MOOC Research Looking Back: MOOC Research Looking Forward
Meina Zhu and Curtis J. Bonk
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AECT DDL, January 24, 2018

October 2015
Predictors of Retention and Achievement in a Massive Open Online Course

"If MOOCs are to fulfill their promise as a way of providing all learners with opportunities to obtain education at a low cost, much more research is needed regarding how to engage these students and help them to be successful in these environments.” (p. 952)

September 2016
MOOCs, Graduate Skills Gaps, and Employability: A Qualitative Systematic Review of the Literature

"In 2013, research had already indicated that MOOCs offered unprecedented choice, customization and gave thousands of participants the possibility to have greater ownership and control over their learning experiences “rather than being constrained by centralized, instructor-controlled learning based on delivery of pre-fabricated curriculum” (McLoughlin, 2013). (p. 78.)

2015
Instructional quality of Massive Open Online Courses (MOOCs).
Margaryan, Bianco, & Littlejohn, Computers & Education, 80, 77-83.

“As MOOCs proliferate, drawing in increasing numbers of faculty and learners worldwide, the issue of their instructional quality becomes increasingly pressing.” (p. 82)

2015
Digging deeper into learners’ experiences in MOOCs: Participation in social networks outside of MOOCs, notetaking and contexts surrounding content consumption
Veletsianos, Collier, & Schneider, BJET, 46(3), 570-587.

“To gain a deeper and more diverse understanding of the MOOC phenomenon, researchers need to use multiple research approaches (e.g., ethnography, phenomenology, discourse analysis) add content to them.” (p. 583.)

The Numbers: MOOCs in 2016 (Dec 25th, Class Central)
Cumulative Growth in Number of MOOCs (2011-2017)

<table>
<thead>
<tr>
<th>Month</th>
<th>Number of MOOCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2011</td>
<td>2</td>
</tr>
<tr>
<td>June 2012</td>
<td>7</td>
</tr>
<tr>
<td>December 2012</td>
<td>90</td>
</tr>
<tr>
<td>June 2013</td>
<td>480</td>
</tr>
<tr>
<td>December 2013</td>
<td>880</td>
</tr>
<tr>
<td>June 2014</td>
<td>1,204</td>
</tr>
<tr>
<td>December 2014</td>
<td>2,090</td>
</tr>
<tr>
<td>June 2015</td>
<td>3,040</td>
</tr>
<tr>
<td>December 2015</td>
<td>4,067</td>
</tr>
<tr>
<td>June 2016</td>
<td>5,287</td>
</tr>
<tr>
<td>December 2016</td>
<td>6,543</td>
</tr>
<tr>
<td>June 2017</td>
<td>7,445</td>
</tr>
</tbody>
</table>

Top 5 MOOC providers by number of registered users (2017)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Provider</th>
<th>Registered users</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coursera (U.S.)</td>
<td>27 million</td>
</tr>
<tr>
<td>2</td>
<td>edX (U.S.)</td>
<td>11 million</td>
</tr>
<tr>
<td>3</td>
<td>XuetangX (China)</td>
<td>7 million</td>
</tr>
<tr>
<td>4</td>
<td>FutureLearn (Britain)</td>
<td>6.3 million</td>
</tr>
<tr>
<td>5</td>
<td>Udacity (U.S.)</td>
<td>6 million</td>
</tr>
</tbody>
</table>

August 17, 2017
By the Numbers: MOOCs in 2016
Class Central, Dhawal Shah

August 7, 2017
FutureLearn and Coventry University to Roll Out 50 Online Degrees (Last year Deakin University announced a similar partnership with FutureLearn)
Class Central, Dhawal Shah

J June 15, 2017
Massive List of MOOC Providers Around The World, China and Korea
(Where to Find MOOCs: The Definitive Guide to MOOC Providers)
University of China MOOC — icourse163.org / China
Class Central, Dhawal Shah
MOOC Study #1: Looking Back
A Systematic Review of Research Methods and Topics of the Empirical MOOC Literature (2014-2016)


Research Background
• MOOC offerings continue to surge (Almanac, 2017-2018; Shah, 2016)
• A scarcity of systematic analysis of empirical studies of recent MOOC research that targets all of the following aspects: research methods adopted by MOOC researchers, the research topics, the geographic locations of MOOC researchers, and the regions of the MOOC delivery.

Research Purpose & Questions
To gain a deeper and more diverse understanding of the current MOOC phenomenon by reviewing recent articles.
1. What are the research methods researchers employed in empirical MOOC studies?
2. What are the research topics or focuses in MOOC studies?
3. How are researchers of empirical MOOC studies geographically distributed?
4. In terms of the delivery of the MOOC, what are the countries which are attracting the most research?

No. Journal Total
1 International Review of Research in Open and Distance Learning (IRRODL) 31
2 Computers & Education 12
3 British Journal of Educational Technology 9
4 Online Learning 7
5 Distance Education 5
6 Educational Media International 5
7 Internet and Higher Education 5
8 Journal of Computer Assisted Learning 5
9 Computers in Human Behavior 4
10 Open Learning 4
11 Journal of Online Learning and Teaching 3


• RQ1: What are the research methods researchers employed in empirical MOOC studies?

MOOC Research Methods Employed

<table>
<thead>
<tr>
<th>Method</th>
<th>United States</th>
<th>Canada</th>
<th>Germany</th>
<th>Egypt</th>
<th>Spain</th>
<th>Mexico</th>
<th>Australia</th>
<th>U.K.</th>
<th>Ireland</th>
<th>Hong Kong</th>
<th>India</th>
<th>China</th>
<th>Turkey</th>
<th>France</th>
<th>Belgium</th>
<th>Russia</th>
<th>Japan</th>
<th>South Korea</th>
<th>Brazil</th>
<th>Mexico</th>
<th>Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualitative</td>
<td>27</td>
<td>12</td>
<td>67</td>
<td>84</td>
<td>5</td>
<td>67</td>
<td>1</td>
<td>27</td>
<td>12</td>
<td>67</td>
<td>84</td>
<td>5</td>
<td>67</td>
<td>1</td>
<td>27</td>
<td>12</td>
<td>67</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed methods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>80</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Quantitative</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>0</td>
<td>10</td>
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</tr>
</tbody>
</table>

• RQ1: What are the research methods researchers employed in empirical MOOC studies?


• RQ2: What are the research focuses in MOOC studies?


• RQ3: How are researchers of empirical MOOC studies geographically distributed?
Research Background

- MOOCs can be beneficial to both learners and instructors (Hew & Cheung, 2014)
- Instructional design is critical for online learning (MOOC) (Johnson & Aragon, 2003; Phipps & Merisotis, 1999)
- Instructors are one of the five main components of MOOCs; the other four are learners, topic, material, and context (Kop, 2011)
- Few studies have examined instructional design from MOOC instructors’ perspectives (Margaryan et al., 2015; Ross, Sinclair, Knox, Bayne, & Macleod, 2014; Watson et al., 2016)

Research Purposes & Questions

Research Questions:
1. What are the design considerations of instructors when designing MOOCs?
2. What challenges do instructors perceive when designing MOOCs?
3. How do instructors address the challenges that they perceive related to MOOCs?

Research Methods

- Sequential mixed methods design (Creswell & Clark, 2007)

Data Collection:
- survey, interview, and course review

Participants:
- 143 survey participants (10% response rate) and 12 interviewees

Research Methods

- MOOC instructors interviewed

<table>
<thead>
<tr>
<th>Country</th>
<th>Subject Area</th>
<th>Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>Language and Literacy</td>
<td>Coursera</td>
</tr>
<tr>
<td>U.S.</td>
<td>Education</td>
<td>Coursera</td>
</tr>
<tr>
<td>U.S.</td>
<td>Chemistry</td>
<td>Coursera</td>
</tr>
<tr>
<td>U.K.</td>
<td>Public Health</td>
<td>FutureLearn</td>
</tr>
<tr>
<td>U.K.</td>
<td>Language and Literacy</td>
<td>FutureLearn</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>Math</td>
<td>Coursera</td>
</tr>
<tr>
<td>Mainland China</td>
<td>Math</td>
<td>Coursera</td>
</tr>
<tr>
<td>Canada</td>
<td>Psychology</td>
<td>Coursera</td>
</tr>
<tr>
<td>Australia</td>
<td>Public Health</td>
<td>Open2Study</td>
</tr>
<tr>
<td>India</td>
<td>Computer Science</td>
<td>edX</td>
</tr>
<tr>
<td>India</td>
<td>Management</td>
<td>edX</td>
</tr>
</tbody>
</table>
Data Analysis

<table>
<thead>
<tr>
<th>RQs</th>
<th>Data Sources</th>
<th>Data analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1</td>
<td>Survey-multiple-choice questions</td>
<td>Descriptive statistics</td>
</tr>
<tr>
<td></td>
<td>Survey-open-ended questions</td>
<td>Content analysis (Elo &amp; Kyngäs, 2008)</td>
</tr>
<tr>
<td></td>
<td>Interview</td>
<td>Content analysis</td>
</tr>
<tr>
<td></td>
<td>MOOC review</td>
<td>Content analysis</td>
</tr>
<tr>
<td>RQ2</td>
<td>Survey-multiple-choice questions</td>
<td>Descriptive statistics</td>
</tr>
<tr>
<td></td>
<td>Survey-open-ended questions</td>
<td>Content analysis</td>
</tr>
<tr>
<td></td>
<td>Interview</td>
<td>Content analysis</td>
</tr>
<tr>
<td>RQ3</td>
<td>Survey-multiple-choice questions</td>
<td>Descriptive statistics</td>
</tr>
<tr>
<td></td>
<td>Interview</td>
<td>Content analysis</td>
</tr>
</tbody>
</table>

Analytical Framework

Alario-Hoyos, Pérez-Sanagustín, Cormier, and Kloos' (2014) MOOC design considerations

<table>
<thead>
<tr>
<th>Design considerations</th>
<th>Example (Alario-Hoyos et al, 2014)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources</td>
<td>Technology resources and human resources</td>
</tr>
<tr>
<td>Pedagogy</td>
<td>Motivate students, participatory learning, and collaborative community etc.</td>
</tr>
<tr>
<td>Logistics</td>
<td>Time required while planning MOOCs and peer assessment</td>
</tr>
</tbody>
</table>

Context

The Number of MOOCs the Instructor has Designed

- Less than 5,000: 30%
- 5,000-10,000: 29%
- 10,001-15,000: 5%
- 15,001-20,000: 1.3%
- More than 20,000: 2.1%

MOOC Delivery Format

- Instructor led with teaching assistants, moderators, and/or tutor support: 12%
- Instructor led with no additional teaching support: 23%
- Self-paced: 23%
- Primarily learner/participant driven (i.e., cMOOC): 10%
- Hybrid or blended type of MOOC: 5%
- Other: 20%

I Have Many Prior Experiences Related to Designing Full Online or Blended Courses Prior to Designing the MOOC

- Strongly disagree: 66%
- Disagree: 38%
- Neutral: 12%
- Agree: 20%
- Strongly agree: 22%
RQ #1. What are the design considerations of instructors when designing MOOCs?

- Learning objectives
- Assessment
- Time for designing MOOC
- Engaging learners

One instructor from the UK mentioned:

“When we were designing, we tried to have a hook for each week, a reason for learners to come back each week. So, we built that into our learning design. So what’s going to be the big thing that makes you want to join the course in Week One.”

RQ #1-1. How do MOOC instructors design the course to encourage interaction among learners?

- Asynchronous discussion forums
- Pair-based types of tasks
- Social media

Peer interaction encouraged in MOOC (out of 136)
Findings

• Asynchronous discussion forums

One instructor mentioned:
“And then there’s also an asynchronous discussion board within each module. So there will be prompt...And then there were a lot of discussions back and forth with students about suggestions on things they could consider, or maybe there were stuck on something and so they would like help...Within discussion forum, there’s a showcase and that is the opportunity to get feedback from peers.”

Findings

RQ #1-2. How do MOOC instructors design the course to encourage interaction between instructor and learners?

• Online discussion forums
• Platform messages
• Social media connections

Findings

Instructor-learner interaction encouraged in your MOOC (out of 136)

<table>
<thead>
<tr>
<th>Interaction Method</th>
<th>Encouraged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online discussion forum</td>
<td>111</td>
</tr>
<tr>
<td>Platform message</td>
<td>49</td>
</tr>
<tr>
<td>Social media connections (e.g., Facebook, Twitter)</td>
<td>26</td>
</tr>
<tr>
<td>Personal email</td>
<td>27</td>
</tr>
<tr>
<td>Not applicable</td>
<td>14</td>
</tr>
<tr>
<td>Virtual meeting</td>
<td>4</td>
</tr>
<tr>
<td>Phone call/message</td>
<td>0</td>
</tr>
</tbody>
</table>

Findings

• Not much instructor-learner interaction

One instructor mentioned:
“Because there’s not much interaction, even between me and students. When I first launched this MOOC, I paid closer attention. Maybe I replied to some students. Now I think Coursera somehow grabs some students to be mentors or something. There are other people commenting. It seems like I do not have to do anything. Every week, perhaps three hundred more students register. Nobody bothers me.”

Findings

• Not much instructor-learner interaction

One instructor from the U.S. mentioned:
“I think there’s more of an interaction at least a reaction between like the instructor and the students, students and student, and you can’t really simulate that in this kind of MOOC format.”

Findings
Findings

Ways to monitor learners’ learning

- Modular or unit-based progress
- Weekly or daily reports offered by learning.
- Self-monitoring and self-evaluation
- Moderator, tutor, or teaching assistants feedback
- Not applicable (learner progress is not monitored)
- Peer or group member reports
- Personal tracking from tutors, moderators, and
  - Personal tracking from instructor

Findings

An instructor from the US mentioned

“Within discussion form, there’s a showcase and that is the opportunity to get feedback from peers. And also we have facilitators, who are volunteers, who go in and offer feedback.”

Findings

RQ #1-3. How do MOOC instructors design the course to encourage learner-content interaction?

- Discussion forum
- Embedded video lectures and tutorials
- Article or book readings

Findings

Learner-Content Interaction in MOOCs (out of 136)

<table>
<thead>
<tr>
<th>Interaction Type</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion forums or threads</td>
<td>123</td>
</tr>
<tr>
<td>Readings (including textbooks, literature, and scientific)</td>
<td>75</td>
</tr>
<tr>
<td>Expert interviews</td>
<td>54</td>
</tr>
<tr>
<td>PowerPoint and other presentation slides</td>
<td>32</td>
</tr>
<tr>
<td>Visuals (e.g., concept maps, diagrams, flowcharts,)</td>
<td>16</td>
</tr>
<tr>
<td>Video examples (e.g., TED talks, YouTube, etc.)</td>
<td>12</td>
</tr>
<tr>
<td>Social media (e.g., Facebook, Instagram, Snapchat, etc.)</td>
<td>10</td>
</tr>
<tr>
<td>Mobile applications</td>
<td>8</td>
</tr>
<tr>
<td>Podcasts</td>
<td>8</td>
</tr>
<tr>
<td>Instructor blogs</td>
<td>6</td>
</tr>
<tr>
<td>Virtual conferences and summits</td>
<td>4</td>
</tr>
</tbody>
</table>

Findings

One professor from the U.S. stated that:

“Besides videos, there was a suggested book.”

Another instructor noted that she used visuals in her MOOC “I had a whole lot of graphical material that I used in class. And I had got them from one of the texts that were published in the area and had been allowed to use them, because I was recommended the textbook.”
Findings

RQ #2. What challenges do instructors perceive when designing MOOCs?
- Assessment methods
- Engaging students’ learning
- Time limitation

Findings

RQ #3. How do instructors address the challenges that they perceive related to MOOCs?
- Explore other MOOC examples
- Seek help from the platform/Colleagues/Institutions

Findings

Discussion

- The pedagogical factors were the primary design considerations and challenges in MOOC design (Watson, S. L., Loizzo, J., Watson, W. R., Mueller, C., Lim, J., & Ertmer, P. A., 2016).
- The assessment and engagement strategies are the main considerations as well as challenges (Hew & Chung, 2014).
- The time limitation of creating MOOCs was the primary logistical consideration (Hew & Chung, 2014; Watson et al., 2016).
Conclusions

- This study indicated that MOOC instructors are trying to encourage online interaction in MOOC; however, there is no universal understanding of strategies of encouraging online interaction and instructor-learner interaction is still not optimal.

Limitations

- Limited to MOOCs which are mainly delivered in English
- Volunteer bias
- Only review 12 MOOC Courses

Implications

- For MOOC instructors:
  - May inform them about what other instructors are most concerned with and tend to target in MOOC design as well as their efforts in addressing the possible design challenges.
- For instructional designers:
  - May help them in the consulting process.

Future Studies

- Assessment design
- Engaging activity design
- Course design that supports self-directed learning
- Further observations and analyses are needed to better understand how MOOC instructor design and deliver their MOOCs to encourage online interaction and learner success.

Thank you!

Questions and Comments...

AECT Webinar, January 24, 2018
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MOOC RESEARCH