

DEVELOPERS' PERSPECTIVES ON MOOC SUSTAINABILITY IN UNIVERSITI TEKNOLOGI MALAYSIA

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Abstract

The rapid growth of Massive Open Online Courses (MOOCs) has impacted Malaysian higher education landscape where the Ministry of Higher Education has launched Malaysia MOOC, the first country in the world to implement government-initiated MOOCs for all public universities. The ministry allocates RM500 million for all public universities to offer the MOOC, under the 2016-2020 Eleventh Malaysia Plan. In the context of Universiti Teknologi Malaysia, it is one of the primary forerunners in MOOCs execution and implementation for Malaysia MOOC. Known as UTM MOOC, it has been implemented since 2014 and up to September 2016, it has reached its third cycle. However, there is a deficit of researches conducted on developer perspective in MOOC implementation, specifically in its sustainability in the Malaysian higher educational institution. Hence, this study aims to gauge the perceptions of MOOC developer within the parameter of Universiti Teknologi Malaysia. Critical case sampling method is chosen via a series of interviews with 13 out of 20 developers of 7 MOOCs in the first cycle of its implementation. The finding from this research is hoped to guide policy makers, university administrators and MOOC managers in optimizing MOOCs execution at the institutional level, which will lead to its sustainability and effectiveness of all the MOOCs stakeholders.

Keywords: Massive open online course; MOOC; Developers; Universiti Teknologi Malaysia

1.0 INTRODUCTION

Massive Open Online Courses (MOOCs) is primarily known as the driving force of disruptive innovation especially for higher education worldwide. The pervasive learning ecosystem enables learners to have access to quality learning materials from universities albeit their demographic locations, sociocultural backgrounds, nationalities as well as level of education. Malaysian higher education has prolifically taken a dynamic approach in embracing MOOCs to transform the existing brick-and-mortar higher

educational institutions. In 2014, national branding of MOOC, heralded as Malaysia MOOC is introduced at 20 public universities nationwide, complementing the Malaysian Educational Blueprint (MEB). All the public universities developed myriad MOOCs which are accessible via <https://www.openlearning.com/malaysiamoocs> which is hosted via OpenLearning, the MOOC platform provider that has been officially appointed by the Ministry of Higher Education for this initiative. One of

the universities that is a prolific developer of MOOC for Malaysia MOOC is Universiti Teknologi Malaysia. There has been researches conducted on MOOC implementation in Malaysia of the aspects of user motivation and institutional readiness.

However, there is yet any research in gauging the MOOC developers' perception on its implementation in any Malaysian higher educational institution albeit its significance in sustaining its success in the long run. Hence, these research main objectives are twofold. First, it analyses past researches conducted on MOOCs developers' perception on MOOCs implementation in higher education, globally and nationwide. Secondly, it analyses developers' perception within the context of Universiti Teknologi Malaysia in order to identify the success factors in sustaining MOOCs at the institutional level.

This paper is divided into five sections. The first part explores the prior development of MOOCs in Global Higher Education. The next section focuses on MOOCs conducted in Malaysian higher education. In this section, Malaysia MOOC initiative is discussed apart from the national policies that underpin the initiative. This is followed by findings on MOOCs in Universiti Teknologi Malaysia (UTM) which is known as UTM MOOC. Literature on MOOCs Sustainability in Malaysian higher education is also discussed consequently. The section on Methodology and Design outlines the mapping of the qualitative research and methodology via Stakeholder Analysis and interviews with Malaysia MOOCs stakeholders. Section on Result and Discussion synthesizes the data findings and further discussion on the discourse analysis. Lastly, the paper is concluded with summarization of this research and propagation of future studies.

2.0 LITERATURE REVIEW

In order to explore developers' perspectives on MOOCs Sustainability in Universiti Teknologi Malaysia (UTM), it is essential to understand the significant congruence between developers' roles and MOOCs sustainability in higher education.

According to [1], developers play an important role in the success of MOOCs as they "decide and define the key completion area for the course" as well as review, upgrade and optimize the value-added process for its sustainability. In order to review how the developers impact MOOCs sustainability, this section reviews literature on these aspects [1] MOOCs in Malaysia, [2] MOOCs in UTM as well as [3] MOOCs Sustainability in Higher Education. Throughout this paper, MOOC in UTM will be addressed as UTM MOOC.

MOOC in Malaysia

Malaysia MOOC is initiated by the government in tandem with Malaysian Education Blueprint for Higher Education, National Economic Model and Economic Transformation Programme [2]. It was pre-launched on 19 September 2014 by the then Second Education Minister, Datuk Seri Idris Jusoh. It was a milestone for Malaysian higher education as Malaysia is the first country in the world to implement the government-initiated Massive Open Online Courses (MOOCs) initiative for public universities. [3] Contrasting with main objective of global commercial MOOC providers that specifies on monetization, MOOCs in Malaysia focuses on complementing the blended learning ecosystem with existing on-campus learning environment [4]. In this context, the main objective was to ensure online learning complements the oncampus learning experience and ease accessibility to synchronous and asynchronous learning.



Fig. 1. Screenshot of Malaysia MOOC's website

The Malaysia MOOC initiative is part of the Ministry of Higher Education strategic plan in expedite the quality and "boost the ranking of Malaysian higher education on global scale" [3]. Prior to Malaysia MOOC, Taylor's University was the first Malaysian higher educational Institutions that initiated MOOC courses. Apart from Taylor's University, Open University Malaysia has also initiated MOOC courses [5] and by 2025, all Malaysian universities are expected to adopt MOOCs to add value to oncampus learning experience [6] OpenLearning is an Australian-based MOOC platform provider which has been appointed as the official MOOCs platform for the Malaysia MOOC initiative. [7]

MOOC in Universiti Teknologi Malaysia

Universiti Teknologi Malaysia (UTM) is one of 20 public universities in Malaysia as well as the primary research university in Malaysia that is the forerunner in MOOCs execution and implementation extensively. Prior to OpenLearning, UTM MOOCs were hosted on EdX platform in 2014 before it was formally hosted at OpenLearning platform. The progressing updates and changes are key indicators on how the MOOCs

managers as well as course developers have congruently optimized its development and execution.

Since its inception in 2014 and up to September 2016, it has reached its third cycle. UTM MOOC is one of the strategies for UTM to be a globally-connected higher education player that is renowned for its academic and research expertise. UTM MOOC is the hub for accessing online courses via OpenLearning platform and could be accessed via <https://www.openlearning.com/utm>. This site is not limited just for UTM students but is accessible for other students from other universities nationwide and beyond, as long as they have access to computer and the Internet.

From the inception of UTM MOOC to its third cycle, 37 courses were developed and offered to UTM undergraduate students. Up to 1st October 2016, 5429 end-users have registered for UTM MOOC, encompassing more than 24 countries worldwide. As part of the Malaysian Education Blueprint, [8] UTM has implemented Blended Learning for MOOCs execution where 30 percent of learning is conducted via MOOCs while 70 percent is carried out via face-to-face and classroom interaction. Above all, UTM MOOCs used as a blended learning approach in a higher learning institution to complement traditional teaching and learning methods. It is an innovative and competitive initiative to increase institutional visibility in the global higher education.

Pertaining to UTM MOOC Development, there are four major steps streamlined by UTM in ensuring its efficient execution and sustainability. Figure 2 depicts the UTM MOOC Development Process.

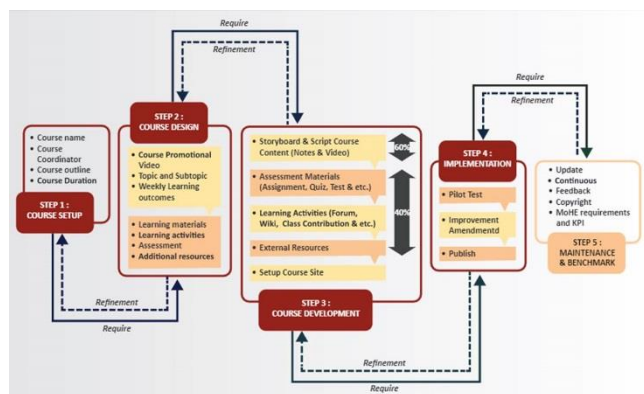


Fig. 2. UTM MOOC Development Process

Step 1: Course Setup

The MOOC course will be named alongside appointment of course coordinator. The outline of the course and the duration are finalized.

Step 2: Course Design

The MOOC promotional video will be recorded using iStudio application at the Centre of Teaching and Learning (CTL) in UTM. The learning materials, activities and assessment are planned alongside weekly learning outcomes.

Step 3: Course Development

Storyboarding, scripting and learning activities are set at this phase. Assessment materials to aid engagement and understanding are designed before uploading the course site.

Step 4: Implementation

Pilot test is conducted to ensure the course will run smoothly as well as testing for any glitch. Once rectified, the course is published. This is followed by series of feedback, upgrades, copyright and key performing index criteria.

MOOC Sustainability in Malaysian Higher Education

Sustainability refers to policy, situation, product, process or technology that can be perpetually maintained and sustained for an indefinite time. [9] In the context of higher education, Connectivism Theory [10] and Disruptive Innovation Theory [11] are the underpinning theories for this research.

Connectivism synthesizes innovative learning theories, social structures and technology. The theory ascended the robust development of higher education. It perpetuates the needs to innovate higher education for higher education sustainability. [12]

In the context of MOOCs, higher education needs to shift away from the focus of increasing the quantity of students in higher education to making a quality post-secondary education more cost effective. Quality is a paramount indication of success more than quantity of MOOC produced on annual basis. One of the main highlights of global higher education as it requires reassessment and realignment of the institution's goals, resources and processes in order to address global and national challenges. [13]

Due to its rapid growth in expediting access and cost to quality education worldwide, interests on MOOCs sustainability has escalated [14];[15] yet a search of literature revealed that there has been a steady increase of literature on MOOCs in higher education covering myriad aspects from educational, institutional, financial and socio-cultural areas. Nonetheless, literature on developers' perspectives on MOOCs implementation is underdeveloped and scarce.

Pertaining to state-of-the-art research on MOOCs Sustainability in Malaysian higher education, a

qualitative research was conducted on stakeholders view on MOOC sustainability on Malaysian MOOC [6] where Malaysia MOOCs champions and stakeholders were interviewed on their perspectives on Malaysia MOOCs sustainability in higher education.

Based from the findings, three main areas for MOOCs Sustainability were identified: [1] Value Proposition, [2] Infrastructure and [3] Financial and nine Critical Success Factors for MOOCs Sustainability were identified as the following: [1] Product Service, [2] Market Positioning, [3] Competitive Advantage, [4] Organizational, [5] Core Resources, [6] Technological Architecture, [7] Value-added Processes, [8] Source of Income and [9] Revenue Structure.

Hence, it is essential to gauge whether the proposed Conceptual Business Model for MOOCs Sustainability in Malaysian Higher Education is in sync with the developers' views who are one of the main stakeholders in the success of MOOCs in Universiti Teknologi Malaysia. This will enable higher educational institution to enhance their success in MOOC implementation in a long run. Figure 3 depicts Conceptual Business Model for MOOCs Sustainability in Malaysian Higher Education.

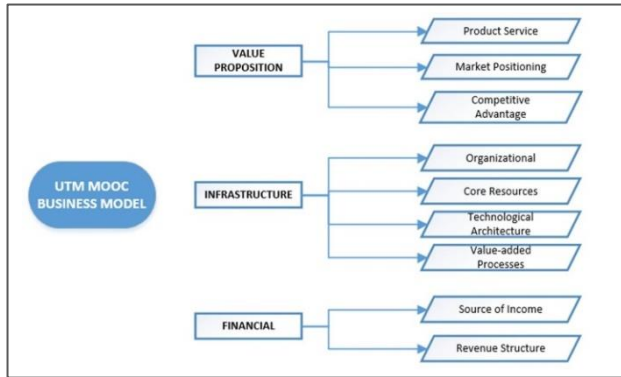


Fig. 3. Conceptual Business Model for MOOC Sustainability in Malaysian Higher Education

3.0 METHODOLOGY AND DESIGN

This study adopts a qualitative approach where semistructured interview is the chosen method. Since the scope of this research is limited to 20 target respondents who are the developers of MOOC courses for the first cycle of UTM MOOC, critical case sampling is decided as the most feasible method as it can "facilitate logical generalization" based on critical roles for a debut or new program or initiative. [16]

Hence, critical case sampling is implemented where respondents are chosen based on their involvement in UTM MOOC course development for the first cycle. The qualitative research is conducted

by synthesizing meta-analysis on state-of-the-art research on MOOCs as well as developers' experiences in developing UTM MOOCs. The correspondence is structured based from the Stakeholders' View for MOOCs Sustainability for Higher Education [6] where substantive conclusion on factors leading to MOOCs Sustainability could be drawn upon. Despite entering its third cycle and having myriad stakeholders in UTM MOOCs comprising UTM Manager, Administrators, Developers and End-Users, this research is designed to collect data solely from the UTM MOOC developers of the first cycle.

4.0 DATA COLLECTION

In the context of this research, 13 out of 20 developers for the first cycle of UTM MOOCs agreed and were available for data collection. All the project leaders for 7 MOOCs in the first cycle were available for data collection and 6 co-developers were also involved during this phase. The project leaders comprised of senior lecturers with extensive experience in the course as well as background knowledge on developing online learning materials. Interview is the qualitative method chosen for data collection for this research. A series of interviews with semi-structured questions were conducted with these 13 target respondents within a week's time in late September 2016. The interviews are conducted in phases, depending on the target respondents' availability. Then, target respondents were audiotaped and transcribed using Atlas.Ti, a qualitative data analysis software for qualitative data analysis.

Table 1. UTM MOOC Cycle

MOOC CYCLE	NO. OF MOOC	PROGRESS
1 st cycle	7	100%
2 nd cycle	11	In progress
3 rd cycle	23	In progress
TOTAL	41	

In the context of 1st cycle of UTM MOOC, 7 MOOC courses were developed by 20 developers from 5 faculties: [1] Faculty of Built Environment [2] Faculty of Civil Engineering [3] Faculty of Computing [4] Faculty of Electrical Engineering and [5] Faculty of Education. Table 1 depicts the UTM MOOC cycles. There were 20 developers encompassed lecturers from aforementioned faculties in UTM were involved in the first cycle of UTM MOOC development. For the first cycle, there are seven MOOCs being developed within the span of one year. These MOOCs are initially offered to undergraduate students but then opened to any endusers who registered for UTM MOOC at OpenLearning platform. Table 2 depicts the MOOCs offered alongside the percentage of progress.

Table 2. UTM MOOC for 1st phase

NO	COURSE	CODE	PROGRESS
1	Mechanical & Electrical Works Measurement	SBEQ3 213	95%
2	Highway Engineering	SKAA 2832	95%
3	Digital Electronics	SKEE 1223	60%
4	Data Structures and Algorithms	SCSJ 2013	100%
5	Web Programming	SCSV 1223	60%
6	Web-based multimedia development	SPPM 4342	95%
7	Research methods in education	SPPP 3042	60%

All the interviewees were approached using a set of questions that are designed based on the main themes aggregated from literature findings on MOOCs sustainability in higher education: value proposition, infrastructure and financial. The semi-structured questions serve the purpose of identifying patterns of emerging factors and elements expressed by the interview but flexible enough for further alteration as the interview progresses, depending on the interviewee's areas of expertise and roles in MOOCs provision, development and implementation. This exploratory approach were implemented in this research where the design of the data collection is gearing towards coding and synthesizing any commonalities and trends, [17] particularly in MOOCs sustainability in Malaysian higher education.

Three common questions were addressed to all target respondents; (1) background information, (2) experience developing the first cycle of MOOC, (3) success factors for MOOCs sustainability in Malaysian higher education from the aspects of value proposition, infrastructure and financial. Question three focuses on the success factor identified from primary and secondary data. By identifying commonalities, thematic identification in analysis can be expedited.

5.0 DATA ANALYSIS AND DISCUSSION

The transcribed data were analysed and summarized using Atlas.Ti, a qualitative data analysis software. The usage of open coding [18] revealed emerging patterns on factors and elements of MOOCs sustainability in Malaysian higher education. After synthesizing and analysing the data from the interviews, three main categories were coded : [1] Value Proposition, [2] Infrastructure and [3] Financial.

Value Proposition

Pertaining to value proposition offered by an existing platform provider, enhancing the quality of learning experience is the main factor that will influence MOOCs sustainability in Malaysian higher education. This is in tandem with Malaysian Education Blueprint where the antecedent factor for MOOCs implementation in higher education is to complement the on-campus experience via blended learning. One of the respondents opined that *"MOOCs definitely propels the uniqueness of UTM as a premier research university where UTM MOOCs can be accessible by anyone worldwide."*

Apart from that, one of the respondents shared how the MOOC he had designed have successfully landed him a collaboration with an industry partnership from Indonesia.

All of the interviewees believed that MOOCs sustainability in higher education is highly influenced by the quality of MOOCs offered on UTM MOOC. *"UTM MOOC is designed tactfully and thoroughly by ensuring quality control requirements are met before being assessable and available to the masses."*

Market positioning is also highlighted by the interviewees. MOOCs is catalytic in enhancing the brand and reputation of UTM by leaps and bounds . One interviewee stated how developing niche areas for UTM MOOC could optimize academic expertise as well as expand the branding influence beyond the on-campus learning. The interviewee said, *"I have students from Nigeria, United Kingdom and many European countries who enrolled in my MOOC subject. Few has shown interests in studying in UTM."* This is supported by a few by another interviewee who mentioned *"We can showcase the brand and the quality of the courses."*

Creating niche subjects for MOOCs is one of the way Malaysian MOOCs can provide competitive advantage to other existing MOOCs platforms from myriad higher education worldwide. Apart from offering niche subjects such as Islamic Banking, Halal Entrepreneurship, and so forth, perusing MOOCs for research is seen by the interviewees as way Malaysian higher education could reposition its core competencies and enhance MOOCs sustainability in the respective institutions.

"As a research university, UTM MOOC could be the gateway to encourage lifelong education where end-users can be connected to the experts at UTM sans the demographic barriers and time constrains."

Apart from providing value proposition to the higher institution, the interviewees stated that MOOCs could

enhance the quality of the learners as competent and possessing better collaborative and networking skills.

"For on-campus students, MOOC is seen as a motivation to complement face-to-face interaction as well as hands-on projects. This will better prepare them in facing rapid challenges and changes of the corporate world."

Infrastructure

Infrastructure is defined as institutional, technology architecture, resources and processes that are essential in sustainability of MOOCs in higher education. All of the developers opined on the important role of top management to champion and implement the Malaysia MOOC initiative in order to influence its sustainability in higher education.

"The top management has been very supportive in ensuring UTM MOOC's success. However, a comprehensive guideline would be eminent in ensuring a more effective execution."

Technological architecture is also one of the key elements of MOOCs sustainability based from the interviewees' feedbacks. Accessibility, connectivity and technical support are some of the mentioned aspects pertaining to infrastructure.

"Overall, accessibility and connectivity is good but there should be upgrades and optimization conducted to ensure end-users interactivity. Apart from that, interactivity with the developers can be improved by providing tech support to aid developers who are juggling with other tasks."

One interviewee responded that there is a need for more interactivity in MOOCs implemented in Malaysian higher education. Social media enhancement is considered by the interviewee to be the main consideration for MOOCs development in near future.

"I feel the latest version of UTM is greater as we can track the students' progress. However, I face issues in monitoring their progress on a daily basis as I have classes to attend apart from other responsibilities."

"It would be more effective if the platform could be accessible via social media platform."

The majority of the interviewees stated that skilful and motivated instructors will influence MOOCs sustainability in Malaysian higher education. A skilful instructor can motivate students to enhance their efficacy in understanding the content as well as adapt it for upskilling.

"In order to enhance the courses, we need dynamic instructors who are motivated in conducting and executing MOOC. Although time is a challenge, I have the passion to learn and so far, my students greatly benefit from MOOCs implemented in my class."

Financial

Based from the Disruptive Innovation Theory, one of the main factors of MOOCs sustainability is developing a viable business model. A good business model is a catalyst for a successful planning tool when it focuses on how all the elements of the system fit into a working whole. The organization achieves superior performance when they are unique, when they apply feasible competitive strategy in their strategic planning. This is supported by a statement made by an interviewee.

"Designing unique and localized content will garner more attention from users as it is different from the typical MOOCs offered by thousands of universities worldwide. To be ahead of the game, developing MOOC in local languages can be a key factor to its sustainability."

Generating source of income to sustain MOOCs in Malaysian higher education is also highlighted by some interviewees. This is due to the fact that the production cost of MOOCs for respective higher education is escalating.

"I believe there is a great potential for commercialization when it comes to our MOOCs. We can partner with other corporate sectors where we provide a win-win situation in marketing their products and marketing our academic expertise."

The developers believe that UTM MOOCs have the potential to go beyond on-campus learning and be an alternative revenue stream for the institution.

6.0 CONCLUSION

MOOC implementation in Malaysian higher education has dramatically shifted the focus of national higher education. In identifying the value and core competencies, the views from the developers who are the important stakeholder in its implementation needed to be researched thoroughly.

With the growing concern on the cost of producing MOOCs as well as developing better MOOCs, identifying developers' views on MOOCs sustainability is important. Nonetheless, research on MOOCs sustainability in higher education is limited and represents equivocal results. As Malaysia MOOC is the world first government-initiated MOOCs for public

universities, this study is significant, especially by taking consideration of developers' views. Hence, it is hoped that more research will entail where their views will impact on the effectiveness of MOOC implementation in UTM or any universities nationwide.

This research attempts to gauge and analyse the views of developers on UTM MOOCs sustainability in Malaysian higher education. The literature analysis conducted on MOOCs sustainability in higher education has identified three main factors: educational, institutional and financial.

The findings from this research is hoped to provide developers standpoints in order to identify the factors and elements required for MOOCs sustainability in Malaysian higher education.

Research done within the parameter of UTM is a way to gauge developers' perspective in planning and executing better MOOCs for its sustainability in a long run.

This research is hoped to offer a guideline for policy makers, academics and researchers in managing MOOCs at their respective higher educational institutions. For further study, views and perspectives from other stakeholders will be further explored in identifying the key factors for MOOCs sustainability in higher education. This research is hoped to expedite the success rate of MOOCs sustainability in UTM.

Acknowledgement

Our deepest gratitude to Universiti Teknologi Malaysia, especially the current and past UTM MOOCs managers, all the developers of UTM MOOCs and OpenLearning for their assistance in this research.

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