



A SYSTEMATIC REVIEW OF THE RESEARCH TOPICS IN ONLINE LEARNING DURING COVID-19: DOCUMENTING THE SUDDEN SHIFT

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AGENDA

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- Aim of the Study
- Research Questions
- A Systematic Review of Online Learning
- Method
- Data Analysis
- Results
- Discussion
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BACKGROUND

Structural changes in online learning during the pandemic include:

A significant increase in the number of online learners.

A shift from online learning being an alternative to traditional schools to being the only educational option available.

These changes have led to:

Changes in online learning research approaches and topics.

Shifts in research locations to explore the impact and challenges of emergency remote forms of teaching and learning during COVID-19.

Governments have been involved in this research to determine the impact and challenges of online learning during the pandemic.



AIM OF THE STUDY



The present study aims to investigate the changes in online learning caused by the COVID-19 pandemic, with the goal of informing online learning scholars and practitioners and guiding future research.



The scope of the study includes both emergency remote teaching and learning as well as traditional online learning.



It is difficult to differentiate between the two due to the constantly changing perceptions, awareness, and practices of online teaching and learning throughout the pandemic.



To compare research topics in online learning before and during the pandemic, the study adopts Martin et al.'s (2020) online learning research framework and compares their findings with more recent research.

RESEARCH QUESTIONS

01

What are the most and least researched topics in online learning during COVID-19?

02

What are the differences in research trends in online learning before and during the COVID-19 pandemic?

03

What new topics emerged during COVID-19?

A SYSTEMATIC REVIEW OF ONLINE LEARNING

SEVERAL SYSTEMATIC REVIEWS HAVE BEEN CONDUCTED ON ONLINE LEARNING AND REMOTE TEACHING DURING THE PANDEMIC

Crompton et al. (2021) found that strategies for supporting remote learning included:

- Communication
- Delivery systems
- Student readiness
- Partnerships
- Engagement
- Resources

Bond (2020) recommended further funding support for:

- Professional development
- Promoting equity
- Adopting collaborative learning opportunities
- Leveraging synchronous and asynchronous technology

Bond et al. (2021) found that:

- Studies focused on undergraduate students and their perceptions of emergency remote learning.
- Studies were conducted in various countries and largely focused on Health, Natural Sciences, and Math field.
- Synchronous collaborative tools along and text-based tools were the primary technologies used.

Mishra et al. (2021) found that:

- 67.88% of the studies focused on postsecondary education
- K-12 research was disproportionately low
- Identified four research clusters:
 - Technologies for teaching and learning
 - Psychosocial issues
 - Learners
 - Eclectic category
- The United States was the most productive country during the pandemic, and research was published in countries.

MARTIN ET AL.'S (2020) SYSTEMATIC REVIEW OF ONLINE LEARNING

Martin et al. (2020) conducted a systematic review of online learning research from 2009 to 2018.

They reviewed three previous systematic reviews on online learning by Berge and Mrozowski (2001), Allent-Runnels et al. (2006), and Zawacki-Richter et al. (2009) to facilitate their analysis.

Based on these studies, Martin et al. (2020) developed a framework with three components/stakeholders of online learning: the learner, the course and instructor, and the organization.

The resulting framework included 12 research themes.



Martin et al. (2020) found that a high percentage of online learning studies dealt with the learner (55.73%) compared to the course/instructor (29.89%) or organization (14.38%).



Learning/learner engagement was the most researched theme in online learning (28.92%), followed by learner characteristics (21.65%). Instructor characteristics was the least researched theme (3.39%).



A systematic review of recent online learning research since the emergence of COVID-19 is needed to understand how research topics have changed.



The purpose of this study is to examine research topics in online learning during COVID-19 using a systematic review methodology.

MARTIN ET AL.'S (2020) SYSTEMATIC REVIEW OF ONLINE LEARNING (CONT.)

METHOD

This study conducted a systematic review of recent literature on online learning published during the COVID-19 pandemic from February 2020 to April 2022.

The research process followed Cooper (1988) procedure for a systematic review and included five stages:



The study had four key inclusion criteria for the literature search:

- Confined to online learning environments.
- Empirical studies adopting quantitative, qualitative, or mixed-method approaches.
- Published since the beginning of COVID-19 (i.e., from February 2020 to April 2022).
- Written in English.

Exclusion criteria included studies that did not meet the inclusion criteria:

- Editorials or opinions.
- Meta-analyses or systematic reviews (e.g., Salas-Pilco et al., 2022).
- Technical reports, corporate and non-profit documents, unpublished dissertations, conference proceedings, book reviews, and other miscellaneous reports.
- Studies with pre-COVID-19 data

INCLUSION AND EXCLUSION CRITERIA

The literature search was conducted through a computer-based database search using three representative databases: Web of Science, Education Resources Information Center (ERIC), and Google Scholar.

The databases were chosen based on their extensive coverage of publications in education fields (ERIC), scholarly works (Web of Science), and a variety of disciplines (Google Scholar).

A combination of the following keywords was used to search for relevant studies: "Online learning," "distance learning," "online teaching," or "online learners," and "COVID-19" or "pandemic."

The search was limited to the period between February 2020 and April 2022 to examine the research trends in online learning during COVID-19.

Reviewed titles and abstracts of 454 publications

Excluded 47 studies due to insufficient or missing data

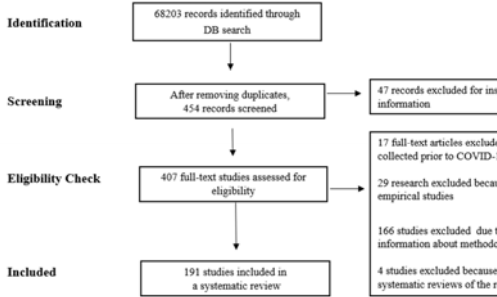
Full-text screened 408 publications by two authors

Excluded 216 studies due to insufficient data, non-empirical studies or systematic reviews, or data collection periods prior to January 2020


Double checked methodology sections to ensure data collection was after the COVID-19 pandemic began

Included 191 online learning studies out of over 68,000 records identified


THE SEARCH AND EXCLUSION PROCESS ILLUSTRATED USING THE PRISMA FLOW DIAGRAM




DATA ANALYSIS

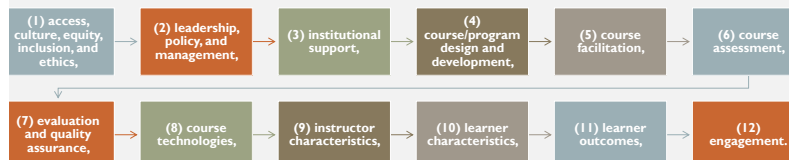
 A coding scheme was created in an excel file and then transferred to SPSS for analysis of descriptive data.

 Coding scheme included categories for journals, titles, years, author names, participants, data collection, data analysis, topics, keywords, and others.

 Martin et al.'s (2020) research framework was used to code for research domains and themes.


 Studies were categorized into one of three domains: organization, courses and instructors, and learner.


EACH STUDY WAS CLASSIFIED INTO ONE OF 12 RESEARCH THEMES BASED ON KEYWORDS, ABSTRACT, AND TITLE



 Two researchers conducted a pilot coding of the first ten articles

 Initial intercoder reliability was 93.99%

 Each researcher coded half of the rest of the articles

 After coding completed, a thematic analysis was conducted using Braun & Clarke's (2006) approach

RESULTS

The 191 studies analyzed in the systematic review came from 31 peer reviewed journals.

Some of the journals include: *British Journal of Educational Technology, Education and Information Technologies, Education Sciences, Frontiers in Psychology, Journal of Computer Assisted Learning, Online Learning, Computers and Education, Frontiers in Education, Asia Pacific Education Research.*

LOCATION OF PUBLICATIONS

Online learning research was conducted in 58 countries.

Some of the countries where research was conducted include:

United States	Canada	Mexico	China	Bangladesh	Thailand	United Kingdom	Estonia	Ghana	Egypt	United Arab Emirates	Australia	New Zealand
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The United States has been the most productive country in terms of online learning research published during the COVID-19 pandemic thus far, with 17.8% of the total research (N= 34).

China, including Mainland China, Hong Kong, and Taiwan, also produced nearly as large a portion (N= 32, 16.7%) of the publications during this time.

THE METHODS USED

Quantitative methods were predominantly used in online learning research (N= 111, 58.1%).

Qualitative methods were the second most common method used (N= 46, 24.1%).

Mixed methods were used in a smaller proportion of studies (N= 33, 17.3%).

Only one study which adopted a developmental research methodology was included in the analysis.

More than half of the research (N= 122, 63.54%) adopted a mixed methodology.

Approx. 1 in 5 studies (N= 36, 18.75%) used interviews, including focus group interviews, to conduct qualitative research.

Only four studies in the pool of 191 studies adopted an experimental or quasi-experimental research design.

THE PERCENTAGE OF RESEARCH TOPICS

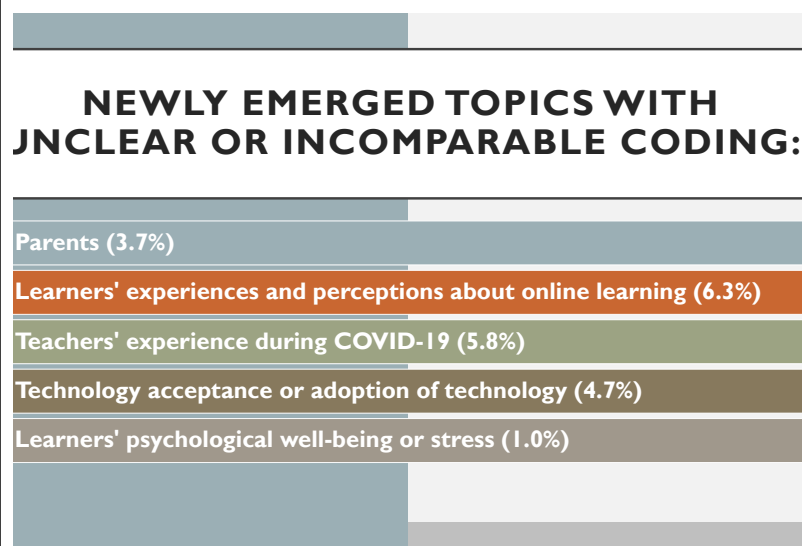
Category	Research Topics	Current study (2022)	Martinez (2019)
Learner	Engagement	22.5	
	Learner Characteristics	6.3	
	Learner Outcome	4.2	
	Learners' Experiences and Perceptions	6.3	
	Learners' Psychological Well-Being	1.0	
Course and Instructor	Evaluation and Quality Assurance	0.5	
	Course Technologies	11.0	
	Course Facilitation	3.1	
	Course Assessment	3.1	
	Course Design and Development	12.6	
Organization	Instructor Characteristics	5.8	
	Teachers' Experiences and Perceptions	5.8	
	Institutional Support	5.8	
Others	Access, Culture, Equity, Inclusion, and Ethics	1.6	
	Leadership, Policy, and Management	2.1	
Others	Adaptation to Online Learning	4.7	
	Parents' Involvement in Online Learning	3.7	

THE RESEARCH SETTINGS

The research settings were diverse and included early childhood, K-12, higher education and adult and lifelong learning.

Higher education was the most predominant research setting (64.5%), followed by K-12 settings (26.7%).

Only three studies were conducted in early childhood and two studies in adult learning.



DISCUSSION

THE MOST AND LEAST STUDIED RESEARCH TOPICS

Most online learning research before the pandemic was conducted on learners, but during the pandemic, the focus expanded to include courses and instructors as well.

Over 70% of the reviewed literature was about online learning in higher education, like previous findings.

K-12 online learning research accounted for only 26.7% of the reviewed literature, despite significant growth in virtual schools in the U.S. in recent years.

Engagement was the most researched theme in online learning during COVID-19 (22.5%), and research on learning outcomes remained low (about 4%). The popularity of engagement as a research theme warrants further investigation.

THE DIFFERENCES IN RESEARCH TRENDS IN ONLINE LEARNING BEFORE AND DURING THE COVID-19 PANDEMIC

Course design and development and course technology received more attention in academia during the pandemic compared to the pre-COVID-19 era.

Research interest shifted from learners to instructors during the pandemic due to the structural changes taking place in schools and higher education institutions.

Least researched areas, such as access, culture, equity, inclusion, and ethics, leadership, policy, and management, course facilitation, and course assessment, need greater attention for better understanding the long-term success of online learning.

Researchers in the United States have been the most prolific in terms of published online learning research, but the present study included research conducted in 58 countries.

Nearly 30% of all countries in the world community produced online learning research during the pandemic, demonstrating the extensive global expansion of online learning.

Experimental research studies were nearly nonexistent during the first two years of the pandemic, likely due to the suddenness of the shift to online environments and the need to study what was happening throughout the pandemic.

NEW TOPICS EMERGED DURING COVID-19

Studies showed parents' involvement in online learning and technology acceptance or adoption of online learning

Parental involvement is important in the success of K-12 online education

Technology acceptance model (TAM) has re-emerged in recent online learning research

Some topical changes and emerging areas of research could be due to the evolution of online learning research

Online course design and development may have become increasingly essential during the pandemic

Instructor training, motivation to teach online, and pedagogical decision making are important considerations for course quality and effectiveness.

LIMITATIONS

The study only examined peer-reviewed journal articles, potentially excluding research published in other outlets.

The articles reviewed were limited to publications in English, potentially missing important findings and discussions published in non-English journals.

Longitudinal research is needed to understand the effectiveness and impact of online learning during and beyond the pandemic, including the impact of instructor online training programs.

There may be unpublished studies currently in process or accepted for publication that took place during the pandemic.

The study did not differentiate between traditional online learning and emergency remote teaching, but future research may need to address this distinction.

Research attention is needed on hybrid learning models, including HyFlex course design, and the impact of open and online educational resources.

Further research is needed on the wellness and mental health of online learning participants, including learners, instructors, instructional designers, and program administrators.

IMPLICATIONS FOR INSTRUCTORS, PRACTITIONERS, AND RESEARCHERS

Systematic reviews of research on educational technology can show where technology is being used and evaluated.

The pandemic forced the deployment of online learning, leading to hundreds or thousands of researchers studying its impact.

Online and blended learning are now pervasive and require professional development for teachers, students, and parents.

Researchers need to conduct cross-institutional, cross-cultural, and longitudinal studies on online teaching and learning to understand implementation and impact.

There are many new opportunities for learners, educators, institutions, organizations, and government in online learning, but quality remains a concern.

It's time to make new discoveries and design novel pedagogical methods to advance online teaching and learning.

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Conflicts of interest:

There were no conflicts of interest in this research.

Availability of data and material:

The data used and/or analyzed in the current study are available from the author upon request.

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