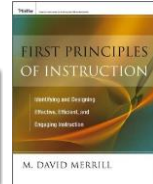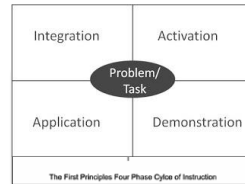## Learning is Changing: Four Modest Little MOOC Studies to Help Save the Planet

Curtis J. Bonk, Professor, IST, IU, cjbonk@Indiana.edu
Meina Zhu, Doctoral Candidate, IST, IU, meinzhu@iu.edu

Presentation to class at the University of West Florida
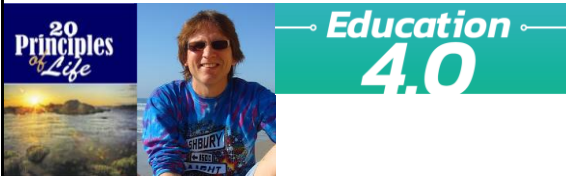**Instructor: Dr. Minkyoung Kim**
February 21, 2019

Merrill's First Principles of Teaching/Instruction
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html

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Bonk's Last Principles of Teaching/Instruction (Education 4.0?)
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html
http://www.applicadthai.com/articles/education-4-0/

Bonk's 20 "Last" Principles of Instruction (LAST = Learning Activation System Template)
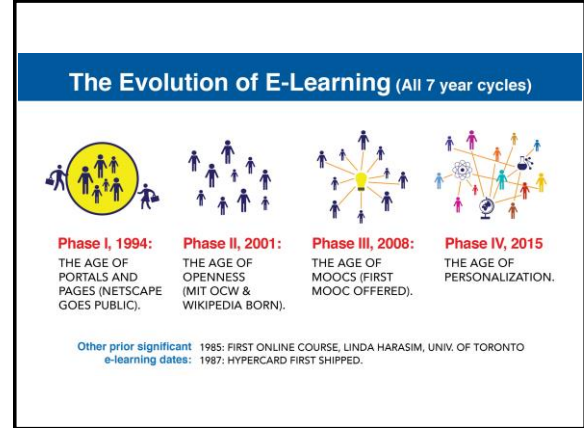http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html

Flexibility
Support and Feedback
Choice and Options
Nontraditional Learning
Convenience
Spontaneity
Passion and Inspiration
Collegiality
Organization
Relevance and Meaningfulness
Sharing
Trial and Error (i.e., it is ok to fail)
Cheerfulness and Optimism
Expanded Resources
High Expectations
Purpose and Vision
Human Connectedness   #20 ???
Empowerment and Autonomy
Cognitive Apprenticeship

Education 20/20

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20 New Roles of the Instructor

Captain
Course Ambassador
Consumer Advocate
Counselor
Curator
Change Catalyst
Conductor
Cook
Concierge
Comedian
Camping Trip Guide
Coach
Consultant
Course Expedition Leader
Collaborator
Community Organizer
Chemist
Care Giver
Cultivator
Colleague

The Evolution of E-Learning (All 7 year cycles)

Phase I, 1994:
THE AGE OF PORTALS AND PAGES (NETSCAPE GOES PUBLIC).

Phase II, 2001:
THE AGE OF OPENNESS (MIT OCW & WIKIPEDIA BORN).

Phase III, 2008:
THE AGE OF MOOCS (FIRST MOOC OFFERED).

Phase IV, 2015
THE AGE OF PERSONALIZATION.

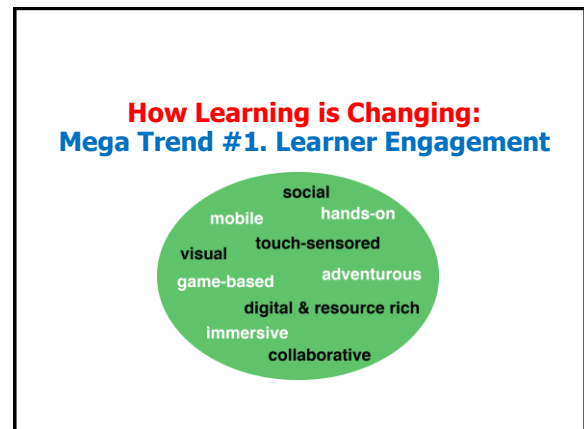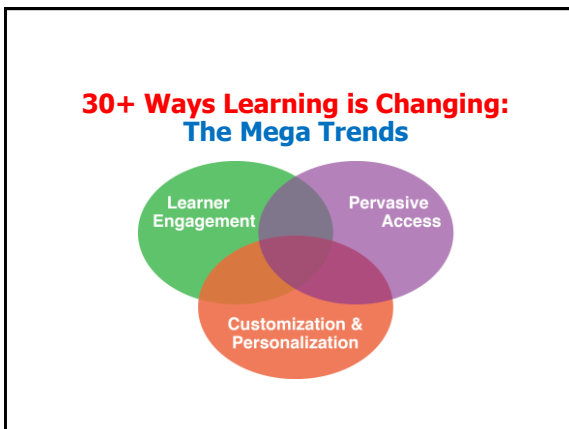Other prior significant e-learning dates: 1985: FIRST ONLINE COURSE, LINDA HARASIM, UNIV. OF TORONTO
1987: HYPERCARD FIRST SHIPPED.

September 26, 2018
Remember Education 2.0?
The rise and fall of the company behind 'Reader Rabbit' and all your favorite educational games
Abigail Cain, The Outline
https://theoutline.com/post/6293/reader-rabbit-history-the-learning-company-zoombinis-carmen-sandiego?zd=1&zi=ambuobk7
Rocky's Boots: https://www.youtube.com/watch?v=a-NLh58bIIk
Project YES (Curt Bonk): https://youtu.be/bZD5mQH4Ups

Fast Forward 30+ More Years...
"Anyone can now learn anything from anyone at any time."

30+ Ways Learning is Changing:
The Mega Trends

Learner Engagement

Pervasive Access

Customization & Personalization

How Learning is Changing:
Mega Trend #1. Learner Engagement

social
mobile   hands-on
visual   touch-sensored
game-based   adventurous
digital & resource rich
immersive
collaborative

January 3, 2018
Learning is More Mobile
CES 2018: Your guide to the biggest consumer electronics show
USA Today
https://www.usatoday.com/story/tech/news/2018/01/03/ces-2018-your-guide-biggest-consumer-electronics-show/1000779001/
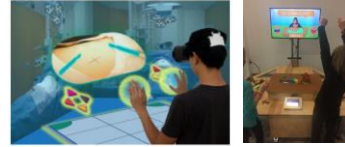

The Octopus watch from Joy, an icon-based watch for kids to have good habits is on display during CES.

May 1, 2018
Learning is More Hands-on
3 ways districts can use AR and AI
Justin Anglio, eSchool News
https://www.eschoolnews.com/2018/05/01/3-amazing-ways-our-district-is-using-ar-and-vr/

EarthShake, the first educational game for the NoRILLA system, teaches early physics principles through hands-on learning.

May 1, 2018
Learning is More Immersive
3 ways districts can use AR and AI
Justin Anglio, eSchool News
https://www.eschoolnews.com/2018/05/01/3-amazing-ways-our-district-is-using-ar-and-vr/

When a teacher glances around her classroom, Lumilo allows her to see real-time analytics (in the form of icons) floating directly above each student's head. The teacher can glance directly at a student or "click" on a student's icon to see more detailed information about where and how that student might be struggling.

July 19, 2017
Learning is More Immersive
HoloLens Assists in Live Surgery
Tommy Palladino, Next Reality
https://hololens.reality.news/news/hololens-assists-live-surgery-0178887/
Video #1: 1:09: http://curtbonk.com/hololens.html
Video #2: 1:37: http://curtbonk.com/hololens2.html
07/19/2017
HoloLens Assists in Live Surgery
Numerous examples exist of doctors and surgeons using HoloLens to plan surgeries. The device has even been used to view reference images during a procedure and stream it to a remote audience. Until recently, it has not been used to augment the surgeon's view of the patient during a live surgery.
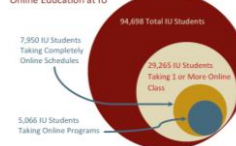Original Video: https://hololens.reality.news/news/hololens-assists-live-surgery-0178887/

How Learning is Changing:
Mega Trend #2. Pervasive Access

informal
free   global
video-based
open
synchronous   ubiquitous
direct from experts
online
immediate

November 1, 2017
Learning is More Online (Access)
Indiana University, Office of Online Education
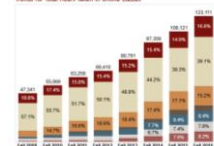
December 19, 2017
OER Adoptions on the Rise
Lindsay McKenzie, Inside Higher Ed
https://www.insidehighered.com/news/2017/12/19/more-faculty-members-are-using-oer-survey-finds
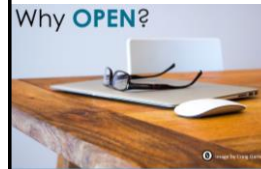

March 27, 2017 (Access)
Learning is More Free and Open
Beyond Free: Harnessing the resonant value in open
and collaborative practices for the public good
David Porter, CEO, eCampus Ontario,
Open Education Ontario Summit
https://www.slideshare.net/David_Porter
https://www.ocls.ca/events/open-education-ontario-summit

May 7, 2014 (Access)
Learning is More Global
CNA - Speaking Exchange (video chats)
https://www.youtube.com/watch?v=-S-SEfwpF0k
FCB Brazil and the CNA language school network are launching the
Speaking Exchange project, which connects CNA students in Brazil with
Americans living in retirement homes.

July 29, 2018
Learning is More Synchronous
Why Silicon Valley is teaming up with San
Quentin to train young people to code
Jessica Guynn and Megan Diskin, USA TODAY
https://www.usatoday.com/story/tech/2018/07/25/california-youth-learning-code-prison-help-san-quentin-inmates/810122002/
Video (1:46): http://curtbonk.com/san-quentin.html

January 5, 2017
Learning is More Immediate...
Move over T. rex, new dinosaur unveiled, Amanda Jackson, CNN
http://www.cnn.com/2016/01/14/living/titanosaur-new-dinosaur-on-display-new-york-irptl/
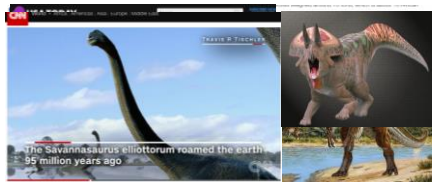
September 27, 2018
Learning is More Immediate...
Dinosaur Discoveries
New 26,000-pound dinosaur discovery
was Earth's largest land animal
Ashley Strickland, CNN
https://www.cnn.com/2018/09/27/world/new-giant-dinosaur-brontosaurus-relative/index.html

How Learning is Changing:
Mega Trend #3. Customization

massive
blended
self-directed
flipped
communal
personal
competency-based
on-demand
modifiable
modular

January 20, 2016
Learning is More Blended
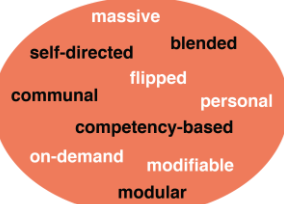**Universities tap growth of craft beer,**
offer classes, Chicago Tribune
https://www.chicagotribune.com/business/ct-college-craft-beer-offer-classes-20160120-story.html

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August 2, 2018
Learning is More On Demand (PDAs)
Hey, Alexa, Should We Bring Virtual Assistants to
Campus? These Colleges Gave Them a Shot
Lindsey Ellis, The Chronicle of Higher Education
https://www.chronicle.com/article/Hey-Alexa-Should-We-Bring/244129
24 seconds: http://curtbonk.com/jetsons24.html
44 Seconds: http://curtbonk.com/jetsons44.html

January 9, 2017
Learning is More On Demand
Jill Watson, Round Three, Georgia Tech course prepares for third semester with virtual teaching
assistants, Jason Maderer, Georgia Tech News Center
http://www.news.gatech.edu/2017/01/09/jill-watson-round-three
The Terribly Thin Conception of Ethics in Digital Technology, David Golumbia,
Uncomputing
http://www.uncomputing.org/
Bot teacher that impressed and fooled everyone, Donald Clark, Plan B
http://donaldclarkplanb.blogspot.co.uk/2016/12/bot-teacher-that-impressed-and-fooled.html

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May 20, 2016
Chapter 18: Changing the Tune:
MOOCs for Human Development? A Case Study
(agMOOCs in India)
Balaji Venkataraman and Asha Kanwar (COL)
http://www.agmoocs.in/

MOOCs are Like Library
Books...

MOOCs and Open Education Around the World
http://routledge-ny.com/books/details/9781138807419/

Talk Outline

1. MOOC Weird Stuff
2. MOOC Systematic Literature Review
3. MOOC ID Considerations and Challenges
4. MOOC ID for Self-directed Learning
5. Others

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Polls

Poll #1: Who in here has taken a MOOC?

Poll #2: Are you happy or frustrated

when you take a MOOC?

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Some Weird Things Going On...

Weirdness #1...We're Teaching the World
October, 2018
Sarah Fister Gale, CLO
https://magazine.clomedia.com/issue/october-2018/teaching-the-world/
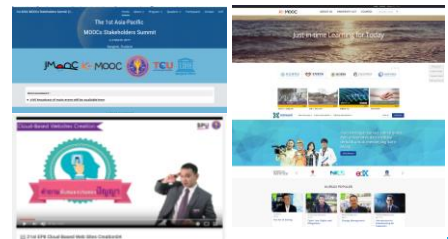https://magazine.clomedia.com/issue/october-2018/

35

Weirdness #2: Your Friends are doing MOOCs
June 15, 2017
Massive List of MOOC Providers Around The World, Class Central
JMOOC, K-MOOC, and T-MOOC?
https://www.class-central.com/report/mooc-providers-list/

36

Weirdness #3: Summer MOOC Discounts
Email inbox: June 10, 2018

https://www.edx.org/course

37

Weirdness #4: Cyber Monday Discounts
Email inbox: November 26, 2018
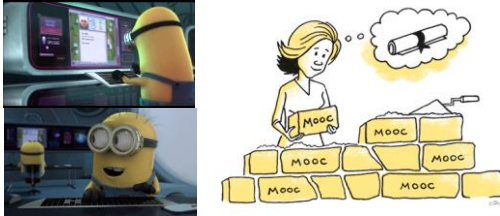## edX (Summer discounts)

https://www.edx.org/course

38

Weirdness #5…The MOOC Wave
May 21, 2018
The Second ave of MOOC Hype Is Here, and It's Online Degrees
Dhawal Shah, Class Central
https://www.edsurge.com/news/2018-05-21-the-second-wave-of-mooc-hype-is-here-and-it-s-online-degrees
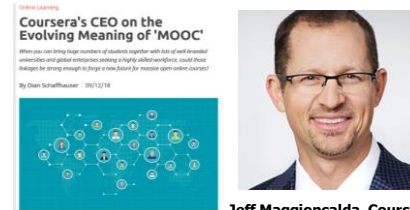

39

September 12, 2018
Coursera's CEO on the Evolving Meaning of 'MOOC'
Dian Schaffhauser, Campus Technology
https://campustechnology.com/articles/2018/09/12/courseras-ceo-on-the-evolving-meaning-of-mooc.aspx

Jeff Maggioncalda, Coursera CEO

40

October 12, 2018
Weirdness #6…Degrees Via the MOOC
EdX: From MicroMasters to Online Master's Degrees
Lindsey McKenzie, Inside Higher Ed
https://www.insidehighered.com/news/2018/10/12/edx-launches-nine-low-cost-online-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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Weirdness #7…MOOCs in Wedding Announcements
September 26, 2018
The Future of Professional Credentialing … in an Engagement Announcement
Joshua Kim, Inside Higher Ed
https://www.insidehighered.com/digital-learning/blogs/technology-and-learning/future-professional-credentialing-engagement

The future bride graduated from the University of Vermont with a bachelor's degree in anthropology and is currently pursuing a master's degree in public health. She is employed as a care navigator with Apple.

The future groom graduated from Worcester Polytechnic Institute with a bachelor's degree in mechanical engineering and is currently pursuing a master's degree in mechanical engineering. He has been accepted in the Harvard Business HBX CORe program and plans to start in November. He is currently working as a technical program manager at Apple.

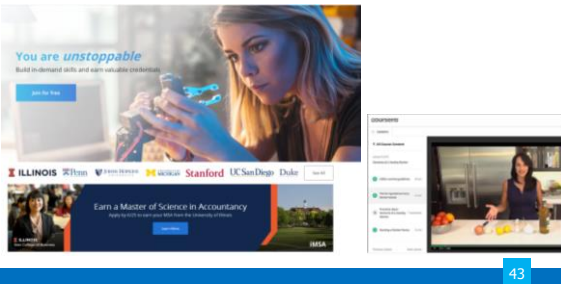*They are planning on a summer wedding in 2020.*

INSIDE HIGHER ED

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Weirdness #8...Master's of Accountancy MOOCs?
Email inbox: June 11, 2018
Coursera
https://www.coursera.org/

43

Weirdness #9...Discounted MOOC-based MBAs
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
https://www.class-central.com/report/futurelearn-coventry-university-roll-50-online-degrees/

Degree	Provider	University	Cost
MS Computer Science	Udacity	Georgia Tech	$6,600
MS Analytics	edX	Georgia Tech	$10k
MBA	Coursera	University of Illinois	$22k
MS CS Data Science	Coursera	University of Illinois	$19.2k
MS Accounting	Coursera	University of Illinois	$27.2k
Masters in Innovation and Entrepreneurship	Coursera	HEC Paris	€20k
Cyber Security (Masters)	FutureLearn	Deakin University	£24k
Development and Humanitarian Action (Masters)	FutureLearn	Deakin University	£24k
Professional Practice: Information Technology (Masters)	FutureLearn	Deakin University	£24k

44

Weirdness #10...MOOC-based Pricing Charts
December 30, 2018
MOOC-Based Degrees, Pricing Chart
IBL News
https://www.class-central.com/pricing-charts/mooc-based-degrees

45

August 12, 2016
A Life of Happiness and Fulfillment
Indian School of Business, Rajagopal Raghanathan
https://www.class-central.com/mooc/2860/coursera-a-life-of-happiness-and-fulfillment

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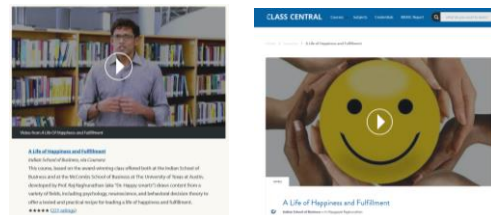
June 14, 2016 (Customization)
Chapter 15: Learning About MOOCs by Talking to Students
Charles Severance, Univ. of Michigan
Anuar Lequerica, Class Central
https://www.class-central.com/report/dr-chuck-graduate-ceremony-python-specialization/

MOOC Trends and Recent Data

Slide 49

MOOCs are not dead
August 19, 2018
Cumulative Growth in Number of MOOCs, 2011-18
Almanac 2018, Chronicle of Higher Education
https://www.chronicle.com/article/Top-5-MOOC-Providers-by-Number/244090?cid=cp216

49

Slide 50

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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Slide 51

MOOCs Stats

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

CLASS CENTRAL

101M Students   900+ Universities   11.4k Courses

By the Numbers: MOOCs in 2018

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Slide (October 12, 2018)

October 12, 2018
Microcredentials and Nanodegrees
Learning is More on Modular
edX Expands MicroMasters Programs With Data Science ("nanodegrees")
Digital Leadership and More, Sri Ravipati, Campus Technology
https://campustechnology.com/articles/2017/03/01/edx-expands-micromasters-program-with-data-science-digital-leadership-and-more.aspx
Lindsey McKenzie, Inside Higher Ed
https://www.insidehighered.com/news/2018/10/12/edx-launches-nine-low-cost-online-degrees

Slide (January 9, 2018)

January 9, 2018
MicroMaster's Degrees
Learning is More on Modular
MIT launches MITx MicroMasters in Principles of Manufacturing, MIT Open Learning
http://news.mit.edu/2018/mit-launches-new-mitx-micromasters-program-principles-manufacturing-0109

Slide (December 7, 2018)

December 7, 2018
Reinventing the College Degree: A Future with Modular Credentials
IBL News
https://iblnews.org/2018/12/07/reinventing-the-college-degree-a-future-with-modular-credentials/

Slide 1

January 20, 2016
Coursera Specializations
https://www.coursera.org/browse?utm_medium=email&utm_source=marketing&utm_campaign=aUAR4L-fEsW6i-NodUB9Qw&languages=en

coursera

Achieve Your 2016 Goals with Over 33 New Specializations

Coursera Specializations

What do you want to learn?

Coursera Removes Free Track From Some MOOCs
January 25, 2016

Coursera x 全球名校
Specializations
Master a skill with a **targeted sequence of courses**
Apply it in a **capstone project**
Earn a **Specialization Certificate**

Slide 2

October 30, 2017
MOOCs ramp up new fields
Report: 59% of employed data scientists learned skills on their own or via a MOOC
Alison DeNisco Rayome
https://www.techrepublic.com/article/report-59-of-employed-data-scientists-learned-skills-on-their-own-or-via-a-mooc/

Report: 59% of employed data scientists learned skills on their own or via a MOOC

Data scientists are in high demand and short supply, but they may not need a degree in computer science to get a job, according to a new report from Kaggle.

WHERE TECH MEETS THE ROAD

HOW TO KICKSTART A DATA SCIENCE CAREER

ALISON DENISCO
STAFF WRITER, TECHREPUBLIC

Slide 3

Khe Foon (Timothy) Hew (2018)
Hew, K. F. (2018). Unpacking the Strategies of Ten Highly Rated MOOCs: Implications for Engaging Students in Large Online Courses. *Teachers College Record, 120*(1).
https://www.coursetalk.com/

Hew's (2018, p. 1) analyzed 4,565 coursetalk review comments of 10 highly rated MOOCs. He found "six key factors that can engage online [MOOC] participants and nine reasons for participant disaffection."
1. Problem-centric learning supported by clear explanations.
2. Active learning supported by timely feedback (e.g., assignments, projects, discussion).
3. Course resources that cater to participants' learning needs or preferences.
4. Instructor attributes (e.g., passion, enthusiasm, hum of examples).
5. Peer interaction.
6. Instructor availability.

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Slide 4

Quotes: Veletsianos et al. (2015-2016)

"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)

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

"**Dependence on Particular Research Methods May Restrict our Understanding of MOOCs.**"
George Veletsianos & Peter Shepherdson's Study (2016). Systematic Analysis and Synthesis of the Empirical MOOC Literature Published in 2013-2015. *IRRODL.* http://www.irrodl.org/index.php/irrodl/article/view/2448/3655

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Slide 5
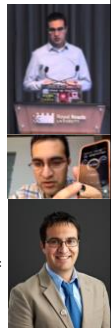
Three Studies

Study #1
• MOOC Literature Review

Study #2
• MOOC Design Considerations and Challenges

Study #3
• MOOC Design for SDL

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Slide 6

Study #1
MOOCs
Literature Review
(2014-2016)

Zhu, M., Sari, A., & Lee, M. M. (2018). A Systematic Review of Research Methods and Topics of the Empirical MOOC Literature (2014-2016). *The Internet and Higher Education, 37*, 31-39.

Research Purposes & Questions

The purpose was to gain a deeper and more diverse understanding of the current MOOC phenomenon and identify the gap in MOOC empirical studies.

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?

61

Journals of the Articles

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
12	Journal of Asynchronous Learning Network	3

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RQ1 & RQ2

MOOC research focuses and methods

	Quantitative	Qualitative	Mixed methods
Student-focused	39	9	26
Design-focused	19	12	17
Context and impact	9	6	5
Instructor-focused	0	3	2

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RQ2

Specific Focus of MOOC Research (2014-2016)

SELF-REGULATED LEARNING   CHEATING   **SOCIAL LEARNING**

MOTIVATION   ENGAGEMENT   SATISFACTION

ASSESSMENT/MEASUREMENT/EVALUATION

PROFESSIONAL DEVELOPMENT   COMMUNICATION/INTERACTION

LEARNERS' EXPERIENCE   QUALITY OF MOOC   **RETENTION AND COMPLETION/DROPOUT**

INSTRUCTIONAL/MOOC DESIGN

K-12/PRE-COLLEGE   PERFORMANCE/OUTCOME

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RQ3 Locations

Location of MOOC Research Team Members (2014-2016)

UNITED STATES
UK
SPAIN
AUSTRALIA
CANADA

CHINA
NETHERLANDS
TURKEY
TAIWAN
CHILE

DENMARK
EGYPT
GERMANY
IRELAND
PORTUGAL
SOUTH KOREA

BANGLADESH
BELGIUM
CYPRUS
ECUADOR
GREECE
FINLAND
ISRAEL
HONG KONG
MEXICO
NEW ZEALAND
SAUDI ARABIA
SOUTH AFRICA
SWEDEN
UAE

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Implications

- **A continuous expansion of methodological approaches in MOOCs research is needed.**
- **More empirical MOOC research focusing on instructors' perspective might provide more comprehensive picture of MOOC phenomenon.**
(Note: Data collection is continuing...)

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The study expanded!

Total Number of Empirical MOOC Studies Published in Different Journals from 2013-2018

Table 1
(Note: the table only includes the top nine journals in terms of the number of empirical MOOC studies)

Journals	Number of empirical studies
International Review of Research in Open and Distributed Learning	51
Computers & Education	22
British Journal of Educational Technology	15
Online Learning	12
Distance Education	11
Journal of Online Learning and Teaching	11
The Internet and Higher Education	10
Computers in Human Behavior	10
Open Learning	8

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Research Methods
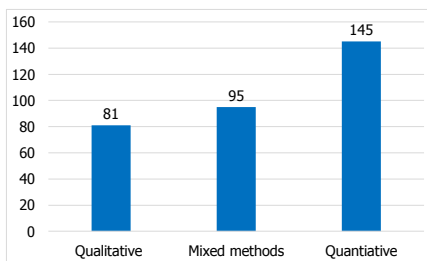
Figure 2. Research methods used in empirical MOOCs studies from 2013-2018 (N=321 studies)

Data Collection Methods
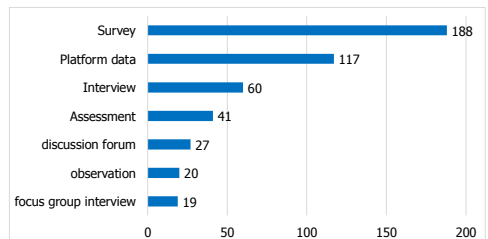
Figure 5. Data collection methods used in empirical MOOCs studies from 2013-2018 (N = 321 studies)
(Note: some studies contain more than one data collection method and this figure only includes the main data collection methods)

Study #2
MOOCs Design Considerations and Challenges

Zhu, M., Bonk, C. J., & Sari, A. (2018). Instructor experiences designing MOOCs in higher education: Pedagogical, resource, and logistical considerations and challenges. *Online Learning*, *22*(4), 203-241.

Research Background

- **MOOCs can be beneficial to both learners and instructors** (Hew & Cheung, 2014).

- **Instructional design is critical for online learning** (Johnson & Aragon, 2003; Phipps & Merisotis, 1999).

- **Instructors are one of the five main components of MOOCs** (Kop, 2011).

- **Few studies have examined instructional design from MOOC instructors' perspectives** (Margaryan et al., 2015; Watson et al., 2016).

72

Research Purpose

The purpose of this study is to provide suggestions for future MOOC instructors and instructional designers in higher education through exploring MOOC design considerations and challenges from the instructor's perspective.

73

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?**

74

Research Design

- **Sequential mixed methods design (Creswell & Clark, 2017)**

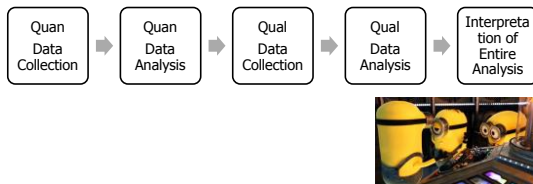Quan Data Collection → Quan Data Analysis → Qual Data Collection → Qual Data Analysis → Interpretation of Entire Analysis

75

Data Collection

- **Data Collection:**
  - ○ **Survey, interview, and course review**
- **Participants:**
  - ○ **143 survey participants (10% response rate)**
  - ○ **12 interviewees**

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12 Interviewees

No.	Countries	Subject areas	Platforms
1.	The U.S.	Language and Literacy	Coursera
2.	The U.S.	Education	Coursera
3.	The U.S.	Education	Canvas
4.	The U.S.	Chemistry	Coursera
5.	UK	Medicine and Health	FutureLearn
6.	UK	Language and Literacy	FutureLearn
7.	Hong Kong (China)	Math	Coursera
8.	Mainland China	Math	Coursera
9.	Canada	Psychology	Coursera
10.	Australia	Medicine and Health	Open2Study
11.	Sweden	Computer Science	edX
12.	India	Management	edX

77

Data Analysis

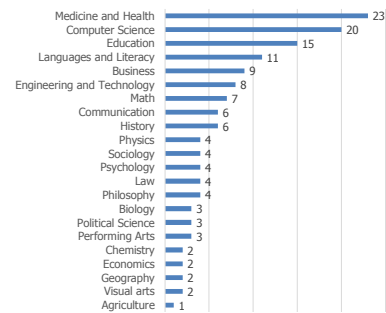| RQs	Data Sources	Data analysis
RQ1	Survey-multiple-choice questions	Descriptive statistics
	Survey-open-ended questions	Content analysis (Elo & Kyngäs, 2008)
	Interview	Content analysis
	MOOC review	Content analysis
RQ2	Survey-multiple-choice questions	Descriptive statistics
	Survey-open-ended questions	Content analysis
	Interview	Content analysis
RQ3	Survey-multiple-choice questions	Descriptive statistics
	Interview	Content analysis

78

Research Context

The Number of MOOCs the Instructor has Designed
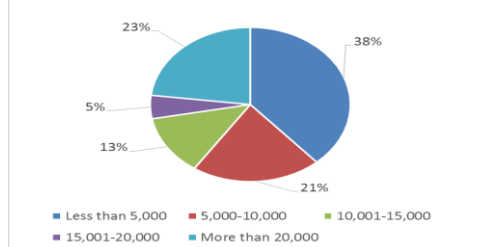

79

Research Context

MOOC Subject Areas

Subject	Count
Medicine and Health	23
Computer Science	20
Education	15
Languages and Literacy	11
Business	9
Engineering and Technology	8
Math	7
Communication	6
History	6
Physics	4
Sociology	4
Psychology	4
Law	4
Philosophy	4
Biology	3
Political Science	3
Performing Arts	3
Chemistry	2
Economics	2
Geography	2
Visual arts	2
Agriculture	1
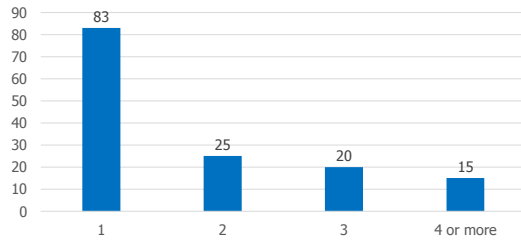
80

Research Context

The Number of Learners Enrolled in Recent MOOC

- Less than 5,000 — 38%
- 5,000-10,000 — 21%
- 10,001-15,000 — 13%
- 15,001-20,000 — 5%
- More than 20,000 — 23%

81

Findings RQ1

RQ #1. What are the design considerations of instructors when designing MOOCs?

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

An example of learning objectives:

82

RQ1 Survey Results

MOOC Design Considerations

Consideration	Count
Objectives of the course	104
Assessment activities (e.g., peer review, quiz)	92
Duration of the course	84
Time for designing this MOOC	71
Platform of offering this MOOC	69
Pedagogical approaches	67
Learning contents that will be delivered	66
Instructors' role	66
Support from institution	65
Flexibility	60
Support from the platform	54
Collaborative learning support	53
Available existing intellectual resources (e.g., OERs, videos)	46
Hardware resources (e.g., recording studios, cameras)	44
Target learners' self-directed learning ability	44
Cultural sensitivity	41
Learning theory	41
Software resources (e.g., video editing software)	34
Source of motivation	31
Tools for communication (e.g., Facebook, Twitter, blog,...)	27

83

RQ1 Interview Results

Engage learners

One instructor from US mentioned:

"I engaged people in the forum. So **each week I would write a message that would be the new welcome page for the week** that would say, 'hey come to the forum and ask questions about this or come to the forum introduce yourself'... Of course, I tried to get students to feel like **I was engaged with them during the videos by asking them questions** and telling them to do things during the video."

84

14

Findings RQ2

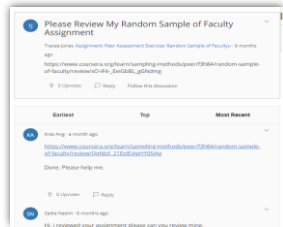**RQ #2. What challenges do instructors perceive when designing MOOCs?**

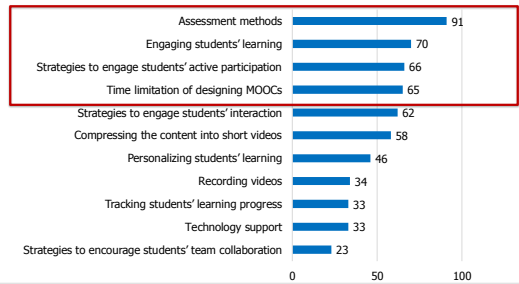- Assessment methods
- Engaging students' learning
- Time limitation

(Note: Above is an example of peer-assessment.)

85

RQ2 Survey Results

Design challenges faced by the MOOC instructors

Challenge	Value
Assessment methods	91
Engaging students' learning	70
Strategies to engage students' active participation	66
Time limitation of designing MOOCs	65
Strategies to engage students' interaction	62
Compressing the content into short videos	58
Personalizing students' learning	46
Recording videos	34
Tracking students' learning progress	33
Technology support	33
Strategies to encourage students' team collaboration	23

86

RQ2 Interview Results

Time limitation

One instructor from education subject mentioned:

"I think one of the challenges is time. It does take a lot of time to get the videos done. **I did not get a course release when I was doing, and it was a side project at the same time as my regular load.**"

87

Findings RQ3

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
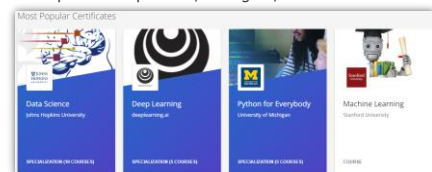
88

RQ3 Survey Results

Ways to Address Challenges

Way	Value
Browsing other MOOCs for ideas, examples, and benchmarks	89
Seeking help from the platform	81
Seeking help from colleagues	71
Seeking help from institution (e.g., administrator)	67
Seeking help from other MOOCs instructors	51
Reading books or articles related to MOOCs	49
Seeking help through online searching	43
Attending training sessions or workshops	41
Reading news related to MOOCs	34
Attending conferences or other professional events on MOOCs	28

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RQ3 Interview Results

Explore other MOOC examples

One MOOC instructor from the US mentioned:

"**When I started making the MOOC, I could see MOOCs that other people had made.** So I could see what other people did in terms of having videos with questions embedded in the videos, which I really liked."

90

15

Discussion

- The **time limitation** of creating MOOCs was the primary logistical consideration (Hew & Chung, 2014; Watson et al., 2016) and challenges.
- The **pedagogical factors** were the primary design considerations (Watson et al., 2016) and challenges in MOOC design.
- The **assessment and engagement strategies** are the main considerations as well as challenges.

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Implications

- **For MOOC instructors**
  - o 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**
  - o Guide attention to ID in the areas that MOOC instructors might need them to help in consultation.
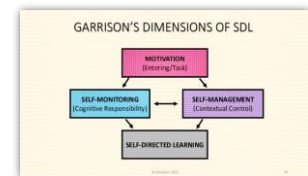
92

Study #3
MOOCs Instructional Design to Facilitate Participants' Self-directed Learning

(Dissertation)

Key Terms

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

(1) self-management

(2) self-monitoring

(3) motivation

GARRISON'S DIMENSIONS OF SDL

MOTIVATION
(Entering/Task)

SELF-MONITORING
(Cognitive Responsibility)

SELF-MANAGEMENT
(Contextual Control)

SELF-DIRECTED LEARNING

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Research Background

- **Learners need self-directed learning skills and strategies to be successful in MOOCs** (Halawa, Greene, & Mitchell, 2014; Littlejohn & Milligan, 2016), as there is a lack of personalized interaction with teachers.
- **Self-directness of a learner might vary in different learning environments which means that the learners could be more self-directed in one learning environment than another** (Hiemstra, 1994).

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Research Background

- **Instructional design can greatly influence students' interaction and engagement** (Garrison & Cleveland-Innes, 2005) **and success in online learning** (Song, Singleton, Hill, & Koh, 2004; Swan, 2001).
- However, few studies have examined instructional design and the delivery of instruction using MOOCs from instructor perspectives (Margaryan et al., 2015; Watson et al., 2016); **especially lacking is research on instructors' perception of SDL and how they design MOOCs to facilitate students' SDL.**

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Research Purpose

- **The purpose is to inform instructors or instructional designers and MOOC providers of the current practices of designing MOOCs to facilitate learners' SDL.**
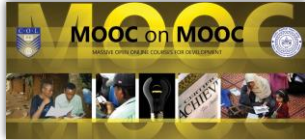
97

Research Questions

1. **How do MOOC instructors perceive participant SDL skills?**
2. **How do MOOC instructors perceive their facilitation of participant SDL skills?**
3. **How do instructors design and deliver MOOCs to facilitate participant SDL skills?**
   a. How is technology being used by MOOC instructors to support the development of participant SDL skills?
   b. What technology features or functions do MOOC instructors want to have to improve their facilitation of MOOC participant SDL skills?

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Research Design

Explanatory sequential mixed methods design

(Creswell & Clark, 2017)
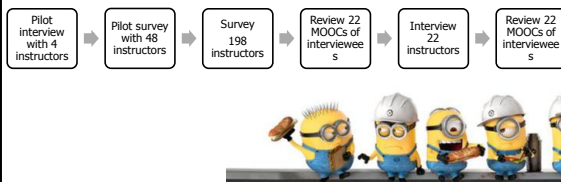
Pilot interview with 4 instructors → Pilot survey with 48 instructors → Survey 198 instructors → Review 22 MOOCs of interviewees → Interview 22 instructors → Review 22 MOOCs of interviewees

99

Data Collections

Survey:
- Volunteer sampling (Creswell & Clark, 2017)
- 198 instructors responded to the survey (10% response rate)

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

MOOC review:
- Reviewed 22 interviewees' MOOCs

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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
Dylan	Israel	Science	Coursera	M	5 or more	3	I without T

Data Analysis

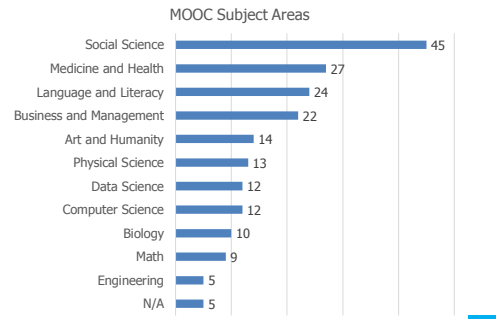| RQs	Data Sources	Data analysis	Tools
RQ1	Survey	Descriptive statistics	SPSS
	Interview	Content analysis (Elo & Kyngäs, 2008)	NVivo
RQ2	Survey	Descriptive statistics	SPSS
	Interview	Content analysis	NVivo
RQ3	Interview	Content analysis	NVivo
	Course review	Content analysis	NVivo

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Trustworthiness

1. **Validity survey:** Experts review, think-aloud interview, and pilot test (EFA)
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
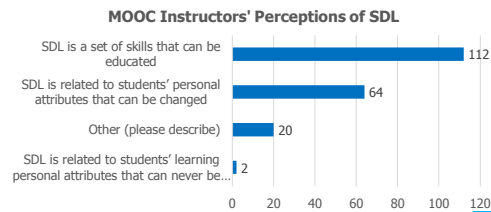
103

Research Context

MOOC Subject Areas

Subject	Value
Social Science	45
Medicine and Health	27
Language and Literacy	24
Business and Management	22
Art and Humanity	14
Physical Science	13
Data Science	12
Computer Science	12
Biology	10
Math	9
Engineering	5
N/A	5

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RQ1 Perceptions of SDL

- A majority of the MOOC instructors thought that these skills or attributes are not static, and that SDL as a set of skills can be educated or students' personal attributes that can be changed.

MOOC Instructors' Perceptions of SDL

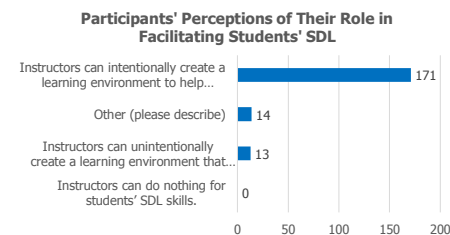|	Value
SDL is a set of skills that can be educated	112
SDL is related to students' personal attributes that can be changed	64
Other (please describe)	20
SDL is related to students' learning personal attributes that can never be…	2

105

RQ1 Interview Results

- Emma's understanding of SDL is more related to self-management and motivation. She said:

  When I think about self-directed learning, I think about students **managing their time and managing the coursework on their own, and how it fits into their schedules and their lives, how they interact with materials**, what's going to keep them engaged.

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RQ2 Perceptions of Facilitation of SDL

- Most of MOOC instructors thought that they can intentionally or unintentionally facilitate students' SDL.

Participants' Perceptions of Their Role in Facilitating Students' SDL

	Value
Instructors can intentionally create a learning environment to help…	171
Other (please describe)	14
Instructors can unintentionally create a learning environment that…	13
Instructors can do nothing for students' SDL skills.	0

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RQ2 Interview Results

- **Ashely emphasized the importance of both instructors' facilitation and students' SDL skills. She said:**

  The participant has a lot of flexibility on how they approach the content. I mean, obviously, we have things like assignments. We have things like online forums. And there're ways that we scaffold the learning experience. But there still is a lot of choice for the learner.

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RQ3 Strategies to Facilitate SDL

- **Students' intrinsic motivation plays an important role. However, extrinsic motivation provided by the MOOCs might help transfer extrinsic motivation to intrinsic motivation.**

Motivations	Strategies
Entering motivation	MOOC instructors helped students **identify the needs and goals of learning** and sense of achievement.
Task motivation	MOOC instructors motivated students through instruction, learning materials, feedback, and learning community.

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RQ3 Learning Community

Putting yourself on the map (External resource)

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RQ3 Strategies to Facilitate SDL

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

Self-monitor		Strategies
Internal feedback	Cognition	MOOC instructors provided quizzes for self-assessment, tutorial on technology use, learning advice, navigation of the course, progress indicators, resources, 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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RQ3 Self-assessment

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RQ3 Progress Indicators
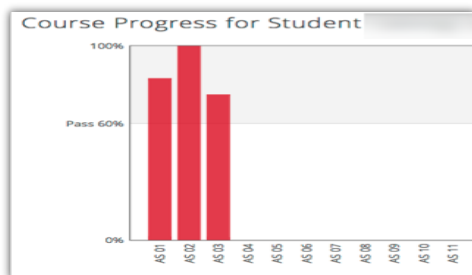
113

## RQ3 External Feedback-Peer-assessment

114

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RQ3 Strategies to Facilitate SDL

- **They helped students' self-management concerning setting learning goals, time management, resources and support management although among the three elements of SDL, MOOC instructors had less control over students' management.**

Self-management	Strategies
Enactment of learning goals	Providing discussion questions, reflections, survey, and appreciation students' learning goals.
Time management	Providing time frame, progress indicator, short learning units, and flexible timeline.
Management of resources and support	Providing flexible learning resources, peer-assessment, accessibilities, clear expectations, and short learning units.

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RQ3 Time Management
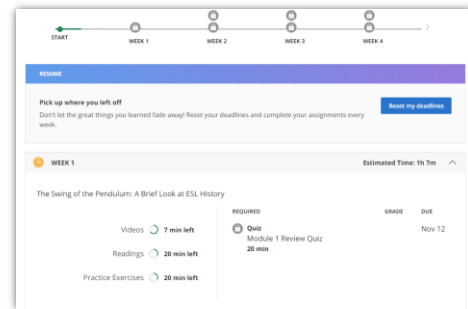
116

RQ3-a Tech Use for SDL

- Synchronous communication technologies
  - o Google Hangouts   YouTube Live

- Asynchronous communication technologies
  - o Discussion forum   Blog   Slackbot   Flickr

- Multimedia (e.g., video and graphics)
- Feedback technologies

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RQ3-b Tech Expectations for SDL

- **Adaptive learning systems**
- **Artificial intelligent systems**
- **Learning analytics**
- Interactive technologies
  - o Interaction between learners and content
  - o Interaction among learners and other participants
- Tools embedded in platforms

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Discussion

- **SDL can be Changed**
- **MOOC Instructors can Facilitate SDL**
- **Strategies to Facilitate SDL**: A variety of strategies can be used to facilitate student SDL skills in terms of motivation, self-monitor, and self-management.
- **Tech for SDL:** Tech plays an important role in facilitating SDL skills.
- **Tech expectations:** Adaptive learning systems, artificial intelligent systems, and learning analytics were expected to have to support SDL.

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Implications

- **For MOOC instructors and Instructional Designers**
  - o Build learning community
  - o Inspire intrinsic motivation
  - o Personalize learning
- **For MOOC providers**
  - o Create a personalized learning environment
  - o Provide learning analytics to support learning and teaching

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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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Other Related MOOC Studies

4. Sari, A. R., Bonk, C. J., & **Zhu, M**. (in revision). MOOC Instructor Designs and Challenges: What can be Learned from Existing MOOCs in Indonesia and Malaysia? *Asia Pacific Education Review.*

5. **Zhu, M.**, Bonk, C. J., & Sari, A. (in review). MOOC Instructor Motivations, Innovations, and Designs: Surveys, Interviews, and Course Reviews. *Canadian Journal of Learning & Tech.*

6. Doo, M., Tang, Y., Bonk, C. J., & **Zhu, M**. (in review). A Mixed Methods Look at Motivation and Career Development of MOOC Instructors. *Australasian Journal of Educ. Technology.*

7. Bonk, C. J., Sabir, N., Sari, A., **Zhu, M**., Xu., S., & Kim, M. (in preparation). MOOC instructors' efforts to address learner diversity in design and implementation.

8. **Zhu, M.**, Sari, A. R., & Bonk, C. J. (in preparation). Systematic review of MOOC research from 2012-2019. (Intended for special issue of ETR&D)

9. Doo, M., **Zhu, M.**, Bonk, C. J., & Tang, Y. (data collect). MOOC instructor engagement.

10. **Zhu, M.**, & Bonk, C. J. (data collect). MOOC Student Perceptions of Effective SDL Strats.

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Tired of MOOCs…?

Do we have time for another study?

Other Related MOOC Studies

International Review of Research in Open and Distributed Learning
Volume 19, Number 4

September – 2018

Pushing Toward a More Personalized MOOC: Exploring Instructor Selected Activities, Resources, and Technologies for MOOC Design and Implementation

Curtis J. Bonk[1], Meina Zhu[1], Minkyoung Kim[2], Shuya Xu[1], Najia Sabir[1], and Annisa R. Sari[1,3]
[1]Indiana University, USA, [2]University of West Florida, USA, [3]Yogyakarta State University, Indonesia

Abstract

This study explores the activities, tools, and resources that instructors of massive open online courses (MOOCs) use to improve the personalization of their MOOCs. Following email interviews with 25 MOOC

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Figure 1. **MOOC instructor departmental or primary discipline affiliations (n=150)**

MOOC subject area

Subject	Value
Medical and health	26
Education	22
Social science	18
Business	14
Computer science	14
Natural science	12
Climate science	7
Language	7
Data science	7
Art	6
Engineering	5
Math	4
History	4
Astronomy	2
Philosophy	2
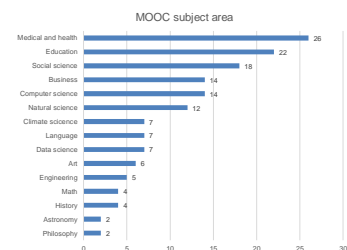
126

Figure 3 and 4. Effort placed on meeting unique learner needs when designing and delivering most recent MOOC
(Note: on a scale of 1 (low) to 10 (high) (n=144))

Meeting unique learner needs during MOOC "design" phase

Low (1-3)	Medium (4-7)	High (8-10)
48	46	50

Meeting unique learner needs during MOOC "delivery" phase

Low (1-3)	Medium (4-7)	High (8-10)
42	61	41
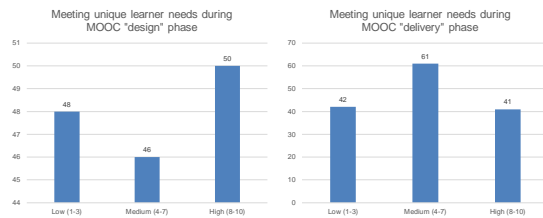
127

Figure 6. Number of MOOCs that offer different types of learning system automation and adaptation (n=127)

Types of learning automation employed in MOOCs

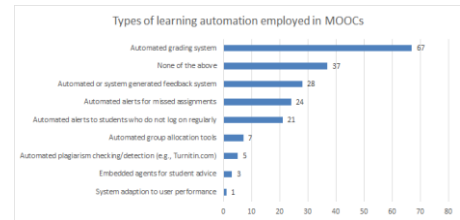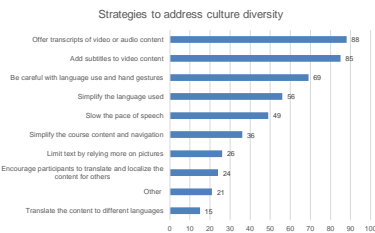|	
Automated grading system	67
None of the above	37
Automated or system generated feedback system	28
Automated alerts for missed assignments	24
Automated alerts to students who do not log on regularly	21
Automated group allocation tools	7
Automated plagiarism checking/detection (e.g., Turnitin.com)	5
Embedded agents for student advice	3
System adaption to user performance	1

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Figure 9: MOOC instructors (n=133) instructional practices to address cultural diversity

Strategies to address culture diversity

Offer transcripts of video or audio content	88
Add subtitles to video content	85
Be careful with language use and hand gestures	69
Simplify the language used	56
Slow the pace of speech	49
Simplify the course content and navigation	36
Limit text by relying more on pictures	26
Encourage participants to translate and localize the content for others	24
Other	21
Translate the content to different languages	15

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Table 1. Instructional Practices of MOOC Instructors to Address the Variety of Student Competencies and Needs (n=142)

Table 1

Instructional practices of MOOC instructors to address the variety of student competencies and needs (N=142)

Items	Response percent	Response count
Establish learner-based discussion forums	81.0%	115
Embed supplementary course materials	78.2%	111
Post timely course announcements and emails	63.4%	90
Record video tutorials or walkthroughs	40.8%	58
Emphasize project-based learning over exams	34.5%	49
Using preexisting online videos (e.g., Lynda.com, TED talks, YouTube, etc.)	32.4%	46
Other	26.1%	37
Hold synchronous lectures, meetings, and events (e.g., Skype, Google Hangouts, Zoom, etc.)	23.9%	34
Establish study groups	19.0%	27
Establish learner reflection journals or blogs	16.2%	23
Schedule virtual office hours and meetings	14.1%	20
Offer face-to-face meet-up opportunities	7.0%	10

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Table 2: Items instructors provided in their most recent MOOC (n = 126)

Items the current MOOC covered	Percent	Count
Optional readings, videos, or other materials	74.6%	94
Learner selected incentives (e.g., certificates, badges, course credit, etc., options)	64.29%	81
Options with course tasks and assignments	38.10%	48
Learner discussion and negotiation of content	36.51%	46
Two or more media elements to learn the same content	31.75%	40
Learner determined or contributed content	30.16%	38
Learner selected learning pathways (i.e., different routes to learn the same content)	19.05%	24
Learner portfolios of course accomplishments	16.67%	21
Choice in team or collaborative partners (i.e., self-formed teams)	12.70%	16

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Discussion, Significance, and Conclusion

30+ Ways Learning is Changing:
Recapping the Three Mega Trends:
Engagement, Access, and Customization

Any Questions?
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Slides and Proceedings Paper at TrainingShare.com:
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