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Designing the Introductory IS Course Using Student Personas: Lessons Learned from Product Design

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ABSTRACT

The introductory information systems course has been a challenge to deliver for business school faculty members. One part of the challenge is to clearly understand the students who will take the class. An extension of user-centered design (UCD) called a persona has been used to gain understanding and develop empathy for target users/consumers of product design efforts. Extending the use beyond product design, personas were used to revise and design the introductory operations and information management class at a major western university. The use of personas led to a number of class innovations including the use of a blog, the selection of practitioner oriented book, and the use of recent students who had completed the class as recitation leaders. Preliminary results have included increased enrollments in advanced elective classes in operations and information management.

Keywords

Personas, user centered design, course design, empathy

INTRODUCTION

The challenge

Teaching the introductory information systems (IS) course has been problematic at many universities (George, Valacich, and Valor, 2004). The course has even been referred to by some as a "widow maker" (Kroenke 1988) due to the challenges faced by faculty charged with teaching the class.

This situation has appeared in the redesign of the Introduction to Operations and Information Management (OPIM) class at a major western university. At this university, the structure for each section of the class was two large mega section lectures every week with around 250-275 students, and multiple once-a-week recitation sections with ideally 35-40 students in each recitation. In the past, student reaction to the class has been negative with many students asking why they needed to take such a class when they will be managers and will hire someone to handle "technical" problems. The class has been a challenge to teach, and interest in the information systems advanced classes has been waning, especially since the tech bubble collapse in the early part of the decade.

Since the introductory class often serves as a "feeder class" for more advanced classes (George et al., 2004), students who are required to take an introductory class and are not inspired by the subject matter and the career potential often will not take advanced classes. Thus, enrollments in electives and student majoring in the subject area have suffered. There even were threats within the business school to discontinue the information systems major and eliminate elective classes. The problems with the introductory course were having a direct impact on the viability of the entire department.

The opportunity

During the summer of 2008, the authors were presented with an opportunity to completely redesign the introductory class in Operations and Information Management. The class attempts to integrate topics in operations and information management and often is referred to as the "systems" class. The authors were allowed to start with a blank slate, and were encouraged to be innovative with the course design.

In taking on the redesign, the authors believed that many course redesign efforts (including past efforts to redesign this specific course) were unsuccessful because many instructors/faculty did not sufficiently understand and consider the needs, goals, and frustrations of the students prior to designing a course. The failures of course design efforts were mirroring the issues that have been prevalent during product design. Many product design efforts have had trouble centering the design process on the actual needs, goals, and frustrations of the target users/customers (Pruitt and Adlin, 2006; Schaffer, 2004), while meeting the users' needs is fundamental to designing a usable and useful product (Fucella, 1997; McLeod,1992; Roberts, 1998).

Without understanding the target consumers of the course (i.e., the students), the authors believed that their chances to deliver a product (i.e., the course) that satisfied the students were remote. With reduced enrollment in the information systems field (Granger, Dick, Van Slyke and Watson, 2007), most students in a business school typically are not information systems majors. Therefore, the introductory course must appeal to the interests and needs of a wide variety of students that are not

only uncommitted or information systems majors, but also marketing, finance, management, and accounting majors. Understanding the perceptions of this broad student audience was imperative to succeeding with the course redesign effort.

Due to the importance of a student focus in teaching (Holmes, 2003), in this paper we propose that an approach to course design much like product design should be undertaken. Specifically, the incorporation of the core principles of user-centered design (UCD) and the use of personas are advocated. In the following section, we first introduce UCD and personas, and then present how UCD principles and personas were used to design the introductory course.

APPROACH

UCD and personas

At the core of the course design approach that we undertook is UCD. In broad terms, user-centered design (also known as human-centered design) is a design approach, which focuses design activities on user needs rather than aesthetics (Norman, 1988). By focusing on users throughout the design process, UCD tries to facilitate a user focus where the goals, tasks, and needs of users drive design activities (Gould, Boies and Ukelson, 1997). UCD has received widespread adoption among practitioners and is believed to have led to the design of more usable systems (Vredenburg, Mao, Smith and Carey, 2002).

However, in many circumstances, UCD has had trouble achieving the desired user centeredness. Users often are not the focal point of UCD processes (Gulliksen, Göransson, Boivie, Blomkvist, Persson, Cajander, 2003), and consequently, a disconnect often exists between designers and users (Grudin and Pruitt, 2002). To enhance the user focus throughout the design process, the use of personas has been advocated (Cooper, 1999; Pruitt and Adlin, 2006). Personas are "fictitious, specific, concrete representations of target users" (Pruitt and Adlin, 2006, pg. 11). A persona represents an aggregate of target users who share common behavioral characteristics (i.e., is a hypothetical archetype of real users) (Cooper, 1999)). Even though a persona represents the similarities of a group of individuals about whom information is collected (usually through interviews and observations), the persona describes a specific and fictitious individual who is given a name and a face. A lengthy narrative is written about this fictitious person, the persona. The narrative contains specific information about the persona's occupation, family, friends, possessions, likes, and so forth (Grudin and Pruitt, 2002). These details make the persona seem like a real person in the minds of designers (Cooper, 1999). The narrative also summarizes the information about the goals, needs, and frustrations of the persona when using the proposed system or product.

By creating a vivid and lifelike representation of the target users, personas cause the designers to create an empathetic connection with the designated users (Norman, 2004). In effect, the needs of the users represented by the personas are more likely to be incorporated into the resulting design decisions. The student personas presented in the following section facilitated the creation of an empathetic connection with the students in the introductory course.

The student personas

Prior to making any decisions concerning the design of the course, attempts were made to center our decisions on the student needs. One of the authors participated in a student focus group to understand the frustrations with the current version of the course and the student needs relevant to the introductory systems course. Based on the focus group discoveries, a student persona was developed that the authors felt identified their future students. This resulted in the persona for Molly as shown in Figure 1.

Note that there is an attempt to "personalize" Molly including her interests, goals, and background information. To test the authors' assumptions about Molly, two advanced undergraduate students and another instructor all slated to teach recitation sections reviewed and scrutinized the early versions of the persona. Several rounds of reviews were done resulting in the persona shown in Figure 1.

MOLLY GORDON

AGE: 20

MAJOR: Marketing

YEAR: Junior

PRIMARY GOALS

- To be challenged to think!

- To see the value of putting forth extra effort

- To learn why systems are important in the marketing field

- To not be burdened with definitions and "techy talk"

- To be engaged with and involved in the class

Molly Gordon is about to start her 3rd year at the the business school. From the day she first entered the halls of the business school, she knew that she wanted to be a Marketing major. Since high school, she has envisioned herself working at an advertising agency, and she has already successfully completed an internship at an ad firm in New York.

She is a driven student who has excelled in all of her classes at the business school thus far. She does not mind putting in the extra effort to get an A in a class as long as she sees the value of doing so.

However, she is not looking forward to attending the Introduction to Operations and Information Management class. Her friends that have taken the class warned Molly about the class. They told her that the class has nothing to do with marketing, is filled with "techy" talk that most students do not understand, and to do well you just have to memorize definitions. Molly's friends thought the class was a waste of time and money.

Molly recently heard from her undergraduate advisor that the class is going to be completely changed this upcoming semester. First of all, she despises classes that simply ask the students to memorize facts, definitions, and slides. She feels that her intellect, knowledge, and effort is underutilized in such classes. Molly wants to THINK in the class! She wants to analyze a particular situation or real-world case and apply her knowledge. She feels that it is particularly absurd to be asked to memorize definitions and features of specific technologies. She has grown up with the internet and technology. She does not need to know the definition or features of a certain technology because she already knows how to use it!

Also, Molly wants the new class to become more relevant to her own interests in marketing. She hopes to learn how systems interact with, help, and influence the work that marketers do in the real world. She hopes the skills and knowledge that she learns through the class will set her apart when she interviews for her first job after college.

Finally, Molly hopes that the professor of the class will engage the students and encourage them to be personally involved in the class. She does not want to come to class, sit in a large auditorium, and just take notes every day. Molly wants to share her knowledge, opinions, and perspectives with her fellow classmates. She wants to get deeper into the material, to discuss its real world impacts, and to learn from not only the professor but also from the perspectives of her classmates.

Figure 1: Molly Persona

The feedback received from the reviewers also stated that Molly was not representative of a large percentage of the student audience that would be encountered in the introductory class. The focus group was composed of a select group of students (many of which were top students at the business school), so the perspective of these students was not representative of the many of the other students in the target student audience. Based on past experiences with teaching and interacting with undergraduate students, the student recitation leaders suggested a second persona. This led to the development of the David persona, shown in Figure 2. Again, several iterations were needed to develop David's persona. The combination of the Molly and David personas provided a more representative view of the students that we would encounter in the class.

DAVID KING

AGE: 19

MAJOR: Undecided

YEAR: Sophomore

PRIMARY GOALS

- To see the real-world impacts of the class

- To not be burdened with learning complex technologies

- To understand how systems & technology affect managers and CEOs

- To see the value of putting forth an effort in the class

- To have fun!

David King is about to start his sophomore year at the business school. David's father is a partner at Accenture (a Fortune 500 consulting company), and he hopes to follow in his father's footsteps and one day become a manager in the business world. However, he currently is undecided about his major, and has found only a few classes that were even remotely interesting to him at the business school.

David is willing to work hard, but only when he enjoys the class and sees the value of him putting forth an effort. However, he is dreading attending the Introduction to Operations and Information Management (OPIM) class during the upcoming semester because he believes that the class will be teaching him only about complex technologies. He commonly thinks of systems majors as computer science majors without the quantitative skills for an engineering degree. He feels comfortable using his iPhone and other devices that are essential to communication and getting his school work done, but has had trouble even doing complex operations with numbers in Excel. In the systems class, David is afraid of being exposed as someone without technical savvy.

David also aspires to become a well-known CEO one day, and doesn't think that CEOs need systems knowledge and skills to do their jobs effectively. He thinks that systems are something that only techies work with. Personally, he only uses technologies when he has to, and has no interest in simply learning about new technologies or systems.

David has heard a rumor from his friends that the Introduction to OPIM will be going through a complete overhaul before the start of the upcoming semester. While he is very skeptical that the new version of the class will be of any interest to him, he hopes that the professor can make an effective case to him for how systems impact the work that businesspeople do every day.

Additionally, David hopes that the value of even offering this class at the business school becomes apparent. Currently, he has trouble understanding why the OPIM department is part of the business school -- marketing, finance, accounting, and management make sense to him, OPIM systems do not. So, he hopes that the professor can clearly illustrate how businesses depend on systems, and why business school students need a systems education.

Finally, David hopes that the class presents the material in a fun and interactive manner. Classes that simply feed students with Powerpoint slides tend to "lose" David. He stops paying attention and develops a very cynical view of the class.

Figure 2: David Persona

Using the student personas to drive innovation

The goals and frustration of the two personas (David and Molly) drove course design decisions and led to specific innovations in the class. One value of the personas was to keep the course designers from developing a class that they wanted to deliver to a class that the students wanted to take.

The first challenge was the choice of a book and readings. One issue mentioned in a recent ISWorld discussion is that the books for the class are expensive and quickly out of date. One person commented that there is no "Samuelson" for IS referring to Paul Samuelson's classic economic textbook. After thorough and agonizing review of many introductory textbooks in both operations and information systems and the suggestions of other faculty, the authors were not finding a match between what David and Molly desired and the textbooks they reviewed. The designers desired a book that addressed making better decisions through improved business intelligence in all the functional areas of business that the students in the class would chose as an area of concentration (accounting, finance, management, marketing, operations, etc.). Considering Molly's and David's lack of interest in technology with the desire to learn how systems apply to them led to the selection of a more practitioner-oriented book on Business Intelligence (BI) supplemented with cases and articles.

Molly's desire to be engaged in the class and share her thoughts led to the establishment of a course blog. One inspiration for the blog was a commonly encountered statement in the student focus group. Students stated that an earlier version of the class did "not make me think." Thus, online participation was part of the class grading where students had to comment on a post that posed a provocative and current question that stimulated discussion or required the student to share an experience from his/her life that applied to the class material.

Identifying with the personas also led to creation and use of several tangible models that were themes for the class. One model, represented on a single page, linked and aligned the information system tactics (the technology) with the information system objectives (IS results/presentation of information) to assist in performing business tactics (what functional areas needed to do) to achieve business objectives (avoided costs and increased revenues). The model focused on the "bottom line" and how each functional area could help improve profitability.

Another model, the "Information Cross" is a single page diagram/model presenting how both internal and external data can be an input to cross the analysis gap (Online Analytic Processing/OLAP) to produce information which combined with insights and imagination produces business intelligence/knowledge that leads to power in the marketplace. The "cross" is completed when the importance of communication based on trust in both technology and people in organizations is stressed as the foundation for the use of business intelligence.

To add working world reality to the class that was desired by both David and Molly, attempts were made to make all exercises and blogs meaningful and current. To stress the importance of business intelligence for all functional business areas, student teams in recitation were introduced to a diagram within the business intelligence vendor, Cognos, website where they were able to view short videos of using BI in different functional areas. The students then had to share their discoveries with other students in their recitation section about BI in the functional area they were assigned and how it related to concepts in the class. The final exercise for the class was done in conjunction with a concept restaurant with a large corporate sponsor. Student teams were challenged to apply class concepts to suggest improvements in decision making through the use business intelligence, supply chain, inventory management, and other concepts from the class. The Spud Brothers restaurant team, including a vice-president of marketing from corporate sponsor Simplot, visited and addressed the class and answered questions the students generated to complete their assignments. The student results were used and applied by the restaurant.

To add further relevance and a relationship with the real working world, guest speakers from industry were used that could relate the material to a student's future job and employment. One speaker came from a BI consulting company and related many working world examples. Another speaker came from a large beverage company that was a leader in supply chain management. Speakers from the state governor's CIO office and a former consultant project manager rounded out the speakers. The working world also was brought to the students through the use of case studies, both from the book and from other sources. Companies included Continental Airlines and their data warehouse efforts, Audi and their assembly line management, the Oakland Athletics baseball team and their use of baseball intelligence in personnel management, Disco SA and data mining efforts to manage customers, and several other cases that related the course material to the working world.

One of the final pieces of the puzzle for assisting Molly and David was the choice of recitation leaders. To assure open communication and a clear understanding of the students in the class, the decision was made to use "peer leaders" or undergraduate students who either had a background in the material or had just taken the class serve as recitation leaders. The top scorers on exams and exercises in the first delivery of the class (about 5% of the students) were given the opportunity of writing final exam questions instead of taking the final exam. This required them to continue to be active attendees, but also gave the instructors the opportunity to get to know them better and offer some of them positions as recitation leaders for the following semester. Four of the six current recitation instructors came from this group.

RESULTS

The persona driven course redesign led to some interesting preliminary results. The first anecdotal evidence for the course redesign's success is that enrollments in advanced classes increased. As shown in Table 1 comparing year-to-year enrollments, advanced classes filled to capacity in all but one class. Several of these enrollments are capped due to room size, so it is not known if enrollments might have grown even more.

Course	Spring 2008	Spring 2009
Visual Programing	*Not offered*	35 students
Systems Thinking	35 students	41 students
Business Intelligence	13 students	57 students
Supply Chain Management	*Cancelled*	30 students
Management of Service Operations	54 students	79 students
Managing Business Processes	34 students	45 students
Project Management	35 students	51 students

Table 1: Spring 2008 versus Spring 2009 enrollments

The most promising result is the increase in enrollment of more than 400% in the business intelligence course. Business intelligence was the content area that was the primary area of focus in the redesigned course, and the course matter that had the most direct relevance to marketing, finance, and other functional areas.

The authors are still gathering additional anecdotal evidence, and testing the success of the redesign effort. In UCD, testing a design with representative users and making changes in an iterative manner is fundamental to the success of design efforts. The course redesign is being approached in the same manner, where student feedback is driving additional changes. After teaching the class for one semester, the authors continue to make discoveries about the class and its students, resulting in small changes to tests, exercises, delivery, and our personas. It is a continuous design process enhanced by working with the recitation leaders who more closely identify with the personas used to design the class.

GENERAL DISCUSSION

The use of the Molly and David personas led to two insights that have implications for a broad range of educators. First, the importance of an empathetic connection between students and instructors/faculty became apparent. Also, the personas provide guidance on how educators should focus on technology in classroom instruction.

The importance of empathy

The use of personas in the course design could be applied to other courses in all disciplines. It is essential to know our students prior to writing the syllabus, selecting textbooks, setting class objectives, and creating means of assessment. A disconnect from the audience and a lack of empathy for the student's perspective could lead to a course designed based on the assumptions of the instructor.

The creation of the persona forces the instructor/designer to assume the role of the different categories of students in the class. Identifying with their needs and objectives allows closer alignment and inclusion of rigorous, yet meaningful, class components. More importantly, reviewing and testing the persona is revealing since assumptions made by the designer can be challenged by those more close to the situation.

The role of technology

The students coming into the introductory classes are much more technically sophisticated than students of the past. But this knowledge often is limited to specific technologies with a focus on entertainment and amusement. As portrayed by the David and Molly personas, many of today's students have no particular interest in technology for technology sake or how information systems could make them better business people. They want to apply the technology to something that will create

a more fulfilling life style. This could mean that they use technology to communicate with others or to keep a log of their social activities, and have not been informed how information systems could enhance their careers.

CONCLUSIONS

Some might believe that the information systems field is in a state of danger. Based on faculty job availability and student enrollments in information systems classes, evidence backs this belief. It may be time to rethink the role of IS in business school education or face the threat of extinction.

Redesign of the introductory class is a starting point for rejuvenation. Using a student-centered approach enhanced by personas could assist us in redesign efforts. The challenge is then to apply this approach to all of our course offerings. If students see the field as meaningful and career enhancing, chances for thriving in the future are brighter and will not lead us to an endangered species status.

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