Opportunities and challenges in Personalized MOOC Experience

Ahmed Mohamed Fahmy Yousef
Fayoum University
Fayoum - Fayoum University
POBox: 63514
amf00@fayoum.edu.eg

Ayse Saliha Sunar
University of Southampton
University Road, UK
SO17 1BJ
ass1a12@soton.ac.uk

ABSTRACT
To provide MOOC participants with efficient learning resources and feedback according to the unique needs of each learner is obvious a greater challenge. In this paper, we describe the top five challenges that have the power to hinder the overall personalize MOOC experience. In addition to that, we suggest new opportunities considering individual differences in order to support personalized MOOC experience.

Categories and Subject Descriptors
K.3.1 Computer Uses in Education: Collaborative learning; Computer-managed instruction (CMI) and Distance Learning; J.1 Administrative Data Processing: Education.

Keywords
Massive Open Online Courses; MOOCs; Personalized MOOC; Learning Analytics; Recommender Systems.

1. INTRODUCTION
In recent years, Massive Open Online Courses (MOOCs) permeated our higher education institutions in several ways. The presence of MOOCs opened the door for massive number of participants around the globe to join free online courses from many number of universities, regardless of their ability or educational levels [1]. However, to provide MOOC participants with efficient learning resources according to the unique needs of each learner is really a big challenge. Learners are not only different in their behaviors and learning approaches, but also different in their personality, intelligence, emotion, and abilities [2]. This opens the door for the next major milestone in personalization of MOOC experience. The aim of this paper is to explore the opportunities and challenges in personalized learning experiences in MOOCs.

2. PERSONALIZATION OF MOOCs
The educational community was introduced with MOOCs in 2008 and has experienced many kinds of MOOCs (e.g. cMOOCs, xMOOCs, sMOOCs, bMOOCs) [1]. By the late of 2011, researchers have started paying attention for personalization of MOOCs. Sunar et al. [3] conducted a systematic review on

personalization of MOOCs. They reviewed the academic literature from 2011 until 2014 and found that, the number of literature on personalization of MOOCs has been sharply increased in 2013. Thus far, the number of related papers is still low [3].

The authors further provide a classification of three distinct types of studies. These concerned with 1) the need or motivation for personalization in MOOCs. 2) Outlines of plans or proposals for implementing personalization in MOOCs. 3) Accounts and evaluations of the implementation of personalization services in MOOCs [3]. Recent evidence suggests solutions based on personalization and adaptation educational techniques such as personalized learning pathways and personalize feedback. However, much uncertainty still exists about the relationship between MOOCs as an open world class and building personalized service based on the learning networks [3]. We concentrate here on the major challenges and the promising opportunities in the development of personalized MOOCs experiences.

3. CHALLENGES
In this section we present the top five challenges, all of which have the power to hinder the overall personalized MOOC experience.

3.1 Diversity
The MOOC learners are significantly diverse. Gua and Reinecke [4] investigate learners' demographic differences and their study pattern in MOOCs through the data of 140,456 MOOC learners. The learners participate from around 200 different countries and speak many different languages. Additionally, they have also variant of motivation and objective for enrolling in MOOCs. They also differ regarding to their study pattern. For example, some learners show linear participation while others jump from one lecture to the other. Moreover, some learners mainly join online discussion while others firmly focus on assessments. Therefore, each learner needs different kinds of support in MOOCs for more beneficial study. However, current MOOCs are inefficient to meet the needs of very wide spectrum of MOOC learners.

3.2 Rigid Curriculum
Learning activities and course content design in most of current MOOCs are still set by the course authors [1]. The main critique of this pedagogy approach is that, the learner is hinder profit from higher cognitive skills include abilities like analysis, synthesis, and evaluation [5].

3.3 Teaching assistants
Since thousands of learners benefit from a MOOC, the teaching assistance offered to support the learning activities in network

learning becomes a critical issue [1]. The challenge now is how to support learners with learning assistance to resolve individual problems and provide scaffolding learning assistance.

3.4 Assessment and Feedback

The current versions of MOOCs are restricted to closed exercise types like multiple-choice tests and short quizzes. In order to overcome the inefficient assignment system, some MOOCs offer peer assessment [6]. However, assessment criteria and expertise level of learners are still concerns in this method. Moreover, these methods cannot be considered learner-centered approach because they do not consider the individual needs. The challenge here is how to support MOOC participants with immediate and constrictive feedback.

3.5 Data Privacy

In order to provide personalized learning experience in MOOCs, providers are required to track and collect participant data. This approach arises some significant ethical concerns regarding the protection of learners' privacy [7]. Thus, realizing the potential of using learning data in MOOCs requires a new paradigm for tackling the ethical and privacy issues [7].

4. OPPORTUNITIES

This combination of findings provides some support for the conceptual premise that personalized learning experience in MOOCs can be a powerful tool for learning and contribute to improve learning outcomes. In this section, we will explore some of research opportunities in the area of personalized MOOCs.

4.1 Learning Analytics

Massiveness and diversity, one of the biggest challenges of MOOCs, produce huge amount of data. Along with demographic data, learners activities during a MOOC leading to a better understanding and enhance learning outcomes [1].

4.2 Personal Recommender System

One of the commonly used methods for personalization in MOOCs is recommender system [3]. Tag-based recommendation and in conjunction with collaborative content-based filtering have the potential to improve learning experience in personalized MOOCs and to provide more accurate recommendations for course participants [9].

4.3 Inquiry-Based Learning

Inquiry-based learning first appeared in schools in the early 1960s during the discovery learning movement [10]. Sharples et al. [11] investigated personal inquiry-based learning toolkit based on participants investigating topics of personal significance supported by the inquiry system [11]. Further investigation and experimentation into personal inquiry-based learning in open learning scenarios such as MOOCs is strongly recommended.

4.4 Self-assessment

Several studies have produced estimates of electronic assessment in MOOC platforms, but there is still few researchers focused on the learners' self-assessment [1]. In this regard, we suggest developing a self-assessment toolkit enabling learners to measure and evaluate themselves, independently from their teachers.

4.5 Personal Learning Portfolio

Personal learning portfolio for MOOC participant is quite different from the traditional e-portfolio [12]. In our approach, personal learning portfolio is going beyond an assessment tool for instructors towards more individual and dynamic student centered portfolio collecting individual's learning activities at the home institute in blended form or online in MOOCs platforms.

5. CONCLUSIONS

Massive Open Online Courses (MOOCs) are delivered via web to potentially thousands of learners at a time. However, learners differ from each other and every one has its own characteristics and its own learning background. This paper highlighted some challenges in personalizing of MOOCs and suggests new opportunities for personalized MOOC based on learners needs.

6. REFERENCES

[1] Yousef, A. M. F., Chatti, M. A., Schroeder, U., Wosnitza, M., & Jakobs, H. 2014. MOOCs-A Review of the State-of-the-Art. In Proc. CSEDU 2014 conference, Vol. 3, 9-20.

[2] Daneman, M., & Carpenter, P. A. 1980. Individual differences in working memory and reading. Journal of verbal learning and verbal behavior, 19(4), 450-466.

[3] Sunar, A. S., Abdullah, N. A., White, S., & Davis, H. C. 2015. Personalisation of MOOCs: The State of the Art. In Proc. CSEDU 2015 conference, Vol. 1, 88-97.

[4] Guo, P. J. and Reinecke, K. 2014. Demographic differences in how students navigate through MOOCs. In Proceedings of the first ACM conference on Learning@ scale conference, 21-30. ACM.

[5] Kompa, J. S. 2012. Disadvantages of Teacher-Centered Learning. Joana Stella Kompa. Np, 25.

[6] Kulkarni, C., Wei, K. P., Le, H., Chia, D., Papadopoulos, K., Cheng, J., ... & Klemmer, S. R. (2015). Peer and self-assessment in massive online classes. In Design Thinking Research (pp. 131-168). Springer International Publishing.

[7] Marshall, S. 2014. Exploring the ethical implications of MOOCs. Distance Education, 35(2), 250-262.

[8] Daries, J. P., Reich, J., Waldo, J., Young, E. M., Whittinghill, J., Ho, A. D., & Chuang, I. 2014. Privacy, anonymity, and big data in the social sciences. Communications of the ACM, 57(9), 56-63.

[9] Sarwar, B., Karypis, G., Konstan, J., & Riedl, J. 2001. Item-based collaborative filtering recommendation algorithms. In Proceedings of the 10th international conference on World Wide Web, 285-295. ACM.

[10] Bruner, J. S. 1961. "The act of discovery". Harvard Educational Review 31 (1): 21–32.

[11] Sharples, M., Scanlon, E., Ainsworth, S., Anastopoulou, S., Collins, T., Crook, C., & O'Malley, C. 2014. Personal inquiry: Orchestrating science investigations within and beyond the classroom. Journal of the Learning Sciences, (ahead-of-print), 1-34.

[12] Mason, R., Pegler, C., & Weller, M. 2004. E-portfolios: an assessment tool for online courses. British Journal of Educational Technology, 35(6), 717-727.