OMSCS vs. MOOCs

Massive Open Online Courses (MOOCs) once offered the promise of accessibility and affordability. However, MOOCs typically lack expert feedback and social interaction, and have low student engagement and retention. Alternative programs for online education have emerged, including the Online Masters of Computer Science (OMSCS) Program at Georgia Institute of Technology. This program has been hailed as an immense success, and enrollment continues to grow each year.

We adopt the perspective of cognitive science to answer the question: Why do only some online educational courses succeed?

Self-Efficacy + Self-Regulated Learning

We adopt a socio-cognitive perspective and examine psychological aspects of student cognition in the online program in an attempt to answer the above question. The literature in educational psychology, and socio-cognitive theory relates perceived student self-efficacy and actual self-regulated learning with student success.

It proposes that (1) students with high perceived self-efficacy are more likely to be successful learners, and (2) learning environments that promote self-regulated learning in practice are more likely to result in student success.

The socio-cognitive explanations operationalize the earlier hypotheses and allow us to systematically study them. If student cognitive values with motivational and cognitive constructs, then we should observe some evidence for them in the online program in computer science.

H1: Students in the online AI class have high perceived self-efficacy.

H2: Students in the AI class use self-regulation in their learning within the course.

H3: The self-efficacy of the students is at least partially informed by the demographics of the online student population, which are different from the demographics of the residential student population.

H4: Student cognition for those enrolled in the online AI class is characterized by high measurements of psychological constructs and may contribute to why the course is considered a success.

We posit that measuring specific motivational and self-regulation components of students in the online AI course will help determine if there is a relationship between the online AI course being success and the type of cognition exhibited by the students. Successful online programs might very well be the result of increasingly motivated and educated students. The investigation begins with first modeling student cognition using motivational and self-regulation constructs, and briefly reviewing objective measurements of student performance.

Research Questions

RQ1: Do students in the online AI course have high self-efficacy and do they use self-regulation in their learning?

RQ2: Do student measures for each construct change from the beginning of the term to the end of the term?

RQ3: Do student measurements in self-efficacy and self-regulation correlate to one another?

Success in Online Education Programs: A Snapshot

We measure learner motivation and self-regulation in one course in the OMSCS, specifically a course on artificial intelligence (AI). Surveys of students indicate that students’ self-reported assessments of self-efficacy, cognitive strategy use, intrinsic value, and confidence in teaching support are not only fairly high, but also generally increase over time.

Survey Information

Adapted MSQ Instrument
- Self-Efficacy
- Motivation Components
- Self-Regulation Components
- Multiple Subscores Identified

Survey Findings

Survey Results

Participants

One course, Three groups:
- Spring 2017 online students
- Fall 2017 online students
- Fall 2017 residential students

Demographics

Gender
- Male: 136
- Female: 48

Highest Level of Prior Education
- Bachelor’s degree: 55
- Master’s degree: 31
- Doctoral degree: 4

Response Rate

87% Spring
85% Fall
81% Campus

Citations
