Wikifolios, reflections, and exams for online engagement, understanding, and achievement

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Framework

We are refining three instructional practices in online introductory-level graduate courses on Learning Theories at Indiana University. The course serves a challenging mix of educators, designers, trainers, & researchers. Some are tech-savvy distance learners while others are residential students taking their first online course. It is a required course for many MEd students and a first course for some doctoral students. Despite varied backgrounds and goals, all are expected to gain enduring understanding of the major theories of learning and the primary processes in human cognition, as outlined in a popular graduate-level text.

This particular section also included students enrolled in a certificate program that promised more advanced levels of professional social networking. But many of the students were busy full-time teachers, and the course was taught by busy regular faculty. As such it was crucial that the course be manageable for both students and faculty within the standards 12-hour per week commitment. These techniques were gradually introduced and refined over several semesters. Other could gradually incorporate the specific strategies in the context of a normal teaching load; preparing to implement all of the strategies from the start of an existing course would likely be as labor-intensive as designing an entirely new course.

Making it Work

Our efforts were guided by newer participatory theories of learning and new connectionist models of teaching. These theories are used to refine wikis, wiki commenting, and other features in the open-source Sakai platform (and available in many commercial online course management systems). The course is organized around weekly wikifolios where students consider and discuss the relative relevance of course readings to a personally relevant instructional problem. First, assignment-specific online videos, course-specific FAQs, and a program-specific help page allow even novice online learners get their homepages and personal introductions up quickly (Figure 1). Second, students define a unique instructional problem (Figure 2). These contexts anchors most course learning. Third, the problems are used to organize students into professional networking groups (literacy, comprehension, writing, math, and science). For the next eight weeks, students then post and discuss weekly wikifolios that correspond with one chapter from the text. On each of these assignments, each student selects and defends at least three “most relevant” and one “least relevant” implications for education (Figure 3) and five most relevant specifics.

During each week, students and the instructor comment within and across groups (Figure 4). Students are encouraged to begin projecting their professional identities by considering the consequences of the implications and specifics for their particular lesson, domain, and role.

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Threaded discussions emerge in the comments. These discussions can get quite extensive, and allow the instructor to strategically insert more advanced topics that would otherwise overwhelm the students. These eight weeks include two assignments address course goals that previously were only accomplished in the more advanced course. One has students reframe their instructional problem and the textbook implications using newer situative theories of learning; another has them learn to search out and evaluate scholarly references to a core reading using Google Scholar.

During the last five weeks, each group uses a discussion forum and the relevant text chapter to create an expanded groupwiki (Figures 6 and 7). These present (a) an exemplary lesson, (b) the entire set of chapter implications, (c) a lengthier set of specifics, (d) annotated links to relevant web resources, (e) the most relevant instructional debate, and (f) descriptions of relevant professional social networks based on initial participation.

Even if time was available to strictly grade all of the posts and discussions, doing so would undermine participation. Instead, students post brief reflections on how the wikifolio showed three types of engagement (Figures 8 and 9). At weeks five, ten, and 15, students can get full points for each wikifolio for having a draft posted by the weekly deadline and including meaningful reflections.

So far, the results are quite promising. In the most recent classes, all of the students successfully completed all of the assignments, including two aforementioned challenging ones. In the most recent class, weekly wikifolios averaged 1,580 words. Sixteen students posted 1,047 comments on average, while the instructor posted only 50. The average student comment length was 120 words, ranging as long as 730 words. In an anonymous course evaluation, every student who responded agreed or strongly agreed that the wikifolios and comments helped me better understand the relevance of course content to the educational issues I am dealing with.

Accountability for broad coverage is accomplished using midterm and final exams in the OnCourse testing subsystem. Multiple-choice and short answer items constructed or selected so that answers could not be readily looked up in a time-limited context. This provided rigorous evidence prior engagement and additional motivation, without allowing this exam to drive instruction or undermine participation. Evidence of broad coverage of course content is shown in the high midterm and exam scores across the two most recent courses. The average scores across the four were 92, 96, 91, and 85 percent; the lowest scores across the four tests were 66, 80, 72, and 79 percent. In an anonymous evaluation, none of the students disagreed with the statements the content of the exams were appropriate and what I expected and the form of the exam was fair and what I expected.

Future Implications

One promising innovation we are currently experimenting is assigning “badges” for particularly noteworthy wikifolios, comments, or discussion threads. These currently consist of instructor-awarded badges (e.g., early bird for posting first, provocateur for a particularly good comment), and are simply highlighted text in the comments. We will shortly begin introducing peer-assigned badges. The ultimate goal is a crowdsourced system with multiple levels of peer-assigned badges like the ones that are currently in use at Peer to Peer University and in discussion forums for programmers (e.g., Stackoverflow.com).
Figure 1. Example Homepage with Personal Introduction.
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Figure 2. Example Anchoring Instructional Problem.
IMPLICATIONS

1. Aid students in proceduralizing their knowledge and linking it to conditional knowledge

I believe this is the primary purpose of my case study assignments. They read the book, they’re learning what certain drugs do but the case put them in context and gives them an opportunity to solve a real world problem. How the students approach many disease processes or changing clinical signs needs to be proceduralized. This need and the heavy emphasis on practicing with evidence-based practice has led to many facilities creating “order sets” that gives the procedures steps to a patient with a certain health care condition. For example a patient with chest pain will always get certain labs drawn, an EKG and the same medicines. These order sheets aren’t available for every condition however.

2. Help students organize new information into meaningful “chunks”.

This relates to my assignment as students order medications and diagnostic test for various conditions. Since the students do multiple case studies we use the cases to help students begin to develop a system to problem solve a complex medical condition. They then need to write it down in that system so that others can understand it. This system entails the student to “chunk” out sections. They must also give a rational for their decisions.

3. Help students activate their current knowledge.

One big advantage of teaching the acute care NP program and hand selecting who get accepted into the program as director of the program I know that the students I have are all excellent bedside nurses. They will have observed many of the cases we teach or carried out the orders of treatment plans. As an NP they need to build on the “why” of how they do these things. I do not think I emphasize enough about what they already know. Connecting these activities with experiences they have already had will make the cases more powerful.

LEAST IMPACTFUL

Recognizing that the starting point of learning is what the students already know their prior knowledge. I think overall this is a very important concept but somehow I was smart enough to decipher this before they even get to my class. So it doesn’t directly relate to the use of cases. I have monitored since I took over the program what the “elements” were of people who are the most successful in the program. These attributes have then been added as scoring elements during their interview for the program. The intention is that all of the students coming in will be at a certain level of knowledge in nursing. Most of the nurses I take have at least 5 years experience in an ICU or ER, and at a large facility. 5 years in a hospital with 4 ICU beds is not the same as one with 40. However, that being said they do come from different specialty areas so I need to think about how to incorporate their strengths in assignment that relate more to their specialty areas so that it would assist their peers.

RELATIVE SPECIFICS

1. “Production rules specify how chunks are transformed and apply only when a rules conditions are satisfied by the knowledge available in declarative memory.” (p. 58)

So I had a discussion in another wiki about how I was confused with what “chunks” were and have now discovered that what I thought were “chunks” were actually production systems. However, we have come full circle, as “chunks” are an essential part of production systems. The cases need to fulfill the requirement of creating declarative information that allows the students to develop production rules. Since “experience” is what activates an
Figure 4. Typical Wiki Commenting by Week Three.
Relevant External Resources for Science

Open Education Resources for Science

> [http://science.nsta.org/enewsletter/2006-06/news_stories_high.htm](http://science.nsta.org/enewsletter/2006-06/news_stories_high.htm) This website presents a long list of free resources for science teachers. This seems helpful given the broad range of resources (from NASA to CourtTV).

> [http://path.upmc.edu/cases.html](http://path.upmc.edu/cases.html)

A giant database of case studies (by patient history and by diagnosis). Could be useful for teacher as well as for student research


Blogs and Discussion Forums about Science

> [http://www.artofteachingscience.org/?page_id=12](http://www.artofteachingscience.org/?page_id=12) I just added this in response to a comment. This blog is more related to science in general (not just nursing or case studies) and therefore should be most relevant to the rest of the class. Discusses issues in science and in teaching science.

> [http://teaching.berkely.edu/bgd/collaborative.html](http://teaching.berkely.edu/bgd/collaborative.html) Education blog from UC Berkley discussing the issue of collaborative learning. Helpful in that it provides tips/strategies to maximize the benefits of group work/learning.

> [http://scienceblogs.com/channel/education/?utm_source=globalChannelGutn_medium-link](http://scienceblogs.com/channel/education/?utm_source=globalChannelGutn_medium-link) Blogs about science. You can pick various science topics such as education, medicine, then environment etc.

> [http://synthesizingeducation.com/blog/-Great](http://synthesizingeducation.com/blog/-Great) commentary on cooperative learning, online vs classroom instruction etc.

Articles or Websites about Science

> [http://ublib.buffalo.edu/libraries/projects/cases/case.html](http://ublib.buffalo.edu/libraries/projects/cases/case.html) The National Center for Case Study Teaching in Science. This site, although more hard science than biology, does have some nice tutorials on how to develop and write a good case study.


> [http://primeinc.org/casestudies/nurse_practitioner/](http://primeinc.org/casestudies/nurse_practitioner/) Nurse Practitioner Case Studies. This website has a number of cases that could be used in collaborative group work.

> [http://isites.harvard.edu/fs/html/icb_topic58474/wigintro.html](http://isites.harvard.edu/fs/html/icb_topic58474/wigintro.html) Working in Groups. This is an online document that has good ideas for making group work successful.

Figure 5. Groupwiki Featuring Relevant External Resources.
8. Draft reflection. Add a reflection at the bottom of this wikifolio. Write a few sentences in which you reflect on how your wikifolio is evidence of three types of engagement:

- **Consequential engagement.** What were the consequences of the big ideas in the chapter for you wikifolio. In other words, what did you do differently because of the big ideas in the chapters. Can you reflect on what the consequences of your selected lesson for understanding the big ideas in this chapter? Some lessons and domains are more suited for using this item format and this will impact what you learn about it.

- **Critical engagement.** Can you imagine why someone might disagree with you about the consequences of the ideas in the chapter and how you implemented them? Do you think that a different selected lesson might have been better for learning the ideas in this chapter?

- **Collaborative engagement.** Where did you learn what you learned in this chapter? Did your classmates provide you with helpful insights? Be specific. Did you learn anything from reading the wikifolios of your classmates?

Figure 6. Reflection Prompt.

| Implication #2: Develop an Awareness of a General Problem Solving Strategy |
| Consequential Reflection: Although, I have just argued that critical thinking applies to my lesson, I still feel many of the implications for problem solving as apply. Since students will be given a specific goal to solve, the lesson must support students' identification and background of the problem, students' choice and use of specific strategies to solve the problem, and evaluation of the solution after it has been met. In this lesson, the use of a list is the basic strategy being practiced and communicated. Other ideas and strategies may be used or shared such as color coding the list, using food group flashcards, using a calculator to stay on budget. |
| Critical Reflection: Since the authors divide the chapter into different sections - problem solving and critical thinking - one might argue that my lesson can not have elements of both. However, through my study and experience in education, nothing is rarely exclusively one thing or the other. Compromise is often the case. I had a difficult time drawing the boundary lines for one or the other. With this in minds, I feel it is important to recognize where they overlap in my lesson. The knowledge is important to both - background knowledge and strategy knowledge. I also believe the evaluation of the solution or metacognition are important components of both. |
| Discussion Reflection: This week's discussion has been the most revealing for me. Through comments made on my wiki as well as reading one of my classmate's wiki, I adopted my original view of my lesson and critical thinking. I have now adopted the implication that critical thinking is a reflective activity that involves knowledge, evaluation, and thinking and our thinking. As my lesson includes these components, I would now argue that critical thinking is a valuable part of my lesson and am grateful to my classmates who had a broader sense of this concept than I did. |

Figure 7. Typical Wikifolio Reflection.