Longitudinal study of students' use of design ethnography during a capstone design course

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Motivation

Design Ethnography

Ethnography. Business Week. Retrieved from images.businessweek.com

Uncovers tacit needs of stakeholders and provides richer understanding of context in which a product will be used

-Evolved from anthropology techniques
-Involves immersing oneself in stakeholders' environment
-Has been shown to improve product design by allowing for complete understanding of all stakeholders
-Few studies performed to better understand how students learn these skills

Tools Include:
-Observations
-Interviews
  -Formal
  -Informal
-Photography
-Videotaping
-'Deep hanging out'
-Social mapping

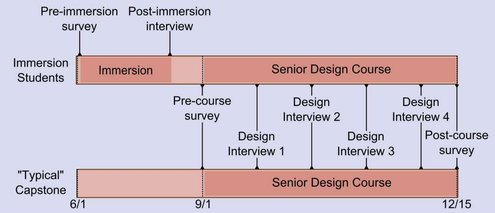
This subset of tools is commonly applicable to student capstone design projects

Research Question

How do capstone design teams incorporate design ethnography into their projects?
  -How does a design ethnography immersion experience affect students' use?

Methodology

-Two (of eight) design teams (Teams 4 & 5) had members who participated in an 8 week clinical immersion experience
  -These students performed clinical observations and interviews in a low-income country (LIC) during the summer prior to the design course
-The study timeline is depicted below



	Team 1	Team 2	Team 3	Team 4	Team 5	Team 6	Team 7
Team Members	5	5	4	4	4	4	4
Majors	ME	ME	ME	ME & BME	ME & BME	ME	ME
Immersion Experience	No	No	No	Some	Some	No	No
Project Sponsor	Research Lab	Research Lab	Doctor (UM)	Doctor (LIC)	Doctor (LIC)	NGO & Professor	Company
Project Description	Lab Equip.	Lab Equip.	Medical Consumer Product	Medical Device (LIC)	Medical Device (LIC)	Medical Device (LIC)	Consumer Product

Analysis:
-Teams' four transcripts were compiled for analysis
-Transcripts were read as complete sets and descriptive summaries were created
-Summaries/transcripts were read/re-read to identify team themes

Findings

Largely successful use of design ethnography

Team 4

Immersion students transferred their experience successfully to the design project, while non-immersion students were able to productively question the immersion students opinions. The team continued to interact with stakeholders/ experts throughout the design proccess.

Interview 1
"I'd say a lot of [our user requirements and engineering specifications] were guided by our interviews and observations [during the immersion]."

"It really helped to have [two new team members] because that was a good checkpoint...on things we had assumed."

Team 5

The team ran into initial issues related to conflicting stakeholder opinions (UM versus low-resource setting). The team identified certain doctors/experts who they returned to extensively to gain feedback on ideas.

Interview 1
"...because all the [low-income country] doctors were valuing some things differently than the American...doctors. That was interesting to deal with."

"Dr. [ ] really encouraged us to look at sensitivity and specificity. I guess we trust his judgement on that and agree with him, so we read more about it."

Attempted use of design ethnography

Team 6

Students weren't able to use stakeholder interviews effectively during the early portion of the semester because they would only receive solutions (not requirements). Students used published guidelines and ceased to interact with stakeholders/experts during later design phases.

Interview 1
"A lot of the ideas that [the doctors brought] to us...they were really interesting, but I don't know if we will be able to implement [them]."

"We went to [an NGO's guidelines] for our user requirements."

Team 3

Students relied exclusively on their sponsor to provide requirements for their design project. Their design concept had to be completely thrown out once they finally obtained end-user feedback due to negative reactions.

Interview 1
"We haven't talked to any [end-users] yet...we prepared a survey to [collect information]."

Interview 3
"...[our original concept] would be a good idea...but at the same time, all of the feedback that we've gotten from users...is that [it wouldn't work]."

Missed opportunities to use design ethnography

Team 2

Sponsors/end-users had significantly different conceptions of what the design project should be and what user requirements were required. Students could not help these end-users/ sponsors define their ideas; leading to issues late in the semester.

Interview 1
"...we met with one of the graduate students...and that cleared [up] a lot of requirements, but there was a lot of conflict...between what people wanted."

"...it actually took three interviews to really get the numbers [we needed]."

Team 1

Students received a clear and "complete" list of user requirements from their sponsor, but were then thrown-off schedule when additional requirements were requested late in the semester.

Interview 1
"A lot of [the user requirements were] easy because [our sponsor] had a very clear idea of what exactly she wanted."

Interview 4
"...there were some [features] that [our sponsors] thought of late...they didn't tell us about it until [late] into the designing process."

Team 7

Students were unable to extract the necessary information from their sponsors in order to develop adequate user requirements or make informed decisions. The team was overly dependent on the project sponsor and didn't look elsewhere for the required information.

Interview 1
"Most of our requirements came directly from [our sponsor]."

"They were very good at describing what they wanted, but qualitative, not quantitative."

Interview 3
"we originally thought the welds would be more expensive...we were led to believe that by our sponsor."

Conclusions

Teams 4 & 5 (immersion students) used observations and interviews throughout the design process (to varying degrees of success) despite obstacles that were present in its use.

Teams 6 & 3 attempted to use interviews during the various design phases, however they weren't able to obtain usable information from these interactions.

Teams 1, 2, & 7 missed opportunities to implement design ethnography techniques during portions of their design process that could have helped them achieve better results and in a more efficient manner.

Future Work

Detailed coding will be performed in order to further develop the themes found during holistic analysis of the transcripts shown above.

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