Research Theme #1

- **Theme #1:** Meina Zhu, Annisa Sari, Ying Tang (a visiting scholar in Hong Kong...now post-doc in Informatics), and I have spent four years developing a unique database of over 3,300 massive open online course (MOOC) instructors from around the world.

- We have mined by looking at MOOC instructor motivation (why do they do this?), personalization practices, cultural sensitivity, gamification practices, instructional design challenges, pedagogical practices, how they foster learner self-directed learning, professional development (how are they trained), engagement and altruistic behaviors, etc.

Research Theme #2

- **Theme #2:** Meina and Annisa are also working with Mimi Lee (an IST alum at the U of Houston) to do a systematic comprehensive review of ALL MOOC research in SCOPUS database and other journals not in SCOPUS since inception (nearly 500 studies) (2009-2019). I am supervising the project and mentoring them so they learn to publish without my name attached.

Outline

1. Research Background
2. Research Purpose and Questions
3. Research Design
4. Results
5. Discussion, Conclusion, Limitations, and Implications

Key Terms

**Massive Open Online Courses (MOOCs)**

Coined by David Cormier from Canada when he referred to the Connectivism and Connective Knowledge course (de Freitas et al., 2015; Fini, 2009).
Key Terms

“Massive”
The large number of learners enrolled in a MOOC. One study revealed that the median number of learners in a MOOC was around 8,000 (Chuang & Ho, 2016) at the time of the study.

“Open”
Access to the course content. Usually, learners enroll in MOOCs with minimal requirements; once enrolled, they can obtain all course resources, interact with peers, and share their knowledge with classmates (Daniel, 2012; Kop, 2011; McAuley, Stewart, Siemens, & Cormier 2010).

Key Terms

Self-directed learning (SDL) (Garrison, 1997)
(1) Self-management
(2) Self-monitoring
(3) Motivation

MOOCs Examples

MOOC Certificate

MOOC Degree
MOOC Degree

35+ Legit Master's Degrees You Can Now Earn Completely Online

EdX: From MicroMasters to Online Master's Degrees

<table>
<thead>
<tr>
<th>Institution</th>
<th>Master's Degree</th>
<th>Online Cost (USD)</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curtin University, Australia</td>
<td>Marketing</td>
<td>$22,386</td>
<td>1.5-3 years</td>
</tr>
<tr>
<td>Georgia Institute of Technology</td>
<td>Cybersecurity</td>
<td>$9,920</td>
<td>2-3 years</td>
</tr>
<tr>
<td>Georgia Institute of Technology</td>
<td>Analytics</td>
<td>$9,960</td>
<td>1-3 years</td>
</tr>
<tr>
<td>Indiana University</td>
<td>IT management</td>
<td>$21,000</td>
<td>1.25-3 years</td>
</tr>
<tr>
<td>Indiana University</td>
<td>Accounting</td>
<td>$21,000</td>
<td>1.25-3 years</td>
</tr>
<tr>
<td>University of California, San Diego</td>
<td>Data science</td>
<td>$15,000</td>
<td>1-3 years</td>
</tr>
<tr>
<td>University of Queensland, Australia</td>
<td>Leadership: service innovation</td>
<td>$18,156</td>
<td>2 years</td>
</tr>
<tr>
<td>University of Texas at Austin</td>
<td>Computer science</td>
<td>$10,000</td>
<td>1.5-3 years</td>
</tr>
</tbody>
</table>

MOOCs Trends


Top five MOOC providers

MOOCs Stats


Research Background
Learners need self-directed learning skills and strategies to be successful in MOOCs (Kop & Fournier, 2010; Littlejohn, Hood, Miligan, & Mustan, 2016), as there is a lack of personalized interaction with teachers. Self-monitoring, as one of the SDL skills, can improve learning performance (Chang, 2007; Coleman & Webber, 2002). Teaching self-monitoring skills will benefit learners (e.g., Deklos & Harrington, 1991; Maag et al., 1992; Malone & Mastroppieri, 1991; Schunk, 1982).

However, few studies have examined instructional design and the delivery of instruction using MOOCs from instructor perspectives (Zhu, Sari, & Lee, 2018; Margaryan et al., 2015; Watson et al., 2016); especially lacking is research on instructors’ perception of student self-monitoring and how they design MOOCs to facilitate student self-monitoring.

This study is to inform instructors or instructional designers and MOOC providers of the current practices of designing and delivering MOOCs to facilitate student self-monitoring by finding out how the instructors who are concerned with facilitating self-monitoring skills put these considerations into MOOC design.

1. How do MOOC instructors design and deliver their MOOCs to facilitate students’ self-monitoring skills?
2. How are various technologies employed to support MOOC learners’ self-monitoring skills?
Research Design

Explanatory sequential mixed methods design (Creswell & Plano-Clark, 2017)

Survey:
- Volunteer sampling (Creswell & Plano-Clark, 2017)
- 198 instructors responded to the survey (18% response rate)

Interview:
- Homogeneous purposeful sampling (Creswell & Plano-Clark, 2017; Patton, 2002)
- Maximal variation sampling (Creswell & Plano-Clark, 2017)
- 22 interviewees via Zoom

Document analysis:
- Reviewed 22 interviewees' MOOCs

Pilot interview with 4 instructors
Pilot survey with 48 instructors
Survey 198 instructors
Review 22 MOOCs of interviewees
Interview 22 instructors
Review 22 MOOCs of interviewees

Data Collections

Data Analysis

RQs | Data Sources | Data analysis | Tools
--- | --- | --- | ---
RQ1 | Survey, Interview | Descriptive statistics, Content analysis | SPSS, NVivo
RQ2 | Survey, Interview | Descriptive statistics, Content analysis | SPSS, NVivo
RQ3 | Interview, MOOC analysis | Content analysis | NVivo

Trustworthiness

1. Validity survey: Experts review, think-aloud interview, and pilot test (PCA)
2. Reliability survey: Pilot test and internal consistency reliability (Cronbach alpha)
3. Triangulation: Data sources, researchers, and methods
4. Member checks: Interview transcriptions
5. Peer debriefing: Committee and colleagues
6. Researcher reflexivity: Constant reflection and be forthright with our positions
7. Thick description: Report the context, data sources, and analyses in detail
8. Prolonged engagement: Immersing in instructors’ MOOCs before the interview and continue reviewing the MOOCs after the interview

Survey Participant Disciplines

MOOC Subject Areas

- Social Science
- Medicine and Health
- Language and Literacy
- Business and Management
- Art and Humanity
- Physical Science
- Data Science
- Computer Science
- Biology
- Math
- Engineering
- N/A

Participant disciplines by number:

- Social Science: 27
- Medicine and Health: 17
- Language and Literacy: 14
- Business and Management: 13
- Art and Humanity: 12
- Physical Science: 12
- Data Science: 11
- Computer Science: 10
- Biology: 9
- Math: 9
- Engineering: 5
- N/A: 5

Survey participant disciplines.
Results

RQ1 Design and the Delivery of MOOCs to Facilitate Student Self-Monitoring Skills

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. helps the student be in control of his/her learning</td>
<td>4.15</td>
<td>0.55</td>
</tr>
<tr>
<td>1. helps the student set his/her own learning goals</td>
<td>3.88</td>
<td>0.91</td>
</tr>
<tr>
<td>1. helps the student evaluate his/her own performance</td>
<td>3.94</td>
<td>0.76</td>
</tr>
<tr>
<td>1. helps the student be responsible for his/her learning</td>
<td>4.06</td>
<td>0.79</td>
</tr>
<tr>
<td>1. helps the student be able to focus on a problem</td>
<td>3.87</td>
<td>0.74</td>
</tr>
<tr>
<td>1. helps the student be able to find out information related to</td>
<td>4.02</td>
<td>0.70</td>
</tr>
<tr>
<td>learning content for him/herself</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. helps the student have high beliefs in his/her abilities of learning</td>
<td>3.73</td>
<td>0.74</td>
</tr>
</tbody>
</table>

Table 1 Mean Score and Standard Deviation of the Specific Self-Monitoring Skills that the Participants’ MOOC Facilitate

RQ1 Strategies to Facilitate Self-monitoring

- Both internal feedback and external feedback were provided to help students' self-monitoring.

<table>
<thead>
<tr>
<th>Self-monitoring</th>
<th>Strategies</th>
</tr>
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<tbody>
<tr>
<td>Internal feedback</td>
<td>Cognition</td>
</tr>
<tr>
<td></td>
<td>MOOC instructors provided quizzes for self-assessment, tutorial on technology use, learning advice, learning aids, and instructional modeling.</td>
</tr>
<tr>
<td></td>
<td>Meta-cog</td>
</tr>
<tr>
<td></td>
<td>MOOC instructors encouraged students to reflect and think critically by providing reflection questions and building learning community.</td>
</tr>
<tr>
<td>External feedback</td>
<td>MOOC instructors, teaching assistants, and peers involved in providing external feedback.</td>
</tr>
</tbody>
</table>

RQ1 Strategies to Facilitate Self-monitoring

- Cognition

  - Lucas, a social science instructor stated:
    
    I do think frequent quizzes and somewhat lengthy quizzes are really helpful... It makes the whole thing hang together as a unit. So, I gave a little quizzes at the end of my videos.

RQ1 Strategies to Facilitate Self-monitoring

- Metacognition

  - A science instructor from the US, Samuel, utilized weekly questions to foster self-monitoring and reflection in his MOOC. As he stated:
    
    We do ask, kind of, a summary discussion question at the end of the week. I’ll ask: “What did you learn? How do you feel about that? How would this apply to a real-world application?” So, we asked those kind[s] of reflection questions.
External Feedback - Instructor Feedback

Joseph from the UK provided feedback through panels or lectures. As Joseph explained:

We have [a] discussion moderator, who was also in that space talking to students. So, we try to engage students on some of those points, and question some of the things that they're saying. Maybe get them to reflect.

External Feedback - Peer Feedback

Emma, encouraged learners to provide feedback to their peers. As she observed:

We also put in peer evaluation because the interaction between students would motivate them. We give a very, very basic syllabus because we don’t know what the educational background and the levels of the students. We gave them five different key points to enable them to evaluate other students on assignment.

Figure 2. Example of tool for peer-assessment in MOOCs

Figure 3. Example from discussion forum used for building a learning community

Synchronous communication technologies
- Google Hangouts
- YouTube Live

Asynchronous communication technologies
- Discussion forum
- Blog
- Slackbot
- Flickr

Discussion, Conclusion, Limitations, and Implications
Limitations

• This study did not include MOOC instructors whose MOOCs were not delivered in English
• Low response rate
• We could not verify whether the strategies that MOOC instructors reported were effective or not

Discussion and Conclusion

• Facilitate Self-monitoring through self-assessment: Such results concurred with the findings reported a few years ago by Kulkarni et al. (2013).
• Facilitate Self-monitoring through fostering reflection: the results are in line with the implications of a study by Parker et al. (1995) and Schraw (1998).
• External feedback (instructors, TAs, and peers) motivates students as well as helps learners with their self-monitoring.
• Tech for Self-monitoring: These technologies included: (1) synchronous communication technologies, (2) asynchronous communication technologies, and (3) feedback tools. The results confirm with the findings of Blaschke (2012) and Junco, Heiberger, and Loken (2010) that social media can support students SDL.

Implications for Future Research and Practice

• Future research might want to explore different forms of instructional scaffolds and supports for self-monitoring
• Educators might want to design and evaluate innovative training programs for SDL in this age of massively open online teaching and learning
• Designers of MOOC platforms as well as MOOC vendors might evaluate MOOC retention and completion rates resulting from the introduction of new technology tools and features for self-monitoring, self-management, and motivation

Top 10 Strategies to Facilitate SDL in MOOCs

1. Helping students set their own learning goals;
2. Building learning community;
3. Offering immediate feedback;
4. Embedding quizzes for self-assessment;
5. Providing progress indicators;
6. Providing reflection questions;
7. Designing short learning units;
8. Providing flexible timelines;
9. Highlighting estimated time frames;

Thank you!
Questions and Comments?

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