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

Daniel T. Hickey[1] and Firat Soylu[2]

Framework
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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
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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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[1] Associate Professor, School of Education – Learning Sciences Program, Indiana University, dthickey@indiana.edu
[2] Cognitive Science and Instructional Systems Technology Programs, Indiana University, fsoylu@indiana.edu

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.

J   's Problem Definition

Problem: I am currently using medical case studies that the students (adult learners) complete independently the students learn a lot but I am doubling my class size this fall so grading 20- 20 page case studies is a nightmare and students do not have an opportunity to learn off each other. We also have not had a lot of time in class to discuss the process they have gone through finding the differential diagnosis etc. So I wanted to transform these cases into team based learning activities and bring some discussion of the cases into the classroom or even create simulations out of the cases. Questions: 1) How do I create a case study team based learning assignment that still creates Individual Accountability in a Cooperative Learning Setting? 2) How do I support the case study learning in class? 3) How can I have the cases drive the learning and use class time only to fill in the gaps rather than "death by powerpoint"? 4) Theoretically adult learners should be allowed to be self directed learners but how do I confirm accountability in a high stakes outcome?

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 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 set" that gives the procedural 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 student's 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 3. Weekly Wikifolio with Most Relevant and Least Relevant Implications.

E⸻ ⸻ (2010-05-18 07:48:16.0)   Comment   Edit

E⸻ - Thanks for your thoughts. I found your own description of an area of improvement for your lesson was very thoughtful. It seemed you really tried to connect the reading to your definition problem. I agree with you that going over learning objectives at the beginning with students is an effective way to focus their attention. It might also help to have the objectives written out visually where they can be seen throughout the activities you have planned. This way you and your students can continually refer back to them to maintain focus.
I also had trouble ranking the implications. I am glad to hear I was not the only one for who that exercise was difficult!
I think you are on the right track in regards to the importance of students' familiarity with computer skills and reading website information as you stated in most relevant implication one and in your description of automaticity. It would be difficult for students to accomplish the objectives of the State Content Standards if they are too bottled up with figuring out how to use the computer effectively.
Thanks for all your thoughts Emily!

E⸻ ⸻ (2010-05-19 14:01:20.0)   Comment   Edit

E⸻,
I think the reason why it's so hard to rank them because the concepts overlap. Also, I had a little trouble with the chapter in terms of trying to organize the information presented. My mind likes to put info in neat boxes, and so many of the concepts had interrelationships. I'm hoping that seeing what others wrote as well as the comments I receive will help me to break down the info.
Thanks for letting me know I'm on the right track :-)

C⸻ ⸻ (2010-05-20 19:42:15.0)   Comment   Edit

E⸻, I also felt so many of the concepts overlapped that it was hard to pick out which was most relevant. When it comes to reading memory is such a big component to building reading skills that this chapter was very relevant to our problem area.
I also found the definition of short term memory vs working memory a little confusing...glad to read I wasnt the only one

Daniel Thomas Hickey (2010-05-24 12:24:10.0)   Comment   Edit

Just wanted to let you know that this thread is very useful. Once you see that they overlap, the struggle to tell the difference between them is really useful for getting at what they are really saying. Nice job. The difference between STM and working memory is really a historic one. See the note on page 26 that "many researchers now prefer..." The shift away from STM and LTM also reflected the impact of neuroscience which show that these are really just different functions rather than "parts" of the brain.

L⸻ ⸻ (2010-05-18 15:40:51.0)   Comment   Edit

E⸻, My comment is about your "least important implicaton".
I found the distinction between short-term memory and working memory a little difficult to understand, too. From what I was able to gather, these two ideas aren't necessarily seperate things, but rather, the working memory is more of a refinement of the idea of the short-term memory.
I think STM has been conceived of as one unitary 'thing', but since there seemed to be so many different processing activities happening within the STM, researchers thought maybe it should be refined to reflect that. Instead of one 'thing', it was actually a grouping of specialized functions, and called that grouping "working memory".
I think what that implication is saying is that auditory and visual information can be processed seperately without

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 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

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

↗http://www.dmoz.org/Science/Educational_Resources/Curriculum_Development/. Another bucket of free resources. Includes K-12 and curriculum ideas.

Blogs and Discussion Forums about Science

↗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.berkeley.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=globalChannel&utm_medium=link. Blogs about science. You can pick various science topics such as education, medicine, then environment etc.

↗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 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://ublib.buffalo.edu/libraries/projects/cases/teaching/novel.html The National Center for Case Study Teaching in Science How to write a case.

↗http://www.actionbioscience.org/education/herreid.html Actionbioscience.org. "Using Case Studies to teach Science"

↗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 Working in Groups. This is an online document tha 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.