Research Insights into How Instructors Design and Deliver MOOCs to Facilitate Participant Self-monitoring

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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**

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Key Terms

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).

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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.

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Key Terms

"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).

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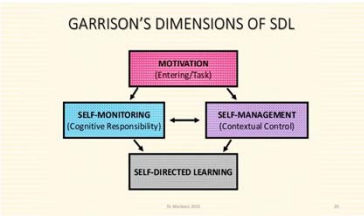
Key Terms

Self-directed learning (SDL) (Garrison, 1997)

(1) Self-management

(2) Self-monitoring

(3) Motivation



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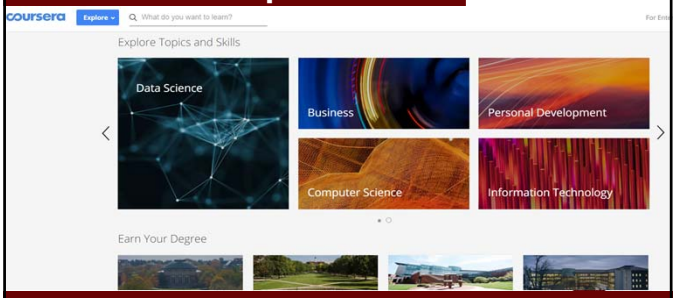
MOOCs Examples



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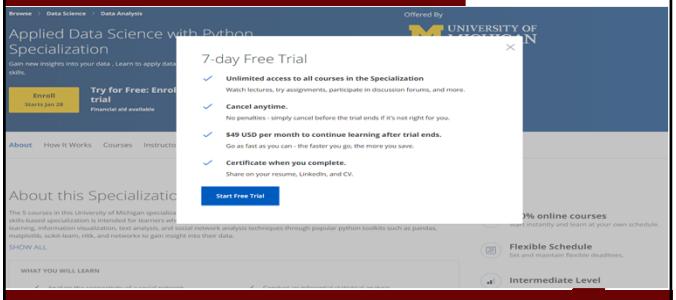
MOOC Certificate



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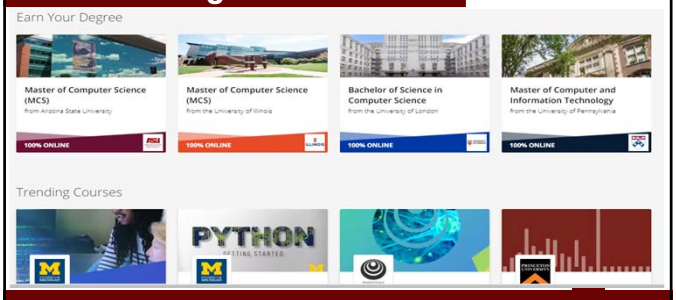
MOOC Degree



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MOOC Degree

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

Laurie Pickard Mar 4th, 2019

Master of Public Health, University of Michigan via Coursera
Total Cost: $44,520 (may be lower for Michigan residents)
Duration: 20-22 months

Global Master of Public Health, Imperial College London via Coursera
Total Cost: $25,000 (lower for UK residents)
Duration: 24 months

Master of Development and Humanitarian Action, Deakin University via FutureLearn
Total Cost: $8,158 ($11,490 AUD)
Duration: 12 months (full time)

MSc Nursing, Coventry University via FutureLearn
Total Cost: $16,125 (12,500 GBP)
Duration: 24-60 months

MSc Disaster Management and Resilience, Coventry University via FutureLearn
Total Cost: $17,222 (13,350 GBP)
Duration: 24-60 months

MSc Emergency Management and Resilience, Coventry University via FutureLearn
Total Cost: $17,222 (13,350 GBP)
Duration: 24-60 months

Bachelor's Degrees

The advent of MOOC-based bachelor's degrees is so recent that only two of them currently exist, and the coursework for these degrees isn't yet fully developed. The University of

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EdX: From MicroMasters to Online Master's Degrees

Institution	edX Master's Degree	Online Cost (USD)	Duration
Curtin University, Australia	Marketing	$22,366	1.5-3 years
Georgia Institute of Technology	Cybersecurity	$9,920	2-3 years
Georgia Institute of Technology	Analytics	$9,900	1-3 years
Indiana University	IT management	$21,000	1.25-3 years
Indiana University	Accounting	$21,000	1.25-3 years
University of California, San Diego	Data science	$15,000	1-3 years
University of Queensland, Australia	Leadership: service innovation	$18,156	2 years
University of Texas at Austin	Computer science	$10,000	1.5-3 years

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MOOC Degree

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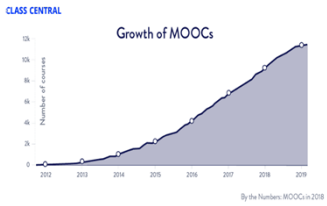
MOOCs Trends

Year of MOOC-based Degrees: A Review of MOOC Stats and Trends in 2018, Dhawal Shah, Class Central--January 6, 2019



- Coursera – 37 million
- edX – 18 million
- XuetangX – 14 million
- Udacity – 10 million
- FutureLearn – 8.7 million

Top five MOOC providers

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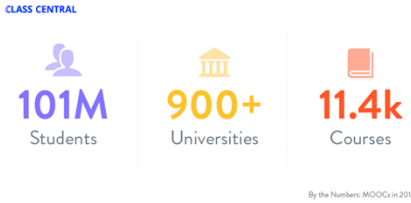
MOOCs Stats

Year of MOOC-based Degrees: A Review of MOOC Stats and Trends in 2018, Dhawal Shah, Class Central--January 6, 2019



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Research Background

Research Background

- **Learners need self-directed learning skills and strategies to be successful in MOOCs** (Kop & Fournier, 2010; Littlejohn, Hood, Milligan, & Mustain, 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., Delclos & Harrington, 1991; Maag et al., 1992; Malone & Mastropieri, 1991; Schunk, 1982).

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Research Background

- 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.**

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Research Purpose and Questions

Research Purpose

- **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.**

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Research Questions

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?**

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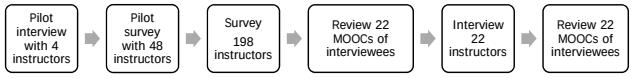
Research Design

Research Design

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



Data Collections

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

Pseudonym	Country	Subject area	Platform	Gender	No. of O/B	No. of M	Mode of the M
Lucas	US	Social science	edX	M	0	1	I without T
Branden	US	Education	Udacity	M	0	5 or more	Self-paced
Logan	US	Literacy and Language	Coursera	M	5 or more	5 or more	I with T
Emma	US	Literacy and Language	Coursera	F	2	1	Self-paced
Jason	US	Science	edX	M	1	1	I with T
Jackson	US	Medicine and health	Coursera	M	5 or more	1	Self-paced
Samuel	US	Education	FutureLearn	M	4	3	Self-paced
Hannah	US	Education	Blackboard	F	5 or more	1	I with T
Ashley	US	Education	EdX	F	0	5 or more	I with T
Andrew	UK	Art	FutureLearn	M	0	3	I with T
Emily	UK	Medicine and health	FutureLearn	F	2	2	I with T
Aiden	UK	Social science	FutureLearn	M	0	1	Self-paced
Henry	UK	Social science	FutureLearn	M	0	1	Self-paced
Joseph	UK	Medicine and health	FutureLearn	M	1	1	Self-paced
Joshua	UK	Literacy and language	FutureLearn	M	2	2	I with T
Mason	Australia	Education	Coursera	M	5 or more	1	I with T
Ethan	Australia	Business	Coursera	M	3	1	I without T
Ben	Australia	Social science	edX	M	1	1	I with T
Paul	France	Computer science	Coursera	M	1	1	I with T
Fernando	Belgium	Research methods	Blackboard	M	5 or more	3	I with T
Jacob	Netherland	Science	Coursera	M	0	1	I with T

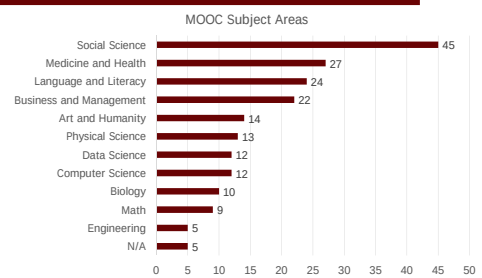
Data Analysis

RQs	Data Sources	Data analysis	Tools
RQ1	Survey	Descriptive statistics	SPSS
	Interview	Content analysis (Leech & Onwuegbuzie, 2007)	NVivo
RQ2	Survey	Descriptive statistics	SPSS
	Interview	Content analysis	NVivo
RQ3	Interview	Content analysis	NVivo
	Document 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:** Immerse in instructors' MOOCs before the interview and continue reviewing the MOOCs after the interview

Survey Participant Disciplines



Results

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

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

Items	Mean	SD
1. helps the student be in control of his/her learning	4.15	0.55
1. helps the student set his/her own learning goals	3.68	0.91
1. helps the student evaluate his/her own performance	3.94	0.78
1. helps the student be responsible for his/her learning	4.06	0.79
1. helps the student be able to focus on a problem	3.87	0.74
1. helps the student be able to find out information related to learning content for him/herself	4.02	0.70
1. helps the student have high beliefs in his/her abilities of learning	3.73	0.74

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RQ1 Strategies to Facilitate Self-monitoring

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

Self-monitoring		Strategies
Internal feedback	Cognition	MOOC instructors provided **quizzes** for self-assessment, **tutorial** on technology use, learning advice, learning aids, and instructional modeling, etc.
	Meta-cog	MOOC instructors encouraged students to reflect and think critically by providing **reflection questions and building learning community**.
External feedback		MOOC instructors, teaching assistants, and peers were involved in providing external feedback.

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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.

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RQ1 Strategies to Facilitate Self-monitoring

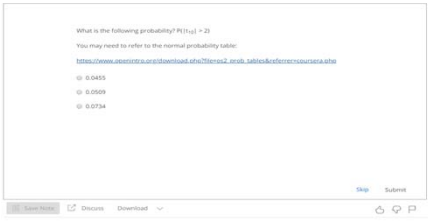

Figure 1. Example of the quizzes embedded in videos used in MOOCs

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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.

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RQ1 Strategies to Facilitate Self-monitoring

- **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.

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RQ1 Strategies to Facilitate Self-monitoring

- **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.

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RQ1 Strategies to Facilitate Self-monitoring

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

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RQ1 Strategies to Facilitate Self-monitoring

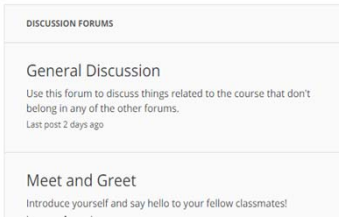

Figure 3. Example from discussion forum used for building a learning community

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RQ2 Tech Use for Self-monitoring

- **Synchronous communication technologies**
  - Google Hangouts
  - YouTube Live
- **Asynchronous communication technologies**
  - Discussion forum
  - Blog
  - Slackbot
  - Flickr
- **Feedback technologies**

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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**

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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** (instructor, 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.

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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

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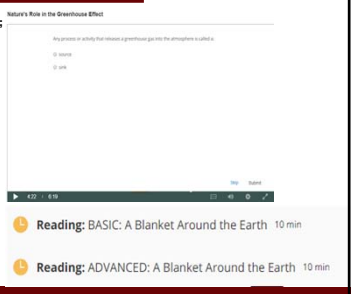
Top 10 Strategies to Facilitate SDL in MOOCs

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;**
10. **Making available optional learning materials.**



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Follow-up study (in process)

MOOC Student Perceptions of Effective SDL Strategies

- **Survey (n = 314)**
- **Interview MOOC students**
- **Document analysis (MOOC course review)**

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Thank you!
Questions and Comments?

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