is like any form of communication. It requires formal rules and informal guides. Without them chaos ensues.

Students were encouraged to develop a system by which to make communication easy and useful. With thirty to forty students in an environment, these rules are very important. The first two offerings developed independently the following system of managing chat discussions.

Symbol	***Meaning***	***Analysis***
!	*Raising your hand to make a comment*	*Comments were differentiated between questions by the class. If somebody wanted an answer, this was seen as different than simply wanting to raise a point.*
?	*Raising your hand to ask a question*	
X	*Two meanings:* *1. If I raised my hand I am taking it down.* *2. If it is a class vote, it means yes.*	
... (an elipse)	*Please wait. I am not finished with my current thought.*	*This is one of the most used conventions developed by students. It keeps a train of though alive while a student finishes typing. It allows for quicker entrances to*

		the chats, but also affords the slow typer a chance to finish their thought.
. (period)	*The thought (after an ellipse) is finished.*	*Periods became important in a class of 40 people. With many people wanting to "speak" we needed to know when someone was finished.*
Jose (where Jose is the name of the person raising their hand)	*A person's screen name is used to call on the person with a question or comment.*	*This technique does tend to mirror the structure of a class with the teacher calling on students who raise their hand.*
Pore speling are as comman as bad gramma.	*Bad spelling and grammar miscues are accepted in the chat environment.*	*While people took more time on bulletin board posts, most chat comments are made very quickly and spelling and grammar mistakes are excused out of hand. After about six weeks, very few people even apologized for it.*

It is possible that the first class came up with the conventions above, and the second class merely found out about them from the first group and copied them. The third group, a smaller one, eschewed the above conventions opting instead for complete freedom of conversation. The result has been less directed conversations, but the fact that there is no "calling on" students has resulted in discussions taking more unconventional turns.

The third group appears to have more experience in chats. Given the recent explosion in web-based chat clients this is not all that striking. The third group does tend to use more conventional chat abbreviations such as LOL (laughing out loud), IMHO (in my humble opinion), or BRB (be right back). What is striking is that with rare exceptions, almost nobody has used emoticons in the chats. Emoticons are anthropomorphic ASCII-based symbols used to convey emotions. For example, :-) is a person smiling. ;-) is a person winking to show that they are kidding. :-(would mean that you are sad. Emoticons are often used in email messages or bulletin boards to help make up for the lack of non-verbal speaking cues. Students have been asked pointedly why they chose not to use them in class. The response is perhaps best summed up by the following quote: "Emoticons are just too damn hard to type."

While we have experience with chats, and could mandate a set of conventions, the fact that the students generate them every course offering provides ownership and affords them the opportunity to generate a small, manageable piece of the environment early on. This early control allows for larger manifestations during the content generation phase of the class. It also contributes to the growth of the learning community as students take more control of the class.

The Affective Dimensions of Web based instruction.

Several themes emerged that related to the way students interacted with each other and the feelings they experienced as they participated in the class. We chose to categorize these themes as factors which influenced the affective outcomes of the class. We will discuss two here, fast friendships and being overwhelmed.

Fast Friendships

The relationships forged in the online classroom are remarkably intense. That intensity seems to transend geographic proximity. Friendships were forged by people at the same site, and by people cross-site. Most people, regardless of their attitude towards the class, state that they feel the bonds of the community are significantly stronger in the online class than regular classes. Part of this is due to the feeling of "shared suffering." The class is a tremendous amount of work simply to stay current on the bulletin board discussions. Also, working at a distance causes its own unique set of difficulties. Students who go through it together form strong bonds.

One ironic part of the friendships is that often times people did not know which site their classmates were at. Despite the fact that students at one location had been in multiple classes together, they still did not know each other by name. Examples of this are illustrated in **Vignette Two**.

Vignette2:

Students and faculty meet face to face at mid term. We do this as a means of "checking in" and reconnecting for people who may need it, and as a time for the reflection essential to constructivistic learning (Yost & Sentner, 2000). While some issues and procedures are discussed, the purpose of these mid term meetings are as much social as pedagogical. Food and beverages are served.

During one mid term meeting, one group met at a local pub. Charlene (from Atlanata) sent Ed (from Memphis) the following message:

***Charlene**: Ed: I am having problems with my car. Do you think you could give me a ride to (the pub) tonight?*

***Ed**: Charlene I'd love to, but I live in Memphis.*

Beyond being funny, the point is illustrative of the way friendships were made. There was often times no regard for an Atlanta Group and a Memphis Group. People considered themselves to be a class.

During the mid-term meetings for the classes, people wear name tags. The reason is that most people, don't know each other's names when they meet face to face despite the fact that they are in classes together regularly. Or more precisely, while they know the names quite well they don't know the faces. This non-specific knowledge was not limited to names and faces. On the last virtual meeting of one course one instructor referred to a student (with a somewhat obscure first name) in a chat using the masculine second person pronoun, only to be informed by that student and several others that he was a she. No "walks on the wild side" intended.

During an exchange on the bulletin board about why people feel the bonds are stronger in a web-based class, two points emerged as strongest: the constructivist nature of the class and the regular communication. While the regular communication will make people feel more connected, we posit that the constructivist nature of the class allows for a greater feeling of ownership by both the individuals and the group.

Being Overwhelmed

The single largest problem encountered in this class is the amount of time it requires. Because of the constructivist nature of the class, students may have as great a problem with this as the professors. In one class offering there were 1,763 posts to the bulletin

board alone. Two of the three courses together generated over 4000 pages of discussion board and chat transcripts. This does not include the private emails, or the didactic material contained in the student-generated mini-lessons. For many students, keeping up with these posts became a mission. These students would often log on to the course website many times during the day. One student logged on a staggering twenty three times in a single day.

For other students, keeping up seemed to be impossible. Once a student fell behind, the ability to participate dwindled in nearly all communications. For nearly all participants in the class, the feeling of being hopelessly behind happened often. If a person was without internet access for a period of three to seven days, they would come back to scores of unread messages. During the period before a student group presented their mini-lesson this feeling increased. Because so much time was spent working on the mini-lesson some students may have neglected the bulletin board posts.

Those students who did not succeed in the course seemed to fall behind at a critical juncture and then never even attempted to catch up. In two of the course offerings we were able to monitor the student use of the bulletin boards. At about the midway point of the semester we would send each student an email telling him or her how we thought they were doing in the course. This included a notice of how many messages were available on the discussion boards and how many they had read.

In each course there was a cadre of students who became known as the "one percenters." These were students who had read only around 1% of the total messages available on the discussion boards. (The actual percentages ranged from less than one to slightly over 10%.) While we didn't want to use the number of messages read as an indication of class participation (for one thing we really only could measure number of messages clicked-on; we had no idea whether they were actually read) the great disparity in the percentages (the rest of the class averaged around 85 or 90% at any given time) did seem to indicate that some students needed to try harder. Measuring participation became an active discussion topic in each of the courses but in almost all cases, the one percenters never managed to catch up. Interestingly those students who participated actively had a difficult time believing there were some students at such a low level of participation.

Conclusions

The content for this class and the type of advanced students who took the class afforded a unique opportunity for the study of the course content and the study of the environment. Our content was not didactic in nature. Our course interactions were often self directing. The findings presented here may not hold relevance for didactic content areas or for other types of learners or learning environments. This was a level 5 environment (Harmon & Jones, 1999) and as such was probably much more constructivistic in nature than most other web-based courses.

However, one thing seems to be apparent: online learning environments are not the same as traditional environments. And while this truth may seem obvious, it appears to be lost

on the vast majority of people in the great rush to internet-based learning. Careful consideration must be made of your learners, the environment, and other issues associated with an educational system (Jones, Harmon & Lowther, In Press). For example one of the most obvious issues in internet-based learning, the technology itself, provided one of the biggest surprises and the most challenges for a technically oriented group of people. For others we can expect this to be an even greater issue.

The power of the technology is great. The allure of using it in university settings is intoxicating. But we must continue a careful and never ending study of internet-based learning even as we move forward with it. In this way we can find ourselves leveraging its unique strengths while avoiding its sometimes significant limitations. The power of Web-based Instruction lay not in its ability to replicate what we do in traditional classrooms; it is in its ability to create what we cannot do in those classrooms.

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