A Systematic Review of Research Methods and Topics of the Empirical MOOC Literature (2014-2016)

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Growth of MOOCs
Cumulative Growth in Number of MOOCs (2011-2017)

<table>
<thead>
<tr>
<th>Month</th>
<th>Number of MOOCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 2011</td>
<td>42</td>
</tr>
<tr>
<td>June 2012</td>
<td>94</td>
</tr>
<tr>
<td>December 2012</td>
<td>298</td>
</tr>
<tr>
<td>June 2013</td>
<td>486</td>
</tr>
<tr>
<td>December 2013</td>
<td>860</td>
</tr>
<tr>
<td>June 2014</td>
<td>1,126</td>
</tr>
<tr>
<td>December 2014</td>
<td>2,292</td>
</tr>
<tr>
<td>June 2015</td>
<td>3,040</td>
</tr>
<tr>
<td>December 2015</td>
<td>6,080</td>
</tr>
<tr>
<td>June 2016</td>
<td>10,000</td>
</tr>
<tr>
<td>December 2016</td>
<td>10,092</td>
</tr>
<tr>
<td>June 2017</td>
<td>13,485</td>
</tr>
</tbody>
</table>

Registrations by MOOC Provider
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>Xuetang (China)</td>
<td>7 million</td>
</tr>
<tr>
<td>4</td>
<td>FutureLearn (UK)</td>
<td>6.3 million</td>
</tr>
<tr>
<td>5</td>
<td>Udacity (U.S.)</td>
<td>6 million</td>
</tr>
</tbody>
</table>

June 15, 2017
Massive List of MOOC Providers Around The World, China
(Where to Find MOOCs: The Definitive Guide to MOOC Providers)
University of China MOOC — icourse163.org / China
Class Central, Dhawal Shah

June 15, 2017
Massive List of MOOC Providers Around The World, K-MOOC (Korea)
(Where to Find MOOCs: The Definitive Guide to MOOC Providers)
June 15, 2017
Massive List of MOOC Providers Around The World, IndonesiaX
(Where to Find MOOCs: The Definitive Guide to MOOC Providers)
https://www.class-central.com/report/mooc-providers/

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

November 2014
Where is Research on Massive Open Online Courses Headed? A Data Analysis of the MOOC Research Initiative
Gasevic, Kovanovic, Joksimovic, and Siemens, IRRODL, 15(5), 143-176

"Research needs to come up with theoretical underpinnings that will explain factors related to social aspects in MOOCs that have a completely new context and offer practical guidance of course design and instruction." (p. 167)

Dragan Gasevic and colleagues (including George Siemens), 2014, IRRODL, 15(5)

May 25, 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.)

May 25, 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.

"Qualitative data and approaches can equip researchers to investigate the reasons why learners engage in video-watching behaviors in the ways that they do." (p. 583.)
George Veletsianos & Peter Shepherdson’s Study (2016)
A Systematic Analysis And Synthesis of the Empirical MOOC Literature Published in 2013-2015
“Dependence on Particular Research Methods May Restrict our Understanding of MOOCs”

February 2016
A Systematic Analysis and Synthesis of the Empirical MOOC Literature Published in 2013-2015
George Veletsianos and Peter Shepherdson, IRRODL, 17(2), 198-221

“Analysis suggests that researchers have favored a quantitative, if not positivist approach to the conduct of MOOC research. Survey data and secondary data collected via automated methods dominated the analyses. While some interpretive research was conducted in MOOCs in this time period, it was often basic. Very few studies were informed by methods traditionally associated with qualitative research approaches (e.g., interviews, observations, and focus groups).” (p. 214)

August 2017
A Contemporary Review of Research Methods Adopted to Understand Students’ and Instructors’ Use of Massive Open Online Courses (MOOCs)

“There are a number of research avenues which could be explored based upon the findings of this study. First, additional research strategies should be considered to understand students’ and instructors’ experience in using MOOCs.” (p. 605)

“Second, triangulation of a wider range of research methods and data source should be undertaken. Beyond triangulation of surveys and interviews or log files, MOOC scholars are encouraged to combine other research methods to triangulate findings, such as diary studies and focus groups.” (p. 605)

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
Explores the research paradigms and topics of MOOCs to gain a deeper understanding of the MOOC phenomenon
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?
Research Method - Data Collection

Data selection criteria
- Empirical study
- From education perspective
- Published between October 2014 - November 2016
- Mainly from Scopus
- Keywords "MOOC" and "Massive Online Open Course(s)"
- Journal articles
- Written in English

Research Method - Data Collection

1. Journals listed in Scopus
2. Journals not included in Scopus:
   - EDUCAUSE Review & Quarterly
   - Online Learning
   - the International Journal on E-Learning
   - Journal of Interactive Media in Education
   - Journal of Online Learning Research
   - the Journal of Open Flexible and Distance Learning

Research Method - Data Collection

- Exchanged the data collected and cross-checked the re-coded information (inter-rater agreement across all items was 91.1%)
- 146 papers were included

Research Method - Data Collection

- Authors and their affiliations
- Location of the authors
- Location of the MOOC delivery
- Year of publication
- Title
- Journal name
- General analytic method (e.g., qualitative, quantitative, or mixed methods)
- Data collection methods
- Data analysis methods
- General study focus
- Special study focus
- Article URL address

Context

MOOC Research Papers Published by Year

Context

<table>
<thead>
<tr>
<th>No</th>
<th>Journal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>International Review of Research in Open and Distance Learning (IRRODL)</td>
<td>31</td>
</tr>
<tr>
<td>2</td>
<td>Computers &amp; Education</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>British Journal of Educational Technology</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>Online Learning</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>Distance Education</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Educational Media International</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Internet and Higher Education</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Journal of Computer Assisted Learning</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>Computers in Human Behavior</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>Open Learning</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>Journal of Online Learning and Teaching</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>Journal of Asynchronous Learning Network</td>
<td>3</td>
</tr>
</tbody>
</table>
Research Method-Data Analysis

**RQ 1**

**Analytical Frameworks**
Quantitative research, qualitative research, and mixed-methods (Creswell, 2003)

**Data Collection Methods**
Interviews, surveys, focus groups, tests, and observations, and discussion forum, platform database, and learning analytics
Tashakkori and Teddlie (2003)

**Research Method-Data Analysis**

**RQ 2**

**Analytical Frameworks**

**Research Topics**
The five categories were:
1. student-focused,
2. teacher-focused,
3. design-focused,
4. context and impact, and
5. other

Veletsianos and Shepherdson (2015)

**Research Method-Data Analysis**

**RQ 3**

**Analysis method**
Geographical Distribution
Examined the affiliations of all the authors of these 146 studies. When completed, we calculated the country location for all the MOOC authors in this study as well as the locations for just the first author of the 146 MOOC studies.

**Research Method-Data Analysis**

**RQ 4**

**Analysis method**
Countries of MOOC origin or delivery
The researchers calculated the countries of the MOOC being studied. For the published studies which did not specify the name/location of MOOC delivery or used the general MOOCs for the research, the researchers coded them as "Global."

Results-RQ1-Data Collection Methods

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

![Bar chart showing data collection methods](chart.png)

Number of Data Collection Methods Employed in MOOC Research:
- Qualitative: 27%
- Mixed methods: 52%
- Quantitative: 47%
- More than 3: 8.22%
- 1: 16.44%
- 2: 31.51%
- 3: 43.84%
Data Sources of MOOC Research (2014–2016)

- Design Narratives
- Discussion Forum Data
- Platform Data
- Focus Group Interview
- Observation Journals
- Observation
- Social Media

Results-RQ1-Data Collection Methods

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

<table>
<thead>
<tr>
<th>Data Collection Methods</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey</td>
<td>67</td>
</tr>
<tr>
<td>Database</td>
<td>25</td>
</tr>
<tr>
<td>Interview</td>
<td>24</td>
</tr>
<tr>
<td>Discussion forum</td>
<td>15</td>
</tr>
<tr>
<td>Quiz/test</td>
<td>11</td>
</tr>
<tr>
<td>Observation</td>
<td>4</td>
</tr>
<tr>
<td>Learning analytics</td>
<td>1</td>
</tr>
<tr>
<td>Focus group interview</td>
<td>1</td>
</tr>
</tbody>
</table>


- Descriptive Research
- Causal Comparative Research Design
- Case Study
- Collaborative Autoethnography
- Interpretative Case Study
- Multi-case Study Analysis
- Qualitative Thematic Analysis
- Autoethnography
- Phenomenology
- Comparative Study
- Empirical Investigation of the Network Dynamics

Results-RQ1-Data Analysis Methods

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

<table>
<thead>
<tr>
<th>Data Analysis Methods Employed in MOOC Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive statistics</td>
</tr>
<tr>
<td>Inferential statistics</td>
</tr>
<tr>
<td>Content analysis</td>
</tr>
<tr>
<td>Social network analysis</td>
</tr>
<tr>
<td>Thematic analysis</td>
</tr>
<tr>
<td>SWOT analysis</td>
</tr>
<tr>
<td>Phenomenological analysis</td>
</tr>
<tr>
<td>Collaborative Autoethnography</td>
</tr>
<tr>
<td>Grounded approach analysis</td>
</tr>
<tr>
<td>Constant comparative method</td>
</tr>
</tbody>
</table>

Results-RQ2-Research Focus

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

<table>
<thead>
<tr>
<th>Primary Research Focus of Empirical MOOCs Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-focused</td>
</tr>
<tr>
<td>Design-focused</td>
</tr>
<tr>
<td>Context and impact</td>
</tr>
<tr>
<td>Others</td>
</tr>
<tr>
<td>Instructor-focused</td>
</tr>
</tbody>
</table>

Specific Topics of MOOC Research (2014–2016)

- Self-Regulated Learning
- Cheating
- Social Learning
- Motivation
- Engagement
- Assessment/Measurement/Evaluation
- Professional Development
- Learners' Experience
- Quality of MOOC
- Retention and Completion/Dropout
- Instructional/MOOC Design

K-12/Pre-College
### Results-RQ2-Research Focus

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

<table>
<thead>
<tr>
<th>Detailed Focus</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retention and completion/dropout</td>
<td>11</td>
</tr>
<tr>
<td>Assessment/Measurement/evaluation</td>
<td>10</td>
</tr>
<tr>
<td>Instructional/MOOC design</td>
<td>10</td>
</tr>
<tr>
<td>Learners' experience</td>
<td>10</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>10</td>
</tr>
<tr>
<td>Engagement</td>
<td>8</td>
</tr>
<tr>
<td>Attitude</td>
<td>7</td>
</tr>
<tr>
<td>Performance/outcome</td>
<td>5</td>
</tr>
<tr>
<td>Collaborative learning and peer support</td>
<td>5</td>
</tr>
<tr>
<td>Communication/interaction</td>
<td>5</td>
</tr>
<tr>
<td>Higher education</td>
<td>5</td>
</tr>
<tr>
<td>Professional development</td>
<td>4</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>4</td>
</tr>
<tr>
<td>Self-regulated learning</td>
<td>4</td>
</tr>
</tbody>
</table>

### Results-RQ2-Research Focus

**Research Methods Used in Each Research Topic**

<table>
<thead>
<tr>
<th></th>
<th>Quantitative</th>
<th>Qualitative</th>
<th>Mixed methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-focused</td>
<td>19</td>
<td>9</td>
<td>26</td>
</tr>
<tr>
<td>Design-focused</td>
<td>19</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>Context and impact</td>
<td>9</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Instructor-focused</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

### Results-RQ3-Geographical Distribution

**RQ3: How are researchers of empirical MOOC studies geographically distributed?**

![Geographical Distribution of MOOC Research Authors](image)

### Location of MOOC Research Team Members (2014–2016)

- **UNited States**
- **UK**
- **Australia**
- **Canada**
- **Others**
- **Global**

### Results-RQ4-Countries of the deliveries

**RQ4: In terms of the delivery of the MOOC, what are the countries which are attracting the most research?**

![Countries of MOOC Delivery in Research Sample](image)
## Implications

- It may be advantageous for MOOC researchers to target MOOC instructors as well as instructional designers and the entire course development, production, and evaluation team.

- The research on MOOCs remains a vital and growing area of interest for educational researchers across disciplines and regions of the world.

## Future directions

- A continuous expansion of methodological approaches in MOOCs research is needed.

- Cross-cultural comparison research might indicate how MOOC research paradigms differ in various regions of the world.

- More localized understanding of educational philosophies and values are needed.

## References


