

**TEACHING BUSINESS AS DESIGN:
BUILDING A "BUSINESS MODEL DESIGN" COURSE**

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This paper reviews experiences, perspectives gained and lessons learned in developing and teaching a "Business Model Design" course as part of an interdisciplinary university curriculum over a period of 2 years. This new course treats businesses as designed systems, subject to standard user-centered and iterative design methodologies, and it's part of a five-course sequential core curriculum for business, design and engineering students which won the Core77 award for educational initiatives in 2012.

The development and teaching team, as well as the students, are interdisciplinary, so differing perspectives of faculty and discipline-specific pedagogical traditions in developing the course had to be integrated. Business faculty, for instance, were used to offering non-sequential courses, so the idea and advantages of a sequential core curriculum had to be explained and demonstrated. Business and engineering teaching also tends to focus on "content" rather than process, and the ideas that the Business Models course might focus on a semester-long project, or use class time for team meetings while assigning lectures as homework, were surprisingly controversial.

Having taught the course twice so far, important lessons were learned and major adjustments made by faculty teaching the course. For instance, the course began as a "lecture course with a project". However, this traditional structure was optimized for delivering "content" rather than teaching process skills, and it generated a huge offline grading burden for faculty, while failing at the stated purpose of teaching innovative design of businesses. Introducing effective design- and business-based strategies such as benchmarking, reporting by exception, and in-class review of deliverables in process has transformed the course into a much more effective and efficient vehicle for teaching innovation.

NEED FOR AN INTEGRATED INNOVATION CURRICULUM

University faculty teaching design, business and engineering generally acknowledge that development of products and systems in the real world is accomplished by interdisciplinary teams of engineers, designers and businesspeople, working together. Priorities and schedules are set and revised, opportunities are found and framed, and new products are prototyped and evaluated concurrently in a robustly interdisciplinary context. This is the way things have worked for decades, and, given acceleration of the product development cycle, it's now hard to imagine any other way it could happen.

This being the case, it's also generally acknowledged that it would be a good thing if students had some experience working this way while in school, and some education in best practices for doing

interdisciplinary innovation. This is not an easy thing to do, however, as it requires faculty to collaborate themselves, working across traditional academic disciplinary boundaries. In the interest of giving students a better sense of the give-and-take way real projects work, faculty at Philadelphia University started to reach across these boundaries about ten years ago, putting together a series of interdisciplinary student projects, some with outside sponsors.

As many design educators know, it's quite difficult to get projects like these to deliver on their promise, primarily because of the structural impediments presented by the structure of higher education, and because the projects tend to concentrate on the design brief for the project itself, and assume too much about how much students know about the processes involved in working on such projects.

Specifically, in the experience of the faculty involved, projects tended to fail or underperform educationally in the following ways:

- Because students were involved in a common project but enrolled in different classes, there was little or no common work time or space for project work. This led to students working in isolation on shards of the project, without the benefit of interdisciplinary expertise that collaboration was supposed to bring.
- Engineers and business students couldn't immediately work on a project on the first day of class- because they'd never worked on a project before, and didn't know what to do.
- Students had little sense of business and engineering as creative disciplines, and no training in team-based iterative concept development. Teams tended to wait for ideas from the "creative" designers. With the creative role taken, business and engineering students saw their role as evaluating the ideas for financial and scientific viability. Having not been involved in generating the ideas, generally this meant rejecting one round of concepts after another. This concept-vetting process would then go on long enough that it expended all project time intended for development and iteration.

Because these issues couldn't be resolved in the context of ad-hoc projects, and because they thought these skills were important enough to be a formal part of the curriculum, a group of design, engineering and business faculty began discussions with the university president and provost in 2005; these turned into an organized effort by several committees and task forces to develop a sequential, five-course core curriculum in innovation which is shared by all undergraduate students in business, engineering and design disciplines. This curriculum runs sequentially for all four undergraduate years, alongside the general-education core and the majors, and includes the following courses, in order:

Integrative Design Processes: Function and makeup of teams, basic user-centered observational research, brainstorming, iteration, basic prototyping, effective project management and presentation.

Business Model Design: Businesses as designed systems, elements and functional parts of successful businesses, markets and marketing, basic financial and growth strategies, reverse-engineering and researching existing businesses, adapting to change, principles of disruptive innovation.

Systems Thinking: A group of classes (students choose one) offering in-depth experience working with complex systems. These include options like Biomimicry, or Materials Selection and Analysis.

Ethnographic Research Methods: An in-depth introduction to the processes, challenges and ethical issues involved in pursuing user-centered research for product development using techniques derived from anthropology and social science.

DEVELOPING BUSINESS MODELS DESIGN

The Business Model Design course, second in this sequence, was arguably the most difficult to develop, due largely to the fact that it required the most input from multiple disciplines to be credible and effective.

In contrast, the first draft of the Design Process course was written by a single professor. Although this first innovation course later involved a larger group of faculty who contributed vital resources, projects and perspectives, it was crucial to the success of this first class that the course structure represented a single coherent point of view, and the single-author structure ensured that this happened. The course was based on a long design project, starting with team formation and moving through research and problem framing to prototyping, iteration and final documentation. Side exercises were added only as necessary to create teachable moments or add useful concepts or vocabulary to the ongoing projects.

When it came time to develop the Business Model Design course, in contrast, there was no single course author; it was developed by a leaderless interdisciplinary committee from the start, chosen for breadth and relevance of experience by the Provost's office. None of the team had ever taught, worked, or attempted to write a class together before; nor had they taught a class of the sort they were tasked with creating. The course creation process was characterized by openness, enthusiasm, a sense of adventure, and hard work. This is not, however, to say that it was completely effective. Because the group was inexperienced and diverse, they were also very polite and tended to defer to each other- and this would prove to be the process's downfall. The group found an innovative textbook, Business Model Generation, by Alexander Osterwalder and Yves Pigneur. It was accessible, well-organized, recent and visual. It provided a new business design tool, dividing business functions into nine categories, arranged in a diagram called the "business model canvas" so innovations could be quickly compared, assessed and contrasted. Instructors planned to use the sections of the book as the structure of the course, and add exciting, relevant cases and readings, as well as a team project. The course was duly rolled out for the first time in Fall 2012, with a full complement of Powerpoint presentations explaining key concepts, readings from the Harvard Business Review, Youtube videos about innovative companies, and group exercises.

THE FIRST TIME

The first semester was not by any means a disaster- many students gained an excellent understanding of business innovation principles. This was something many of them- especially the design and engineering students- would never otherwise have been exposed to. Unfortunately, the course designers had over-

courteously allowed each other to stuff it with more content than the two-and-a-half hours a week class format could stand, and nobody had had the courage, or the time, to call the others out and demand edits. Because the course was being taught in five sections and all were expected to cover the same content, the teaching faculty found themselves locked in, unable to adjust course content in progress. The tension between the business professors, who wanted plenty of informational content in the course, and the design teachers, who wanted a major, problem-based course project, resulted in a course with time for neither.

Powerpoint lectures took up all the class time, relegating team meetings to outside time. The visual, diagrammatic style of the book turned out to be a false promise- it was written to be accessible for experienced businesspeople, not college sophomores, and the sequence of the information in the book didn't match up with what students working on a project needed. The business model canvas, while a wonderful tool for analyzing business model innovations, was overly complex and detailed for presenting them in a timely and organized way.

Videos and readings of questionable relevance proliferated; each of these needed an in-class discussion, reflective essay or pop quiz to make sure the students had "covered the material;" in turn, all this assessment activity distanced students from engaging productively with the subject matter, made the course seem punitive, and forced faculty to spend hours grading assignments, rather than talking to students about concepts or projects. Students also rebelled at being assigned arbitrarily to teams, industries and topics, which they felt devalued their personal relationships and professional interests. As students became alienated from what they felt was an unpleasant class, their teammates complained about their lack of engagement in team work, but faculty had few tools for understanding what each team member was actually contributing, as most team work was done outside of class.

CHANGES TO THE COURSE

In response to these major course issues, faculty instituted major changes for the second semester of teaching. Factual content is still presented, but it was deemphasized and put in service to the major in-class projects. The use of class time was reassessed; the class is now taught more like a design studio- although a short one- than like a conventional lecture class. Meaningful changes fell into five general categories. Based on these changes, student satisfaction and engagement with the course has improved dramatically, as shown both by student reports and by faculty assessments of their team project work. The changes made are described below.

Flipped classroom and reference model:

The well-designed Powerpoint decks and online videos are assigned as homework instead of being presented in class. This allows class time to be used for team meetings with the instructor and discussion, direction and assessment of the project. Readings are assigned as necessary; rather than

being read and discussed section-by-section, the textbook is read in its entirety in the first two weeks of the term, and is thereafter used as a reference for completing the class project.

Work in progress:

The current team project in progress is reviewed and critiqued each class by the instructor in a "desk crit" or formal presentation. This gives team members formal, timely feedback without creating additional grading burdens.

Student-driven teaming:

4/5 person teams are formed by students, following "speed dating" events.

Each team completes a team charter, which defines member performance standards, team goals, and- perhaps most importantly- what can get a member fired from the team.

Teams are allowed to select project topics based on mutual interests and goals, in consultation with the professor.

Reporting on exception:

- Rather than presenting the entire project at each drop date, teams are instructed to present only meaningful changes since the last presentation.
- Whenever possible, teams are advised to compare and contrast their business model designs with actual in-market competitive models, rather than explaining them in isolation.
- Rather than present and explain entire business model canvases, teams are advised to select and present a prioritized slate of 3-4 "best ideas" or "most important innovations."

360° feedback:

- In a version of a standard corporate practice, team members have the responsibility, twice a semester, to evaluate the performance of each of their teammates and themselves in detail. They are evaluated on ten-point scales for effort, organization and creativity, and can also write in comments. At the beginning of the semester, it's made clear (and written into the course syllabus) that these evaluations will form a major component of the final grade.