Assignment A2:CS6460

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RESEARCH LOG

BACKGROUND

My objective is to explore pedagogy and contents in online learning that supports 21st century skills (critical thinking, problem solving, teamwork etc). The audience is a suburban population (students enrolled in my own school) in North India where literacy rate is very low. Finding and retaining qualified teachers seems to be more difficult. So I thought of online content delivery as an alternative by providing adequate infrastructure.

Last week I explored lots of research papers and found that researchers agreed to use technology (multimedia) in course content. Use of multimedia helps in deep conceptual understanding of the subject especially in STEM (my interest domain).

This week I was more focused on finding pedagogy and e-learning tools that support a successful online course delivery. Through studies, I came to know some tools that have been successful and a broader approach to pedagogy in online teaching that align with inquiry driven, project based and constructivist approaches.

PAPER1

Bibliographic Information

Jill Bryant, Alisa J. Bates (2015): creating a constructivist online instructional environment. Tech-Trends 59, 17-22 (2015).

https://link.springer.com/article/10.1007/s11528-015-0834-1#cite

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

This paper describes the process which was taken to implement a community-focused, constructivist, on-campus pedagogy to online format. Grounded in social constructivism, several online tools (for example, google docs etc) and instructional methods were used to finalize the course. It explores the potential of online tools and instruction methods.

Main Takeaways

Effective learning is social, means, relationships between students and teachers during classroom activities and discussions. Healthy feedback from teachers makes a huge difference in student's learning outcomes. To make it social, various online tools and platforms were used (like podcasting for student dialogue, Google Docs for shared writing and real time feedback etc). Approach was quite successful in delivering the objective.

PAPER2

Bibliographic Information

Steele, John; Holbeck, Rick; Jean (2019): Defining effective online pedagogy. Journal of Instructional Research, v8 n2 p5-8 2019.

https://link.springer.com/article/10.1007/s11528-015-0834-1#citeas

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

Author tried to outline the best pedagogical approach to online learning (assuming that learning is a social construct) and put heavy emphasis on the teacher's presence. However, they found it complex in comparison to classroom pedagogy as it is difficult to offer personal feedback (based on grade level, subject contents etc.).

Main Takeaways

Defining best pedagogy is quite difficult in online teaching given lots of variables of interest at different grade levels. For example, if we consider undergraduate, graduate and PHD level courses, then multiple choice short answers could be an option for undergraduates but it may not fit with PHD students, they need an essay form of explanation on any topic with logic.

PAPER3

Bibliographic Information

Wiest, Lynda. (2012). Effective Online Instruction in Higher Education. Quarterly Review of Distance Education. 13. 11-14.

https://link.springer.com/article/10.1007/s11528-015-0834-1#citeas

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

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PAPER4

Bibliographic Information

Alison S. Lockman, Barbara R. Schirmer (2020): online instruction in higher education: promising, research-based, and evidence-based practices. Journal of Education and e-Learning Research. Vol. 7, No. 2, 130-152, 2020.

https://eric.ed.gov/?id=EJ1258655

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

This paper is a summarized view of research in effective instructional practices from 2013-19. Research has been kept around undergraduate and graduate students. It is a collection of qualitative, and mixed method experimental research of 104 studies. It is found that towards the learning outcome, offline and online mode depends on common factors (like multiple forms of learning resources), except the user friendliness in case of e-learning tools.

Main Takeaways

Learning resources to address different student learning needs, high instructor presence, quality of faculty-student interaction, academic support outside class, promotion of classroom cohesion and trust are key factors for successful learning.

PAPER5

Bibliographic Information

Duncan, H. E., & Young, S. (2009). Online pedagogy and practice: Challenges and strategies. The Researcher, 22(1), 17-32.

https://eric.ed.gov/?id=EJ1258655

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

Teachers describe forging instructor/student and student/student connection as a great challenge in online learning along with student engagement. They relied on a constructivist framework to overcome these challenges.

Main Takeaways

Now reading so many articles, it is quite evident that different forms of pedagogy (video/audio, document sharing tools etc) are a solid foundation to overcome above mentioned challenges. Same has been used by teachers to foster healthy discussion and engagement among students.

PAPER6

Bibliographic Information

T.J. Kennedy, M.R.L. Odell (2014): Engaging Students in STEM Education: Science Education International Vol. 25, Issue 3, 2014, 246-258

https://eric.ed.gov/?id=EJ1044508#:~:text=Engaging%20students%20in%20high%20quality,and%20the%20engineering%20design%20process.

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

Author suggests that the success of online learning platforms depends on what students get to learn. To fulfill that criterion from a teacher's perspective, the author offers 3 pedagogical approaches based on his experience over 30 years of teaching.

Main Takeaways

To deliver effective online instruction, three pedagogical approaches have been put forward: 1) let students do most of the work. 2) interactivity is the heart and soul of effective asynchronous learning. 3) strive for presence.

PAPER7

Bibliographic Information

Enid Acosta (2015): Enhancing the online class: Effective use of synchronous interactive online instruction. Journal of Instructional Pedagogies. Volume 17, November 2015

https://files.eric.ed.gov/fulltext/EJ1102879.pdf

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

We are used to using PPT (slide presentation), written lectures and essays in the traditional form of classroom, till date we don't have the same freedom to express our content in online format. This paper proposes methods of presenting content through use of interactive online platforms.

Main Takeaways

As I have mentioned the value of including multimedia in online format. Similar statement has been made by the author and supported the use of video/audio and graphics in place of long text.

PAPER8

Bibliographic Information

Denis P Rudd (2014): the value of video in online instruction. Journal of instructional pedagogy. https://files.eric.ed.gov/fulltext/EJ1060143.pdf

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

Using some experiment and past research, the author tried to show how course content delivered in video format impacts the learning outcome and what it requires from the teacher's end.

Main Takeaways

Better collaboration among students and teachers, increased awareness and knowledge of technology, application of instructional objectives to job specific skills were acknowledged.

PAPER9

Bibliographic Information

Hadidi, Rassule and Sung, Chung-Hsien, "Pedagogy of Online Instruction - Can it Be as Good as Face-to-Face?" (2000). AMCIS 2000 Proceedings. 288. http://aisel.aisnet.org/amcis2000/288

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

This study does not specifically talk about improvement in performance, instead it advocates that we can achieve the same level of rigor in online courses at graduate level as in offline if we satisfy a few criteria.

Main Takeaways

Study shows that courseware that contained outlines, cases, links to various sites, self-grading online quizzes, audio files, video files and conference tools achieved the same response as off-line courses.

PAPER10

Bibliographic Information

Rebecca Chiyoko. Fostering valuable learning experiences by transforming current teaching practices: practical pedagogical approaches from online practitioners (2020). https://www.emerald.com/insight/2398-5348.htm

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

This article discusses three principles and practical advice to transform current pedagogical practices into effective online teaching.

Main Takeaways

Focus has been given to peer discussion, immediate feedback and active collaboration among students while doing activities. We should have a support system which offers these characteristics.

PAPER11

Bibliographic Information

Lay CD, Allman B, Cutri RM and Kimmons R (2020) Examining a Decade of Research in Online Teacher Professional Development. Front. Educ. 5:573129. doi: 10.3389/feduc.2020.573129

https://www.frontiersin.org/articles/10.3389/feduc.2020.573129/full

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

This study explores the theme of online teacher professional development programs in the past decade. How was it? How is it in current form? And where it may go?

Main Takeaways

Author has not concluded on this topic, instead demanding for more rigorous research keeping two main agenda in mind: 1) integration of exponential growth of technology in development programs 2) focus on the local context.

PAPER12

Bibliographic Information

Annis Lee Adams (2020) Online Teaching Resources, Public Services Quarterly, 16:3, 172-178, DOI: 10.1080/15228959.2020.1778598.

https://www.tandfonline.com/doi/abs/10.1080/15228959.2020.1778598

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

This study explores different websites and e-learning tools that may help teachers in designing and delivering online classes.

Main Takeaways

In the paper, various suggestions about websites and external libraries have been made, which may help educators and students to get interesting learning materials (like Socrative.com, padlet.com, thinglink.com etc).

PAPER13

Bibliographic Information

Rohit Mehta, Earl Aguilera. A critical approach to humanizing pedagogies in online teaching and learning (2020). The International Journal of Information and Learning Technology Vol. 37 No. 3, 2020 pp. 109-120.

https://www.emerald.com/insight/2056-4880.htm

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

This study talks about approaches to humanize the online pedagogy, in other words, how to make it more inclusive?

Main Takeaways

Author has taken a critical instance on universal design of learning (UDL), according to them, it does not fit with inclusive learning when taken in the context of online learning. They call for more research to make it humanistic. However, do not offer any guidance.

PAPER14

Bibliographic Information

Mishelle Taylor, Suzanne Perumean. The Benefits of Online Teaching for Traditional Classroom Pedagogy: A Case Study for Improving Face-to-Face Instruction (2011). MERLOT Journal of Online Learning and Teaching. Vol. 7, No. 3, September 2011. https://jolt.merlot.org/vol7no3/stone_0911.pdf

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

Using an online statistics course, this study explores how we can apply online pedagogy to traditional classrooms and what are the benefits in doing so.

Main Takeaways

Following points summarized the lessons learned from the online statistics course: 1) improved understanding about what materials are needed to improve student's learning. 2) Improved ability to organize and deliver course material logically and consistently. 3) Improved willingness to seek out and complete training on how to teach in the traditional classroom. 4) Improved ability to create multiple strategies for the submission of student work and clarification of misunderstandings.

PAPER15

Bibliographic Information

Benjamin, Gleason; Stefania, Manca (2019). Curriculum and instruction: pedagogical approaches to teaching and learning with Twitter in higher education. VOL. 28 NO. 1 2020, pp. 1-8, © Emerald Publishing Limited, ISSN 1074-8121.
https://www.researchgate.net/publication/335039268_Curriculum_and_instruction_pedagogical_approaches_to_teaching_and_learning_with_Twitter_in_higher_education

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

Author uses his experience in teaching college students using social media like twitter and shares experience as to how we can engage students at mass level using such media.

Main Takeaways

This study was quite interesting to me personally, if we can use twitter for course delivery, it will make a tremendous difference in literacy at mass level. Study found twitter increased student participation, helped facilitate conceptual understanding, and increased interaction with real world experts.

PAPER16

Bibliographic Information

María Jesús Rodríguez-Triana , Luis P. Prieto, Tobias Ley, Ton de Jong, Denis Gillet. Social practices in teacher knowledge creation and innovation adoption: a large-scale study in an online instructional design community for inquiry learning. International Journal of Computer-Supported Collaborative Learning (2020) 15:445–467. https://link.springer.com/article/10.1007/s11412-020-09331-5

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

According to the author, social practices (interaction with peers and experts while solving real world problems, as per current trend it is also called inquiry based learning) play an important role in new knowledge creation. To utilize this concept, knowledge appropriation models have been developed that will help in connecting social practices to new knowledge model development.

Main Takeaways

It has been found that inquiry-based learning supports new knowledge creation. However, It has been found that inquiry-based learning definitely supports new knowledge creation. However, this study says that it is difficult to quantify or measure the impact of new knowledge. Knowledge application model requires more refinement to help in this regard.

PAPER17

Bibliographic Information

Breanna N. Harris | Pumtiwitt C. McCarthy | April M. Wright | Heidi Schutz | Kate S. Boersma | Stephanie L. Shepherd | Lathiena A. Manning| Jessica L. Malisch | Roni M. Ellington. From panic to pedagogy: Using online active learning to promote inclusive instruction in ecology and evolutionary biology courses and beyond. https://pubmed.ncbi.nlm.nih.gov/33250996/

Source (Google Scholar etc)

Google Scholar

Brief Original Summary

This paper suggests broadly applicable strategies and techniques that weave together active and inclusive teaching practices especially in STEM (biology) for online teaching.

Main Takeaways

Main strategies have been categorized in following domains: 1) active learning 2) scientific teaching 3) backward design 4) inclusive teaching. 5) universal design for learning. 6) trauma informed pedagogy. Combinedly, it may open a path to an inclusive learning platform.

SYNTHESIS

Research in pedagogy suggests that learning happens as a social construct (Bryant et al., 2015; Steele et al., 2019), which means discussion, sharing of information, and collaboration plays a key role in active and successful learning. Since such activities are well supported by technologies, technology has been given preferences in an effective online pedagogy (Steele et al, 2019). Further research suggests that even online pedagogy can be made more inclusive (catering to different needs of students) and active (Harris et al., 2020). To make it inclusive, the author suggests the use of Universal Design Of Learning framework as a base. Framework also helps in designing culturally responsive, trauma informed pedagogy, participants interaction is the key. Few studies suggest that developing an online community of professionals is of utmost necessity in order to create new knowledge about online pedagogy moving forward (Triana et al, 2020).

In parallel to online pedagogy, there is lots of research about content delivery in online instruction and most of the studies supported the use of multimedia (audio/video content) and documents sharing softwares (Benjamin et al., 2019; Rebecca 2020; Hadidi et al., 2000). Technology that supports multiple pedagogies,

learning resources to address different student learning needs, high instructor presence, quality of student faculty interaction, and academic support outside of class have been given high importance.

Based on past practices, few studies are targeted to use of specific tools and websites (Bryant et al., 2015; Annis 2020). Such online platforms (like twitter, socrative.com, etc) and tools (google docs) are well equipped to facilitate practices (like immediate feedback, synchronous interactions etc) that are of high importance in successful online instruction.

So the use of technology in online instruction is integral to successful online instruction given an informed pedagogy that suits to such environments.

There are still some open questions like:

1) Which e-learning tool satisfies what degree of learning (percentage weight) on various learning parameters (like creativity, critical thinking, communication/presentation etc) when integrated with a STEM subject?

2) How will technology facilitate teachers' presence whenever students demand?

REFLECTION

As discussed in the first assignment, the use of technology enhances student's learning (mentioned in so much research). So, this week my complete focus was on pedagogical approach towards online content delivery. I found research that especially talks about what kind of pedagogy to be used in e-learning. However, we have relatively less evidence-based study that talks about the impact of used technology and associated pedagogy. Looking at required 21st century skills (critical thinking, creativity, teamwork, problem solving etc), I look forward to exploring technologies that were used in STEM subjects and made significant improvement on those parameters. Is current use of multimedia sufficient to

infuse these qualities into students or we need further changes in pedagogy that fits with technological advancement.

PLANNING

From this week reading, in terms of pedagogy for e-learning platform I can summarize my understanding in following points:

1) Teachers' presence on online platforms is important.

2) Peer discussion and student-teacher interaction facilitate knowledge creation.

3) Use of multimedia helps in deep conceptual understanding.

Moving forward, I would like to explore more on 21ts century skills (as mentioned above) while teaching STEM subjects and how much impact do the current technologies and pedagogy have? Is there any alternate pedagogical strategy that considers these parameters in STEM or other subjects?

ACTIVITY

INTRODUCTION

" Online education and MOOCs were praised as having the potential to equalize access to education, but critics have suggested that they are having the opposite effect and are disproportionately used by already-affluent audiences. What is the truth about the relationship between online education and equity of access? Is it having an equalizing effect, or is it actually widening the gap in access to education? In answering this, you could choose to consider equity based on gender, race, socioeconomic status, geographic location, or other factors, but you do not need to cover them all."

In contrast to critics, I think MOOC has democratized education and open access to a larger population (Santosh, 2021; Valeria, 2019) . I know there are still populations who could not take advantage of this trend due to lack of infrastructure, but it is improving every year with government support (NPTEL platform). In my understanding, we must support this trend of MOOC or online education by offering continuous improvement in terms of quality teaching contents and digital infrastructure.

We are currently living in a knowledge economy, education equipped with practical skills is way forward to any nation's growth (Valeria et al., 2017). If I look at developing countries like India or Pakistan, It would be highly difficult to create so many physical universities and schools that may cater to billions of people even in a span of 10 years. Even if we create this infrastructure, it is highly unlikely that we will be able to train so many teachers. Creating digital infrastructure (that will support other areas like Healthcare too) would be a practical approach going forward.

Now coming to the given argument about the equity of access based on gender, race, socioeconomic status, geographic location, or other factors. In Indian context, I would say if we can put more focus on following dimensions (as mentioned below), MOOC would be able to offer equal education to all in coming decades:

ADVANTAGES OF MOOC

MOOC may Support Basic Education to All Children

Recent initiatives (Jyoti et al., 2017) taken by the government (like SWAYAM, NPTEL etc) to offer free education will help in bridging the educational gap between rich and poor. Since these channels are open to everyone and do not differentiate on race and social-status. Once we have basic infrastructure in place (in a few years down the line), it will have enormous benefit to the nation.

MOOC may Help in Gender Equality and Social Inclusion

MOOC can help in inclusive learning (as mentioned in IndianFoundation: role of MOOC in SDG4) by giving access to the girls and women at their own place who could not go to nearby college or schools due to societal pressure or family situations. In India we have smartphones in almost every home and it will reach every village household in the coming decade along with internet facilities that will bring transformation if we continue improving MOOC.

MOOC may Support Time Bank Concept

A concept similar to Switzerland (youth support elderly in their household work and get credit from related organizations) we can adopt in India, where youth who belong to good socio-economic status (having access to good internet and electronic equipment) can offer classes and tuition to the underserved population in the neighborhood. Teacher youth can be given credit for their work by either government or universities.

MOOC may Support Mastery Learning and Imagination towards Expert Teacher for All Concept

With recent advancement in machine learning, it is very much possible to offer students a personalized learning where contents and feedback will be based on the student's current state and understanding. One of the data scientists from an Indian company, Jio, talks about the same (TED Talk, Apr 5 2016). If we continue on this path of machine learning and integrate it into education, most likely we will have expert teachers available for all whenever we demand.

CONCLUSION

Having pointed out all these advantages, there are certainly lots of caveats associated with MOOC (for example, course contents, possibility of cheating

during assessment etc) but we have to appreciate this trend looking at larger benefits to society.

REFERENCES

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Rebecca Chiyoko. Fostering valuable learning experiences by transforming current teaching practices: practical pedagogical approaches from online practitioners (2020). https://www.emerald.com/insight/2398-5348.htm

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Rohit Mehta, Earl Aguilera. A critical approach to humanizing pedagogies in online teaching and learning (2020). The International Journal of Information and Learning Technology Vol. 37 No. 3, 2020 pp. 109-120. https://www.emerald.com/insight/2056-4880.htm