Academic Statement of Purpose

Name Omitted *PhD in Human Computer Interaction*

Introduction

Education - quality education - is the mechanism that engages students across the world and provides them with enriching learning experiences. However, across the educational world, teachers face high student-teacher ratios, limited resources, and little support. Additionally, educational focus has shifted from learner engagement to simple metric outcomes. Human Computer Interaction (HCI) has the power to address these needs. Access to technology has allowed us to recognize the problems facing teachers, provide efficient solutions, and help the educational community refocus on learner engagement. I feel that the Doctoral Program at the Carnegie Mellon University will allow me to contribute to this niche within the field of HCI. I will be able to discover innovative ways to support learning engagement for students across the world, specifically those within developing countries.

Motivation

During my undergraduate work, my experience at the [Place omitted] marked my transition from engineering design to research. In this role, my work in Hierarchical Task Analysis and GOMS taught me that HCI and software design had the power to create effective solutions across many domains.

The experience that brought me my understanding of the possibilities of this application in the education realm was during my time volunteering for Teach for India. While working full-time for a financial services company as a User Experience Designer, I also taught fourth and fifth grade students in math and science. I strove to move beyond traditional face-to-face learning and utilized new methods, such as collaborative learning. I wanted to evaluate whether the use of technology could help lessen educational barriers and help students learn more efficiently. I initiated a project to understand how children with Dyslexia face problems while in classrooms. I was able to guide the team at Teach for India to design an application called SortingHat, which assists teachers in detecting the probability of a child being dyslexic through game-based interaction. I saw first-hand the ability to understand a problem contextually and design an empathetic solution to meet the needs of students and teachers in real classroom settings. I believe that HCI has the power to mitigate problems that interfere with engagement while enhancing opportunities for it.This eagerness to bring such change has motivated me to study HCI and its application in education and learning technologies.

Graduate Research Experience

Over the course of my graduate research studies, I have had numerous opportunities that pushed me out of my comfort zone, including the submission of two first-author papers with doctoral students in my department (in review), in addition to two draft papers which are in progress. Under Dr. [Name Ommitted], I am working on my thesis in collaboration with Bloomberg to understand how financial analysts use social media to perform sensemaking and generate trade ideas. My resultant thesis, motivated by uncovered social media usage problems, proposes the design of TweetSight, a new tool that allows financial analysts to navigate and read contextual tweets while reading a relevant news article. I am currently drafting a first author paper to be submitted to ACM's Designing Interactive Systems 2017 describing this research.

In addition to my thesis, my longing for exposure in the educational field drove me to work with Dr. [Name omitted]. I began my studies in this department through a summer research internship assessing the quality of group collaboration in a classroom by coding chat conversations using an existing coding schema. Afterwards, I took a computer-supported collaborative learning course run by [Name omitted] to work on another research study in the field of education. Utilizing my research exposure in behavioral studies of expert communities, we are now trying to evaluate how students use an assistive collaborative educational tool to support design learning in collaborative, informal-learning contexts . We are using modified usability methods and focus group studies over a period of four weeks in an after-school design club to understand how students use these collaborative learning management tools and to what extent they meet the needs of young learners. I will be submitting the resultant work in Interaction Design and Children's conference, 2017 as a first author paper.

Future Research Direction

As a result of these experiences, my primary doctoral research interest is in studying educational communities and their adoption of innovative learning methodologies to improve students' learning engagement. I feel that grounding my design research studies in real-world educational contexts can help me design useful technological applications. I am also interested in understanding the problems experienced by teachers while utilizing socio-cognitive teaching methodologies in classroom activities.

CMU's PhD in HCI program is the perfect home for my doctoral research, as there are a number of faculty whose work aligns very closely with my interest in educational technologies and learning sciences. Considering my interests in these areas, Dr. Carolyn Rose's work in collaborative learning will be an excellent lens for my work. I was introduced to her work by my instructor, Dr. Marcela Borge. Their work has greatly informed our approach, especially the paper, "Activity Design Models to Support the Development of High Quality Collaborative Processes in Online Settings" as we have worked to bring a usability study to a collaborative environment in afterschool setting. Dr. Amy Ogan would also be a great fit for my research in understanding how new educational technologies, such as collaborative learning management tools, improve shared understanding between peers. Also, her work in understanding cognitive tutors outside America such as "Cognitive Tutor Use in Chile: Understanding Classroom and Lab Culture" can help me understand the impact of such educational tools on population with unique needs back in India. I have also contacted Dr.Jessica Hammer, whose research is especially relevant to a student of HCI that conducts game based learning research in education. Her recent work on gamification in education field, really appealed to me as someone who is trying to introduce game based collaborative learning system (such as Colearnr). Keeping my interests in mind, the HCII's interdisciplinary program is ideal for me to pursue research in education and learning sciences.

In summary, my experience includes over three years conducting design research in both educational and professional domains, and a background in programming frameworks such as Ruby on Rails, Jquery, D3.js and Android. Due to my cross-cultural experiences in countries including India, Nepal, and Japan, I'm able to balance the importance of understanding the needs of people with the inevitable constraints under which systems are designed. With my strong background in Human Computer Interaction and my drive to solve problems in the educational community, I feel I am a strong candidate for the doctoral program in HCI at CMU.