10 Dimensions Model for Quality MOOC Design

Yuki Ichimura
yici@kumamoto-u.ac.jp
Doctoral Student
Graduate School of
Instructional Systems
Kumamoto University
Kumamoto, Japan

Hiroshi Nakano
nakano@cc.kumamoto-u.ac.jp
Professor
Graduate School of
Instructional Systems
Kumamoto University
Kumamoto, Japan

Katsuaki Suzuki
ksuzuki@kumamoto-u.ac.jp
Professor
Research Center for
Instructional Systems
Kumamoto University
Kumamoto, Japan

Abstract   Rapid growth of Massive Open Online Courses (MOOCs) has called for instructional design for quality learning experiences. Responding to the needs, Ichimura & Suzuki (2017) have suggested the 10 Dimensions Model from the review of MOOC related literature, with a focus on critical elements of course design of MOOCs. This current study includes verification of the Model, analyzed with the quality guidelines of MOOCs available now. The quality criteria addressed in the guidelines are associated with each dimension.

Key words: Massive Open Online Courses(MOOCs), Instructional Design, 10 Dimensions Model

INTRODUCTION

Massive Open Online Courses (MOOCs) had rapid growth since right after it was launched. This phenomenon was often argued as disruption or hype (Shah, 2020). Since then, the quality and pedagogical design of MOOCs have been discussed as the area to be improved, with no consensus yet been emerged (Margaryan et al., 2014). Under these situations, responding to this concern addressed by the previous researchers, we sought a design framework for MOOCs and developed 10 Dimensions Model for MOOC design (Ichimura & Suzuki, 2017). Recently, the contribution of empirical research on Massive Open Online Courses (MOOCs) has been increased by instructors and designers around the world (Lu et al., 2021). In this current paper, we studied the available quality guidelines of MOOCs and verified our 10 Dimensions Model (Ichimura & Suzuki, 2017) with them.

10 DIMENSIONS MODEL

10 Dimensions Model (Ichimura & Suzuki, 2017) summarized and synthesized four works of literature that addressed MOOC design: Conole (2013)'s Learning Design Framework, Taxonomy addressed from Schneider (2013), Gover, et al. (2013)'s framework, and Mooc Canvas by Alario-Hoyos et al.(2014). When Ichimura & Suzuki (2017) developed this Model, we analyzed past systematic reviews of the literature on MOOCs, covering between 2008 to 2015, and carried out a forward reference approach. In addition, under the criteria, we conducted a database search. Peer-reviewed journal papers that covered design of MOOCs concerning instructional quality were scarce at the point, and the even existing papers did not fully explain the whole design components comprehensively, in particular, for the massive and open

online environment. The design elements addressed by the previous four models were identified, and a comprehensive model that covered all the underlying elements of the design of the various MOOCs was constructed in 10 Dimensions Model (Ichimura & Suzuki, 2017). In total, nine key elements were identified from the past models, and "support" dimension was added as a critical dimension, attributed to other literature reviews. (Fournier and Kop, 2015)

The features and forms of MOOCs have not ever been stable even in the past less than 10 years and a variety of versions exists. The 10 Dimensions Model (Ichimura & Suzuki, 2017) targets the use of MOOC design beginners, who are developing typical open and free access MOOCs in their institutions. Figure 1 illustrated the core 10 dimensions consists of MOOC design. The three elements on the bottom layer consist of "Basic Design Decisions", including "Resources", "General Structure" and "Vision". Each dimension includes multiple subcategories that were identified from the review.

Grover et al. (2013) proposed a MOOC design and evaluation framework, in which they suggested the core elements of the learning environment in MOOCs as Interactive Learning Environment (ILE). Their framework illustrated the mutual interaction of the elements. Above the seven elements, "Learning Analytics" that supports evidence-based improvement, "Pedagogy" that are core learning and instructional dimension, "Communication", "Supports", "Technologies", "Learner Background" and "Assessment" are interactive and act reciprocally (Ichimura & Suzuki, 2017).

Our studies after the first publication of the 10 Dimensions Model have been underway with the aim that enriching the framework of the Models. We have attempted to fill 10 dimensions with contents of design descriptions. We have conducted empirical studies related to pedagogy, assessment, vision, and support dimensions, thus far. The prescriptive analysis on the instructional structure of existing MOOCs examined sequential analysis, learning contents and assessment activities associated with cognitive levels (Ichimura, Noda, Suzuki & Nakano, 2020). The study on learning experiences of first MOOC learners examined the learning supports from the learners' needs (Ichimura, Nakano & Suzuki, 2020).
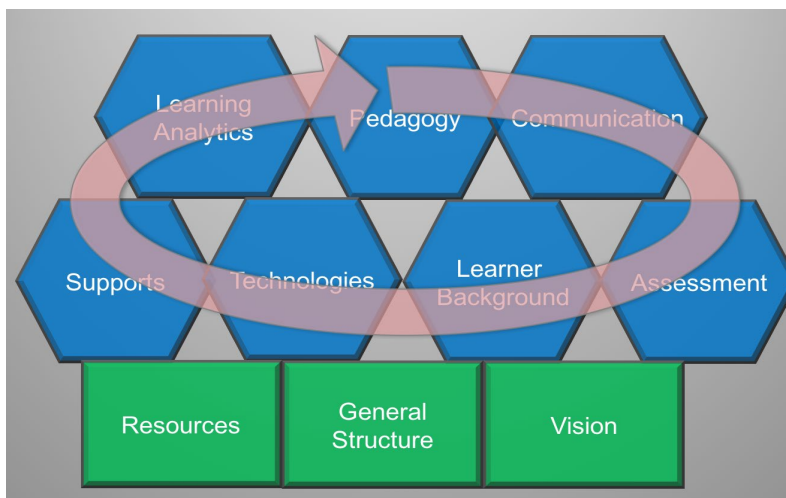

Figure 1 Ten Dimensions Model (Ichimura & Suzuki, 2017)

RESEARCH DESIGN & METHODS

In this current study, we verified 10 Dimensions Model (Ichimura & Suzuki, 2017) with four quality guidelines of MOOCs available now. The purpose of this study is to see if the 10 Dimensions Model can be confirmed and to reinforce the 10 Dimensions Model with the additional views of quality guidelines utilized in the realm of MOOC practices. We examined and identified how each dimension is addressed in the quality standards.

The following four quality guidelines and measures were analyzed: OpenupEd Quality Benchmarks for MOOCs (Rosewell & Jansen, 2014), MOOC Scan Questionnaire (Margaryan, Bianco, & Littlejohn, 2015), Guidelines for Quality Assurance and Accreditation of MOOCs (Commonwealth of Learning, 2016), Quality Reference Framework (QRF) for MOOCs from the European Alliance for the Quality of Massive Open Online Courses (Stracke, et al., 2018). The three guidelines, issued before our model was published, were not returned in the previous literature search criteria and our model was developed without inclusion of them. That was a limitation of our previous study, and the current paper investigated and reinforced the 10 Dimensions Model with the quality guidelines.

OpenupEd Quality Benchmarks (Rosewell & Jansen, 2014) included 32 indicators with the two main levels: institutional level and course level. MOOC Scan Questionnaire (Margaryan, et.al., 2015) had three sections that were 1) course details, 2)objectives and organizations, 3) instructional design, assessed with Merrill's (2002) First Principles of Instruction. 37items in total were included. The guideline from the Commonwealth of Learning (2016) covers multiple levels of guidance, including quality dimensions presented by presage, process, and product stages and checklist for accreditation. The checklist has eight focus topics with 38 items. Quality Reference Framework (QRF) of the European Alliance for the Quality of Massive Open Online Courses (MOOQ) (Stracle et al., 2018) provides the Key Quality Framework, Criteria, and the Quality Checklist. QRF was categorized by design phases: 1) analysis, 2)design, 3)implementation, 4)realization, 5)evaluation, as well as perspectives including 1,) pedagogical 2,) technological 3) strategic, and roles. The items and measures addressed in the four quality guidelines were mapped, using 10 Dimensions Model (Ichimura & Suzuki, 2017), and analyzed.

RESULTS

The analysis process is underway, and the initial report is presented in this paper. The common criteria across the multiple guidelines were detected. The open nature of MOOCs was particularly addressed in the guidelines that are associated with the Resource dimension. MOOCs are open access, and the materials and media in the course are a matter of copyright license. Attribution of copyright and intellectual property rights was strictly required (Rosewell & Jansen, 2014: Stracle et al., 2018). In addition, the use of materials licensed under Creative Commons and Open Educational Resources was highly recommended by the guidelines (Rosewell & Jansen, 2014: Commonwealth of Learning, 2016).

Table 1 :Additional Elements Found in the Four Quality Guidelines

Dimensions	Excerpts from the 4 Quality Guidelines
1.Resources	"Course components have an open license and are correctly attributed." (Rosewell & Jansen, 2014)
2.General Structure	"Clearly outline the course requirements." (Margaryan, et.al., 2015) "Identify possible certification for different levels of completion." (Stracke, et al., 2018)
3.Vision	"The purpose of the MOOC is stated clearly." (Commonwealth of Learning, 2016)
4.Learner Background and Intention	There are "self-report instruments that measure learners' motivations and goals, prior learning experiences, demographic information, contextual information, learning behaviors" (Commonwealth of Learning, 2016).
5.Pedagogy	"Provide activity options for participants with various learning needs." (Margaryan, et.al., 2015) "Aid students to construct their own learning, and to share and communicate it with others" (Rosewell & Jansen, 2014). "Define learning pace, personalization and monitoring progress ."(Stracke, et al., 2018)
6.Communication	Give learners of "peer-interaction groups specific directions for interaction." (Margaryan, et.al., 2015) "Design interaction via blogs, forums & social media platforms to foster social learning" (Stracke, et al., 2018)
7.Assessment	"Assessment and evaluation are integrated throughout the course." (Commonwealth of Learning, 2016) "The course provides learners with regular feedback through self-assessment activities, tests or peer feedback." (Rosewell & Jansen, 2014)
8.Technologies	"The tools used in the course are readily available to students." (Commonwealth of learning, 2016). Integrate technological tools "to foster interaction, communication and experience sharing". (Stracke, et al., 2018)
9.Learning Analytics Data	"Provide documentation of findings , reviews, and analysis from learning analytics, other form of data obtained in the course of the MOOC" (Stracke, et al., 2018).
10.Support	"Provide community teaching assistants to render feedback and support to learners" (Stracke, et al., 2018) . "Students have clear routes to academic, technical and administrative support" (Roswell, & Jansen, 2014).

Clear definition, outline and direction were highlighted across the multiple dimensions. Clear course description, prerequisite knowledge and skills, course requirements, the purpose of the MOOCs, learning outcomes, were basic information suggested in the guidelines. The guidelines also suggested clear definitions and statements of direction for MOOC learning, including, learning and assessment processes, learning materials, locations and navigations in the courses, the requirements for communication, the purpose of the technological tools, and support (Rosewell & Jansen, 2014: Commonwealth of Learning, 2016: Stracle et al., 2018). Clarity was emphasized across the dimensions and design stages from definition to presentation. It might be seen obvious, however, for diverse MOOC learners who have diverse online learning experiences, it is crucial to maintain explicit presentation.

The guidelines commonly encouraged diverse learner's self-regulated learning. To encourage self-regulated learning, high quality materials and support were addressed to be designed. As a tool, a self-report survey asking motivations and goals for participating in the MOOCs was introduced(Commonwealth of Learning, 2016).

Although the basic progress is self-study that is participants' independent learning in MOOCs, the guidelines encouraged learners' mutual interaction and communication of their gained knowledge. Communication and collaboration encourage the active engagement of the participants. Due to the massive class size, to enable interaction between participants in MOOCs, making use of online affordance, mobile apps and social media are necessary. Even synchronous interaction was encouraged in the guidelines.

For catering to a big population of learners, technology and learners' community functions for learning support. This way promoted community building and social learning, supporting the concept of community of learners.

Criteria addressed in the four quality guidelines were associated with 10 dimensions. The volume of items associated with each dimension was varied. Among 10, a great number of items were associated with the pedagogy dimension. On the other hand, "learning analytic data" had fewer items. Some excerpts from the quality guidelines associated with the 10 dimensions are as shown in Table 1.

Discussion

The initial phase of the results was presented. The results of the analysis on common criteria across the four quality guidelines supported the interactivity of dimensions, constructing the learning environment that was suggested in the 10 Dimensions Model. The design of learning activities to accommodate diverse learning needs and their self-regulated learning was encouraged. High-quality support design, pedagogy, learners' background and intention were associated with the criteria. Communication, technology, pedagogy and support dimensions were illustrated as that they functioned for other dimensions in the unique MOOC learning environment.

The association of criteria from the four quality guidelines enriched the 10 Dimensions Model. The results suggested the views on the quality for each dimension, required from the different focuses. Overall, 10 Dimensions covered the items suggested in the four quality guidelines. We will continuously explore

additional inputs for the contents of dimensions. The current 10 Dimensions Model was developed for MOOC design beginners. For advanced designers who have more discretion in the institution, the improvement for an advanced version of the Model might be needed.

The guidelines had a small number of statements about learning analytics. This dimension might be an area to be explored. Among these, the use of analytic data for evaluation of the course was addressed in the guideline (Stracke, et al., 2018). In the cycle of design, evaluation and improvement is the phase that is considered evidence-based improvement, using learning analytic data (Grover et al., 2013) in the 10 Dimensions Model.

Conclusion

10 Dimensions Model (Ichimura & Suzuki, 2017) was developed when the research on MOOC design was still limited. The Model synthesized the elements that construct MOOCs, that would provide an understanding of the mechanism for quality design. The current paper introduced the analysis of the Model using four quality guidelines available now to verify the Model. The analysis is still underway, and some important common attention on the design has emerged from the analysis. Those criteria were responding to the characteristics of massiveness and open learning environment of MOOCs, and crucial for independent learning of the participants who have diverse learning experiences and needs. In the guidelines, interaction and knowledge sharing of learners were encouraged with the use of technology, despite the great number of participants. Further analysis will investigate how each dimension is designed to meet the criteria addressed in the guidelines.

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