Postdoc Academic Chat #5

Blended Learning - What's all the Hype About?

Tuesday, February 16, 2016

READINGS

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#1. Blended Learning: Introduction

The posting below is the introduction to the new book, Blended Learning: Across the Disciplines, Across the Academy, edited by Francine S. Glazer who is also the author of the introduction. Published in Association with the National Teaching and Learning Forum, by Stylus Publishing, LLC. 22883 Quicksilver Drive Sterling, Virginia 20166- 2102. [http://www.styluspub.com]. – R. Reis

Today's college students lead blended lives. In fact, if we loosely define the term blended to mean "partially virtual, partially tangible," then we can safely say all our lives have steadily become more and more blended. We access our news online, we pay bills online, we communicate through e-mail and social networks. People with Internet access go first to the web for information. We access the world via smartphones; why not access education that way too?

At its simplest, blended learning courses are those in which a significant amount of seat time, that is, time spent in the classroom, is replaced with online activities that involve students in meeting course objectives. Educause, a nonprofit organization whose mission is to promote the intelligent use of information technology in higher education, classifies courses based on the amount of time spent in each modality (Allen, Seaman, & Garrett, 2007). According to its classification scheme, blended courses have between 30% and 79% of activities online, face-to-face courses can include up to 29% of online activities, and fully online courses can include up to 20% of face-to-face activities.

Garrison and Vaughan (2008) define blended learning as "the thoughtful fusion of face- to-face and online learning experiences . . . such that the strengths of each are blended into a unique learning experience . . . Blended learning is a fundamental redesign that transforms the structure of, and approach to, teaching and learning" (p. 5).

The unique characteristic of blended learning is that a significant portion of the activities occur in two areas: in person and online. Various other pedagogies - lecture, problem- based learning,

Just-in-Time Teaching, cooperative learning, and others - can then be superimposed on the blended framework. The challenge of blended learning is to link, or blend, what happens in each medium so that face-to-face and online activities reinforce each other to create a single, unified, course.

A large body of literature, often categorized as the no significant difference literature, is often cited in support of the contention that there is no discernible benefit in the learning outcomes of students taught online compared to students taught in a face-to-face environment. In fact, careful meta-analyses of this literature reveal an important difference: Online learning, and in particular blended learning, can result in significantly better student learning compared to learning in the conventional classroom.

A meta-analysis conducted by the U.S. Department of Education (2009) winnowed down over 1,000 empirical studies to 51 that used a rigorous research design to measure student learning outcomes in both environments and provided sufficient information to allow calculation of an effect size. The finding was that students in fully online and blended courses tend to perform better than students in face-to-face courses, with students in blended courses performing significantly better. Another finding of the study was that the more time students spent on task, the greater the differential in student performance. These findings are attributable in part to active learning strategies, which include opportunities for reflection and interaction with peers, and in part to the enriched content that characterizes well-designed online and blended courses.

However, a significant caveat is in order: The studies in this meta-analysis do not demonstrate that online learning is superior regardless of how it is implemented. The combination of elements in the treatment conditions produced the observed benefits. In many of the studies showing an advantage for online learning, the online and classroom conditions differed in terms of time spent, curriculum, and pedagogy. The successful courses included additional learning time. Online and blended learning, lacking the time

constraints imposed by face-to-face courses, are much more conducive to the expansion of learning time (U.S. Department of Education [2009] p. xvii). The successful courses also included more interactive materials (learning objects) and additional opportunities for collaboration.

In another meta-analysis of the literature, Zhao, Lei, Yan, Lai, and Tan (2005) identified three types of interactions-instructor and students, students and their peers, and students and content-as essential elements in determining the efficacy of a course's design. They further stated that courses with synchronous and asynchronous components-for example, blended courses-report more positive outcomes than courses that are entirely synchronous or entirely asynchronous. When the design of the various studies is teased apart, it's possible to group subsets that identify specific variables. Three components of online learning stand out as contributing to more effective learning: discourse, via discussion boards, blogs, or other media; reflection, either public or private; and writing to learn strategies.

To summarize, blended learning courses employ active learning strategies through the use of a variety of pedagogical approaches. The asynchronous nature of the blended component of the

courses has the salutary effect of expanding the time students spend on course material. Discussions conducted online encourage reflection and usually reach 100% participation. As a result, the face-to-face time can be used more effectively, with students extending the material beyond what might be achieved in a conventional face-to- face course. The students in a blended course make more and richer connections between what they are learning and what they already know, creating a robust scaffold to organize the information. The following sections contain a more detailed look at some of the characteristics of successful blended learning courses.

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#2. Keep the Lecture, Lose the Lectern

The posting below gives many interesting examples of how the "flipped classroom" is playing out at several institutions. It is by Margaret Loftus and is from the September 2013 issue of Prism, the magazine of the American Society for Engineering Education. [www.asee.org] 1818 N Street, N.W., Suite 600, Washington, DC 20036-2479. R. Reis.

Doug Fisher came to online teaching by happenstance: A temporary leave from Vanderbilt in 2008 had him scrambling to make arrangements for his popular computer science and engineering database class. MOOCs - massive open online courses - were still in their infancy, so Fisher found no help on the Internet; instead, he taught the course via video-conferencing. Yet the notion of incorporating digital content of his own or of others' struck a chord, says Fisher. "That's what planted the seed."

Fast-forward five years, and Web-based material has become an integral part of Fisher's courses, prompting his recent appointment as director of the new Institute for Digital Learning at Vanderbilt, charged with developing the university's digital learning strategy. He and other proponents say "blended learning" is a promising model, leveraging the flexibility of online learning and the social interaction of the classroom. Typically, lectures are filmed and posted online, assigned to students to view on their own. That frees up meeting times for greater interaction and hands-on work. "In a blended format, when you come to class you're engaged in active learning, as opposed to coming in and sitting down and just listening and trying to absorb," says Steve Cramer, a professor of civil and environmental engineering at the University of Wisconsin, Madison and associate dean for academic affairs in its engineering college.

What's more, he notes that the focus on in-class problem solving better prepares students for the realities of industry.

Classroom hybridization - also called flipping the lecture - is cropping up in engineering curricula throughout the country, from lone instructors experimenting with the approach to department- wide efforts. Says Fisher: "Our students have been exploiting online content for their education for a long, long time, [while] instructors are just beginning to." The competition from strictly online courses has also had an impact, observes Eric Holloway, managing director of Purdue's School of Engineering Education. "MOOCs put pressure on all universities to figure out their story on online education."

Changing the Dynamic

Last year, Purdue rolled out a series of online learning modules for its two-semester introductory course Transforming Ideas to Innovation. Developed by Holloway and his team, each module introduces a concept through a five- to 20-minute video lesson, which instructors can use in class or, more typically, assign as homework. "It's enough to change what happens in class, from a lecture to a discussion," he says. "We used to say 'Read Chapter 2 before class.' Now we're starting the class right off. It changes the dynamic."

The modules are also designed to allow flexibility in how instructors operate their classrooms. Purdue School of Engineering Education Associate Professor Alice Pawley was inspired to flip her entire lecture in the sections she teaches. In addition to using the modules, she records her own lectures for students to view before each meeting. A typical class begins with a quiz on the recorded material, and then she, her graduate teaching assistant, and four peer teachers help the

students with homework problems or group projects. "We're trying to spend time in ways that make use of the fact that we're in a room with lots of people," says Pawley. The approach also fosters teamwork skills, which is built into the course context - a boon for students whose schedules are so tight they have difficulty meeting with their peers.

At the University of California, Irvine, Mechanical Engineering Professor David Dimas is putting a modified blended approach to the test. Over a three-year period, Dimas and two colleagues gradually introduce digital elements into their dynamics, finite element analysis, and vibrations classes. By the third year, the team provides students with recorded lectures in addition to the in- class lectures, and institutes online homework submission and short online quizzes. Surprisingly, the majority of students report that the repetition of lectures doesn't diminish their attendance. "What we see is that students consume both," Dimas says. "They see it as another resource." Having access to a recorded lecture resonates with 18-year-olds, who can start and stop them at their leisure. "They are used to YouTube. They are used to these little short segments," he says. "It broadens out the times during the week that the student is engaged with the material."

After teaching control systems for more than 10 years, Greg Mason, a mechanical engineering associate professor at Seattle University, turned to YouTube to break down his course into 40 digestible segments. Like Pawley, he administers a quiz at the start of class, assigns a problem, and then roams the aisles, chiming in when summoned. His goal is to render the material less theoretical and to foster confidence in his seniors, who are taking their last required class. "Now is the time to practice being an independent thinker. When you go to work, they're not going to hand you a textbook," Mason says. As an instructor, he has found the move liberating: "You don't have to follow notes or stay on the syllabus, so if a student asks a question, and it takes you down a rabbit trail, that's OK."

The University of Wisconsin, Madison is taking a more institutionalized approach. Cramer estimates that 10 to 15 percent of undergraduate engineering classes, mostly entry-level courses such as dynamics and statics, are blended. The extent depends on the instructor. "There's no saying it has to be 100 percent one way or another." In his structural engineering course, for example, the class meets less frequently than a standard lecture-based course. When students do gather, most of the time is spent in active problem-solving, which Cramer says more accurately reflects engineering practice today. "Employers are hiring students for what they can do, not what they know. It's not so much facts and figures, but how they can take that and solve problems."

Nonetheless, flipping the lecture isn't universally embraced. "Some professors really like being the 'sage on stage and some students really like that," says Holloway, who admits to comments such as "I paid my tuition to have the professor teach me, and now I'm watching videos?"

Awake and Active

Overall, however, response has been positive. "Students who are traditionally really good students tend to be resistant. They have a system, so they don't want to rock the boat. But in a couple weeks they usually get on board," says Mason. Cramer reports that 70 percent of his students prefer the blended to the traditional approach. "An even higher percentage appreciates the in-class problem solving sessions that we do, but the only way you get those is to remove the lectures," he adds.

At UC Irvine, Dimas's research found a slight upward trend in grades: One blended dynamics class saw an average final exam score of 66 percent, up from 61 in the first year of the study. Some instructors report that the students who benefit most may be those who don't thrive in

traditional lecture classes. "The bottom end moves up," says Cramer.

Perhaps more important, say blended learning advocates, is the increase in student engagement. A UW, Madison study found that students in a flipped lecture class performed equally well as those in a traditional class, but they spent more time doing open-ended problems. "We didn't change the content," says Cramer. "They just had an opportunity to solve more problems and more complicated problems."

Classroom design is a crucial component, as stadium-style lecture halls with fixed seating simply are not conducive to collaboration. Cramer recalls his difficulty in a room with that traditional setup: "It had rows of tables that didn't allow me to circulate among the groups solving problems. I struggled because I couldn't physically get between chairs and tables. When we moved to a room with round tables, it made a huge difference." Several of the classrooms at Purdue were built for interaction, with furniture on wheels so teams can sit next to each other and shift when necessary.

To be sure, implementing blended learning commands a considerable chunk of time and energy. Pawley reports that "my workload isn't lower, but my stress is." On a larger scale, a willing faculty, a supportive administration, and ongoing pedagogical consultation are essential, says Cramer. "It often falls to a few willing faculty, but institutionally, you can't move a broad spectrum of classes if you don't have a system in place."

Ultimately, the approach shifts the role of the instructor from lecturer to coach. Fisher, for one, now finds the traditional format unsatisfying. "I'd much rather go into a classroom and hand out problems sets and [let] it be noisy," he says. "I'm much more excited walking into a classroom nowadays. The students seem much more excited. I don't worry about how to keep them awake; they're awake and active."

---------- Margaret Loftus is a freelance writer based in Charleston, S.C.

#3. Three things I learned through teaching a flipped class

Chronicle of Higher Education

December 4, 2012, 4:23 pm

http://chronicle.com/blognetwork/castingoutnines/2012/12/04/three-things-i- learned-through-teaching-a-flipped-class/

By Robert Talbert

Right after my last post — nearly a month ago — I began to ask myself, *Why is it taking so much effort to blog?* The answer was readily apparent by looking at my OmniFocus inbox, which was filled with orange-colored "Due Tomorrow" tasks having to do with making screencasts for the flipped transition-to-proofs course. I realized that I could have any two of my sanity, screencasts completed in time to deploy to the class, or regularly- appearing blog posts. I resigned myself to the fact that this semester I was screencasting *instead* of blogging. But now — it hardly seems possible — the screencasting is done and

we're moving toward exams next week. So it's time to release the pent-up blog posts.

I have a *lot* to say about my experience going full-on flipped classroom with the proofs course. I regret that I couldn't give more of a day-by-day accounting of how the class has gone, because I've been approached by a lot of people who are interested. For now, I just wanted to write about the three most significant lessons that I learned by doing the class flipped:

It's exhausting. I mean that in a good way. I taught both sections of my course back-to-back and every day after the second section was done, I returned to my office completely spent. That's because we took the lectures out of the class meeting and replaced them with problems, done by students in groups, and my job was to keep the plates spinning. I'd have one group that was struggling just to understand the terminology and use the notation of a problem correctly, while at the same time I'd have another group that would breeze through the problem in 10 minutes. The first group I have to give help that is precisely gauged so as to get them moving without giving away the key concept; the second group I have to invent problems on the fly to keep them occupied. And there were groups in between. For 50 minutes, twice a day three times a week, my job is to be something like an academic air traffic controller, keeping all these students engaged, moving forward, and learning what they needed to learn. Anybody who suggests this is less work than just lecturing for 50 minutes, or even 20 minutes followed by group work, is out to lunch. But this is what learning looks like when it's really working — you're using up resources and pushing yourself and those around to places you've not been. A good form of exhaustion.

It's also sort of magical. I never got tired of seeing students come in, having put together a personally optimal combination of viewing and reading, and work on problems together —

screwing up and getting confused at first, but then through a combination of a little help from me and a lot of help from each other, finally figuring out the right proof strategy or coming up with some clever trick in their arguments. *Students were learning and it was not because they were listening to me*. The flipped class has left me with a profound appreciation of how mysterious human learning is. Our reduction of learning to lectures, note-taking, and homework seems almost offensively simplistic in light of that mystery. I think our students need more of the mystery.

Students are ready to be taught this way. Maybe I just have unusually industrious and adventurous students, but I never had one remotely negative comment from students about how we were doing the class — and they had plenty of opportunities. In fact one student told me that he couldn't see how this class could be taught in any way *other* than flipped. I think the flipped structure benefitted students in every conceivable way. It gave them more structured tasks to do outside of class, which helped their time management and cognitive load (especially the few students in my classes who had kids). It gave them time, space,

and a social network in class to encounter difficult tasks and complete them. It freed up huge amounts of time outside of class to work on the Proof Portfolio. And I think students *get* that it benefits them in these ways.

I never told the proofs students this, but when I designed the course over the summer, I actually had two complete courses mapped out — one flipped, the other traditional that paralleled the flipped course. And this was done in such a way that if student complaints about the flipped version ever rose to the level of mutiny, I could activate the "kill switch" and revert the whole course back to an un-flipped form. I remember well the last time I taught a fully-flipped class and ended up getting wave upon wave of complaints from students, some of whom marched straight to the Dean's office after the second week demanding that I "teach the class". But it seems like, either because I'm in a different institution now or because undergraduates have passed some sort of tipping point, student tolerance for lecturing seems to be dropping in favor of teaching methods that actually treat them like adults.

I've always felt that, within 5–10 years, we won't be talking about the "flipped classroom" — we'll just be talking about the "classroom". This way of teaching, in other words, will be normative and it will be straight lecturing that will seem odd, out of place, and ineffective. Maybe we're closer to that point than I first thought.

Like I said, it's been quite an experience and I hope to be filling in the details here very soon. What do you want to know about what went on?

This entry was posted in Education, Flipped classroom, Inverted classroom, Math, Teaching, Transition to proof and tagged #flipclass, Flipped classroom, Transition-to- proof. Bookmark the permalink.

Comments

Robert Talbert 2 weeks ago in reply to plughu. I had two sections that started with 20 each. By the end of the term, both sections were down to around 15.

It will definitely be less work next time (= Summer 2013) --- all I'll need to do is create the class activities and the guided practice assignments. And I'll only have one section. But there will still be the element of plate-spinning that I mentioned in the article that will keep me busy.

johnbarnes 1 week ago.
Is it possible the students just sensed, somehow, how prepared you were and how enthusiastic? Many educational experiments succeed because the students pick up a signal that the professor is deeply involved, really wants it to work, etc. and they enlist in the professor's project. They don't have to know what your clear vision is on the first day, or even consciously at all, but if they can feel that this is supposed to be great for them, and that you've put your heart into making it great, they'll often put out a very large effort themselves to make it work.

Robert Talbert 3 days ago in reply to johnbarnes.

I should hope so, because in the first week it was a full-court press to "sell" the students on the value of the way we were doing the class. There was no way I was just going to keep a low profile and hope students "sensed" something. I took the battle to them.

On the other hand, I was prepared to do a 24/7, 14-week long sales pitch for the flipped structure if needed, but by week 2 students were very comfortable with it, so I didn't have to be a quasi-motivational speaker the whole semester, for which we're all very grateful.

aldrushler 1 day ago.
I will be attempting the flipped classroom approach for three of my courses, Precalculus, Elementary Algebra, and Math for Teachers. Did you have students do any practice sets for homework outside of class or was all practice done in class with their groups? I am currently planning that students do some practice outside of class. I also want them to complete a quiz at the end of each unit before taking the exam on class for that unit. I'm worried that asking them to watch the video lectures (completely and take notes on them) and do homework and complete a quiz may put them off and then I might get the complaints. Any thoughts would be helpful.