HOW ONLINE FACULTY IMPROVE STUDENT LEARNING PRODUCTIVITY

Katrina A. Meyer
University of Memphis

Larry McNeal
University of Memphis

ABSTRACT

Ten experienced online faculty were interviewed to elicit examples of how they improved student learning productivity in their online courses. The ten faculty represented nine different states, 13 different fields or disciplines, and all were tenured or tenure-track at master's or doctoral level higher education institutions. Based on a thematic analysis of the examples given, improvement in student learning occurred by 1) increasing student access to content, 2) changing the role of faculty (which had two parts: increasing access to and changing faculty roles), 3) increasing interaction with students, 4) emphasizing student effort (including use of experiential learning, group work, learning to learn, and feedback), 5) connecting to the "real world," and 6) focusing on time. These findings suggest that faculty can and do find ways to use different tools in different ways to improve student learning productivity.

KEYWORDS
Student Learning Productivity, Online Learning, Faculty, Higher Education

I. INTRODUCTION

Since the 1990s, higher education has been criticized for its lack of attention to productivity. The National Commission on the Cost of Higher Education [1] detailed a 57% increase in instructional cost from 1987 to 1996 and called for "significant gains in productivity and efficiency . . .[and] alternative approaches to collegiate instruction" (p. 24). The Spellings Commission [2] also stressed the importance of using technology to help improve both productivity and quality in higher education.

This pressure for increased productivity in higher education is the result of several forces: increased student demand for college educations, increased educational requirements for some jobs, a continuing stream of students with educational deficiencies needing remediation, and less state funding. Unfortunately, the current economic decline has caused large cuts in state funding to higher education budgets. Based on changes in state funding of public higher education from FY09 to FY10, 28 states appropriated monies that were 0.1 to 10.0 percent less, 10 more states appropriated monies that were 10.1 to 22.0 percent less, and 12 states appropriated the same or larger monies [3].

Dennis Jones [4] of the National Center for Higher Education Management Systems has also stressed the need for greater productivity from higher education. This is because the generations following the Baby Boomers are achieving, on average, lower educational levels. Therefore, the number of students seeking higher education is projected to be insufficient to fill the jobs that will open as Baby Boomers retire.

Higher education needs to enroll more students and ensure they graduate with the requisite skills for these jobs. President Obama further increased attention on the educational level of the U.S. population when he set a goal to "have the highest proportion of students graduating from college in the world by 2020" [5, ¶11]. It is clear that higher education will continue to face increased attention and oversight from the public, legislators, governors, and the federal government if it cannot improve its productivity.

However, the focus on productivity has rarely incorporated the views or experiences of faculty. Therefore, this research asked faculty how they are improving student learning productivity in their online classes as a way to incorporate faculty experiences into future discussions of higher education productivity.

II. REVIEW OF LITERATURE

A. Achieving Productivity Online

Many have promoted technologies as a means to improve productivity and quality. This issue has benefited from the Program in Course Redesign hosted through the National Center for Academic Transformation [6, 7, 8, 9] and led by Carol Twigg. With funding from Pew Charitable Trusts, 30 institutions redesigned critical courses accompanied by a plan to lower costs and document improved student learning. Those 30 institutions reduced costs an average of 37%, with some projects reducing costs by 15% and others by 77%, and generated a savings of $3.1 million *per year* in operating costs [9].

Productivity without quality is a poor bargain, so it is important to investigate how online teachers affect student learning. In a study of award-winning online teachers [10], faculty were asked to identify effective pedagogical practices for online teaching. The eight most effective pedagogical practices were fostering relationships, engaging students, responding in a timely manner, communicating regularly including feedback on assignments, organizing the course effectively, using technologies effectively, being flexible, and having high expectations. These practices are closely aligned with Chickering and Gamson's [11] "seven principles" of effective pedagogy that were developed prior to the Internet and online learning. In other words, these award-winning online teachers have independently developed nearly the same seven principles, augmented by one additional need to develop facility with technologies. Quality in online coursework, in other words, is not a mystery but an extension of pre-Internet conceptions of good teaching practice.

In a review of over 60 institutional or program-based studies on cost-efficiencies or productivity of online learning [12], various factors were analyzed. These factors were grouped into studies that touched on type of student, faculty skills, the role of additional staff persons (such as instructional designers or technical support), forms of content (such as learning objects), instructional approach (a focus on instructional design principles), infrastructure (its adequacy to support online learning), and policies (such as promotion and tenure see [13] for a justification of this framework). The analysis focused on determining which of these factors, if any, appeared to increase efficiency (defined as the provision of education at either less cost or more students at the same cost) or productivity (the provision of more or better learning at the same or lower cost). Study findings were analyzed across factors for consistencies and inconsistencies.

Based on this work, Meyer [13] abstracted four major principles for achieving productivity through online learning. The first principle is substituting high-cost labor with technology which can be achieved through such means as use of online modules, self-paced learning, reuse of previously recorded podcasts or PowerPoint presentations, or automated grading of tests. The second principle is substituting high-cost labor with lower-cost labor, achieved through the selection, training, and use of peer tutors, graduate assistants and adjunct faculty. The third principle is substituting technology for capital which refers to the

growing use of online learning to slow the growth in demand for new buildings to be funded by financially constrained states. The fourth principle is redesigning courses so that student learning is protected or improved through the creation of more active learning, more feedback, or more social learning in groups or teams of learners. While making the substitutions above, several studies stressed that use of instructional design would ensure that achieving productivity would not happen at the expense of student learning. Instructional design draws upon various learning theories – such as cognitive load, constructivism, social learning – to design, develop, implement, and evaluate learning experiences or materials. Because instructional design goes beyond the first three principles to focus on the design of learning experiences, it is a unique approach for achieving learning in a productive manner. However, the four principles need to be verified further and the current study is an attempt to have experienced online faculty ascertain their value or usefulness for future study.

B. Faculty Views

It is not known how faculty view these four principles, or if they have their own methods for improving student learning in their online courses. College and university faculty are prepared for their positions by earning a doctorate in the discipline or field they will teach; it is rare, except for faculty in colleges of education, for them to have extensive training in how to teach or knowledge of which methods impact student learning, let alone impact the productivity of student learning. Most research done so far on faculty track their integration of technology [15, 16], the impact of new technologies on faculty workload [15, 17], the impact of faculty attitudes toward technology and innovation and their participation in distance education [17], and modeling the influences on faculty technology use [18, 19]. No research yet has explored how faculty affect student learning productivity in their online courses.

The research questions that guided this research are "How do experienced instructors improve student learning productivity through online learning?" and "Are the four principles for achieving student learning productivity through online learning useful?"

III. METHODOLOGY

A. Design

A qualitative design was used to explore how experienced instructors improve student learning productivity through online learning and relevancy of the four principles for achieving student learning productivity through online learning. Patton [20, p. 14] noted "qualitative methods typically produce a wealth of detailed information about a much smaller number of people and cases." Researchers utilize a qualitative approach with the intent of allowing themes to emerge from data collected [21]. "Qualitative inquiry is particularly oriented toward exploration, discover, and inductive logic" [20, p. 55]. Because this study is the first of its kind, it is appropriate to use a qualitative approach, i.e., asking faculty about their experiences teaching online.

B. Sample

This research was approved by the Institutional Review Board at the University of Memphis. Faculty were sought through professional contacts arising in part from an announcement for "volunteers or nominations" to the Western Cooperative for Educational Telecommunications (WCET) discussion board. WCET is a member organization that includes higher education institutions and systems in the U.S. and other nations. A purposeful sample was constructed so that the ten faculty in the sample taught different disciplines at public higher education institutions in nine different states in the north, west, and south. All ten worked at master's or doctoral-level institutions and were tenured or tenure track, so were like many other faculty with similar demands placed on them for instruction, research, and service at public colleges and universities. Because the study depended on tapping the expertise of experienced online faculty, we sought faculty who had taught 10 or more fully online courses. While the point-of-view

of adjuncts teaching online is valid, the focus of this research was on the views of tenured or tenure-track faculty because they are the faculty most likely to influence other faculty to adopt online learning and/or ways of improving student learning productivity.

C. Data Collection

This qualitative study used data from three sources: in-depth interviews, a blog for group discussion, and researchers' notes and journaling prepared during the interviews and analysis. During fall 2009 and spring 2010, the researchers contacted the nominees by email, provided a short overview of the study, and sought their consent to participate in the study. An appointment for a telephone interview was arranged at a time that was mutually agreeable to both parties. At the beginning of the interview, permission was sought and given to record the interview. Participants were assured anonymity and no names of individuals, programs, or institutions would be reported.

Two main questions guided the interviews combined with several subquestions : "How do you attempt to increase student learning productivity in your online courses? What do you do? Can you provide an example?" and "What do you think about the four principles? Are they valid? Will they work?" Each interview took between one and two hours. A note about evidence is useful at this stage. Some interviewees, although not all, asked what evidence would be appropriate for determining whether student learning productivity had occurred. The interviewee was asked to rely on personal observations or data, or whatever gave him or her confidence that learning had occurred. We did not ask for quantitative data or the evidence for learning *per se*, only the interviewees' assessment of which pedagogical tools seemed to work well for student learning productivity. Since faculty are intimately involved in designing, conducting, and evaluating student learning, they were likely to know what was working in their courses. Given the study used qualitative methods to ascertain the faculty's experiences with online learning and student learning, this seemed a reasonable assumption.

Because participants were located in nine different states and they were not available to meet face-to-face, utilizing a focus group was not feasible. Therefore, a blog was created to report emerging findings, elicit participants' comments about the findings or their experiences, and respond to questions posed by the researcher.

Researchers' notes were compiled during the interviews, as voice inflections, unique word choices, and contradictions within an interview and between interviewees. These notes also included initial impressions of possible codes and/or themes and similarities or differences to other interviewees' comments. These notes were important for capturing the interviewee's emotions, emphases, and the feelings for use during the analysis. They also included thoughts on follow-up questions and comparisons to other interviews.

Prior to initiating this research, the first author prepared a memo of her experiences teaching online and impressions of possible instances of improved student learning productivity. This was done for two reasons. First, this process clarified any preconceptions the researchers may have about influences and outcomes of teaching online so that those preconceptions could be "bracketed" or set aside during data analysis. This is one way of lessening the influence of personal bias during the data analysis phase. Second, this process allowed the first author to compare and contrast the participants' experiences with her experiences and connect experiences to prior studies. As interviews were undertaken, a reflexive journal was kept to reflect on emerging connections among interviewees' ideas, the research literature, and professional experiences. This process helped to ensure that interviewees' perceptions were paramount in the analysis, and that their perceptions could be related to and understood in the larger context of prior research.

The first author transcribed the interviews and, for each interviewee, attached the draft transcription to an email to the interviewee. The interviewees were asked to revise, add to, or delete material if they wished to, and the final, revised versions of the transcriptions were used in the analysis. This process, called member checking, ensures that the transcriptions and the interviewee's intent are accurate. Follow-up emails to the interviewees were sent once analysis began to confirm our interpretation of the interviewee's words and meaning as well as the emerging conclusions.

D. Data Analysis

The interviews were analyzed using standard qualitative analytical procedures [22]. This involved identifying similar ideas or approaches in the transcripts, assigning codes to those ideas or concepts, attempting to combine ideas into themes, combining themes or identifying inconsistencies in themes, and relating the entirety to existing theory and research literature. An answer to the first research question was developed through three steps. First, the interview transcriptions, blog, and researcher's notes were read for examples of activities or approaches that the faculty felt had increased the *amount* or *speed* or *quality* of student learning (the working definition for student learning productivity). At this stage, it was decided to focus the analysis for themes on the *pedagogical approaches* that produced learning, rather than focus on specific technologies, which can rapidly change. Second, each theme received a unique code. Third, once codes were identified, they were grouped into logically consistent categories and frequencies noted; this level of the analysis produced conceptual themes. Inconsistencies were also identified as well as relationships among concepts. Apparent inconsistencies were explored to see if they could be resolved with higher-level groupings or concepts that could incorporate the seeming discrepancy.

An answer to the second research question dealing with the four principles mentioned earlier was developed by classifying the examples provided by the faculty interviewees into one of the four principles as defined in the previous work of Meyer [12]. These principles were 1) replacing higher-cost labor with technology, 2) replacing higher-cost labor with lower-cost labor, 3) replacing capital space with technology, and 4) using instructional design to ensure student learning. The frequency and consistency of the examples for each principle provide a tentative answer to this question.

To add reliability to the analysis, the second author reviewed 5% of all codes and thematic analyses, and also provided alternative explanations for tentative conclusions. In this way the analysis can be said to result from a contesting of analysis and interpretation from two points of view or researchers.

IV. RESULTS

A. The Faculty

The ten faculty participants were from master's (n=3) or doctoral (n=7) institutions, which indicates the highest level degree granted by the employing institution. There were four males and six females, and they worked in nine different states in the South, North, and West. They also represented 13 different fields: three disciplines (English, philosophy, and sociology) and 10 professions (criminology, special education, higher education, finance, real estate, human relations, nursing, health policy, safety management, and library media). Several faculty taught in more than one discipline or program or taught courses that could be applied to several degree programs.

B. Improving Student Learning Productivity

The analysis of the 65 examples provided by the ten experienced online faculty produced six themes (several of which include subthemes). The themes included 1) increasing student access to content, 2) changing the role of faculty (which had two parts: increasing access to faculty and changing faculty

roles), 3) increasing interaction with students, 4) emphasizing the importance of student effort (including use of experiential learning, group work, learning to learn, and feedback), 5) connecting to the "real world," and 6) changing conceptions of time.

1. Content

Six of the ten faculty specifically mentioned the ability to increase student access to various forms of course content; for three of them, this was the first example provided so may also represent an important and foundational advantage to online learning. The forms that increased content took went from classical content (readings) to audio or video presentations, Powerpoint presentations with notes or audio recordings, and podcasts. The advantage to student learning of these increased types of content was a) more content, b) content that is available to the student when the student needs it, and c) the ability to repeat content multiple times. The following faculty person gave an extensive example of this theme, and why it worked so well in his class:

> I use streaming presentations. They are basically powerpoints that I've recorded the narration for and I'm currently using Camtasia for that. I have several presentations per topic. I think it's very valuable because the students can watch multiple times. It's not like if they missed a class they've missed an hour and a half of material . . . more rigorous online as I am on campus. I feel that with the online environment, I can have material available online and I can have these presentations that if the student is committed to learning, they have a lot more ability [to learn] than perhaps even in a face-to-face class. I have them use SAS [Statistical Analysis Software] . . . So I created a set of movies with Camtasia where I took them through the operation of SAS. "This is how you open SAS, this is how you do . . . this is what you do when it blows up . . . this is how you build the model." This way, students can watch it over and over again. In my face-to-face class, I gave the same assignment, spent almost every class talking about SAS, and I'd have students come up to me after class and ask, "Professor, where was SAS again?" or "How did you open it up?" They are trying to remember an hour's worth of demonstrations on the board and they ended up protesting and wanting the same movies available to them that the online class had. And the reason was the online class could spend 5 minutes watching the first step, and then pausing, and then duplicating the step, pausing, then duplicating the step. So because they could go back and repeat the material over and over again, the online environment actually helped them.

Another advantage of having content available to students in a variety of modes is the opportunity for the student to learn through their preferred learning style, whether that be aural, visual, or kinesthetic. While no faculty mentioned intentionally providing content in various modes as a way to address learning styles, two mentioned that they felt the ability to tie the mode of the content to learning style might help the student learn more or faster. One faculty person captured the advantage of more content and types of content:

> I'm doing more required reading and all kinds of supplementary activities that they can do. I find these online or I create them . . . I can design and put self-tests on Blackboard and students can take advantage of them if they want to. I'm doing more and more of that. If it's something that can be created online, once it's created, it's there. I just copy it from term to term so I have a growing library of them . . . I think this is a useful way to get in touch with students with different learning types. I've done podcasts and even found others' podcasts I've found on the Internet and link [these] to my course. They may have real world applications which work better for some students. There are ways to

> speak to different types of students. You can't do it all at once in a lecture, but this is way to address different needs.

2. Faculty Access and Role

The first subtheme captures the sentiments of three of the faculty, who felt that online learning definitely *increased students' access to them*. One specifically mentioned that online courses had increased their one-on-one time with students; others felt that online teaching allowed them to tailor instruction to an individual, troubleshoot learning problems, or just provide a more personal touch to the course. One faculty deliberately organized his lower-division course into 48-hour blocks, so that students would need to communicate with him regularly and he could shape their projects. This same individual was committed to making himself available through phone, email, and IM (instant messaging) and gave his students tips on how best to reach him in the days before projects were due.

One interesting related discussion was the adoption of a "24-hour policy," or requiring faculty to respond to student emails within 24 hours. Not surprisingly, faculty chafed at the policy, but were doing it anyway. However, the advantage of such a policy, compared to face-to-face courses, is clear in the view of this professor:

> If you are taking a Tuesday-Thursday class on campus and you walk off campus on Thursday, you can't get to your professor until the following Tuesday. And of course getting a hold of your students is virtually impossible. With the technology, it's made this possible.

This example also illuminates the need for faculty to have better access to students, be it by email, announcements posted to a course management system, or other tool. As one faculty mentioned, a class may need to be cancelled due to illness, a change in assignment made, or a broken link repaired. It may be just as important to student learning that faculty contact them as the reverse.

A second subtheme captured how several faculty felt that *changing their role* seemed to influence student learning. This included the faculty person who gave up control, and saw her students learn more:

> I've had an "ah ha" moment . . . when students get confused about a project, I'd keep adding and adding instructions. I would add another paragraph, or I would add subtitles or subheadings, or more examples, or whatever. And I just kept adding to these guidelines, until they became this big monster. I finally just got tired of it. I said, "If you want to do a regular paper, then here's the guidelines. If you want to do something creative, then you meet the goal in any way you want to." So for example, in the Serial Murder class, I have a common goal for the whole class for their semester project. The goal is to understand the life of a serial killer through a sociological lens. That's it. That's the only goal. And so they choose one option, the regular paper or an alternative option and meet that goal any way they want to. And it has been phenomenal. Does everybody do well? No. And do I still get some boring papers sometimes? But opening up that other side of it to the people who want to do something more creative has been marvelous. They research, they go to the sites, do videos, do skits, and videotape themselves and do simulations. One did an elaborate time capsule and another did elaborate scrapbooking; I had another one who did an absolutely amazing job with a Facebook page.

This focus on the learning outcome or goal and granting freedom to the student to find the best way to achieve it seemed freeing to the professor as well.

This means that assignments are designed in ways to place the professor in the "guiding" role. For example, a different professor described it this way: "I give them a guided structure, so there's stuff for them to look at, and then they can go off on their own. They get required readings and links to look at and then we give them freedom." Faculty are available to answer questions, analyze thinking errors, and provide additional points of view or alternative approaches, but the student receives sufficient structure and material to proceed toward the goal on his or her own. This is an example of the movement away from faculty being the "sage on the stage" to the "guide on the side;" they are still there as designer of the learning, the provider of organization in the course, guide to the confused, advocate for the content or discipline, and evaluator of thinking. These changes in faculty role seem – for some of the faculty interviewed – a key to student learning more and better in their courses.

These two subthemes – increasing access to faculty and changing their role – seem, on the face of it, to be contradictory. But perhaps they are consistent when viewed from the point of view of students. With email, IM, and other forms of communications, faculty are certainly more accessible to students than they were when meetings required that a student make an appointment to visit faculty at an office on campus. And by giving up their role as provider of content in the traditional classroom, faculty can offer different and perhaps more tailored assistance to students. They can answer questions, challenge thinking, and point students to additional resources; this change in faculty role may be a boon to student learning, or so some of the faculty interviewed believed. Thus, the two findings may be complementary, capturing the changes in faculty role that most benefit students.

3. Student Interaction

Another advantage of the online medium is its ability to connect students with each other. This may seem to be no different than an on-campus class, but the faculty felt the sharing done in online discussions was different. In the online setting, students could share their experiences and, especially important for older students in the professional programs, their experiences on the job or in the workplace. For example, in the safety management program,

> We have two discussion board questions that students have to respond to and then they must engage with at least two other students on what they posted. We want to create a dialog. In our program, I see a lot of learning occur from the online students who are professionals in the field. There's a Fire Chief or someone working for the government or industry, and a lot of different perspectives and a lot of material gets brought to the table. The students learn a lot from each other.

This may occur in a face-to-face classroom, but may not. The online discussion board -- whether tied to readings, student presentations, or current events – seemed to elicit more student comment, more comments from all students, and more germane comments. The wallflower could not hide and the person slow to raise a hand in class to speak could take time to find the right words for an online posting.

4. Student effort

This theme introduces several groups of examples whose effectiveness depends on having students expend effort. If these faculty have learned one thing, it is that they must find ways for students to learn that does not depend solely or mostly on faculty lecture or the passive receiving of information. In other words, students must do the work, as is implied by the example below:

> One of the things I did last semester in the [higher education] administration class, I had students do comparisons of various areas like governance and student services in for-profit, non-profit, public, and private community colleges . . . It really turned out to be a

> very successful project because it avoided their having an isolated experience . . . putting them into groups and forcing them to focus on specific areas to produce a final product increases their learning. I could have given them a Powerpoint presentation or a podcast on the various topics and I don't think they would have learned as much. I think it would have been a very static learning experience.

In other words, learning is not a spectator sport, and the sooner students become involved in their own learning, rather than relying on the learning of others (either the learning of faculty or other students), they can and do learn more. Here is another comment that is germane:

> I did have one on-campus student and I told him not to take an online class, but he enrolled in an online class and he hated it and he dropped it. He wouldn't read his stuff or respond to emails. He just wanted to listen to discussions in class . . . he was an "academic loafer." You can't be an academic loafer online. Most of the students online are not academic loafers; they are goal-oriented. They see the relevance of what is being done online – they can use it immediately in the classroom – and they get the support as they need it.

The subthemes which follow provide a number of examples where faculty teaching online required students to take charge of their learning and were pleased with the learning that resulted.

a. Experiential Learning

Two of the interviewees offered several examples of how they used experiential learning in their online courses. One faculty person was a particular advocate of the approach:

> I don't want to say force, but I somehow gentle coerce (a total oxymoron) students to get engaged in the subject matter. I'm very much about experiential learning. So I get them to put down the computer and go out and do something and then come back and talk about it. And when I get them to do that, it takes off.

This is a good description of how experiential learning is connected to the theme of having students do the work. This same faculty person described several assignments that use experiential learning techniques including taking the role of a homeless person (described below).

> Another assignment I do is a little more complicated but I'm always amazed that students still get so engaged in this little activity. I call it "Streets" . . . I have them go out and take the role of a homeless person for a day and then write it up . . . I'd rather do something else because I've learned more about homelessness than I ever wanted to know. But they always say, "Never change this exercise. This was life-changing to me. I never knew. I now think about ways I treat other people and how I look at them and how easily it could be me." And then they come back and talk about this online in the message boards and I really think that's key, to have them discuss it. They will call each other out about it. Somebody will say, "Well it's their choice. They didn't have to do that. They could have gotten a job." And someone else will say, "Are you kidding me? The person I talked to was an executive at one time." It's really nice when you get them to feel it themselves and to monitor it themselves and really engage in it.

Designing an experience that will be educational is not limited by the online setting and can occur wherever students are located and certainly away from the computer. This same faculty person noted "It's a farce to say we can't do this in distance education; of course, we can. I think that because it's an

environment where we have to be a little more creative in thinking of ways to have distant students engaged that it makes us better as instructors, because we can get lazy, too. Now we just have to be a little bit more inventive in how we do it." It is student engagement that is key to productive learning.

b. Group Work

Four of the interviewees specifically mentioned the importance of group work in their online courses. This was true for faculty teaching in both professional programs as well as disciplines. Group work appears to create the opportunity for students to learn from each other, much as was described in the earlier example with the Fire Chief being able to share expertise with other students in safety management classes. Group work was also required by faculty in professional fields since being able to work ably in teams is often a requirement for individuals in these fields. Group work capitalizes upon a synergy of all the participants to produce better work.

Another faculty person designed a discussion board that operated like a blog that students used to develop a learning community around their writing assignments.

> [The discussion board] basically functioned as a blog for the student, with each student narrating their work so each thing they did for the class . . . That way other students then were able to respond to the blog entries and students had a running account of what they had done in the class and other students could read these too and got to see what others had done in the class and see where everybody was and learn to whom to go to for help because they could see who had already done the assignment and they had additional resources to share. Some of them found the textbooks for the class were inadequate, so they went to Barnes and Noble and bought more textbooks and they learned more from those than what I supplied and this was shared with others in the class. That really did develop . . . a real self-propelled learning community in the class. I wouldn't need to write that much and only commented outside the forum through a chat or instant messaging when they needed it. They were very resourceful in finding their own ways to learn about the material and to position themselves as knowledgeable practitioners in the community of practice.

These different types of assignments and organizing of students' efforts can be seen to emphasize the importance that students do the work, but also experience the learning with and among peers who can often help and improve the learning process or the final product or paper.

c. Learning to Learn

Five of the faculty provided examples of student learning that they felt were especially important because they taught students how to learn. For example, by describing themselves in an exercise called "Me," students learned essential sociological concepts and learned to apply them to themselves. The sociology professor described it this way:

> It's their first assignment; it's small -- just two pages. All they have to do is talk about statuses, roles, and the socialization process. Who they are, where they are, what they learned and how societal influences have defined who they are. To tell you the truth, I'm bored with it. I keep wanting to do without it, but they "get" it and they get it at a very early time in the semester which lays the groundwork for the rest of the semester. They finally realize that they themselves are a social product.

There were several additional examples of having students learn how to learn. Two faculty persons used a variety of self-tests or diagnostic tools as ways for students to learn how to evaluate their own learning. A third faculty person used online tests for learning styles to help students identify their strengths and weaknesses and better understand their own, and their students, learning processes. Another faculty person insisted on not providing web links to every resource, since students need "to learn how to find the information." The point was not for the faculty to provide all of the relevant information, but for the student to learn various ways of searching, finding, and evaluating online resources. By requiring students to produce reflection papers, one faculty person felt strongly that the reflection encourages learning by focusing on what the student learned and how they learned it.

These various assignments – applying concepts to oneself, self-evaluation, learning how to find things on the web, reflecting on learning – are examples of a whole range of assignments that can be used to focus the student's attention on his or her own learning. Faculty use a variety of online tools – papers, discussions, projects, tests – as long as they are designed to focus the student on how he or she learns.

d. Feedback

Providing feedback helped students to learn by identifying errors in their thinking. The following faculty person created online quizzes that students could rewrite to correct mistakes:

> One thing that I did very early . . . is to design reading quizzes using Blackboard (Blackboard calls them quizzes, but they are really guides to the reading, concepts and arguments that they should pay attention to). And the way I use those quizzes is students have to submit them by a certain deadline which is usually right after the class period that we discussed the reading . . . they submit them and they are automatically graded by Blackboard but if they miss a question they can do a rewrite. On the rewrite they need to explain why they originally thought their answer was correct and then why they now understand what the correct answer is and why it is a better answer than the one they gave originally.

This is a good example of having students identify and correct their own thinking errors through feedback. Another faculty person did something similar: "I give them two times for any test. Or two times on any short-answer quiz. And if I have time and if they turn things in early, I will give them two times on the big product they have to turn in. I do have a deadline that I don't go past for having everything in."

Several faculty also provided examples of how feedback on assignments seemed to improve students' thinking or writing. The professor who allowed rewrites of assignments that required students to identify errors in thinking felt that students

> Are learning to reflect on concepts and see that they have different meanings and they have to articulate a precise meaning. They become more critical readers through the process and I think that indirectly that makes them more adept at reasoning. I've found those quizzes are a way to provide feedback to students and help them hone their critical reasoning and reading skills without being completely overwhelmed by essays every week.

e. Real World

Many of the faculty interviewed mentioned the importance of providing students with real world, job-related, or practical experience; this is not surprising given the number of faculty teaching in professional

programs. These experiences tend to ground learning in the course by providing three connections. First, real world examples ground course concepts to situations the student may well encounter upon graduation. Second, content or exercises may directly apply to the job the student is preparing for by providing knowledge or skills needed on the job. Third, it may help the student perform better in the job he or she is currently doing. One faculty offered this example of applying course content to the job:

> I decided that the program was practically based; that includes a lot of "how to" stuff. I wanted the students to learn things that they could put into place on the job. For some that are working on the job . . . they can learn as they go. We've been able to keep our seven courses practically-based and insert the theory where needed, use group work and projects . . . they like to do a lot of projects. I give them some flexibility to apply these to their own environment.

Third, projects (undertaken often in teams, taking advantage of the effectiveness of group work) have the potential to combine theory and practice into a particularly effective learning experience. One faculty person gave an example that seemed to fit this last type of project, one which provided experiential learning (an earlier subtheme), a chance to learn skills and knowledge needed for those in the profession, and an opportunity for some deep learning of an important professional tool.

> In my [real estate] appraisal class, I have my students build a regression model that can explain property tax values using multiple regression equations. I have them use SAS, a sophisticated statistics tool. I was working with real assessor data [from the county] and I had them build a model that could be used to explain property values and it was the same type of work that the assessor was doing because the original model [the county assessor] used, I built. So this was real world experience for them with live data.

One can see graduates from this course being able to not only produce property tax values, but better explain them to others which would be a useful skill in the real estate profession.

Another example of learning a professional skill within the context of an online course is from a library media course on collection development:

> [The students] must do a mini collection development where they go in and look at the collection, the age of the collection, to give them an idea what a librarian sees and what needs to be discarded or ordered. They say that it never occurred to them that they would need to discard a book that says, "Some day, a man or woman will land on the moon." It's a very interesting task, and they need to look at science and technology where there's a lot of change, so when they assess the age of a collection they can see it's of 1968 vintage. And then they have to figure out whether to keep that old stuff or have one good item that is current and covers the bases and supplement it with other things.

Again, one can see that the course assignment provides preparation for a real world challenge of librarians everywhere.

f. Time

The comments relating to "time" dealt with several instructional design decisions that impacted students and faculty, and sometimes in different ways. For example, three faculty gave extensive examples of how their design choices for online courses would encourage a *routine for the student* and ultimately save time for both students and faculty. Here is one description of what was done and why:

> I used the same template to make things routine and familiar for the students. I know that there would be some who would disagree with this. If we use good teacher behaviors, it is important that students know what to expect, they have a class routine, so I used the idea of class routine so that the classes looked similar and you'd put things in the same place. We worked on that a couple or three semesters before I was finally happy with the template that we'd use for all of our classes.

Three faculty had thought through precise procedures to *manage content and student time*. One had grouped "material into 17-day cycles (allowing an overlap of a weekend for working students to complete their assignments)," another into weekly assignments beginning and ending on Mondays (to again allow working students to do their homework over the weekend), and still another instituted 48-hour cycles so that students would receive input from the faculty person regularly. This latter example was a way to ensure that "every two days I'm knocking on [the student's] door, and that's been good." Another way to conceive of managing content and time is by making content available online all of the time. This way, being sick or missing a class is less of a problem because the class is online and *always available*.

Still another aspect of the use of time was its *variability*, or the emphasis on giving students the flexibility to learn when the student had time to do so. (While this use of the concept of time seems similar to the previous one, it emphasizes student choices on how to use time rather than faculty management of student time.) In this way, a student "chooses the best time to learn" or "uses the time available to them" as two faculty phrased this idea. And finally, one faculty person had designed her courses so that students could "go as fast as they can go," finishing before the term had concluded or waiting until the final weeks to turn all of the assignments in. Another good example of the variability of time is captured by this professor:

> I think that some of our students are not ready, don't want to be there, they just ate or are tired. With online, if they have the discipline, they can do it when they want to do it, when they have the time, there's nothing on TV, things are settled down, and they say "Now I'll get my work done." The problem is when you have distractions or you *have* to be someplace at some time, you have to be attentive *at that time*. The key is you have to be personally disciplined to go do it.

One interesting comment about time – more particularly the faculty's time – had to do with different *concepts of work time* in light of students' expectations for 24 x 7 availability despite faculty's multiple obligations. For example,

> Do you know that students expect us to answer emails over Christmas holidays? I need a break! You'd better think about this. Younger students live in a tweeter world and they are dealing with faculty who are stuck in an 8-to-5 five-day-a-week thought process. Are we going to change those students? I think not. Are we going to change the faculty? I think not.

The solution proposed was an email policy, explaining when faculty would respond and when they would not. Doing so would not only bridge the two parties' concept of "work time" but also modify student expectations of 24 x 7 faculty availability and reserve some personal or professional time for faculty with multiple demands on their time.

C. Application to Four Principles

The second research question asked, "Are the four principles for achieving student learning productivity through online learning useful?" The first stage to answering this question involved discovering if faculty

were – perhaps without knowing it – implementing the four principles for improving productivity discussed in the research literature. Only four faculty were familiar with these concepts, due in part to those faculty persons' expertise in business-related fields (e.g., human resources, finance, real estate, safety management).

While the other interviewees were not familiar with these concepts, the examples they gave were easily categorized into three of the four principles. For example, all ten faculty described specific projects, learning experiences, or class designs that would – after the original course design had been completed – require less of their time on a day-to-day basis. This is the principle of *replacing higher-cost labor with technology*.

For example, one professor captured this effect with these words:

> Other than your first time through [developing and teaching the course], my second, third, fourth time through I had to go in and change my dates, make sure things are ready for the new semester, check to make sure my links are working, and delete old content. But other than that, my lectures -- my involvement -- was already there. My time going to class was completed.

This insight also identifies an interesting difference between online and face-to-face teaching: the huge time investment for online courses is in developing the online course. This is how one professor captured this idea: "Other than that initial investment, I was able to save a lot of time because my lectures were done once and finished."

Three faculty used GAs or adjunct faculty to take over the day-to-day handling of student questions or teaching the course, thereby *replacing higher-cost labor with lower-cost labor*. As one faculty described this tactic,

> If you have a good graduate assistant, there's no reason they can't do all of the grading of the threads, they can do a lot of work in terms of email, they can be the one to monitor the class. You can use a grad assistant in an online environment far more than you ever could in the face-to-face class because I can give the GA equal billing. I say "[Name of GA] and I are teaching this class." So yes, I think you can substitute low-cost labor for high-cost labor.

While there were no examples of replacing capital buildings with technology, five faculty made specific and strong statements of the *importance of instructional* design in the process of ensuring the online course was productive. This is one example of several such statements:

> You have to look at what you want out of the class, and as you design you can put things in that are different for each class. Nobody taught us this; it's been a little trial-and-error. It would help if someone had told me.

However, this support for instructional design help should not be construed to mean that the faculty knew what instructional design involved or what instructional designers do; they seemed most interested in receiving more help putting a course online and making sure it would work well for students. They could see that it took more than manipulating the institution's course management system, but required understanding much more about how learning occurred, what different approaches existed, and what these approaches accomplished.

The process of categorizing the interviewees' examples into the four principles seemed to work well. All examples could be classified, and the three principles the examples fell under can be influenced by faculty choices. The fourth principle – using technology to replace capital, or the need for new buildings – seems to be an institutional, not a faculty decision. Or rather, saving capital space is not a priority for faculty, but learning how to use their own time more efficiently (by replacing high-cost labor with lower-cost labor and/or technology) is a priority. Instructional design is the key to learning how to be more efficient and also improve student learning. Thus, the four principles may be a useful way of categorizing ways to improve student learning, should categorization be useful to understanding what is happening online and why it is happening as it is.

V. DISCUSSION

Based on the interviews with ten experienced online faculty and the analysis of themes and subthemes presented above, we can offer five tentative insights into the faculty's ability to affect student learning productivity. First, all ten faculty had found ways to improve student learning and had seen evidence that student learning productivity had occurred. That evidence might be different for each faculty or discipline: a comment on a student's course evaluation, test results, or the quality of student products. But each faculty person felt confident they had seen improvements and some felt strongly that their innovations worked quite well for student learning. As one professor put it, "I have been pleased beyond my wildest dreams at the quality of work from students."

Second, all ten faculty had found different ways to do this: different assignments, different tools, and/or different goals. For example, all used online discussions, but they used them differently. Several used them for sharing student experiences on the job or with an assignment, and others used them for discussions of readings, topics, or current events. Still another used them as blogs for students to share their growing understanding of a topic and to share their work products with other students. Another found online discussions worked well for encouraging a testing of ideas or opinions, where students challenged each other or delved deeper into an issue. What is important to understand is that one tool – online discussions – morphed with different goals or assignments. One tool could and was used in a number of ways and for a number of aims. Perhaps learning how to use a tool, as simple as online discussion or as complex as a wiki, in various ways to support different learning outcomes is what faculty need most.

Third, the faculty had, usually without any familiarity with the seven principles of good practice [10, 11], had developed pedagogical approaches that stressed communication between and among faculty and students, engagement of students in their own learning, experiential learning and group work, timely feedback and the management of time, and effective organization of learning. Prepared for the faculty role by earning a doctorate in their discipline or content area, these faculty had developed these effective pedagogical approaches by several means, such as professional development workshops on campus, more experienced colleagues who can share what they have learned, or the eureka of inspired insight. They were also deeply committed to improving their online courses as they learned more about how students learn and learn online.

Fourth, all ten faculty were positive with their experiences online and supportive of online learning. Some preferred the online setting over face-to-face classes and felt online learning was actually better than more traditional forms. As one faculty person stated, "I'm one of those individuals that is 1000% convinced that students can have the same learning experience online that they can have in the face-to-face classroom, if it is designed correctly." Others continued to teach online and face-to-face, so could assess each form for its ability to achieve their educational aims for students. The philosophy professor was particularly impressed by teaching online because

> What is valuable about teaching online and what is valuable about it as a medium for teaching philosophy [is] the online environment is very effective at focusing on the world of ideas. We're looking at thoughts expressed in text on a screen, which is great. The face-to-face classroom has distractions. I don't want to say [online courses are] a natural environment for philosophy. But it is a way to focus on ideas and reflecting on ideas.

This is a powerful insight into the medium of online learning and its potential for improving student thinking and appreciation for ideas.

Fifth, at least three of the four principles appear to be a valid way to group tactics that faculty are using to improve student learning productivity. Faculty may not develop tactics that intentionally address these issues or use the terms proposed in the four principles, but they are finding ways to improve productivity that generally replace higher-cost resources with lower-cost resources (be they staff or technologies) and they value instructional design to make sure the attempt to improve productivity also improves learning. Future studies may need to continue to evaluate these principles to see if they continue to be useful in the analysis of student learning productivity.

Lastly, there is a widespread belief that faculty are a barrier to improving the productivity of higher education. And yet no one, to our knowledge, has asked faculty what they do to help higher education institutions and students use financial and personal resources more wisely. This research challenges those perceptions that faculty are barriers to change with many practical examples of faculty who teach online serving as willing partners to ensuring, increasing, and improving student learning. The faculty in this sample are actively exploring and using online learning to improve student learning productivity, getting students to learn more through thoughtful design of online courses and using existing institutional resources in creative ways to do so. Based on these interviews, we believe experienced online faculty have much to contribute to the discussion of student learning productivity. Perhaps more importantly, their stories and examples may influence some faculty – who prefer to learn from other faculty -- to experiment with online learning. Faculty are often the best advocates for innovations with the skeptics who may demand more than statements of support, but who want proof and practical examples. We hope the examples described by our faculty stimulate further experimentation among faculty teaching online and lure some faculty into exploring with these tools.

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VII. ABOUT THE AUTHORS

Dr. Katrina Meyer is currently associate professor of higher and adult education at The University of Memphis specializing in online learning and higher education. She is the author of Lessons Learned from Virtual Universities, a 2009 publication in the *New Directions in Higher Education* series, and *Cost-Efficiencies of Online Learning*, a 2006 publication of the ASHE Higher Education Report Series. For over three years, she was Director of Distance Learning and Technology for the University and Community College System of Nevada. Prior to this, she served over 8 years as Associate Director of Academic Affairs for the Higher Education Coordinating Board in the state of Washington and was responsible for technology planning and policy related to online learning.

Dr. Larry McNeal is chair of the department of leadership at The University of Memphis specializing in instructional leadership and organizational change in public education with an interest in instructional technology and student learning. He is co-author of a 2010 publication in the National Forum of Applied

Educational Research Journal and a 2006 publication in the Encyclopedic of Education Leadership and Administration. For the past eight years, he has supported the transition from brick and mortar teaching to online teaching

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