


MOOCs for Teacher Professional Development: Reflections, and Suggested Actions

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Abstract

Teacher Professional Development (TPD) has become a major policy priority within education systems worldwide. But keeping teachers professionally up-to-date and providing them professional development opportunities on continuing basis is a big challenge. Massive Open Online Courses (MOOCs) can be a cost and resource effective means to complement the traditional methods of professional development of teachers. This optimism is based on the assumption that use of MOOCs will facilitate mass training of teachers as per their convenience and ease. The other assumption is that being MOOCs-based training, it will be easy to adapt it to different cultures and languages. Considering these assumptions, this concept paper which is based on reviews of different reports, documents and research papers - discusses the challenges of TPD, reflects upon promises of using MOOCs for TPD; details initiatives and experiences of using MOOCs for TPD; and suggests actions for promoting the use of MOOCs for TPD.

Keywords: MOOCs; Teacher Professional Development; TPD; Teachers; Teacher Training; Professional Development of Teachers

Background

The teacher is the key agent in any education system. The National Knowledge Commission of India (NKC, 2007) observed that the teacher is the single most important element of the education system. Echoing the same sentiments an OECD report observes that the quality of an education system cannot exceed the quality of its teachers since student learning is ultimately the product of what goes on in classroom (OECD, 2010). Educational researchers, policy analysts and politicians across the globe often argue and suggest that meaningful and relevant enhancement of teachers' professional capabilities and commitment to education is essential to improve education as a whole. Emphasizing the need of meaningful and relevant professional development of teachers, a review of teacher education in Scotland suggests,

“Long-term and sustained improvement which has a real impact on the quality of children's learning will be better achieved through determined efforts to build the capacity of teachers themselves to take responsibility for their own professional development, building their pedagogical expertise, engaging with the need for change, undertaking well-thought through development and always evaluating impact in relation to improvement in the quality of children's learning” (Donaldson, 2011, p. 84).

Teacher Professional Development (TPD) seems a fit approach to enhance the teachers' capabilities and commitment as it encompasses all behaviours which are intended to effect change in the skills, knowledge and experience one gain both formally and informally as one work, beyond any initial training (Allen, 2009). Teachers participate in professional development to “develop, implement, and share practices, knowledge, and values that address the needs of all students” (Schlager, Fusco, Barab, Kling & Gray, 2004), in other words, to get better at being teachers. As summary, TPD can be considered as an ongoing process of education, training, learning and support activities which is: taking place

in either external or work-based settings; engaged in by qualified, educational professionals; aimed mainly at promoting learning and development of their professional knowledge, skills and values; to help decide and implement valued changes in their teaching and learning behaviour so that they can educate their students more effectively thus achieving an agreed balance between individual, school and national needs (Earley & Bubb, 2004, p. 5).

Practicing TPD: Expectations, and Challenges

Highlighting about the importance of TPD, a report from OECD (2009) underlines,

“No matter how good pre-service training for teachers is, it cannot be expected to prepare teachers for all the challenges they will face throughout their careers. Education systems therefore seek to provide teachers with opportunities for in-service professional development in order to maintain a high standard of teaching and to retain a high-quality teacher workforce” (p. 49)

But promoting TPD is not an easy task even in developed countries. There are many issues and challenges to it. Odden, Archibald, Fermanich and Gallagher (2002) described in detail the various issues for professional teacher development and created a cost-framework to categorize professional development costs that consisted of six key elements: 1) teacher time, 2) training and coaching, 3) administration, 4) materials, equipment, and facilities, 5) travel and transportation, and 6) university tuition and conference fees. Normally one or other of these costs deter teachers from practicing CPD.

The other prominent challenge is that the nature of TPD has also changed, as noted by Quattlebaum (2012),

“Teacher development has moved beyond simple in-service workshops and has expanded into a more robust system of continuing education. In order to advance in their careers, teachers should seek out professional development opportunities which are ongoing and aligned with standards and assessments” (para 1).

Along with these challenges, conditions to run effective TPD programmes are many. Richardson (2003) published a list of characteristics associated with effective professional development, stating that such programs would optimally be:

“Statewide, long term with follow-up; encourage collegiality; foster agreement among participants on goals and visions; have a supportive administration; have access to adequate funds for materials, outside speakers, substitute teachers, and so on; encourage and develop agreement among participants; acknowledge participants existing beliefs and practices; and make use of outside facilitator/staff developers” (p. 402).

Summing up this issue, Gulamhussein (2013) suggests,

“Professional development can no longer just be about exposing teachers to a in a one-time workshop, or giving teachers basic knowledge about a teaching methodology. Instead, professional development in an era of accountability requires a fundamental change in a teacher’s practice that leads to increase in student learning in the classroom”.

Lawrie and Burns (2013) are also of the view that

“Despite a global need for quality teachers, the majority of the world’s teachers receive professional development that does little to promote quality teaching. For many teachers from around the globe,

the frequency of professional development is episodic, the quality varies, its duration is limited, and support or follow-up are almost non-existent” (para 2).

They further observe, “Teacher professional development is in crisis – particularly in the world’s poorest and most fragile countries” (Lawrie & Burns, 2013, para 3). Considering all these expectations and challenges, new approaches to offer TPD become imperative.

Advocating MOOCs for TPD: Promises, and Observations

Basically TPD needs new approaches in terms of content delivery and mode of training and Massive Open Online Courses (MOOCs) have been seen as a potential solution. MOOCs are generally defined as open-ended education programs broadcasted through the Internet to thousands of learners. The other useful aspect is that MOOCs can accommodate a large number of teachers serving in different locations. Therefore, it can be argued that MOOCs which are open and available to anyone with an Internet connection offer numerous possibilities for improvement of training and development of teachers on continuing basis. A further discussion about MOOCs will be useful to substantiate this argument. MOOCs owe the “massive” part of their name as much to the audience they reach (up to 100 000 or more) as to the distribution of this audience covering all continents. MOOCs fall under two main categories: ‘xMOOCs’, which essentially reproduce lecture courses and end with a final examination, and ‘cMOOCs’, which champion a more collaborative approach, also known as “open learning” where participants are relatively autonomous in choosing learning materials and defining learning objectives (Richard, 2014). A Commission appointed by Norwegian Government (2013, p. 26) observes that MOOC term is used as a catch-all for courses with the following characteristics-

- Courses that are online
- Courses that are massive, i.e. scalable in relation to the number of participants
- Courses that are open, i.e. anyone can sign up for them

According to Yousef, Chatti, Schroeder, Wosnitza and Jakobs (2014),

“Massive open online courses (MOOCs) have drastically changed the way we learn as well as how we teach. The main aim of MOOCs is to provide new opportunities to a massive number of learners to attend free online courses from anywhere all over the world. MOOCs have unique features that make it an effective technology-enhanced learning (TEL) model in higher education and beyond” (p. 9).

While, Schultz (2014) argues that,

“Massive Open Online Courses (MOOCs) are digital teaching formats which offer stimuli for developing the concepts of e-learning, Web 2.0 and open educational resources. They can be used before, during and after completion of a degree course and can also be integrated at course, module or degree programme level in academic teaching” (p. 7).

These characteristics of MOOCs make them a cost effective, easily accessible and effective tool for professional development of teachers, as observed by Palmer (2015), “Teacher Professional Development is perhaps the most natural service MOOC providers could immediately provide teachers.”

Detailing the reasons of using MOOCs for TPD, Marquis (2013) argues,

“Teachers are expected to nearly continuously take classes or attend trainings that will enhance their ability to do their job, yet we never acknowledge the effort or take any solid measures to support

it – little to no financial support and no releases time to do the work. But there is a real need for teachers to keep up with the rapid pace of educational innovations and technologies for learning, as well as changes in primary content areas. Two huge obstacles of cost and time stand like daunting sentinels between teachers and fulfilling their ongoing professional development needs. MOOCs could provide one possible solution to this problem” (para 4).

Similarly, Bali (2013) lists five reasons for use of MOOCs by teachers for their professional development. According to him, use of MOOCs will help teachers to: 1) observe how others teach online, 2) join community conversations about topics that interest them, 3) e-live the student experience – online, 4) learn something new in a structured way, and 5) find well-chosen (mostly free) resources on a topic or sub-topic.

Talking about the use of MOOCs for TPD, Jobe, Östlund and Svensson (2014) point-out,

“The utilization of MOOCs for professional teacher development is relatively novel and uncharted. The combination of MOOCs and teacher development seems to offer an obvious win-win situation. Teachers can receive high quality professional development for free, and MOOC providers can expand their user base with motivated, educated learners” (p. 1585).

The appropriateness of MOOCs for career improvement of teachers’ is also a welcome possibility. While they could be used to serve elements of the three categories of TPD (standardized TPD, site-based TPD, and self-directed TPD), MOOCs best lend themselves in terms of usefulness to facilitation of standardized TPDs and certain aspects of self-directed TPDs (Gaible & Burns; 2005; Fyle, 2013). Furthermore, Richard (2014) argues that,

“Massive Open Online Courses (MOOC) should dramatically change professional development and training in the coming years. Centered on building up specific skills and capacities, MOOCs represent a breakthrough in the area of e-learning, covering numerous fields of studies from healthcare to mathematics”.

Using MOOCs for TPD: Initiatives, and Experiences

Regarding the use of MOOCs for TPD, Dikke and Faltin (2015) observe,

“If searching for teacher professional development courses in the web, for example on the MOOC List website¹⁰, more than 130 courses can be found. These courses are provided at MOOC and online education platforms, such as Coursera, Canvas Network, FutureLearn, MOOC-Ed, European Schoolnet Academy, MiriadaX, NovoEd, UPVX, edX, Open Learning, and FUN. The courses are offered mostly in English and Spanish and cover various topics, such as teaching skills, soft skills, language teaching, science teaching, and the use of the Information and Communication Technology (ICT) in the classroom” (p. 3).

This is a clear indication that different countries and institutions are coming forward to use MOOCs for TPD purposes. There is a long list of institutions (British Council and University College London, University of California, Arizona State University, University of Groningen, University of Pittsburgh, UNSW Australia (The University of New South Wales), Universitat Autònoma de Barcelona, The University of Auckland, University of Houston System...) and variety of courses (becoming a better teacher, disability support and awareness, English teaching, learning to teach online, academic integrity, ...). There are number of providers that offer a good number of MOOCs for professional development of teachers. Some of these providers are: Coursera, edX, Canvas Network, Udemy, Udacity, Carnegie Mellon University - Open Learning Initiative, MOOCs from Great Universities, EMMA - European Multiple MOOC Aggregator, FutureLearn, etc.

Besides these initiatives, different governments are also making efforts to utilize the potential of MOOCs to achieve different educational goals. A number of Asian countries like Malaysia, Thailand, Philippines, China, South Korea and India have recognized the potential of MOOCs. There are national brands such as K-MOOCs (in Korea), Thai MOOCs or Malaysian MOOCs. MOOCs have been used to expand people's accessibility to higher education (China), or to reform their existing systems of higher education and lifelong learning (Korea and Malaysia). While in Japan, JMOOCs project was initiated by a consortium composed of universities, corporate houses, governmental institutes and academic societies (Kim, 2015). In India, Ministry of Human Resource Development has recently embarked on a major initiative called 'Study Webs of Active Learning for Young Aspiring Minds' (SWAYAM), to provide an integrated platform and portal for online courses, covering all higher education, secondary education and skill sector courses. SWAYAM is an indigenous (Made in India) IT Platform for hosting the Massive Open Online Courses (MOOCs) (Kanjilal & Kaul, 2016).

In addition to governmental efforts, international organizations are also coming up with novel ways and financial support to popularize the use of MOOCs for different educational purposes including TPD. For example, UNESCO and COL have launched a MOOCs guide for policy-makers in developing countries. This guide intends to raise MOOC awareness in less well equipped developing nations, and to advise their educational policy-makers how, through online learning including MOOCs, they can build new routes to higher education and lifelong learning to benefit increasing numbers of their young and older people (Patru & Balaji, 2016). In Europe, European Union has funded a number of research and cooperation projects on MOOCs. Some of popular MOOCs project funded by European Union include HOME project (Higher Education Online: MOOCs in the European Way), ECO project (Elearning Communication and OpenData), EMMA project (European Multiple MOOC Agregator) and OpenupEd platform (the first MOOCs initiative across Europe) (Kim, 2015). All these efforts and initiatives are a clear testimony that MOOCs are in rise and can be utilized for TPD.

In other side, researchers in different parts of the world are also examining the utility of MOOCs for professional development purposes. In a study on examination of MOOC usage for professional workforce development, Garrido et al. (2016) revealed that the main motivations of MOOC users were found to be in gaining specific job skills (61%), preparing for additional education (39%), and obtaining professional certification (37%). Cole and Timmerman (2015) found that students believe MOOCs hold the potential to augment lifelong learning, even though they serve as inferior alternatives to traditional coursework. While, Koutsodimou and Jimoyiannis (2015) analyzed the responses of 326 participants and revealed that the teachers were satisfied of the course workflow, the assignments and the Web tools used, the support and peer interaction they received. The teachers considered MOOCs as a positive learning and professional development experience, which enhanced their pedagogical and technological knowledge to integrate Web-based tools in educational practice. In conclusion, the results of this study provide promising evidence that MOOCs can effectively support TPD. Another study entitled 'Designing MOOCs for teacher professional development: Analysis of participants' engagement' reports high rates of course completion and teachers' enhanced awareness and willingness to adopt MOOCs as an effective alternative for teacher professional development (Koukis & Jimoyiannis, 2017, p 279). All these studies conducted in different parts of the world with different motives reach a common conclusion-MOOCs present a number of opportunities for professional development of teachers.

Promoting MOOCs for TPD: Reflections, and Suggested Actions

MOOCs offer much varied and innovative potential in their wide geo-graphic range and their ability to reach many and diverse participants, and in their use of collaborative formats and transparent teaching (Schultz, 2014). MOOCs have been perceived as an engaging way to expand expertise and

gain new skills for teachers. As other notable observation, a study from MIT-Harvard revealed that nearly 40 percent of learners who take open online courses are teachers. That finding has researchers wondering whether they can better design online courses once predicted to upend students' experience to meet teachers' needs (Carapezza, 2015). These observations clearly reveal two things, first, MOOCs offer numerous opportunities for teachers' professional development, and second, use of MOOCs for teachers' professional development is rising in different parts of the World. In fact, use of MOOCs for teachers' professional development becomes more relevant in those countries having shortage of means and methods to provide CPD opportunities to the large number of teachers at different levels.

MOOCs can be a game changer in emerging countries where TPD lacks on many counts as observed by Lawrie and Burns (2013, para 3), "In the world's poorest and most fragile countries teachers who need the highest-quality professional development and support often receive the least." Laurillard (2016), who has conducted a study to test the efficacy of an experimental course for teachers who need but do not receive high-quality continuing professional development, claims:

"There is enough evidence from this carefully designed CPD MOOC to see that there is genuine potential for this technology to engage adults in the emerging economies in a form of professional development that would be commensurate with the immense challenge of capacity building on this scale for the teaching profession across the range of skills they need" (Laurillard, 2016, p. 15).

In addition, MOOCs have also been seen as a tool to help teachers to acquire the competences, knowledge and skills needed to participate successfully within different political, economic, social and cultural realms of society.

On the other hand, literature reviews reveal a wide range of issues and concerns related to MOOCs. These issues may be categorized under three categories (i) learner issues: learner motivations; motivation to participate; values and expectations; personal, cognitive or psychological barriers; learner dropout rates; learners' participation and engagement patterns (ii) pedagogical issues: pedagogical design; content and resources; learning material; learning activities; learner guidance and support; tutor and facilitator roles; completion and retention (iii) technological issues: learning objects; instructional design; technologies used; assessment of learner performance; learning analytics (Bonk, Lee, Kou, Xu & Sheu, 2015; Littlejohn, Hood, Milligan & Mustain, 2016; Kumari, 2016; Eriksson, Adawi & Stohr, 2017; Koukis & Jimoyiannis, 2017). Finding appropriate solutions and answers to these challenges and concerns will certainly be helpful to maximize the use of MOOCs for TPD. In addition, need of the hour is that policy makers, researchers and educationists must come forward to find better solutions to utilize the full potential of MOOCs for different segments of teachers living and working in different economic, political, and social settings. In this backdrop, following suggested actions may be helpful to promote the use of MOOCs for TPD in different parts of the globe.

(i) Design 'MOOCs for TPD' Policies

The first step in this direction will be development of appropriate policies at governmental and institutional levels. The governmental policy regarding use of MOOCs will be a kind of generic policy mainly dealing with philosophical and theoretical aspects as well as showing the commitment of respective government of using MOOCs for TPD. For example, American government in 2014 announced that American public school teachers will have free access to 15 online Duke courses as part of a new federal program aimed at improving professional development for educators (Duke University, 2014). These governmental policies will motivate individual institutions to develop their own MOOCs for TPD polices. These policies will answer a number of questions like why teachers are required to use MOOCs, how they can use MOOCs for TPD, who will be the providers of MOOCs,

what credit they will earn by using MOOCs, who will look after their concerns and demands, etc. These MOOCs for TPD policies will serve many purposes. First of all, these policies will ensure the commitment and seriousness of the governments and educational institutions towards TPD of teachers. Second, these policies will be a guiding force for all the stakeholders to implement and organize TPD in a better and effective manner. And, the most sought effect of these policies will be on the individual teachers. These policies will help them to realize that professional development is their right and government as well institution must offer them different opportunities to fulfill their professional development needs.

(ii) Develop 'MOOCs for TPD' Mechanisms

The respective governments and institutions will be required to develop mechanisms to realize the potential of MOOCs for TPD. These mechanisms will provide answers to many questions like how teachers will be guided to use MOOCs, who will be the partners for MOOCs initiatives, how useful MOOCs for TPD will be identified or developed, what platform will be used to offer, what will be the terms and conditions of use of MOOCs, what will be expected type of communication, how problems of participants will be solved, how certification will take place, etc. Besides, other crucial aspects related to use of MOOCs like curriculum planning, instructional design, teaching and assessment will also be covered by these mechanisms. These mechanisms will also involve identification, promotion and evaluation of available MOOCs for TPD purposes. It can be argued that, these mechanisms will play a very important role in use of MOOCs for TPD. These mechanisms will clear the doubts and concerns of respective teachers as well motivate them to come forward to use MOOCs for their professional development. These mechanisms will also pave the way for a competition between different institutions regarding use of MOOCs for TPD. It may be hoped that educational institutions will try to innovate as well outsmart each other in this field, and teachers will be real beneficiary.

(iii) Launch 'MOOCs for TPD' Initiatives

Different countries and organizations have already started a number of MOOCs initiatives but there are hardly any specific MOOCs for TPD initiative. The need of the hour is that different countries and organizations must start need-based MOOCs for TPD initiatives. Launch of these initiatives will be a clear message to the teaching community that governments and institutions see MOOCs as a supporting mechanism to provide professional development opportunities to the teachers. These initiatives will focus to attract teachers from different genres to look after their professional development needs and choose appropriate MOOCs either to supplement their existing knowledge or gain new skills. These initiatives will also be helpful in increasing awareness about TPD needs and offering potential solutions via MOOCs. These initiatives will also provide an opportunity for government policy makers to foster relationships with academic institutions and private-sector partners and work together for teachers' continuing professional development. These initiatives will also encourage different institutions to innovate and collaborate to find out better ways and techniques to use MOOCs for TPD.

(iv) Remove 'MOOCs for TPD' Barriers

Researches reveal that there are two main barriers related to use of MOOCs for TPD. These barriers are language barrier and cost barrier. Talking about the language barrier, Sanchez-Gordon and Luján-Mora (2014) reveal,

“The majority of MOOCs are only offered in English. A quick review of Coursera’s courses shows that 515 courses of a total of 585 courses, approximately 90%, are offered in English. Students with other native languages can have difficulties related to their proficiency in English: for example, non-native speakers read at slower speed than native speakers; the speed difference leads to information overload and cognitive issues. Due to this, the language barrier discourages many potential users of MOOCs” (p. 1455).

They also point-out about cost-barrier in following words, “From the students’ point of view, MOOCs are drifting towards paid courses in the form of SPOCS. From the educational institutions’ point of view, creating a MOOC is getting more expensive because quality keeps getting higher” (Sanchez-Gordon & Luján-Mora, 2014, p. 1455). Therefore, governments and concerned organizations must come up with a plan to minimize these barriers. This can be done by encouraging more and more institutions to adapt already available MOOCs in different languages and by providing subsidies or financial support to willing institutions to develop useful MOOCs for TPD purposes.

(v) Promote ‘MOOCs for TPD’ Cultures

MOOCs have entered in the lexicon of education system of many countries. Different users in different countries use MOOCs for different purposes and have different gains. Banking on this trend, efforts are needed to promote the culture of using MOOCs for professional gains among teachers. The Center for Advanced Research on Language Acquisition define culture as shared patterns of behaviors and interactions, cognitive constructs and understanding that are learned by socialization (CARLA, 2014). Taking cue from this definition, one can say that “MOOCs culture” will encompass the acceptance to adaptation and use of MOOCs and keep evolving, practicing and sharing new theories and practices for professional gains at individual level and in groups. Promotion of MOOCs culture will help the teaching fraternity to learn as well share initiatives, experiments and achievements of using MOOCs. The teachers’ own stories, experiences and anecdotes related to MOOCs usage for professional development will be a part of this culture. Spread of this culture will be a motivation for teachers to come together and start using MOOCs for their professional gains.

(vi) Research ‘MOOCs for TPD’ Practices

As discussed earlier, there is a strong need to start need-based MOOCs for TPD initiatives. But only starting these initiatives will not be sufficient. The other equally important aspect is to learn that whether these initiatives are getting the desired results. Here research about ‘MOOCs for TPD’ practices becomes critical. These researches will be beneficial on many counts. First, these researches will tell that how MOOCs initiatives are working, what are their strengths and at what count they need improvement. Second, these researches will also guide policy planners and providers that how to strengthen or improve the existing initiatives. These researches will also reveal that why a particular initiative is successful and why other initiative is lacking. This information will certainly be helpful to improve the success rate of existing as well as proposed initiatives. In other words, these researches will be helpful to plan need based and locally suitable initiatives of using MOOCs for TPD. Besides, this research support will be helpful to understand the viewpoints and concerns of teachers regarding use of MOOCs for TPD and the inputs will certainly be helpful to guide this movement further.

Conclusion

The advocacy to use MOOCs for TPD purposes is based on many promises. First, “MOOCs have the instructional design and technology necessary to offer a high-quality education-and they’re

clearly attracting smart people who want to advance their professional development” (Coffman, 2015). Second, MOOCs offer a powerful platform for education and development with cost savings and greater efficiency (Florentine, 2015). Third, MOOCs promise to support teacher professional development by providing accessible, flexible and fast-track completion of certified courses (Kumari, 2016). Fourth, participating in MOOCs can help to develop certain teaching, digital, and academic skills (Urrutia, Fielding & White, 2016). Fifth, MOOCs can train a large number of untrained or less trained teachers to become more professional in their practices and approaches (Laurillard & Kennedy, 2017). And most importantly, sixth, MOOCs provide a professional development with alternative credentials recognized by employers (Amigot, 2017). Instead of these proclaimed benefits, teachers still feel reluctant or sometimes ignorant to use MOOCs for professional development purposes. Therefore, it becomes obvious that teaching community as well policy makers must be made aware about novel policies and practices to promote the use of MOOCs for TPD. The suggested ‘MOOCs for TPD’ actions are an attempt in this direction. It can be hoped that different countries, institutions and organizations will take note of and implement the suggested actions to ensure the systematic and effective use of MOOCs to support teachers’ to remain professionally competent and educationally relevant on continuing basis.

References

- Allen, M. (2009). What is continuing professional development (CPD)? *Jobs.ac.uk*. Retrieved from <http://www.jobs.ac.uk/careers-advice/managing-your-career/1318/what-is-continuing-professional-development-cpd>
- Amigot, M. (2017). MOOCs evolve into professional development courses with alternative credentials. *IBL studios*. Retrieved from <https://www.iblstudios.com/2017/07/08/moocs-evolve-professional-development-courses-alternative-credentials/>
- Bali, M. (2013, July 12). 5 reasons teachers should dip into MOOCs for professional development. *MOOC news & reviews*. Retrieved from <http://mooconewsandreviews.com/5-reasons-teachers-should-dip-into-moocs-for-professional-development-2/>
- Bonk, C.J., Lee, M.M., Kou, X., Xu, S., & Sheu, F.R. (2015). Understanding the self-directed online learning preferences, goals, achievements, and challenges of MIT OpenCourseWare subscribers. *Journal of Educational Technology & Society*, 18(2), 349–368. Retrieved from http://www.ifets.info/journals/18_2/26.pdf
- Carapezza, K. (2015, April 2). Who is taking MOOCs? Teachers, says MIT-Harvard study. *PBSO News Hour*. Retrieved from <http://www.pbs.org/newshour/rundown/taking-moocs-teachers-says-mit-harvard-study/>
- CARLA (2014). *What is Culture?* University of Minnesota. Retrieved from <http://carla.umn.edu/culture/definitions.html>
- Coffman, K. (2015, November 18). The professional development advantages of MOOCs. *Delcor*. Retrieved from <https://www.delcor.com/resources/blog/the-professional-development-advantages-of-moocs>
- Cole, A. W., & Timmerman, C. E. (2015). What do current college students think about MOOCs? *MERLOT Journal of Online Learning and Teaching*, 11(2), 188–201. Retrieved from http://jolt.merlot.org/Vol11no2/Cole_0615.pdf
- Dikke, D., & Faltin, N. (2015). Go-Lab MOOC – An online course for teacher professional development in the field of Inquiry-based science education. *7th International Conference on Education and New Learning Technologies, Jul 2015, Barcelona, Spain*. Retrieved from https://telearn.archives-ouvertes.fr/hal-01206503/file/EDULEARN_MOOC_final.pdf
- Donaldson, G. (2011). *Teaching Scotland’s future: report of a review of teacher education in Scotland*. Edinburgh: Scottish Government.

- Duke University (2014). *DOE endorses Duke MOOCs for teacher professional development*. Retrieved from <https://online.duke.edu/doe-endorses-duke-moocs-teacher-professional-development/>
- Earley, P. & Bubb, S. (2004). *Leading and managing continuing professional development: Developing people, developing schools*. London: SAGE Publications.
- Eriksson, T., Adawi, T., & Stohr, C. (2017). Time is the bottleneck: A qualitative study exploring why learners drop out of MOOCs. *Journal of Computing in Higher Education*, 29(1), 133–146. <https://doi.org/10.1007/s12528-016-9127-8>
- Florentine, S. (2015, September 28). 4 ways MOOCs are changing professional development. CIO. Retrieved from <https://www.cio.com/article/2986306/it-skills-training/4-ways-moocs-are-changing-professional-development.html>
- Fyle, C.O. (2013). *Teacher education MOOCs for developing world contexts: Issues and design considerations*. Retrieved from <http://linc.mit.edu/linc2013/proceedings/Session3/Session3Fyle.pdf>
- Gaible, E., & Burns, M. (2005). *Using technology to train teachers: Appropriate uses of ICT for teacher professional development in developing countries*. Washington, DC: InfoDev/World Bank.
- Garrido, M., Koepke, L., Andersen, S., Mena, A., Macapagal, M., & Dalvit, L. (2016). *An examination of MOOC usage for professional workforce development outcomes in Colombia, the Philippines, & South Africa*. Seattle: Technology & Social Change Group, University of Washington Information School.
- Gulamhussein, A. (2013). *Teaching the teachers: at a glance*. Center for Public Education. Retrieved from <http://www.centerforpubliceducation.org/teachingtheteachers>
- Jobe, W., Östlund, C., & Svensson, L. (2014). In M. Searson & M. Ochoa (Eds.), *Proceedings of SITE 2014--Society for Information Technology & Teacher Education International Conference* (pp. 1580–1586). Jacksonville, Florida, United States: Association for the Advancement of Computing in Education (AACE). Retrieved from [https://oerknowledgecloud.org/sites/oerknowledgecloud.org/files/proceeding_130997%20\(3\).pdf](https://oerknowledgecloud.org/sites/oerknowledgecloud.org/files/proceeding_130997%20(3).pdf)
- Kanjilal, U., & Kaul, P. (2016). *The journey of SWAYAM: India MOOCs initiative*. Retrieved from <http://hdl.handle.net/11599/2592>
- Kim, B. (Ed.). (2015). *MOOCs and educational challenges around Asia and Europe*. Seoul: KNOU Press. Retrieved from http://asemlllhub.org/fileadmin/www.asem.au.dk/publications/MOOCs_and_Educational_Challenges_around_Asia_and_Europe_FINAL.pdf
- Koukis, N., & Jimoyiannis, A. (2017). Designing MOOCs for teacher professional development: Analysis of participants' engagement. In A. Mesquita and P. Peres (Eds.), *Proceedings of the 16th European Conference on e-Learning, ECEL 2017* (pp. 271–280). Porto: Academic Conferences and Publishing International.
- Koutsodimou, K., & Jimoyiannis, A. (2015). MOOCs for teacher professional development: Investigating views and perceptions of the participants. *Proceedings of the 8th International Conference of Education, Research and Innovation, 18–20 November*. Seville, Spain: ICERI. Retrieved from <https://library.iated.org/view/KOUTSODIMOU2015MOO>
- Kumari, A. (2016). MOOCs – An online platform for teacher professional development. *Asian Journal of Multidisciplinary Studies*, 4(5), 102–107. Retrieved from <http://www.ajms.co.in/sites/ajms2015/index.php/ajms/article/view/1799>
- Laurillard, D. (2016). The educational problem that MOOCs could solve: Professional development for teachers of disadvantaged students. *Research in Learning Technology*, 24. <http://dx.doi.org/10.3402/rlt.v24.29369>
- Laurillard, D., & Kennedy, E. (2017, December 16). Moocs can still bring higher education to those who really need it. *Times Higher Education*. Retrieved from <https://www.timeshighereducation.com/blog/moocs-can-still-bring-higher-education-those-who-really-need-it>

- Lawrie, J., & Burns, M. (2013, March 14). Teacher development in crisis. *Global Partnership for Education*. Retrieved from <http://www.globalpartnership.org/blog/teacher-development-crisis>
- Littlejohn, A., Hood, N., Milligan, C., & Mustain, P. (2016). Learning in MOOCs: Motivations and self-regulated learning in MOOCs. *The Internet and Higher Education*, 29, 40–48. <https://doi.org/10.1016/j.iheduc.2015.12.003>
- Marquis, J. (2013, May 21). Why MOOCs are good for teacher professional development! *OnlineUniversities.com*. Retrieved from <http://www.onlineuniversities.com/blog/2013/05/why-moocs-are-good-for-teacher-professional-development/>
- NKC (2007). *National Knowledge Commission - report to the nation 2006*. New Delhi: Government of India. Retrieved from <http://www.knowledgecommission.gov.in>
- Norwegian Government. (2013). *Time for MOOCs- MOOC commission sub-report*. Retrieved from https://www.regjeringen.no/globalassets/upload/KD/Time_for_MOOCs.pdf
- Odden, A., Archibald, S., Fermanich, M., & Gallagher, H. A. (2002). A cost framework for professional development. *Journal of Education Finance*, 28(1), 51–74.
- OECD (2009). *Creating effective teaching and learning environments first results from TALIS*. OECD Publishing. Retrieved from www.oecd.org/edu/school/43023606.pdf
- OECD (2010). *PISA 2009 results: What makes a school successful?* OECD Publishing. Retrieved from <https://www.oecd.org/pisa/pisaproducts/48852721.pdf>
- Palmer, M. (2015, March 16). Are we missing opportunities to engage teachers with MOOCs? *edX Blog*. Retrieved from <https://blog.edx.org/are-we-missing-opportunities-engage>
- Patru, M., & Balaji, V. (2016). *Making Sense of MOOCs: A guide for policy-makers in developing countries*. France: UNESCO and Commonwealth of Learning. Retrieved from <http://unesdoc.unesco.org/images/0024/002451/245122E.pdf>
- Quattlebaum, S. (2012, July 26). Why professional development for teachers is critical. *The Evollution*. Retrieved from <http://evollution.com/opinions/why-professional-development-for-teachers-is-critical/>
- Richard, A. (2014). *How do MOOCs fit into professional training?* Retrieved from <http://www.colloquium-group.com/how-do-moocs-fit-into-professional-training/?lang=en>
- Richardson, V. (2003). The dilemmas of professional development. *Phi Delta Kappan*, 84(5), 401–406.
- Sanchez-Gordon, S., & Luján-Mora, S. (2014). MOOCs gone wild. In *Proceedings of the 8th International Technology, Education and Development Conference (INTED 2014)*, Valencia (Spain), March 10–12, 2014 (p. 1449 -1458). Retrieved from <http://desarrolloweb.dlsi.ua.es/moocs/moocs-gone-wild>
- Schlager, M., Fusco, J., Barab, S. A., Kling, R., & Gray, J. (2004). Teacher professional development, technology, and communities of practice: are we putting the cart before the horse? In S. Barab, R. Kling, and J. Gray (Eds.), *Designing virtual communities in the service of learning* (pp. 120–153). UK: Cambridge University Press.
- Schultz, E. (Ed.) (2014). *The potential and problems of MOOCs-MOOCs in the context of digital teaching*. Bonn: German Rectors' Conference. Retrieved from http://www.hrk.de/uploads/media/MOOCs_EN.pdf
- Urrutia, M. L., Fielding S., & White S. (2016). Professional development through MOOCs in higher education institutions: Challenges and opportunities for PhD students working as mentors. *Journal of Interactive Media in Education*, 1, 1–10. Retrieved from <https://www-jime.open.ac.uk/article/10.5334/jime.427/>
- Yousef, A.M. F., Chatti, M.A., Schroeder, U., Wosnitza, M, & Jakobs, H. (2014). MOOCs a review of the state-of-the-art. Paper presented in *CSEDU 2014 - 6th International Conference on Computer Supported Education*. Retrieved from www.openeducationeuropa.eu/en/download/file/fid/35609