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Teacher Professional Development in the Digital Age: Design Considerations for MOOCs for Teachers

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Abstract: Teachers have shown an interest in learning through massive open online courses. In this paper the authors provide suggestions for the design of MOOC-based professional learning opportunities for teachers based on literature previously condensed on the topic of effective teacher professional development. The paper ends with conclusions and directions for future inquiry.

Keywords: teachers, professional development, MOOC, instructional design, online teacher professional development

Introduction

Massive open online courses (MOOCs) have been a topic of debate in higher education the past few years. For some time now, this debate primarily consisted of only two perspectives. On one side, there were people who fully believed in MOOCs and saw them as the future of higher education (Car, 2013; Pappano, 2012); on the other side, there were people who were highly skeptical and critical of MOOCs (Bebell & Peterson, 2015; Carbone, 2014; Pence, 2014).

Many higher education faculty members, even those with years of experiences teaching online, found themselves on the side of the skeptics (Lowenthal & Hodges, 2015). As the hype surrounding MOOCs has decreased, though, some researchers have argued that MOOCs *can* be designed to provide a positive learning experience, one that is comparable to many face-to-face learning experiences offered at colleges and universities in the United States (e.g. Glance, Forsey, & Riley, 2013; Lowenthal & Hodges, 2015; also see Straumsheim, 2015). Recognizing the pedagogical affordances of MOOCs, others have begun to see the potential of MOOCs not as a way to disrupt formal higher education, but rather as a way to improve and extend current professional development practices (Manning, Morrison, & McIlroy, 2014; Hodges, 2015); in fact, some major efforts are currently underway to deliver teacher professional development via MOOCs (Kleiman, Wolf, & Frye, 2013, 2015).

Despite the potential of MOOCs, not all MOOCs are designed well (Lowenthal & Hodges, 2015) or are appropriate for teacher professional development (Kleiman, Wolf, & Frye, 2015). There are likely a few reasons for the observed design flaws, or design mis-match for teacher professional development. First, many MOOCs, in our experience, seem to have an identity problem; they are a mix between a large face-to-face class that is dominated by lectures and exams, and a short self-paced online professional development workshop (Koedinger & Kim, Jia, McLaughlin, & Bier, 2015; Lowenthal, Perkins, Hetrick, & Hofegartner, 2015). Second, many MOOCs are not designed specifically for teacher professional development by instructional designers with experience in teacher education (see Kleiman, Wolf, & Frye, 2015 for a related discussion). Given trends to offer teacher professional development in MOOC formats and some of the perceived problems with how MOOCs are currently designed, we have suggested guidelines for the design of MOOCs for teacher professional development. In the what follows we present the design guidelines we created based on our previous experience designing online instruction, our previous work on good practice for teacher professional development (Hodges, Grant, & Polly, 2013), and previous literature on professional development (Garet, Porter, Desimone, Briman, & Yoon, 2001).

Background of Teacher Professional Development

The body of knowledge recognized and accepted by professionals in any field of study is often evolving, as are the policies and procedures within organizations and government agencies (Hodges, 2015). This is especially true in Education. In many states, teachers are required to complete a set number of hours of professional development over specified time periods to maintain their teaching license/certification (e.g. State of Virginia, 2015). The main purposes for this requirement is so that teachers are up to date with their content knowledge and pedagogical methods. Some teachers meet this requirement by taking traditional for-credit college courses, while others attend workshops and earn professional development hours (e.g., CEUs or PLUs). However, in addition to state mandated continued learning, teachers across the U.S. also often attend a number of school sponsored professional development workshops (i.e., in-service training) each year. In fact, *Time* magazine reports that over 1 billion dollars are spent annually on teacher professional development (Tepe, 2015).

One of the issues teachers and principals face is identifying a good time for professional development; teachers often have limited time outside of the classroom when they are available for professional development (Yamagata-Lynch, 2003). Due to this time constraint, many teachers find themselves only attending short professional development workshops that can be completed in less than a day. Kleiman, Wolf, and Frye (2015) point out that "typically, these workshops provide information through 'sit and listen' presentations that, as research repeatedly demonstrates, may increase awareness of changing expectations, but do not lead to changes in educational practices or improvements in student achievement" (p. 230). The rise of the Internet, and increasing ubiquitous nature of social media and online learning combined with the limitations of traditional forms of professional development has led school systems and educators explore ways to experience professional development online. We will briefly describe some of these new ways to seek professional development in the following paragraphs.

Asynchronous and Synchronous Online Professional Development

Asynchronous, online professional development refers to online professional development experiences where the participants are not online at the same time with their fellow participants or the leader/facilitator of the experience. Synchronous, online professional development refers to experiences where the participants and facilitators are online together at the same time, but most likely not all at the same physical location. As enrollments in for-credit, asynchronous online courses have increased over the years, and more and more educators began completing courses and degree programs online, people began to experiment with offering professional development workshops online in an asynchronous format. The attraction of this type of professional development is largely because it can be taken at anytime, from anyplace; it also can be offered over time and can address some of the limitations of one-time workshops. Despite the benefits of offering professional development in this format, it suffers from some drawbacks; for example, a notable drawback is the fact that prolonged online professional development may suffer attrition for a host of reasons.

While asynchronous online professional development has gained some ground over the years, live synchronous online professional development has grown in recent years due in part to less expensive tools being available for the delivery of it via simple video conferencing options, and the increased availability of increased Internet bandwidth more easily supporting this type of interaction. The main benefits of this type of online professional development are that it can be done from any place, it can be recorded for others to watch who cannot attend (almost automatically creating an asynchronous offering), and it can be broadcast to large groups of teachers (e.g., an entire district). Still, this type of professional development is often too short, lacks meaningful collaboration, and is restricted to a certain time of day.

Social Networking and Personal Learning Networks

Online professional development, whether asynchronous or synchronous, is an organized effort; the online workshops or webinars have to be designed, developed, and delivered. Hodges (2015) describes how some professionals construct their own, informal professional development, through the choosing, adapting, or constructing professional development experiences from available resources online. For instance, educators use applications like Twitter and Facebook to engage in ongoing professional development (e.g. Ferriter, 2010; Forte, Humphreys, Park, 2012). In various ways they are developing personal learning networks, and increasingly may be doing so on mobile devices (Grant & Hsu, 2014). This type of professional development can be done from anywhere and at anytime. It empowers educators to decide when and how they engage with others. Thus, in many ways, this form of professional development is more of a form of lifelong learning and engaging in an ongoing community of practice than taking the occasional workshop. While the potential is there for this type of professional learning to be personalized, it is less structured and not easily documented for institutional purposes like renewing a teaching license/certification. It also requires the time for self-direction, and purposeful self-regulation, necessary to develop trusted resources and to use them, which can be a challenge.

Massive Open Online Courses (MOOCs)

Various types of MOOC experience are beginning to be recognized (e.g. cMOOC, xMOOC, TOOC). For the purposes of the present discussion we will use the term "MOOC" an umbrella term and will define it as Greene, Oswald, and Pomerantz (2015) describe most current MOOCs, "typically involv[ing] structured and sequenced teacher-led activities (e.g. videos, readings, problem-sets) coupled with online assessments and usually some venue for student interaction such as a discussion forum" (p. 927). For instance, in a recent examination of a MIT MOOC, researchers found that 28 percent of the participants self-identified as teachers or former teachers (Seaton, Coleman, Daries, & Chuang, 2015). And while MOOC completion rates are low, Greene, Oswald, and Pomerantz (2015) found that prior level of schooling was a predictor of achievement in MOOCs; thus suggesting that teachers completing a MOOC for professional development might be more likely to complete it than other participants. MOOCs offer teachers and schools/districts an exciting format for teacher professional development online. In many cases MOOCs can be completed from anywhere and at anytime. Unlike other forms of online professional development, MOOCs have the ability to be more cost effective, engage a larger audience, and address nearly any topic. The problem, though, as pointed out earlier, is that despite the affordances of MOOCs, they are still in their infancy and often are not designed in an effective way to meaningfully engage teachers.

While each of these formats of professional development has their own strengths and weaknesses for teachers, we believe there are some exciting opportunities in offering professional development in a MOOC format.

However, we posit that much more forethought needs to be given in how MOOCs are designed for teacher professional development.

Guidelines for Designing MOOCs for Teacher Professional Development

Throughout the rest of this paper, we describe six key design guidelines we created based on our previous experience designing online instruction, our previous work on good practice for teacher professional development (Hodges, Grant, & Polly, 2013), and previous literature on professional development (e.g., Garet, Porter, Desimone, Briman, & Yoon, 2001). We will describe how each of these guidelines can be used to design MOOCs for teacher professional development.

1. Active Learning including Hands on Instruction

Research on professional development highlights the importance to engage teachers in active learning including hands-on instruction (Garet et al., 2001; Lawless & Pellegrino, 2007; Mouza, 2002-2003). In the context of MOOCs, this recommendation could be interpreted as a need for the learning experience to include authentic assignments, assignments that require the application of the skills or knowledge learned to real-world situations. Teachers experiencing professional development are typically teachers with their own classrooms. Provide teachers with opportunities to learn through authentic assignments that can be used immediately, or easily repurposed for use, in their classrooms. Design MOOCS for teacher professional development with activities that make this immediate use or repurposing, easy. The authenticity should provide an excellent motivator to encourage teachers to participate in professional learning.

2. Alignment with Specific Curricular Content and a Focus on Pedagogy

Alignment with specific curricular content and focus on pedagogy (Penuel et al., 2007; Polly, Mims, Shepherd, & Inan, 2010) is an important aspect of teacher professional development. It makes the learning immediately identifiable as meaningful, and can add to the authenticity mentioned in item 1. Many states have their own standards, but there are many options to align MOOC offerings with easily recognizable standards such as the Common Core State Standards for English or Mathematics (http://www.corestandards.org/), the Next Generation Science Standards (http://www.nextgenscience.org/), or the National Educational Technology Standards (http://www.iste.org/standards).

Offer MOOCs on areas of high need for teachers. With the broad audience expected in a MOOC, a narrow area of need may not be possible, but the MOOC should be as focused as possible. There are large numbers of teachers, so even fairly focused MOOCs that may attract only small percentages of teacher, have the potential to attract massive enrollments. For example, instead of offering a MOOC on “math education”, make sure it is clear to potential MOOC participants how your course aligns with state or national standards, or for which grade-levels of teachers that it might be appropriate.

3. Collaborations

As noted in Greene, Oswald, and Pomerantz (2015), typical MOOCs include some aspect of student interaction. Collaboration is recommended for teacher professional development (Vescio, Ross, & Adams, 2006; Rogers, 2000). For teacher professional development, MOOCs should be designed to allow teacher participants to collaborate with each other. Collaboration in this way will support teachers who may meet others to add to their personal learning networks, and will add to the relevance and authenticity of the experience. Collaboration also may lead to a greater likelihood of teachers completing achievements in MOOC-based professional development. Greene, Oswald, and Pomerantz (2015) found that student-to-student interaction was strongly associated with achievement in the MOOC they examined.

4. On-site Support and Just-in-Time Learning

On-site support and just-in-time learning (Lawless & Pellegrino, 2007; van Es & Sherin, 2008) are recommended aspects of teacher professional development. Given the nature of MOOCs, the on-site support for anyone enrolled in the MOOC is not possible. However, just-in-time learning is easily enabled by MOOC experiences. One of the many criticisms of the *sit-and-get* models of teacher professional development is the lack of transfer to actual practice from the context of the professional development experience. When teachers can access professional development when they need it, or are ready for it, it is more likely to be effective. The increasing spread of mobile devices allows teachers to have their personal learning networks with them at those just-in-time moments (Grant, M.M., & Hsu, Y-C., 2014). MOOC designers should ensure that elements in their courses are easily searchable, or allow for personal bookmarking or annotation so that individual users can find the information they need, when they need it. If MOOC providers are creating their experiences to be accessible to students with various disabilities, at least some of these search and usability issues will be ready for all students.

If schools or districts are encouraging teachers to use MOOCs for professional development, they should consider the need for on-site technical support, and even pedagogical support. However, the focus of the present paper is on the design of MOOCs, not the design of professional learning experiences at the school or district level that may incorporate MOOCs. The issue of on-site support will most likely need to be limited to well-crafted online resources to aid MOOC participants who may have difficulty.

5. Remunerations

Remunerations are recommended for teachers to participate in professional development (Cole, Simkins, & Penuel, 2002). MOOC providers, in general, cannot provide remuneration to participants. However, MOOCs can be designed to allow other entities to remunerate completers. Some MOOCs provide certificates of completion, which is one, low-level indication of completion. However, artifacts resulting from the MOOC experience are better indicators of authentic completion, and the development of some skill or competence resulting from the MOOC participation. Can MOOCs be designed to award open badges for better-than-completion participation? The artifacts could be used by school systems as evidence of professional development that could then be compensated by the systems. In time, the value of badges from some MOOCs could become valuable indicators accomplishment, and thus may provide a way of moving beyond direct pay as remuneration. There are indeed recognized challenges in designing MOOCs so that meaningful, artifact-based badges can be awarded, but there may be ways to crowd-source the award of the badges through peer feedback in the MOOCs. Readers who are interested in open badges for teachers, may be interested in reading the Randall, Harrison, and West (2013) article detailed the design of a badging system for pre-service teachers, or the more general open badge development discussion in Devedzic and Jovanovic (2015).

6. Sustained Learning Opportunities Over Time

Finally, teacher professional development should include sustained learning opportunities over time (Garet et al., 2001; Howland & Wedman, 2004; Polly & Hannafin, 2010). MOOC offerings vary in the length of time in which they can be completed. It is understandable that a learning experience, like a MOOC, would have a beginning time and a suggested end, but MOOC materials and the learning communities that they may enable, should remain open to participants so that they can revisit content, assignments, and even discussions when needed. The silo-type, beginning and end of courses in learning management systems at traditional American universities has been identified as a barrier to the continued learning that may follow from structured learning experiences (Hodges & Repman, 2011). This is an area where MOOCs could do better than *regular or traditional* university courses that are often locked down at the end of a semester.

Conclusion and Directions for Future Inquiry

Teachers are enrolling in MOOCS (Seaton, Coleman, Daries, & Chuang, 2015). Given that teachers are educated professionals, recent research (Greene, Oswald, and Pomerantz, 2015) suggests that teachers may make excellent prospects for remaining in, completing, and achieving in MOOCs. However, it is our opinion that designers need to make intentional design decisions to accommodate observed needs of teachers in MOOC-based

professional development experiences. There are ample guidelines from the study of teacher professional development (Hodges, Grant, & Polly, 2013) to use as guides for developing MOOCs for teachers.

This paper is written from the perspective of considering the teachers' viewpoint. School system leaders may have other ideas that would either decrease or increase the interest in offerings MOOCs for teacher professional development. It would be beneficial to analyze the design requirements of MOOCs from the perspective of the stakeholders who may be recommending or verifying MOOC completion, or remunerating teachers for their successful completion of the experience. It should be noted that the literature condensed in this paper regarding effective teacher professional development was all written before MOOC professional development existed. Thus, there is a need to update the summary of literature and important findings as teacher professional development via MOOCs expands and evolves.

References

Bebell, D. J., & Petersen, R. (2015). Leveraging MOOCs for credit-granting institutions: Results from a community college pilot study. Retrieved from http://ssrn.com/abstract=2623155

Carbone, N. (2014). Here a MOOC, There a MOOC. In S. D. Krause & C. Lowe (Eds.), *Invasion of the MOOCs: The promise and perils of Massive Open Online Courses* (pp. 193-203). Anderson, SC: Parlor Press.

Carr, D. F. (2013, March). SXSWedu: A MOOC Love Fest. InformationWeek. Retrieved from http://www.informationweek.com/software/sxswedu-a-mooc-love-fest/d/d-id/1108967?

Cole, K., Simkins, M., & Penuel, W.R. (2002). Learning to teach with technology: Strategies for inservice professional development. *Journal of Technology and Teacher Education, 10*(3), 431-455.

Devedzic, V., & Jovanovic, J. (2015). Developing open badges: A comprehensive approach. *Educational Technology Research & Development*, *63*(4), 603-620. doi:10.1007/s11423-015-9388.3

Ferriter, W.M. (2010). Digitally speaking / why teachers should try twitter. *Educational Leadership, 67*(5), 73-74

Forte, A., Humphreys, M., & Park, T. (2012). Grassroots Professional Development: How Teachers Use Twitter. In *Proceedings of the Sixth International AAAI Conference on Weblogs and Social Media*. Retrieved from: http://www.aaai.org/ocs/index.php/ICWSM/ICWSM12/paper/view/4585

Garet, M., Porter, A., Desimone, L., Briman, B., & Yoon, K. (2001). What makes professional development effective? Analysis of a national sample of teachers. *American Educational Research Journal, 38*(4), 915-945.

Glance, D. G., Forsey, M., & Riley, M. (2013). The pedagogical foundations of massive open online courses. *First Monday, 18*(5-6). Retrieved from: http://bit.ly/1VFq6lO

Grant, M.M., & Hsu, Y-C. (2014). Making personal and professional learning mobile: Blending mobile devices, social media, social networks, and mobile apps to support PLEs, PLNs, & ProLNs. In A.V. Stavros (Ed.) *Advances in communications and media research*, Volume 10 (pp. 27-46). New York: Nova Science Publishers.

Greene, J. A., Oswald, C. A., & Pomerantz, J. (2015). Predictors of retention and retention and achievement in a massive open online course. *American Educational Research Journal, 52*(5), 925-955. doi:10.3102/0002831215584621

Hodges, C. B. (2015). Professional development tools and technologies. In J. M. Spector (Ed.), *The SAGE Encyclopedia of Educational Technology* (pp. 591-594). Thousand Oaks, CA: SAGE. doi: http://dx.doi.org/10.4135/9781483346397.n246

Hodges, C. B., Grant, M., & Polly, D. (2013). Beyond one-shot workshops: Three approaches to STEM teacher professional development. In R. McBride & M. Searson (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2013* (pp. 4795-4800). Chesapeake, VA: Association for the Advancement of Computing in Education (AACE).

Hodges, C.B., & Repman, J. (2011). Moving outside the LMS: Matching web 2.0 tools to instructional purpose. ELI Brief. Available at:http://www.educause.edu/Resources/MovingOutsidetheLMSMatchingWeb/235610

Howland, J., & Wedman, J. (2004). A process model for faculty development: Individualizing technology learning. *Journal of Technology and Teacher Education, 12*(2), 239-263.

Kleiman, G.M., Wolf, M.A., & Frye, D. (2013). *The digital learning transition MOOC for*

educators: Exploring a scalable approach to professional development. Friday Institute for Educational Innovation, College of Education, NC State University. Retrieved from: http://bit.ly/1NomGES

Kleiman, G. M., Wolf, M. A., & Frye, D. (2015). Educating educators: Designing MOOCs for professional learning. In P. Kim (Ed.), *Massive Open Online Courses: The MOOC revolution* (pp. 227-279). New York, NY: Routledge.

Koedinger, K. R., Kim, J., Jia, J. Z., McLaughlin, E. A., & Bier, N. L. (2015, March). Learning is not a spectator sport: Doing is better than watching for learning from a MOOC. In *Proceedings of the Second (2015) ACM Conference on Learning@ Scale* (pp. 111-120). New York, NY: ACM.

Lawless, K. A., & Pellegrino, J. W. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns, and ways to pursue better questions and answers. *Review of Educational Research, 77*(4), 575-614.

Lowenthal, P., & Hodges, C. (2015). In search of quality: Using Quality Matters to analyze the quality of massive, open, online courses (MOOCs). *International Review of Research in Open and Distributed Learning, 16*(5), 83-101. Retrieved from: http://www.irrodl.org/index.php/irrodl/article/view/2348

Lowenthal, P. R., Perkins, R., Hetrick, T., & Hofegartner, C. (2015, October). Teaching a MOOC: Tales from the front lines of Massive, Open, Online, Courses. Paper presented at Online Learning Consortium, Orlando, FL.

Manning, C., Morrison, B. R., & McIlroy, T. (2014). MOOCs in language education and professional teacher development: Possibilities and potential. *Studies in Self-Access Learning Journal, 5*(3), 294-308. Retrieved from: http://sisaljournal.org/archives/sep14/manning_morrison_mcilroy/

Margaryan, A., Bianco, M., & Littlejohn, A. (2015). Instructional quality of Massive Open Online Courses (MOOCs). *Computers & Education*, *80*, 77-83.

Mouza, C. (2002-2003). Learning to teach with new technology: Implications for professional development. *Journal of Research on Technology in Education, 35*(2), 272-289.

Pappano, L. (2012, November). The year of the MOOC. *New York Times*. Retrieved from http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html?_r=0

Pence, H. E. (2014). Are MOOCs a solution or a symptom? *Journal of Educational Technology Systems, 42*(2), 121-132.

Penuel, W., Fishman, B., Yamaguchi, R., & Gallagher, L. (2007). What makes professional development effective? Strategies that foster curriculum implementation. *American Educational Research Journal, 44*(4), 921-958.

Polly, D., & Hannafin, M.J. (2010). Reexamining technology's role in learner-centered professional development. *Educational Technology Research and Development, 58*(5), 557-571.

Polly, D., Mims, C., Shepherd, C. E., & Inan, F. (2010). Evidence of impact: An analysis of the influence of PT3 Projects designed to transform methods courses and field experiences. *Teaching and Teacher Education*, *26*(4), 863-870.

Randall, D.L., Harrison, J.B., & West, R.E. (2013). Giving Credit Where Credit Is Due: Designing Open Badges for a Technology Integration Course. *TechTrends: Linking Research and Practice to Improve Learning, 57*(6), 88-95.

Rogers, D. (2000). A paradigm shift: Technology integration for higher education in the new millennium. *AACE Journal, 1*(13), 19-33.

Seaton, D. T., Coleman, C., Daries, J., & Chuang, I. (2015). Enrollment in MITx MOOCs: Are we educating educators? *EDUCAUSE Review.* Retrieved from: http://bit.ly/1hrhTEn

State of Virginia, (2015). *Virginia licensure renewal manual.*Virginia Department of Education Division of Teacher Education and Licensure, Richmond, VA. Retrieved from: http://tinyurl.com/7rvzybp

Straumsheim, C. (2015, October). Partial credit: The 2015 Survey of Faculty Attitudes on Technology. *Inside HigherEd*. Retrieved from https://www.insidehighered.com/news/survey/partial-credit-2015-survey-faculty-attitudes-technology

Tepe, L. (2015, April). The next experiment in education. *Time*. Retrieved from: http://time.com/3818184/the-next-experiment-in-education/

van Es, E. A., & Sherin, M. G. (2008). Learning to notice in the context of a video club. *Teaching and Teacher Education, 24*(2), 244-276.

Vescio, V., Ross, D., & Adams, A. (2006). *A review of research on professional learning*

communities: What do we know? Retrieved from: http://www.nsrfharmony.org/research.vescio_ross_adams.pdf

Yamagata-Lynch, L.C. (2003). How a technology professional development program fits into teachers' work life. *Teaching and Teacher Education*, *19*(6), 591-607.