

Family Lifebooks A Case Study of Undergraduate Interaction Design at Carnegie Mellon University

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Incorporating students from both communication and industrial design, this article chronicles one approach to teach students a process for working in interdisciplinary product development teams, through collaboration on a project sponsored by a real-world client.

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How might students be prepared for careers in interaction design, particularly at the undergraduate level? This article chronicles one approach undertaken at Carnegie Mellon University's School of Design. The senior interaction design project is a capstone class in the undergraduate design curriculum, designed to incorporate students from both communication and industrial design. The goal of the course is to teach students a process for working in interdisciplinary product development teams through collaboration on a project sponsored by a real-world client. In addition to giving students a process for interdisciplinary teamwork, the course provoked students to think about designing possible experiences of particular groups of users. This article provides a case study of the Fall 2000 class and closes with suggestions for thinking about how interaction design might be taught in the future.

In Fall 2000, the School of Design offered a course to communication design and industrial design students for a semester-long project called "Family Lifebooks," sponsored in part by IBM's Advanced Internet Technology Group. The project focused on exploring the creation, maintenance and display of "lifebooks" for children and adults. A lifebook brings information to people's lives in new ways, utilizing both user interface (UI) as well as physical components of several devices. Most importantly, it changes the current experience of sharing memories, family histories and family stories. Lifebooks could be collections of images, video, stories, school records, medical records or records of meaningful events. For example, a mother could store and access a child's medical records, or a child could share photos with her grandfather who lives in another state.

During the project, IBM's Advanced Internet Technology Group acted in the role of the client by providing additional input, guidance and feedback. The class included onsite visits from IBM's AITG representatives in the early part of the semester and for the final presentation, and students developed project websites to stay in communication with IBM team members throughout the semester.

Process

The project took an experience-based approach to solving a design problem in interdisciplinary teams. The semester was divided into six "mini-projects" that articulated and reinforced elements of the design process: user research and opportunity framing; idea exploration and concept selection; deep concept exploration and scenario development; first product and interface prototype; user testing and prototype refinement; and final client presentation. Case studies were presented and guest lecturers occasionally joined the class to include outside perspectives on how different kinds of experiences might be designed.

User research and opportunity framing

For the early part of the semester, students formed three teams to do broad-based inquiry. Research on people, products and technologies formed the underpinnings of the students' design solutions. One team focused on users, conducting interviews, creating photo-documentations and using Internet-based surveys to understand the current experiences and needs of family communications and memory-sharing. A second team focused on technologies that might be used to bring new product concepts to life. A third team researched competitive products that are currently on the market.

The first few classes also focused on understanding how to work in teams. Students were given information about how to run meetings and to gain consensus on decisions. Each student made a puppet of his or her likeness with a photographic head and a body collaged from pictures out of magazines and catalogues. This served not only as an ice-breaking exercise but as a way of making team roles, interdependencies and to-do items explicit. When puppets were hung next to action items in the senior studio workspace, the instructor could tell at a glance where the team stood in terms of the work process.

After conducting research and analyzing findings during two in-class work sessions, students brainstormed singly and in teams to define possible opportunities for the design of a lifebook. The first client presentation was made, new teams were formed and the ideation phase of the project began.



Puppets were used to reinforce team roles and to articulate action items in meetings.

Idea exploration and concept selection

Critiques were used to communicate concepts and usage scenarios. Building from the statements of opportunities, the teams continued brainstorming. To maintain productivity, teams were asked to generate a certain number of sketches per week. The goal was to develop three concepts and select one for further refinement. Teams were also asked to develop a problem statement, which would serve as a point of reference during key decision-making points in the project. This phase of the project was characterized by iterative client feedback, and culminated in a critique focused on clearly communicating design concepts sketches, quick scenarios and descriptive text.



One team's analysis of user research.

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Deep concept exploration and scenario development

After choosing a concept, teams were asked to vertically and laterally explore their ideas and to begin "building out" the functionality of their product. At this time, teams conducted more focused research about the project's audience and product category.

Students were asked to build scenarios and functionality diagrams to develop a clear idea of what their product would do. Where possible, a problem statement—the "why"—was stressed, so that teams could focus on why they might choose to develop one specific aspect of a product over another.

First iteration of product (form and UI) prototype

Students created the first iteration of their product form and UI prototype, which culminated in a critique. A range of approaches to communicating different product experiences emerged: a family calendar to communicate factual and emotional information in a less traditional, more aesthetic product form; a multipart recording system to capture and reintegrate individual perspectives on a shared experience; and a wearable recording device to download memories to small physical components that could be shared among family members and special friends.

User testing and product prototype refinement

To gain a better sense of how teams' designs matched the actual experience of interacting with a lifebook, students focused on conducting some simple validity tests of their concepts. Companies such as IDEO perform these kinds of tests on concepts to understand how well the product "story," or concept, communicates the value of what will be designed. Because the prototypes delivered by design students are demonstrational, rather than functional, teams essentially tested the value communicated by the concepts instead of the product functionality. Teams then incorporated this feedback into a new iteration of product form and interface.

Final client presentation

One of the most critical skills that students can learn is to communicate their ideas in a clear and salient fashion, whether to a colleague on a team or to a client or shareholder. The final phase of the project focused on creating a 30-minute presentation reporting design process and decisions made as well as giving a demonstration of the final product experience, embodied in the form and the interface interaction.

Students emerged with the three final product concepts. The Loop is a wearable means of recording and sending messages to family and friends through shared physical objects and digital information. Myfilia is a family calendar that supports information-sharing, historical events and family communication. The device hangs on the wall, or it can be placed on a table and tapped or stroked to reveal information. The Trio is a gamelike product that allows members of a family to record individual details about an event and to combine them into a shared narrative.



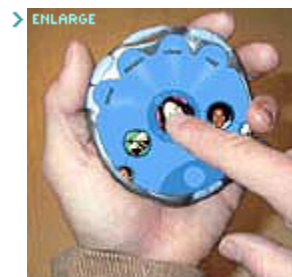
An early prototype of a wearable communications device. Informal user testing revealed orientation problems and led to a simplification of the design.



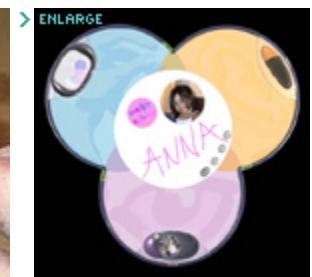
An early prototype of a shared family calendar. The interaction of pushing the product open became a theme which led to a less traditional, more aesthetic product form.



An early prototype of a product that allows individual perspectives on an experience to be combined and shared. The form progressed from a conelike structure to the gameboard metaphor shown here.



The Loop.



The Trio.



Myfilia.

Lessons learned

As educators in design, we can continue to build methods for teaching teams of students how to design experiences. A critical exercise is to give teams several opportunities to articulate and clarify their product story during the semester, whether informally in a critique or formally in a client presentation. Additionally, it was found that crude prototypes served the important functions of making the concept tangible and allowing students and teacher alike to stay focused on the “why” captured by the problem statement—the experience of using the product and the values it embodies.

During this course, students in the class were informed and inspired by the work taking place on the “other side” of campus: robotics, human-computer interaction and electrical and computer engineering, among others. The course has compelled instructors to think about how designers can work in truly interdisciplinary teams with students in engineering and science to design and embody experiences. (1).

Finally, interdisciplinary courses like this one have led the curriculum committee at the School of Design to begin to ask how they might braid together undergraduate students from communication design and industrial design earlier in their educational process. Such a change in the curriculum would encourage students to develop a strength in one discipline, but with a focus on and expertise in interaction and experience design, and would create a clear process for working in interdisciplinary teams.

⤴ Notes

(1) Editors' note: Forlizzi has recently collaborated on a proposal to the National Science Foundation for a grant to make interdisciplinary projects and the spaces to conduct them a priority for the CMU's Human-Computer Interaction Institute and School of Design.

⤴ **Jodi Forlizzi** is an assistant professor with a joint appointment in the Human-Computer Interaction Institute and the School of Design at Carnegie Mellon University. She teaches both undergraduate and graduate level students in the areas of interaction design and team design processes. Her research interests include understanding how people experience products, developing a theory of experience as it relates to interaction design, and understanding how designers interpret and communicate user experience to implicate the design process. Before joining CMU, Forlizzi was a design researcher and project manager at E-Lab in Chicago.