

In an effort to clarify the content of my course, I substituted the statistics textbook I had been using with a custom text the students produced using wiki technology. My students wrote their own textbook using class notes, supplemental handouts, and their own research. The wiki format encouraged collaboration in an uncontrolled and unstructured environment and forced students to teach themselves to use a new and powerful technology. Students took more responsibility for their learning and learned by “teaching” others. For most of the students, the experience was enjoyable and helped to improve their understanding of statistics. For me, the experience was a surprisingly rewarding challenge.

Statistics Students Create Their Own Textbook Using Wiki Technology

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This innovation is in response to several problems I was having with an MBA statistics course. The textbook I selected (Aczel and Sounderpandian), while excellent for a full semester course, was too complex for a two-credit, seven-week course. I wanted an applications course that was predominantly computer driven with very few formulas or theory. My goal was for students to be able to run simple regressions or control charts after having taken the course and I was missing the mark with my current textbook. The students became confused with too much theory in the text and concentrated on the formulas as opposed to understanding the tools. I tried to eliminate the sections that were not critical but found they were too deeply imbedded within other parts of the text that I thought were necessary and I wanted to retain. I could not easily separate the “vital few” from the “trivial many.”

After much soul searching, I decided to teach without a text. I would supplement discussions with annotated examples and encourage my students to use their statistics books from other classes or from the library as reference. I would make full use of Excel and Minitab by teaching the course in the computer lab. A few days before the class was to begin I read an article in *BizEd* (Philip Evans, January/February

2006) called “The Wiki Factor.” The author mentions Richard Watson of the University of Georgia, who teaches XML by having his students write their own text using a wiki. Watson states that, “By creating their own textbook, my students produced something they could feel proud of and leave behind as a resource for the next group of students.”

The idea of students writing their own text suddenly became the solution to fill the textbook void in my class. As I thought about the concept, I realized that this innovation could solve several other problems that I was having in my classes. For example, I often have difficulty encouraging ownership of the learning process and making students responsible for their own learning. By giving them the role of “authority” they ultimately have the responsibility for learning and teaching the material.

As I read more about wikis I realized that this technology really is the next step in the knowledge frontier. Wikis draw on open sourcing (Linux), noncompetitive collaboration, and voluntary self-organizing communities: all relatively new ideas that have produced phenomenal results (Evans and Wolf, 2005). If we can offer students the opportunity to use tomorrow’s tools today, we are really giving them an advantage. And finally, I thought this might be fun for them (. . . and me).



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Objectives

Of course my primary educational objectives are for the students to understand and be able to use statistics, even minimally, and to improve their skills in quantitative analysis. I would like them to feel comfortable with numbers, but in only a seven week semester, I at least want to minimize their anxiety. Secondly, my objectives include improving their ability to collaborate in an unstructured and uncontrolled environment. I would like them to feel more comfortable with not only the new wiki technology, but with the lack of rules that come with it. Finally, I would hope that creativity comes into play. These students must learn and understand the material well enough to be able to write and/or edit a chapter that will be read by at least everyone in the class and potentially anyone who logs onto the site. The creativity they use in learning and writing the material will be important.

The Wiki Technology

A Wiki (meaning quick) is a Website that allows anyone to add or delete content. As no authorization or credentials are required for participation, the source of the information is not monitored for accuracy. However, wikis are public documents that are dynamic in that changes are made constantly. It is hoped that if erroneous information is posted, it will quickly be corrected. The tradeoff is between the validity of the information and the speed and flexibility of information updates. Wikipedia is an excellent example. Anyone can access the site and add or make changes to this popular Internet dictionary. Some suggest that the site is error prone due to a lack of qualified supervision while others counter that the extreme timeliness of the information and collaborative nature is worth the price of questionable validity. An interesting comparison of Wikipedia and the Encyclopedia Britannica actually showed very little difference in accuracy (Giles 2005).

Whichever side of the debate you choose, wikis are here to stay and stu-

dents will have to learn how to use and, most importantly, evaluate Internet information. This textbook writing experience helped address the need to question accuracy, regardless of the source, and to work within a new knowledge framework.

I selected Wikispaces as the site that was the most user-friendly and, most importantly, free. Data entry did not require a special language, although Greek letters and equations were difficult to work with.

Organization

The class met seven times during the semester. The 30 students divided themselves among the class sessions and were responsible for writing the material for their class. The first draft from each group was due the week after it was covered in class. This allowed ample time for the rest of the students to make changes in form or content to the drafts. Everyone in the class was ultimately responsible for the finished product. I graded the final version and gave the same grade to everyone.

Whenever a student made a contribution to the wiki, their name and date was recorded. I had access to that record and could monitor participation; however, I could not monitor the quality or quantity of the contribution. This potential problem actually forced me to treat this more as voluntary participation which is more in line with open source thinking. Whenever I have a grade versus learning tradeoff, I always come down on the side of learning. Grades are artificial and learning is real. By not being able to track contributions, learning may have improved but ease in grading did not.

Presentation

My strategy was to require students to work in a foreign medium with little guidance. They would then be forced to rely on each other, building on trust, cooperation, etc. I also wanted this to be their textbook based on their creativity and not mine. Therefore, I presented only minimal structure and details.

When asked a specific question, I usually turned it back on them. This was their textbook and it was up to them to learn how to use the technology, design the book, and create the final product. While several students were initially frustrated by the lack of direction, it didn't take long for them to seize the opportunity. In retrospect, this was probably one of the best ways that I could have approached this assignment. On the negative side, I wished that I had built in a discussion of each chapter as it became available. This would have given them confidence in the accuracy of their work and a wonderful way to summarize and review the main points of the previous class session. Next semester I will definitely add this to my class discussions.

Effectiveness

I surveyed the students at the end of the semester and from their open-ended responses I discovered many benefits from the students' perspective. Students learned from having to put concepts into their own words and explanations. They said they learned from their classmates and appreciated the extra examples that their classmates provided. One student wrote that reading the wiki was much better than something "written by a professor." They also learned from collaborating (arguing?) with others in the class and building on others' material. Everyone was able to add something to the text and felt ownership of the finished product. The wiki text was more relevant to the class than a textbook might have been. Students liked having the textbook for a quick reference and also as a backup for a missed class. The wiki text was helpful during the final exam (open book and take home format). Many students said that the experience of working with a wiki was exciting and fun. This also provided them with an opportunity to work as a team without the hassle of finding a common meeting time. Working students always have difficulty scheduling team meetings. And, of course, the more practical students preferred the no-cost wiki over the textbook.

I also asked students on a five-point scale the following questions:

I would have preferred having an assigned textbook in this class.

The students were neutral on this question. The class was split.

I enjoyed using Wikispaces.

The majority of students agreed with this statement.

I thought using Wikispaces was stressful.

The majority of students did not think the experience was stressful.

Wikispaces will provide a good textbook substitute for the final.

The majority of students agreed with this statement and several mentioned it to me in class.

I cannot imagine ever using Wikispaces or a similar concept in my future.

I was pleased that a majority of students disagreed with this statement.

From my perspective, the benefits to students included learning to collaborate in an uncontrolled and unstructured environment, using and teaching yourself to use a new technology, and learning by explaining concepts to others—basically, teaching. I strongly believe that the best way to learn is to teach. Unfortunately, I cannot say whether increased knowledge of the subject matter was a benefit of this innovation. The class demographics were very different from previous classes and comparisons cannot be made. However, in theory, they should have learned the material at least as well as they would have using an assigned textbook. Anecdotally, many students evaluated the development of the wiki textbook as a positive learning experience.

As with all innovations I have tried, there are several problems that should be addressed. How should accuracy be controlled; by me or by the students? When I discover errors in the wiki should I: a) fix them, b) mention it to the students or c) wait to see if the students catch them on their own? Students were

frustrated by their lack of trust in the accuracy of their work and I don't yet know how to deal with that. Certainly that lack of trust is prudent when using any Internet source and that may well be what is learned. In comparing the wiki developed text and open source software a big difference occurs. In open sourcing, editorial changes are not anonymous and trust comes from reputation (similar to the underlying theory of EBay). In this classroom wiki, changes are anonymous and no one knows who said what. Trust cannot be built on reputation and lack of trust becomes an issue. I think the solution is more input from me to ensure that the students trust what is written, at least in the final version.

My plan is to use this class wiki textbook with my class next semester. Their responsibility will be to improve upon it by editing errors and adding clarification and examples. To view the entire wiki, the Internet version is available on the Internet at <http://mba640.wikispaces.com/>. As any textbook author knows, errors are hard to eliminate and multiple edits are required. Next semester we will produce Edition Two.

Transferability

I believe that wikis could be used in almost any class, though perhaps not in lieu of a textbook or to the extent that I have used it in my MBA class. Any self-motivating group working on a project could use a wiki.

I also believe that the only downside to transferability lies in the mind of the professor. Almost by definition, professors have the power and control in the classroom - the knowledge base from which everything flows. We operate in a planned command and control structure which would not allow for a volunteer, unstructured wiki. It is very difficult for me to hear students arguing over the interpretation of a statistical tool and not want to immediately jump into the discussion with a "conversation-ending" explanation. It is often the discussion that is the learning tool—not the professor's explanation. I

think that it is through the wiki collaboration that students really learn the material, not through reading a text and listening to lectures. However, I do know that many professors have a difficult time letting go of the control and structure of the classroom and I think this is the most critical barrier to implementation of wikis.

Online Resources

Class wiki textbook: <http://mba640.wikispaces.com/>

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