

THE INNOVATION BOOT CAMP

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ABSTRACT

Faculty in the School of Technology at BYU believe that for students to excel in 21st century economies, cross-disciplinary interaction and innovation methods need to be experienced in each of the schools six disciplines: Industrial Design, Manufacturing Technology, Information Technology, Construction Management, Facility Management and Technology and Engineering Education.

This research paper demonstrates how this goal was accomplished through the development and implementation of a two day Innovation Boot Camp. Each student in the School of Technology is requested to attend this Boot Camp which:

- introduces and practices principles of Design Thinking
- practices problem definition (strategic thinking), rather than problem solving (implementation)
- provides inviting and engaging experiences and projects to reduce anxiety in this new, cross disciplined environment

The innovation boot camp is an intensive two day, hands on, experiential learning experience where students exercise multiple design thinking concepts and define problems and design solutions for two projects.

This paper and presentation will describe the purpose, curriculum, activities and outcomes developed and implemented for the innovation boot camp. The presentation will include a documentary video of the first boot camp which outlines the desired outcomes and activities of the boot camp. Finally, the paper includes an assessment on how the boot camp has affected the school and students a year after its implementation.

Keywords: Design thinking, boot camp, innovation, collaboration, strategic thinking

1 INTRODUCTION

The purpose of the innovation boot camp is to bring together multiple disciplines within Brigham Young University's School of Technology to explore basic principles of Innovation.

School of Technology faculty visited several campuses and businesses that are known for their collaborative efforts such as Stanford's design school and IDEO, and concluded that "design thinking" should be a central philosophy behind the interdisciplinary and collaborative efforts within the School of Technology's varying programs.

With this goal in mind, the ID faculty created an introductory design thinking boot camp for students from Manufacturing Technology, Information Technology, Construction Management, Technology and Engineering Education, and Industrial Design, the programs that reside with in the School of Technology.

The ID faculty believed that such a boot camp would help the students understand the difference between tactical problem solving (implementation), and problem definition (strategic thinking).

The first boot camp, as reported on in this document, included faculty and students from all of the disciplines within the School of Technology listed above. It was two-day, seven to eight hours/day experience.

2 DESIGN THINKING DEFINED

A definition of design thinking has been culled from several sources including National Conference presentations [1], site visits including the Stanford design school and IDEO, publications from The Rotman School of Business [2], Tom Kelley's books [3], and other sources on creative problem solving.

The ID faculty has defined design thinking as a method of defining problems and exploring solutions that are human centered, are clarified and refined through simple and repetitive prototyping, and concludes with a presented proposal.

3 BOOT CAMP GOALS

The ID faculty set several high level goals for the boot camp:

1. Introduce and practice principles of design thinking.
2. Focus on problem definition (strategic thinking), rather than problem solving (implementation).
3. Provide inviting and engaging experiences to reduce anxiety in this new, cross disciplined environment.

For the faculty, this was also an experiment in how to design and convey the principles of design thinking in a short boot camp. Would it be achievable? Would participants value the experience and understand how principles of design thinking might affect other projects?

4 BOOT CAMP TEAMS

The first boot camp consisted of both students and faculty from the five different programs in the School of Technology. There were two students and one faculty member from each program, making 15 participants in all. The students were split into two multidisciplinary groups with six students each. The faculty members were put in their own group. This arrangement gave the students the chance to work independent of the faculty so they could not be influenced by figures of authority. This also developed a sense of competition among the groups; it was a chance for the students to outperform their mentors.

5 BOOT CAMP SCHEDULE

DAY ONE

I. Introduction

- A. The Need for Change from a Culture of Problem Solvers to Problem Definers
- B. Definition of Design Thinking

II. User Centered Exercise

- A. Empathy: Persona Mining—creating meaning through observation (Figure 1)
- B. Personal Filter Exercise—being aware of how your personal point of view affects your observational skills
- C. Gorilla Video— who saw the gorilla?



Figure 1. Persona Mining— seeing and creating meaning

- III. Project — Redesign the Cafeteria Tray (Figure 2)
 - A. Stage 1 – Need Finding through observation, participatory research, and interviewing
 - B. Stage 2 – Present Observations and Synthesized Data (problem defining)
 - C. Stage 3 – Ideation and Prototyping
 - D. Stage 4 – Group Presentations
- IV. Wrap-up—Summary and Evaluation



Figure 2. Cafeteria Tray Exercise

DAY TWO

- I. Previous Session Experience Summary
- II. Summary Exercise— Personal Object Redesign: Wallet (Figure 3)
 - A. Empathy through storytelling.
 - B. Synthesis through metaphor
 - C. Ideation through sketching.
 - D. Refinement through prototyping.
 - E. Validation through presentation.



Figure 3. Wallet Redesign

III. Project—Improvement of Library Experience for Chair-Bound Students: Emphasis on Service (Figure 4)

- A. Stage 1 – Forced Empathy (Wheel Chair/Power Chair Tasks)
- B. Stage 2 – Observation Summary and Data Synthesis (redefining problems)
- C. Stage 3 – Ideation and Prototyping from Multiple Points of View
- D. Stage 4 – Idea Presentation

IV. Summary of Day Two and Full Course Evaluation.



Figure 4. Library Experience for Chair-Bound Students

6 POST BOOT CAMP CRITIQUE

At the end of the two day-long sessions, two different evaluations happened. One was a debriefing session held by the instructors amongst themselves, and the other was a survey collected from the participants.

The instructors' critique can be summarized as follows:

- Teach more specific “techniques” on data synthesis, idea generation, and judgment. Because of lack of specific instruction, the ideas tended to be superficial, not “rich, novel, or intriguing.
- Engage in more “useful play.” Watch the balance between Play and Entertainment.

- Strive for better group dynamics. Have more “Get to know you” activities within groups, and increase cross-group connections. The boot camp was weak on the social side.
- Break the tasks into smaller pieces. Groups had a hard time “pushing through” larger tasks such as “summarize and present your research” in the next hour.

In the participant evaluation, the results were in the majority positive in regards to time spent and knowledge gained. Other notable comments from the survey rated the presenters as “engaging” however, they were occasionally “unclear” and some participants would have liked the boot-camp to have had more structure, including taking the projects beyond a prototype to a working solution.

In evaluating the knowledge component of the boot-camp, when asked “How would you define or explain Design Thinking to your parents or friends?” participants responded:

It is a way of developing ideas starting at the root rather than the problem [as stated].

Design thinking is a family of processes for understanding problems on an ethnographic human-centered level – leading to innovative solution concepts.

It helps to think about things from the user to the problem rather than from the problem to the user. So often, the problem has already been defined for us, but a major key is finding the problem, not just the solution.

The question was asked “Do you have any additional comments or suggestions to make that will help us critically analyze the value of the boot camp and help us improve it?” The following is a representation of the most common issue that was noted:

There were times when we were supposed to be coming up with multiple ideas but it was hard to get motivated because the only thing we were going to do with them was present. If you had rewards for the group with the most ideas and the best ideas then we would have been more inclined to get involved and try harder. You could also bring in someone who matters...to judge the different ideas to decide which ones would be the recipients of the rewards.

This notion of making a participating in an exercise for the sake of knowledge and experience in design thinking proved to be a weak motivation. Students want an expert’s opinion on the work that they did. They want to know if the process accurately created a problem definition and solution that was valued in the real world.

In terms of length (2 days, ~8 hours/day), the split was 60/40 between “Too Long” and “Just about Right”.

One process bottleneck of note was the seemingly long time it took to print research and documentation photos. A computer and photo printer were available to each team; however, printing time helped contribute to the feeling that “...we were just wasting time sometimes.”

7 HAS THE BOOT CAMP AFFECTED THE SCHOOL AND STUDENTS?

More than a year after the first event, evidence of the success or failure of the boot camp were sought out. One indication of its value is how the different programs decided to engage with and support the boot camp.

Three of the programs in the School of Technology, ID, IT and TEE permanently placed the boot camp in their curriculum and require students to attend. Another program, MT suggests their students take it and CM has declined to participate, even though students who participated in the initial boot camp indicated immense interest and value in the experience.

Another indication of success would be how or if students and professors seek opportunities to work collaboratively with each other in classroom assignments. One example of success would be that this year, for the first time ever, ID and IT students will work collaboratively on a six week project. Because both professors and their students have experienced the innovation boot camp the stress of working cross functionally is reduced, they already know some of the other students they will be working with, and the expectations of the project are clear as it is similar to a boot camp project.

Another important indication of success would be how the innovation boot camp can demonstrate its impact on participant's lives beyond their university experiences? Following is a story from a recent school graduate and boot camp participant, who is now teaching in Jr. High School. He explains how the innovation boot camp has positively affected his young students.

My two 9th grade Tech. 2 classes just finished a 2 1/2 week trial of Innovation Boot Camp at Kearns Jr. High. It was the first time these students had heard of innovation. They really seemed to like it. Though many became discouraged with the pressured work load, I found my "usually disengaged students" naturally taking leadership roles and guiding their teams towards success. This boot camp for some reason put a spark into these kids; I had students, who would normally come to class tardy every day, showing up to class well before the bell. At their own will, I had students going out into the market to interview consumers and also use/rent the equipment they were trying to redesign. THIS IS HUGE!! These kids come from a Title 1 school where teachers have to push and pull them to do anything elementary. We had presentations today; I surprised the students with a decorated room, refreshments, and an administrative audience. The principle couldn't stop praising these students and the boot camp.

I know I fussed a bit, having to do your boot camp, but you should know that your students do pay attention and enjoy the hard work you put in for their benefit. Tell the Crazy Bunch over there at BYU that the Innovation Boot Camp can be a huge success for the rising generations, from where they will be teaching. Two thumbs up!

Jon, Feb 18, 2010

8 CONCLUSION

Clearly the School of Technologies Innovation Boot Camp has affected both the curriculum and individuals involved in it. Students, professors and, as evidenced by the story above, students outside of the universities direct influence, have been positively impacted by the boot camp. It is considered a success and has been an ongoing effort. As always, there is room for improvement and concerns about it. For example, there is worry now that the camp is becoming too business like, and that the excitement of the first sessions has disappeared to the point where attendance has become another check-off requirement, and that the extra load put on the professors teaching it are overly burdensome. All these issues considered, the faculty still believe that the problems facing students in today's economy are no longer straight-forward or defined. That moving from a problem solving based education to a problem defining based one is critical for future success. Innovation boot camps such as these will aid in bringing new ideas and methods to the fore front of education, and spread into the workplace and schools of tomorrow.

REFERENCES

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