



Evaluation of Malaysia Pilot

MOOC

FINAL REPORT

***“Positioning Malaysia as a Premier Educational Hub by
Globalising Online Learning”***



MEIPTA



EVALUATION OF MALAYSIA PILOT MOOC



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LIST OF ABBREVIATIONS

AKEPT	Akademi Kepimpinan Pendidikan Tinggi
CADe	Centre for Academic Development
DePAN	Dasar e-pembelajaran Negara
GOL	Globalized Online Goal
ICT	Information and Communications Technology
iDEC	Information and Communication Development Centre
i-Learn	i-Learning Centre
MaDICT	Council of ICT Deans
MASMED	Malaysian Academy of SME & Entrepreneurship Development
MEIPTA	Majlis Ketua-Ketua Penyelaras e-Pembelajaran IPTA
MOHE	Ministry of Higher Education
MOOC	Massive Open Online Course
PSPTN	National Higher Education Strategic Plan
SME	Subject Matter Expert
UiTM	Universiti Teknologi Mara
UKM	Universiti Kebangsaan Malaysia
UNIMAS	Universiti Malaysia Sarawak
UPM	Universiti Putra Malaysia

EXECUTIVE SUMMARY

In the effort of expanding and improving the access of Malaysia Public Institutions of Higher Education, four pilot courses have been chosen, whereby 30% of the overall contents were developed in the form of Massive Open Online Course (MOOC). This initiative is a collaborative effort between various parties at all levels to improve the quality of teaching and learning in these respective institutions. The initiative started in November 2013, with a target deployment in September 2014, taking advantage of the commencement of the first semester of 2014/2015 academic year. A research project funded by the Ministry of Education through the initiative of Malaysian Public Universities e-Learning Council (MEIPTA) was conducted simultaneously.

This report laid out the key findings of the project, the lessons learnt, the outcomes of the evaluation process, and a set of recommendations based on the findings for Malaysian Higher education institutions, policy makers, and academics interested in exploring the use of MOOCs.

We hope that this document will benefit all parties especially to our stakeholder, the Ministry of Education, and give us better understanding of the deployment of MOOC in the national education.

KEY FINDINGS

- The students access MOOC utmostly once a week and majority of them were first time MOOC users. Most students access MOOC in their hostels using the wifi connections at night. MOOC is capable to support learning in providing learning resources and activities outside the classroom. MOOC should benefiting teaching and learning in the classroom with dependable infrastructure. Even though MOOC were new, but the finding showed positive acceptance of MOOC in teaching and learning by the students.
- The lecturers who teach the courses involved with the pilot MOOC were mostly first time users. They were competent in all types of activities embedded in MOOC like: e-content development; file sharing; initiate online quizzes, online forum, social media communication, and interactive presentation activity; but least competent at video production activity. Only few of them who were highly competent at online learning task. This happened, presumably because MOOC is considered relatively new in the Malaysian tertiary education settings, and since MOOC is still at its early stage of implementation (pilot).
- Students evaluated the quality of infrastructure and info structure provided for MOOC: the accessibility of MOOC; Internet speed; video streaming; and downloadable video, which indicates reliable access, equipment and MOOC platform as moderate. Although students were reaching an agreement towards the quality of MOOC access at any

time within their campuses, there was a drawback in regards to the accessibility of videos during lectures.

- Lecturers evaluated the quality of infrastructure and info structure provided for MOOC considerably high. It indicates that lecturers were reaching an agreement on the accessibility of MOOC anywhere within the campus and at any time, agreeing that they have sufficient equipment to access OpenLearning from any device but found difficult. Lecturers were somewhat unsure whether they will definitely use OpenLearning for other courses and were rather sceptical in using the MOOC in their teaching and learning processes. There is a possibility that the platform used, of which OpenLearning was very new to the lecturers.
- Students have reached an agreement on the suitability of curriculum used in MOOC delivery.
- The lecturers have reached an agreement on the suitability of curriculum used in MOOC delivery. However, lecturers' mean score was slightly lower than the students' mean score.
- Students have reached an agreement on the suitability of learning design in MOOC.
- Lecturers have reached an agreement on the suitability of pedagogy used in MOOC.
- Students have reached an agreement on the suitability of the content in MOOC.
- Lecturers have reached an agreement on the suitability of the content in MOOC. However, it was far lower than the students' agreement.
- Students have reached an agreement on the suitability of assessment in MOOC for their learning activities.
- Lecturers have reached an agreement on the suitability of assessment in MOOC, whether by means of giving quizzes in between or at the end of the lesson.
- Lecturers were somewhat unsure whether the training given to them will motivate them to utilize the MOOC in their teaching practices. It was probably due to MOOC was relatively new to them.
- Collectively, the coordinators perceived that lecturers were given the necessary trainings in order to make sure that they were able to utilize the MOOC during their teaching and learning process.

- In overall, based on the findings, it was confirmed that institutions did provide somewhat adequate MOOC teaching and learning supports to lecturers.
- Collectively, the findings on enculturation of MOOC at public universities were the lowest, and it is an alarming phenomenon since enculturation is indeed an important aspect in making sure the success of MOOC implementation.
- It shows that MOOC allowed different range or levels in gaining cognitive benefits. The findings also indicate that students were reaching an agreement on the ability of MOOC in enhancing the quality of teaching and learning in terms of skills and values.
- The lecturers have reached an agreement on the ability of MOOC in enhancing the quality of teaching and learning. Especially in giving the opportunity to them to share their knowledge.
- Insight from the MOOC developers on the (i) MOOC enablers for their institutions; (ii) planning; (iii) development models; (iv) designs (v) development of videos; (vi) quality control of the videos; and (vii) resources management and copyrights issues were sought and the finding shows different approaches were made from different universities in planning, developing and managing the pilot MOOC.

RECOMMENDATION

MOOC PROVIDERS

- The first issue that providers need to consider is the enculturation of MOOC within their institution. More proactive actions and initiatives are needed to be planned ahead and in place by strengthening the awareness among university's staff especially on open education concept.
- MOOCs should succeed in providing the practical, interactive, engaging and hands-on learning experiences which are required for teaching the skill based courses. Therefore, in terms of the pedagogical model, it is crucial to consider the standard formulas of academic courses especially the prevalent MOOC format of short video – quiz – forum that are optimal for this study. There is a need for more engaging strategies - collaboration between peers, team work, and the possibility of interacting and obtaining feedback both from the experts and peers. MOOCs should offer opportunities for learner interactions that allow actual group work and project-based interaction.

- In terms of the business model, universities should not only focusing and putting their expectation on recruiting paying students as the MOOC participants. Other possible models could be based on supplementing existing study programs by offering MOOCs on niche or emerging topics which cannot be covered by any on campus or formal academic programs. Another possibility would entail partnerships between different institutions, where MOOCs would be produced by universities and sponsored by industry or government bodies.
- Continuous research to ensure the quality of the learning experience in MOOC, in terms of engagement, feedback, usability, and appropriateness of content and activities should be also taken into account.

POLICY MAKERS

- MOOCs are considered new phenomenon in Malaysia. However, there are still policy makers at university level that have not realised the MOOC potential and therefore they shall fail in redressing the expected shortage in a skilled workforce for MOOC innovation.
- There is a need to build awareness of MOOC potential within the professional community. Likewise, it is crucial that MOOC providers tune their offerings to the preferences of learners and the needs of industry.
- MOOCs can benefit to address the challenges in connecting the university and industry in maintaining a skilled workforce.
- MOOC can be used for the initial training of university graduates to meet the requirements of entry level jobs when the collaboration with the industry is in place.
- MOOCs can also be used, perhaps even more effectively, for the continuous upskilling of existing employees to meet the needs of the industry.
- There should be partnership between educational providers and the industry to guide them in the production of new MOOCs.

1

INTRODUCTION

1.1 Teaching and Learning with e-learning in Higher Education

Rapid growth of information technology has brought remarkable consummate impacts to the human live equally in business, governance, manufacture, and education. The positive growth of ICT is driving major changes in individuals' professional and personal lives across the world, impacting every facet of society and is now an integral part of how most people interact, work, learn and access knowledge and information (Hatzipanagos, 2015). New and emerging technologies are starting to have a transformative effect on higher education provision, thus makes it as a symbol of a new era in education. As stated by Okaz (2015), the widespread use of digital technology has transformed the face of education. Therefore, it is about time that higher education complies with the growing expectations to assist the students survive effectively in a technologically based world.

Non face-to-face, primarily web-based educational models are starting to emerge in response to the demand for flexibility in learning (Lara, Lizcano, Martínez, Pazos, & Riera, 2014). One example of information technology usage in education is the e-learning. The advent of e-learning systems create a platform for the realization of new study forms (especially the distance mode) and the success of this platform depends on its involvement in integrated solution of information systems at the universities (Abazi-bexheti, 2008). Sadik (2007) mentioned that e-learning as a form of utilization of information technology in education, has been adopted by various institutions of higher education, and has become an important part in providing a flexible learning experience. Consequently, the development of e-learning systems has changed the way teaching and learning is delivered in most higher education institutions in the world.

The use of e-learning is beneficial in creating more flexible and sophisticated interactive learning environment. Researches shown that e-learning has enhanced the effectiveness of education system or training in higher education institutions, specifically the ones that offer open and distance education programmes. Shopova (2011) stated that e-learning has become an important medium in higher education institutions currently as it offers student-based learning (student-centered learning), education training, and more flexible learning methods. Recognizing the importance of e-learning, numerous universities have chosen commercial learning management software such as WebCT, Blackboard, and Moodle for the delivery of e-learning (Herrington, 2009). Volery (2000) asserted that if the universities did not embrace the e-learning technology that is readily available at the moment, they will be left behind in the pursuit of globalization.

1.2 E-learning in Higher Education Institutions in Malaysia

In Malaysia, the National Higher Education Strategic Plan (PSPTN), Ministry of Higher Education (MOHE), refers to a document that translates the direction of national higher education in the future. It focuses on the development of quality human being and intellectual capital to harness demographic dividend. This is in realization of the country's aspirations to become a developed, wealth, and competitive nation. To ensure that the implementation of PSPTN is in accordance to a set phase, the Ministry of Higher Education (MOHE) has developed 21 Critical Agenda Projects, also known as CAPs. Each of these CAPs has its own strategic objectives, indicators, and targets to be achieved through various planned activities. These activities must be executed either at the Ministry or agency level, comprising every agency under MOHE, which includes all higher education institutions.

With the rapid evolution of various technologies and approaches in online teaching and learning, public universities in Malaysia are continuously moving forward in expanding the potential of their e-learning programmes. Currently, nearly every public and private university in Malaysia is implementing e-learning in their teaching and learning with the use of various platforms to support the necessary features and specifications.

In addition, blended learning has also becomes a popular approach for teaching and learning mode in higher education institutions. With the combination of various delivery modes, blended learning not only offers more choices, but it is also more effective in reaching the students. As stated by Farahiza (2010), blended learning is expected: (i) To develop social communication in higher education institutions' community; (ii) To increase learners' competence and confidence; (iii) To provide a quality learning experience; (iv) To develop critical thinking in learning environment; and (v) To integrate technology as an effective tool to deliver contents to the learner.

Parallel to this, public universities in Malaysia currently are being audacious in order to make their courses available online to public and be as open as possible. Realizing this, an initiative known as Globalized Online Goal (GOL) has been created with the aims to transform Malaysia as an education hub internationally by using e-learning as a method to deliver programmes and courses that can be highlighted at the global level.

1.3 Malaysian Blueprint for Higher Education

The National Higher Education Strategic Plan (PSPTN), Ministry of Higher Education, is a document that translates the direction of national higher education for the future that focuses on the development of quality human and intellectual capital. This is to realize the country's aspirations to become a developed, prosperous, and competitive nation. The implementation of Phase 2

PSPTN (2011-2015) which includes Improvement Phase and Strengthening Phase will lead to more robust way in transforming higher education in order to make Malaysia as an excellent higher education hub beyond 2020.

In April 2015, Ministry of Higher Education has launched the Malaysian Educational Blueprint for Higher Education (2015-2025). The development process of this blueprint started with a review of the PSPTN with three distinct phases as follow:

- i. PHASE 1 - Review of PSPTN (February 2013 to February 2014): The Ministry started off with a comprehensive review of current performance and progress on PSPTN to establish a robust fact base on its strengths and weaknesses.
- ii. PHASE 2 - Conceptualization of the 10 Shifts (March 2014 to September 2014): Based on the review of the team’s findings and in consultation with the stakeholders, the Ministry identified 10 Shifts that would be needed to take the Malaysian higher education system to the next level. The Ministry also carefully aligned these Shifts with existing national plans, most notably the Malaysia Education Blueprint 2013-2025 (Preschool to Post-Secondary Education).
- iii. PHASE 3 - Finalization of the Malaysia Education Blueprint (Higher Education) (October 2014 to March 2015): The details of these 10 Shifts were finalized, following another extensive round of public consultation, and guidance from the Cabinet.



Figure 1.1: The 10 Shifts (Source: Executive Summary PPPM 2015-2025)

Based on Figure 1.1, the blueprint has outlines 10 Shifts that will spur continued excellence in the higher education system, namely Holistic, Entrepreneurial and Balanced Graduates, Talent Excellence, Nation of Lifelong Learners, Quality Technical Vocational Education and Training (TVET) Graduates, Financial Sustainability, Empowered Governance, Innovation Ecosystem, Global Prominence, Globalised Online Learning, and Transformed Higher Education Delivery (Executive Summary PPPM 2015-2025). All 10 Shifts addressed the key performance issues in the system, particularly in regard to quality and efficiency, as well as global trends that are disrupting the higher education landscape.

Focusing on the ninth Shifts which is the Globalised Online Learning, Internet penetration in Malaysia currently stands at 67% - the seventh highest penetration rate across Asia. This puts Malaysia in a good position to harness the power of online learning to widen the access to good quality content, enhance the quality of teaching and learning, lower the cost of delivery, and bring Malaysian expertise to the global community. Consequently, blended learning models will become a staple pedagogical approach in all higher education institutions. Students will benefit from robust cyber infrastructure that can support the use of technologies such as video-conferencing, live streaming, and Massive Open Online Courses (MOOCs). Malaysian higher education institutions will also develop MOOCs in their niche areas of expertise, while participating in international MOOC consortiums and building Malaysian education brand globally (Executive Summary PPPM 2015-2025).

To achieve these outcomes, the Ministry will work together with the higher education institutions to build the capabilities of the academic community and explore the establishment of a national e-learning platform to co-ordinate and spearhead the content development. The key initiatives include:

- i. Launching MOOCs in subjects of distinctiveness for Malaysia in partnership with high-profile international MOOC consortiums to build Malaysian global brand.
- ii. Making online learning an integral component for higher education and lifelong learning, starting up with the conversion of common undergraduate courses into MOOCs, and requiring up to 70% of programmes to use blended learning models.
- iii. Establishing the required cyber infrastructures (physical network infrastructure, info structure, platform, device, and equipment) and strengthening the capabilities of the academic community to deliver online learning at scale.

1.4 E-learning Policy

E-learning policy or known as *Dasar e-pembelajaran Negara* (DePAN) was launched on 16 April 2011, during the early stage of Phase 2 PSPTN. It outlines Malaysia e-Learning Roadmap according to the five main pillars known as Infrastructure, Organization Structure, Curriculum and Content, Professional

Development, and Enculturation (Dasar e-Pembelajaran Negara Institut Pengajian Tinggi, 2011).

Since the launched of Malaysian Blueprint for Higher Education, one of the initiatives is the Globalized Online Learning (GOL). The main focus of GOL is to enrich the open education in the context of Open Educational Resources (OER), Open CourseWare (OCW), and Massive Open Online Courses (MOOCs). One main focus in GOL implementation is the upgrading of DePAN to achieve the GOL agenda. Thus, DePAN was later upgraded to a new version which is DePAN 2.0.

Differ with the early version of DePAN, the DePAN 2.0 has stressed not only to the quality aspect but also has encourage innovation in education, branding of Malaysian education, cost reduction, human resource efficiency, and lifelong learning. DePAN 2.0 has also taking into accounts the nation e-learning development, especially in the GOL initiative. DePAN 2.0 outlines six main domains known as organizational structure and governance, infrastructure and info structure, online teaching and learning, development of e-contents, training and professional development, and guidelines for e-learning acculturation.

1.5 Malaysian e-Learning Council (MEIPTA)

Majlis Ketua-Ketua Penyelaras e-Pembelajaran IPTA (MEIPTA) is a council which coordinates the e-learning activities in all the 20 public universities in Malaysia. MEIPTA has been actively involved and stood up for any issues regarding e-learning development in Malaysia higher education. Since the launch of Malaysia MOOC, MEIPTA is one of the entities that enthusiastically involved in the development and deployment process.

1.6 MOOC Initiatives

In effort to expand and improve the access to Malaysian public universities courses, four pilot courses have been developed in the form of MOOCs, in collaboration with the Ministry of Education under the *Jabatan Pengajian Tinggi*. This initiative is a collaborative effort of various parties at all levels with the aim to improve the quality of teaching and learning. The initiative started in November 2013 with a target deployment of four first year undergraduate courses to be offered using MOOCs in September 2014, taking advantage of the commencement of the first semester of 2014/2015 academic year.

The four pilot MOOCs are *Tamadun Islam dan Tamadun Asia* (TITAS), *Hubungan Etnik*, Introduction to Entrepreneurship, and ICT Competency which hosted in OpenLearning platform with the aims for international branding as this platform was used by other universities worldwide. The descriptions for each pilot course are as follow:

1.6.1 Tamadun Islam dan Tamadun Asia (TITAS)

Figure 1.2 displays a screenshot taken from the OpenLearning platform. The MOOC course for TITAS was developed by the academicians in UPM who are the experts in the area, supported by the Information and Communication Development Centre (iDEC) and coordinated by the Centre for Academic Development (CADe). It focuses on the knowledge role of civilization in building the Malaysian society based on the civilization principles to practice the spirit of mutual respect and interaction with various religious communities. This course is crucial in the development of Malaysian civilization so as to make the societies well aware with the current issues, and instill positive attitude towards the culture's dialogue and civilization. This course is divided into five main themes: (i) Introduction to Science and Civilization; (ii) Islamic Civilization; (iii) Cornell; (iv) Chinese Civilization; and (v) Civilization India.

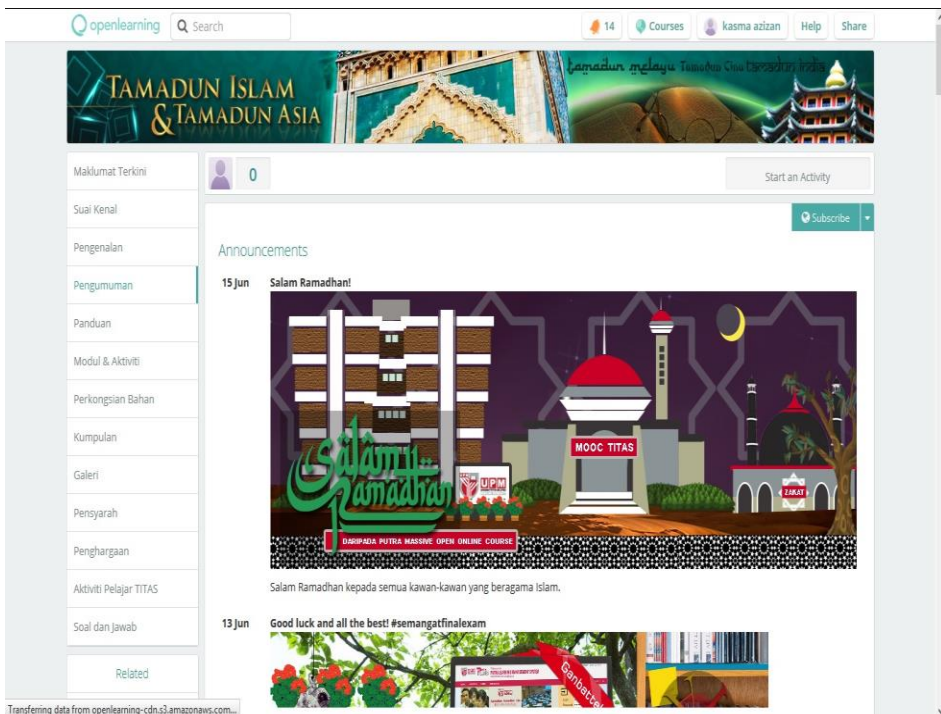


Figure 1.2: TITAS screenshot from OpenLearning

1.6.2 Hubungan Etnik

As shown in Figure 1.3, this course was developed by Universiti Kebangsaan Malaysia (UKM). It covers the ethnic relations in Malaysia by focusing on the social cohesion. The topics covered in this course include Scenario Ethnic Diversity in Malaysia, Lens Social Cohesion in Malaysia, Basic Construction of

Discourse Understanding Ethnic Relations, and the Daily Experience in Building Social Cohesion.

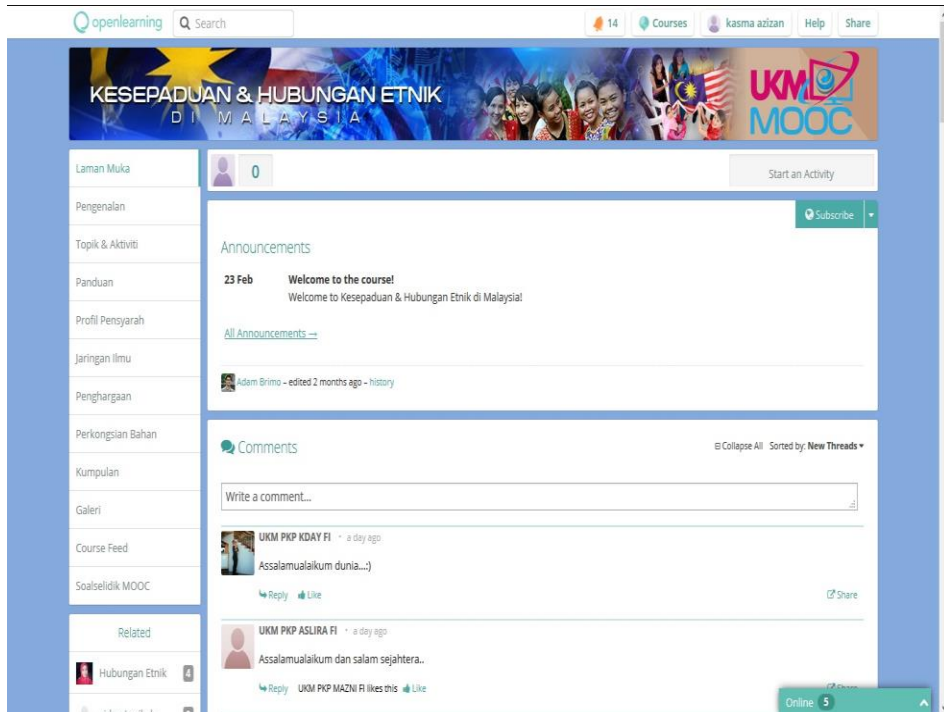


Figure 1.3: *Hubungan Etnik* screenshot from OpenLearning

1.6.3 ICT Competency

As shown in Figure 1.4, ICT Competency was developed by Universiti Malaysia Sarawak (UNIMAS). In the 21st century, learners are expected to utilize information and communication technology (ICT) tools to access up-to-date resources and perform essential computing tasks. This course is tailored to equip learners with the latest ICT knowledge and skills in further enhancing their competency. Through this course, they are able to apply relevant tools and use them effectively for learning purposes. Students are able to access the available videos, documents, and exercises for the course content, with week-by-week scheduling.

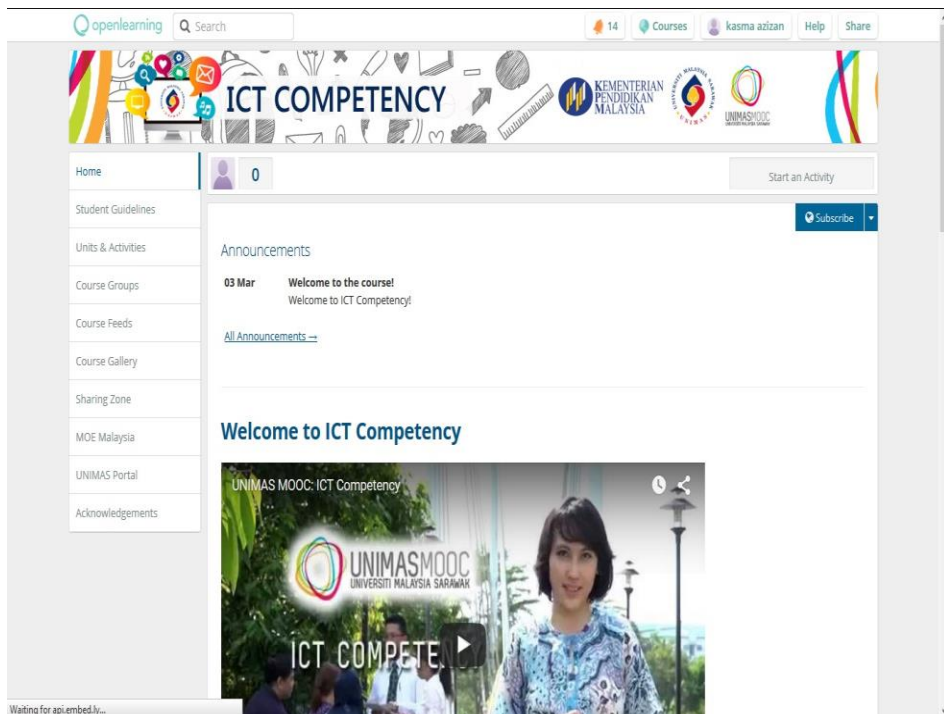


Figure 1.4: ICT Competency screenshot from OpenLearning

1.6.4 Introduction to Entrepreneurship

As shown in Figure 1.5, this course was developed by Universiti Teknologi Mara (UiTM). It provides an overview of the requirements for launching an entrepreneurial career and starting up an entrepreneurial venture. After an appreciation of the concept of entrepreneurship, students will be exposed to the critical role of opportunity recognition and evaluation. The course also shed light on the entrepreneur as the main success factor in the new venture formation and development. The central focus of the course is to prepare the students with the essence of entrepreneurship and business planning skills that is essential for the success of new ventures.

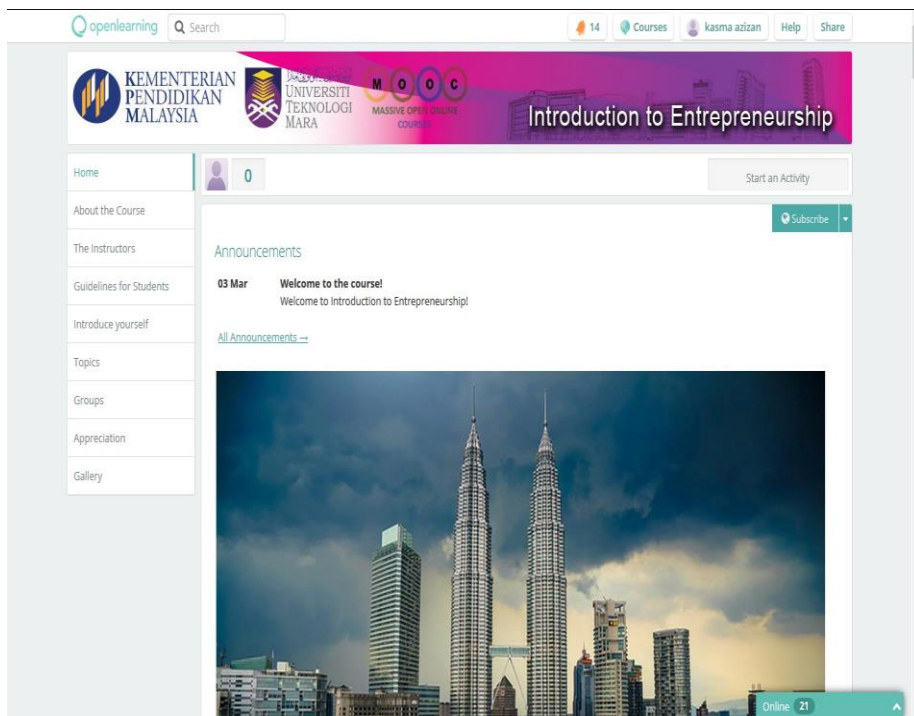


Figure 1.5: Introduction to Entrepreneurship screenshot from OpenLearning

1.7 Project Background

Public universities in Malaysia have always acknowledged the potential of e-learning in reshaping and transforming teaching and learning method within their institutions. In regard, Malaysian public universities are focusing on e-learning as a method to enhance the quality of teaching and learning via blended learning approach, as well as developing e-content for their students. However, at the early stage, little effort was taken on making their courses available online to the public.

This is probably resulted from the notions in DePAN that was launched back in 2011, of which was focused less on preparing e-content available online to the public. As mention earlier, DePAN was revised and an upgraded version namely DePAN 2.0 was formulated and written within the newly launched Malaysian Educational Blueprint for Higher Education (2015-2025) in April 2015.

Since the launching of DePAN in 2011, MOOCs have grown worldwide in significance and impact. Thus, while not explicitly included in DePAN, some public and private universities have started experimenting in this space. In response to this, short-term plan for four pilot courses had successfully

developed in MOOC platform, launched for first year undergraduate students developed by UPM, UKM, UiTM and UNIMAS. MOOC Public University is a strategic agenda or flagship program for all Malaysian public universities. This initiative started in November 2013 with a target deployment of four common first year undergraduate courses to be offered using MOOCs in September 2014, taking advantage of the commencement of the first semester of 2014/2015 academic year.

During one of the MEIPTA meetings in 2014, UPM has been selected by the Ministry of Education to lead a research (grant worth RM 35,000.00) entitled “*Evaluation of Malaysia Pilot MOOC*”. This research project was started on October 2014 and ended in September 2015. Hence, this research aims to evaluate the various aspects of the four pilot courses which were hosted in OpenLearning platform. The four pilot MOOCs courses are *Tamadun Islam dan Tamadun Asia* (TITAS), *Hubungan Etnik*, Introduction to Entrepreneurship, and ICT Competency. The aspects covered are infrastructure and info structure, curriculum, learning design, pedagogy, content, professional development, enculturation, and enhancement in teaching and learning.

1.8 Objectives

The main objective of this research is to evaluate the effectiveness of deployment for four pilot MOOCs offered to the Malaysian public universities first year students in the first semester 2014/2015. The specific objectives are:

- i. Identifying the MOOC usage profile by Malaysian public universities' students.
- ii. Identifying the MOOC usage profile by Malaysian public universities' lecturers.
- iii. Identifying the students' perception on the quality of infrastructure and info structure provided for MOOC usage.
- iv. Identifying the lecturers' perception on the quality of infrastructure and info structure provided for MOOC usage.
- v. Identifying the suitability of curriculum used in MOOC delivery from the students' perspective.
- vi. Identifying the suitability of curriculum used in MOOC delivery from the lecturers' perspective.
- vii. Identifying the suitability of learning design in MOOC from the students' perspective.
- viii. Identifying the suitability of pedagogy in MOOC from the lecturers' perspective.
- ix. Identifying the suitability of content in MOOC from the students' perspective.
- x. Identifying the suitability of content in MOOC from the lecturers' perspective.
- xi. Identifying the suitability of assessment in MOOC from the students' perspective.
- xii. Identifying the suitability of assessment in MOOC from the lecturers' perspective.

- xiii. Identifying the lecturers' perception on professional development in their teaching and learning through MOOC.
- xiv. Identifying the developers' perceptions on lecturers' professional development.
- xv. Identifying MOOC teaching and learning supports.
- xvi. Identifying the lecturers' perception on MOOC enculturation at their universities.
- xvii. Identifying the students' perception on quality enhancement in teaching and learning through MOOC.
- xviii. Identifying the lecturers' perception on quality enhancement in teaching and learning through MOOC.
- xix. Exploring the MOOC developers' perception in developing MOOC.

1.9 Framework

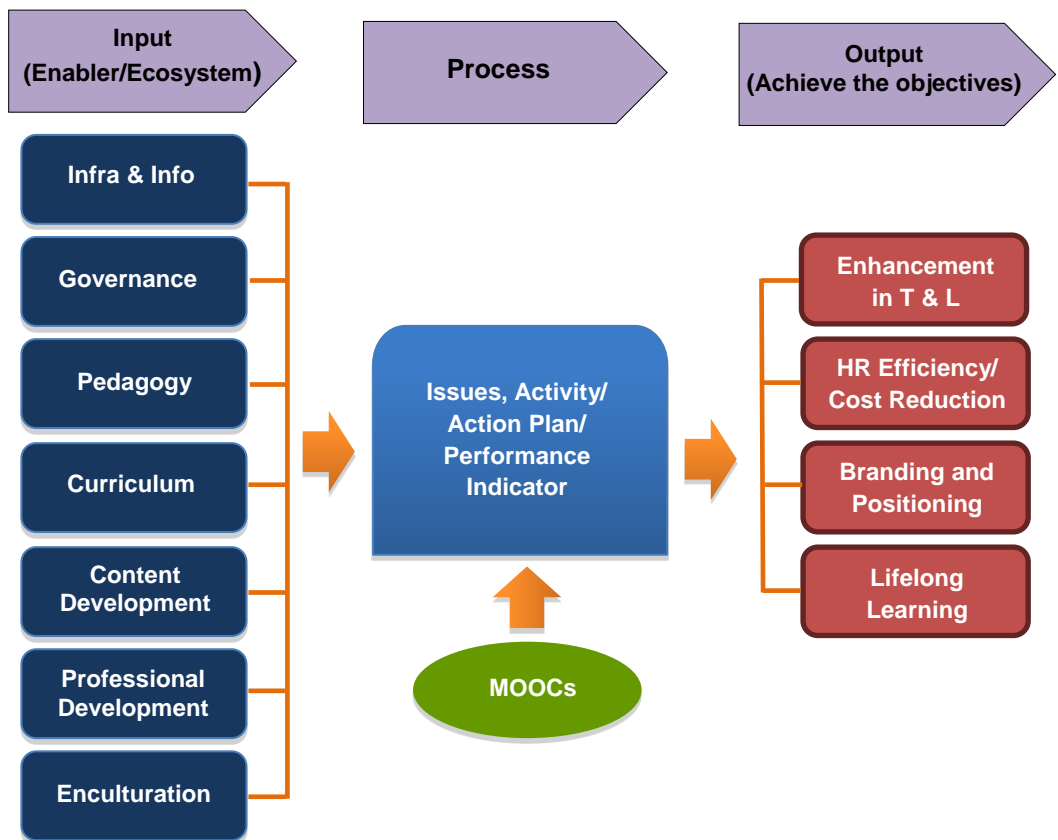


Figure 1.6: National MOOCs Implementation Framework

The research model was adapted from National MOOCs Implementation Framework as shown in Figure 1.6. It focused only on four types of input, namely infra and info, curriculum, learning design, and content for students. Additionally, there are three types of input for lecturers, namely pedagogy, professional development, and enculturation for lecturers. Meanwhile, only enhancement of teaching and learning was chosen for the output.

1.9.1 Input Variables

Infrastructure and info structure refers to the information and communication technologies (ICT) such as computers and the Internet, as well as fixed-line telecommunications, mobile phones, other wireless communications devices, networks, broadband, and various specialized digital devices. ICT infrastructure and info structure are the basic needs of every institution in order to deploy the e-learning services. In this research, infrastructure and info structure variable are focusing on the three constructs identified as access, equipment, and platform. For access, the speeds (scale) of bandwidth and network connection were evaluated. Meanwhile for the platform, the main focus is user friendliness, features and functionality, and navigation.

As for the pedagogy ('learning design' for students' view), the integration of MOOCs in Malaysian university's teaching and learning is important in the process of delivering the courses at the university. The main concerns regarding pedagogy and the learning design in this research are course design and delivery, engagement, assessment, and additional supporting resources. On the other hand, the constructs in curriculum variable are: MOOC have met the curriculum and learning objectives, delivery approach, and learning mode. In content development, high quality content is totally necessary in order to obtain content that is suitable to national education needs. The main focus in this research regarding the content is level of engagement (interactivity and assessment), presentation of content (color scheme), media usage (use, quality, and range of media), alignment with learning objective, quality of content as a whole, functionality, and additional resources. While for professional development, the appropriate training in MOOCs includes skills, knowledge, and attitude. For enculturation variable, the constructs are existence of enculturation mechanism and mechanism publicity.

1.9.2 Process

The 'process' involved of using MOOCs by the universities, students, academics or public were not observed and measured in this research due to complexity of MOOC deployment.

1.9.3 Output Variables

In enhancement in teaching and learning, the main constructs are effectiveness, motivation, level of learning engagement, skills (including soft skills, ICT skill, 21st century skill, collaborative skill, communication skill, leadership skill, and entrepreneurship skill), values and ethics, involvements, learning performance, and teaching improvement. These outputs are important indicators for the Malaysia public higher education institutions undertaking to be in a class with the top universities in the world.

2

LITERATURE REVIEW

2.1 Massive Open Online Course (MOOC)

The current trend in teaching and learning has shown that many higher education institutions around the world have digitized their courses' content and assessment which to be used in the teaching learning processes. Students—with a large number of them, geographically isolated, can enrol in any courses at any institutions that provide distance education. Previously, for most institutions, these online courses could only be accessed by their own students. However, in early to mid-2000, several universities such as MIT (MITOCW), Carnegie Mellon University (OLI), and Berkeley have allowed public access to their online courses. The open and free access to these sites has created additional learning channels and valuable learning platforms for learners (Rizzardini *et al.*, 2013).

Recent popular trend in e-learning is the MOOC or Massive Online Open Course (Daradoumis *et al.*, 2013). MOOCs are a comparatively recent phenomenon in online education. The term MOOC was originally used by George Siemens and Stephen Downes in 2008, and since then has gained its popularity in the USA, especially when Sebastian Thrun, a Stanford professor offered an artificial intelligence course for free (Hu, 2013). MOOC allows anyone to participate in the course alongside a small number of for-credit students. Since then, the term has been referred to any online educational courses that are available freely or at minimal costs, open to a large number of students, and for which the educational materials and resources are freely available online (Zutshi, O'Hare & Rodafinos, 2013). Hanan and Ebner (2013) mentioned that MOOCs offer students the chance to take courses from celebrated specialist experts, without any required courses' prerequisites.

MOOC models are evolving rapidly. To keep track of its developments, a non-governmental organization that represents universities in the United Kingdom created a useful distinction between two categories of MOOCs—cMOOC and xMOOC (Sandeem, 2013). cMOOC is more closely on the original 'connectivist' distributed peer learning model. Courses are typically developed and led by academics through open source web platforms while xMOOC is typically structured around more conventional lecture formats and delivered through proprietary learning management platforms with contractual relationships with institutions or individual academics. xMOOC typically describes courses offered through the Coursera, edX and Udacity platforms (Massive Open Online Courses, 2013). In other words, Zhang (2013) explained that a cMOOC is regarded as a starting point for further exploration. xMOOCs, on the other hand, looked more like a regular post-secondary course with the emphasis on their contents (commonly lecture videos and multiple choice tests).

2.2 Infrastructure and Info Structure

Infrastructure and info structure refers to the information and communication technologies such as computers and Internet, as well as fixed-line telecommunications, mobile phones, other wireless communication devices, networks, broadband and various specialized digital devices. Infrastructure and info structure are the basic needs of higher education institutions to deploy their online learning services, especially MOOCs, of which requires urban facilities for infrastructure and info structure.

As previously mentioned, MOOCs are open and accessible to virtually everyone who has access to the Internet at anytime and anywhere. In order for the higher education institutions to implement MOOC, they have to fulfil several requirements regarding the infrastructure and info structure. In this sense, the server should be scalable in terms of number of users, and it should be able to support simultaneous access of thousands of users (Sarasa-Cabezuelo & Sierra-Rodríguez, 2014). Since MOOC involves videos and lecture materials, it must be available to all courses' participants and must all be digitized. As a rule of thumb, the typical lengthily video lecture must be avoided. The considerable duration of videos should last five to ten minutes only. This requires dedicated technologists and appropriately trained personnel. Media training for inexperience university teachers is the key factor in controlling the quality of the product (Hochschulpolitik, 2014).

For students with low bandwidth Internet connections, the availability of transcripts or lecture slides will be the alternative for streaming videos. Mini-lectures are often easier to watch than long lectures. Furthermore, one of the problems, for instance strict deadlines for some of the courses showed that they do not take into account of the possibility of electricity cuts, and Internet access in some developing countries (Bali, 2014). Due to the network problem, the materials were not easily downloadable, thus made the students faced several difficulties. Students need to have a very good Internet access in order to download the materials and later share them with their peers. Coursera has created a mobile version of their platform and it makes it easier for the students to download the materials from their mobile phones and tablets. Maitland and Obeysekare (2015) recommended students to use the text transcripts of the videos to make it easier to download as compared to the videos.

In terms of MOOCs platform, Evans and Myrick (2015) stated that the forum systems used by Coursera and edX were criticized as being difficult to use; the platforms were also considered hard to use in terms of evaluating the students. From these drawbacks, they suggested that higher education institutions need to provide better technical supports. Furthermore, López-sieben *et al.* (2014) proposed that the MOOCs platform should have the following features: (i) The platform must be robust enough; (ii) The interface must be user-friendly; (iii) The platform should have an advertising and client-capture system; (iv) The platform should include student–student and student–lecturer forums; (v) Security measures to control access to contents and personal details of the

participants; and (vi) Personalized tools to monitor students' individual learning progress. From time to time, it is believed that platform providers would upgrade their platform features for ease of use of their users.

2.3 Curriculum

MOOCs represent a powerful force for change on traditional university curriculum, teaching practices, and the university system as a whole. As stated by Mullaney and Reich (2015), MOOCs have what might be described as "partially asynchronous" structures but include mechanism to encourage synchronicity. They also argued that many of MOOCs courses have only a final date at the end of the courses, release content every week, and some courses used recommended syllabi and reminder emails rather than enforcement mechanisms to keep students moving as a cohort. Although the courses were provided with the recommended syllabus to encourage students to follow it, Mullaney and Reich (2015) asserted that course developers should assume that most students would not stay on-track. Collaborative activities and discussions should assume a dimension of synchronicity. Thus, the MOOCs curriculum should consider the openness and scalable cohorts in MOOC.

The content of each lecture (aims, objectives, types of information, types of assessment), in other words, has determined the means by which it is presented (Lau, 2014). For instance, when the aim of a lecture is to provide general and rather theoretical information about mediation, it has been preferred to present this information through videos (or PowerPoint presentations accompanied by the instructor's voice) that usually facilitate information delivery. According to Dikke and Faltin (2015), teaching science and other subjects that requires conduction of hands-on activities becomes difficult in MOOC due to the limitations of the online course format. They suggested that the use of web-based tools, such as programming simulators for IT-related subjects and online laboratories for STEM subjects, represents a solution enabling the online course providers (universities and training organizations) to create courses covering both theoretical and practical parts of the training and providing complete learning experience for the course participants. Thus, it is crucial to ensure that the MOOC is aligned with the curriculum requirements of the contents and the course, and able to support face-to-face learning.

MOOCs are still at infancy stage. To judge the success of MOOC, students who took the courses must demonstrate several constructive learning outcomes. According to Kuh (2012), the outcomes could be observed through answering these questions: (i) Can students reflect on what they learned in these courses? (ii) Can they integrate the knowledge they have obtained in them with what they gained in other courses? (iii) Can they apply their new knowledge in multiple settings? Boston and Helm (2012) stressed that learning outcomes must be explicit, measurable, effectively assessed, and evidences must be assembled demonstrating added educational value from the courses that will enhance students' lives, aspirations and ambitions. Fidalgo-blanco,

Sein-echaluce, García-peñalvo and Escaño (2014) did a study on improving MOOC learning outcomes throughout informal learning activities. The study demonstrates that people who have undertaken activities based on informal learning have a better perception of the result of their learning. On the other hand, Liang, Jia, Wu, Miao and Wang (2014) examined the correlations among perceived learning experience, learning activities, and learning outcomes. The findings suggested that learners' perceived usefulness rather than ease of use of the MOOC, positively influence learners' use of the system, and consequentially the learning outcome. Thus, the positive learning outcomes could determine the success of a MOOC.

2.4 Pedagogy

Learning through MOOCs demands a high level of self-directedness from the students as they are in charge of their own progress. For instance, students are able to accomplish the activities on their own, able to follow the course at their own pace and able to use additional resources to improve their understandings on the subject matter. Consequently, as stated by Hatzipanagos (2015), learning design to support self-regulated learning is a significant consideration.

If we want to create an environment in MOOCs where committed students could succeed, not only the content should be clear and understandable, we need to pay a close attention to the pedagogy when designing a MOOC. On the students' side however, the term learning design is more appropriate to be used to inform pedagogy since they are the 'learners', not the instructors.

As the claim that MOOC targets a 'massive' student audience, therefore it will require different learning designs compared to small scale university courses. As the MOOC is usually free (anyone with an Internet connection can enrol), offers no accreditation and targeting large audiences, lecturers cannot possibly offer personalized, one-to-one support to students.

Self-regulation explains how students manage their learning by actively setting goals, planning to achieve their goals, identifying and using resources, monitoring their progresses and using self-corrective measures (Zimmerman, 2008). In MOOCs, following each of thousands of students' self-regulatory processes is not feasible, and it is impossible to provide scaffolding to meet each learner's unique needs. However, clickstream data might provide evidence of students' self-corrective behaviours, such as accessing relevant resources or posting in discussion forums between repeated attempts at formative assessments (Campbell *et al*, 2014). Hatzipanagos and Enhanced (2015) presented two toolsets to guide MOOC design self-regulated learning. MOOC-SRL (Self-regulated learning) patterns allow the sharing and reuse of MOOC designs that encourage self-regulation while the MOOC-DTQ (Design Team Questionnaire) is an audit tool that guides instructional designers in pedagogic design decisions made at platform (macro) level as well as at course (micro) level.

Moreover, MOOC should cater students learning needs. The course design and the delivery of content to some extent must fulfil and meet the needs of the students. Within the learning environments like MOOC, students' needs are typically to satisfy their personal interests or to further develop their competencies. Guàrdia *et al.* (2013) drawn a set of design principles in MOOC pedagogy from the students' perspective. The principles were focused on competence-based, learner empowerment, personal learning plan, collaborative learning, social networking, peer assistance, knowledge creation, interest group, assessment, and media technology. By these principles, MOOC could empower learners with networked learning strategies that foster critical thinking and collaboration and putting the students at the centre of the process while providing adequate learning contexts, methods and tools.

Stacey (2014) recommended that pedagogy in MOOC should include: (i) be as open as possible; (ii) use tried and proven modern online learning pedagogies, not campus classroom-based didactic learning pedagogies; (iii) use peer-to-peer pedagogies over self-study; (iv) use social learning including blogs, chat, discussion forums, wikis, and group assignments; (v) leverage massive participation—have all students contribute something that adds to or improves the course in overall. Nevertheless, Kop *et al.* (2011) stated that it should supports human beings in learning through active creation of resources based on the building of connections, collaborations and the exchange of resources between people, the building of a community of students, and the harnessing of information flows on networks.

Parallel to the notion, Ferguson and Sharples (2014) agreed that in order to develop an innovative pedagogy that is capable of catering thousands of students, it has to be interactive, reflective and collaborative. It should also consist of tutorial intervention and guidance, as well as self-sustainable. In relation to that, since MOOCs students are vary in age, Chacón-Beltrán (2014) also suggested that the usefulness of courses offered should take into account the pedagogical aspect. He further explained, pedagogy in the 21th century should provide the opportunity to learners in challenging existing knowledge and move beyond the 'simplicity of a literal functional description of the dichotomized theme of teaching and learning' (Male & Palaiologou, 2015).

Additionally, Margaryan *et al.* (2014) presented an analysis of instructional design quality of 76 randomly selected MOOCs. The results indicated that majority of MOOCs scored poorly on the instructional design principles and most MOOCs scored highly on the organization and presentation of course material. While most MOOCs studies were mainly focused on logistic issues related with the assessment, Grimmelmann (2014) further suggested that MOOCs studies should focus more on how to improve the quality of learning, as well as student's engagement. Kennedy *et al.* (2015) proposed that, MOOCs that have open entry and open curriculum structures, place pressure on students to not only have the requisite knowledge and skills to complete the courses, but also the skills to traverse the courses in adaptive ways that lead to success. Their findings indicated that prior knowledge was the most significant

predictor of MOOC success, followed by students' ability to revise and revisit their previous work.

The main focus of the developers of MOOCs is to create high quality courses. Unfortunately, there is no consensus about which of the actual designs and pedagogical approaches are the most efficient to improve student learning outcomes (Amo, 2014). This shows how every MOOC approach is absolutely different from one another and indeed needed more experimental iterations to consider MOOCs as consolidated learning environments. Thus, Bali (2014) recommended MOOC developers to review the pedagogical challenges of teaching and consider their abilities in providing good pedagogy as a start, and from there, to explore the many possibilities offered by contemporary educational technologies that suit their learners and their own teaching philosophies.

2.5 Content

In order for MOOC to succeed, developers and SMEs have to work together to create good content. So far, they have created hundreds of videos and blog posts, built a database of useful tools and also curated dozens of collections of useful materials (Morris & Stommel, 2015). Teaching content is produced for different levels of knowledge or additional tasks and in-depth modules are offered as options. The opening of content is a benefit that allows students access to knowledge of high recognition universities like Stanford or Harvard. Moreover, open access allows students to enjoy a unique learning process, self-tests, activities and relationships in heterogeneous networking and rich in knowledge and experience (Amo, 2014).

Learning concepts and the appropriate learning programs are developed for adaptive learning processes and individual learning pathways. Whether it is a conventional or online setting, the content of the course must be clear and understandable. Waard (2013) stated that the principles in content design have to be considered to provide interactivity, immediate feedback, and small size content to fit contemporary lifelong learning. Moreover, it is necessary to use information sources that are both recent, as well as those proven over time and always keeping access to content as simple as possible. Meanwhile, Grainger (2013) identified variations in course content, primarily on watching and downloading videos (60-80% of active learners), with other learning and assessment methods utilized by between 30-60% of active students and a relatively small minority (approximately 4%) of students participating in the forums.

Making appropriate use of media is the result of informed decisions on technology affordances (Laurillard, 2002). The importance of producing rich and quality media learning support may be crucial for both lecturers and students to capture their attentions and retentions. On the other direction, in order to improve students' quality productions and support engagement,

guidance on how to determine best media choices according to each intention must be provided. Confront them to the abundance of applications and encourage the exploration of new available tools that support rich interactive and highly audio visual content (Guàrdia, Maina, & Sangrà, 2013).

Beside the use of appropriate media learning support, Hoyos *et al.* (2013) analysed the impact of two built in (Q&A and forum) and three external social tools (Facebook, Twitter and MentorMob) in a MOOC on educational technologies. Most of the participants agreed on the importance of social tools to keep in touch with their partners and share information related to a course, and forum has been one of the preferred means of communication. In terms of motivation, Chacón-Beltrán (2014) stressed that if the participants have a high degree of motivation and self-discipline, course contents should be presented in a progressive way and that participants need to be provided with guidelines and resources in order for them to advance smoothly in their learning processes. Consequently, the content of each MOOC should be determined, the means by which they are presented.

2.6 Professional Development

With large student enrolment, MOOC instructors require quality professional development to ensure the successful delivery of MOOC courses. The instructors must be sufficiently trained towards online course design or online facilitation so that they could use MOOC effectively. This is due to the fact that not all instructors are familiar with online teaching. As mentioned by Seaman (2009), he found that some of the instructors believed that teaching online takes much more time and resources. Even though MOOCs provide personalized learning for students, instructors play an important role to support a large cohort of students who came from various regions and backgrounds. Hence, sufficient training must be provided to the instructors by the universities and institutions.

Due to the evolvement of MOOC during this era, instructors must be equipped with the latest knowledge and skills of using technological tools to create materials in order to support learning. There are many reasons why instructors are rather slow in adapting new technologies. The reasons can be broadly described as lack of institutional support, lack of financial support, lack of time, and lack of basic proficiency with new technologies (Butler & Sellbom, 2002). Without the exposure and training of new technologies especially MOOC, instructors shall be fall behind in integrating their traditional teaching methods with the MOOC.

2.7 Enculturation

Enculturation of MOOC at higher education institutions is a long and challenging process. It is a very important process in order to sustain an

effective teaching and learning practices within higher education institutions communities. This is due to the fact that universities are increasingly attracting global cohort of students and staffs from different cultures and backgrounds, and classes are therefore becoming more culturally diverse (Balnaves, 2013). Just like in MOOCs, which involve large cohorts of students, this creates the need for a “shared space and group identity” so that learning is owned by and more relevant to all students.

Most universities have some kind of instruments that provide the mechanisms for recognitions of lecturers’ involvements in MOOC, incentive or award for MOOC practitioners, as well as organizes MOOC awareness program. These provided mechanisms could foster the MOOC enculturation within that university.

2.8 Enhancement in Teaching and Learning

MOOC may impact society in multiple ways especially in teaching and learning. MOOC may enhance teaching practices, encouraging institutions to develop distinctive missions and provide an opportunity to develop new pedagogy (Daniel, 2012). MOOC may also increases access to good teaching and interesting curriculum for new groups of learners, and help attract students into higher education who might otherwise not have ventured there (Knox, et al. 2012). Amo (2013) stated that the new technological approaches reformulation of online learning tools can enhance the design and pedagogical fundamentals of MOOCs, in order to offer effectiveness and sustainability, as long as there is a quality basis as a through line. However, Daniel and Uvalić-Trumbić (2014) argued that MOOCs are not revolutionary, both because higher education develops by evolution and also because MOOCs mostly do not lead to formal qualifications, serve as the harbingers of an important transformation that will lead to a much greater use of online technologies in teaching, research and academic services.

Can MOOCs be used to improve student outcomes? For the quality enhancement in students learning, can they learn effectively by using MOOC? Muñoz-Merino et al. (2014) split the concept of students’ learning effectiveness into three new concepts: (i) Effectiveness of students with peers, (ii) Effectiveness of students with instructors, (iii) Effectiveness of students with contents. They classified that the first and the second kinds of effectiveness can be measured by considering the number and type of messages submitted by students in discussion forums and addressed to their peers or to the teachers, while the third kind of effectiveness can be measured by considering the number and type of educational resources and activities completed by students. Meanwhile, Gamage, Perera and Fernando (2015) revealed 10 dimensional framework for analysing the effectiveness of e-learning in MOOC, namely interactivity, pedagogy, collaboration, usability, network of opportunity, motivation, technology, content, support for learner and assessment. By these types of learning effectiveness, they can improve the students’ effectiveness in MOOC.

For students who are seeking to broaden their career options, some participants believed that the more certificates they get, the greater their chances to impress future employers (Zheng *et al.*, 2015). This is due to the fact that learning via MOOC could enhance students' skills in ICT, problem solving, critical thinking, communication, entrepreneurship, writing and collaboration (working together). These skills are vital for students in order to compete in the job market and gain employment.

In terms of lecturers' enhancement in their teachings by using the MOOC, they believed that their teachings have improved due to MOOC. However, Sheard *et al.* (2014) found that 70% of the lecturers claimed that there had been no effect on their teachings, while 20% claimed that MOOCs had inspired change in their teaching approaches. Some also stated that MOOCs have provided them with a way to refresh their own knowledge on a topic and thus enrich the quality of their teachings. However, some of the lecturers stated that they were comfortable in offering learning experiences to their students with their current teaching practices without using the MOOC. Eckerdal *et al.* (2014), mentioned that lecturers felt that their pedagogies were somewhat aligned or aligning with MOOCs, for example through providing students with short video 'bites' of lecture material and implementing the flipped classroom model.

3

METHODOLOGY

3.1 Introduction

This study aimed to evaluate the effectiveness of deployment for four Malaysia pilot MOOCs. It focused on variables that already been established in the National MOOCs Implementation Framework. We only focused on several aspects of the framework that were available and measurable at the time the research was conducted. Four types of input, namely infra and info, curriculum, learning design, and content for students were used. Additionally, there are three types of input for lecturers, namely pedagogy, professional development, and enculturation for lecturers. Meanwhile, only enhancement of teaching and learning was chosen for the output. Interviews were conducted to a group of respondents to support the research findings.

This chapter comprises sections on Research Design, Target Population, Sample and Sampling Procedures, Description of Research Instruments, Validity and Reliability of the Instruments, Description of Data Collection Procedures, Description of Data Analysis Procedures and Issues.

3.2 Research Design

Mixed method was used in this research, which involved qualitative and quantitative approaches. According to Ostlund *et. al* (2010), mixed methods research which combined quantitative and qualitative methods is increasingly recognized as valuable because it can potentially capitalize on the respective strengths of quantitative and qualitative approaches. Johnson and Onwuegbuzie (2004) stated that mixed methods research offers great promise for practicing researchers who would like to see methodologists describe and develop techniques that are closer to what the researchers actually use in practice. Therefore, this research adopted mixed method design to obtain the best results in evaluation of Malaysia MOOC.

Quantitative data were collected through different sets of questionnaires for students and lecturers while qualitative data were collected through interviews with the admins/developers of MOOC.

3.3 Population and Sample

The populations for the main research are the first year students from Malaysian public universities who registered for four pilot courses, lecturers

who taught the four pilot courses and the admins/developers of MOOC. The populations for this research are shown in Table 3.1:

Table 3.1: Population

Population	Total
Students	First year students from Malaysia's Public University who registered for four pilot courses (54,566)
Lecturers	Lecturers who taught 4 pilot MOOC courses (1507)
Admins/Developers	Admins/Developers from 4 universities who developed MOOC (UPM, UKM, UiTM, UNIMAS)

From the populations, a total of 4,449 first year students from Malaysian public universities who participated in the online survey were appointed as sample in this research while a total of 164 of lecturers from the populations were assigned as samples. Besides that, four admins/developers for MOOC from UPM, UKM, UiTM, and UNIMAS were also interviewed.

3.4 Instrument

The instrument consists of different sets of questionnaires divided to the students and lecturers. For MOOC's admins/developers, interview sessions were conducted to obtain their opinions on MOOC. Online survey software known as Survey Monkey was used as a platform for data collection method (see Appendices). Meanwhile, descriptive analysis (mean and standard deviation) was used for data analysis.

3.4.1 Students' Questionnaire

A total of 51 items were used as an instrument for the students' questionnaire. The first part consists of several demographic questions such as name of the institution, gender, highest qualification, level of ICT skills, MOOC experience, frequent location, preferred time, and frequency of accessing MOOCs. This is followed by the assessment of MOOCs and the quality of MOOC deployment through students' perception. The questionnaire covered a comprehensive set of variables comprises of four aspects of MOOC input, including infra and info structure, curriculum, learning design, and content of MOOCs. These independent variables were constructed in such a way that the respondents would indicate their agreement on a statement of the items using five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

3.4.2 Lecturers' Questionnaire

A total of 63 items were used as an instrument for the lecturers' questionnaire. The first part consists of several demographic questions such as gender, institutions, competency level of instructional activities, MOOC support, and the institution's support. This is followed by six independent variables known as infra and info structure, curriculum, pedagogy, content, professional development, and enculturation. Meanwhile, the dependent variable is enhancement in teaching and learning. The respondents would indicate their agreement on a statement of the items using five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

The maximum score for this scale is 5 while the minimum score is 1. To calculate the mean score which divide by low, medium and high as shown in Table 3.2, the formula below was used:

$$\begin{aligned}\text{Mean range} &= \frac{\text{Maximum score} - \text{Minimum score}}{\text{Level}} \\ &= \frac{5 - 1}{3} \\ &= 1.33\end{aligned}$$

Table 3.2: Mean score interpretation

Mean score	Interpretation
1 - 2.33	Low
2.34 - 3.67	Medium
3.68 - 5.00	High

3.4.3 Interview with MOOC Developers

An interview session was conducted with four MOOC developers from UPM, UKM, UiTM, and UNIMAS. Interview protocol was developed (see Appendices) to explore the universities' experiences in planning and developing MOOC. Based on the interview, 10 themes were identified i.e.: MOOC Enabler; Development Model; Course Design; Planning; Video Production; Video Quality; Resources and Copyright Issues; Staff Training; Challenges; and Suggestions, and shall be discussed in the next chapter.

3.5 Validity and Reliability

The instruments were validated by two professors who are the experts in the field of Educational Technology. For reliability process, two series of pilot

studies were conducted on the students' survey instrument. It was carried out to the UTeM and UPSI students as shown in Table 3.3.

Table 3.3: Pilot study result for students

Variables	Cronbach Alpha (UTeM)	Cronbach Alpha (UPSI)
Infra & Info	0.529	0.713
Curriculum	0.707	0.807
Pedagogy	0.995	0.990
Content	0.925	0.979
Enhancement in T & L	0.759	0.968

While for the lecturers, a series of pilot studies were conducted to the lecturers' survey instrument for the reliability measurement process. It was carried out to the 30 lecturers as shown in Table 3.3 as below:

Table 3.4: Pilot study result for lecturers

Variables	Cronbach Alpha
Infra & Info	0.827
Curriculum	0.903
Pedagogy	0.908
Content	0.948
Professional Development	0.905
Enculturation	0.721
Enhancement in T & L	0.949

3.6 Data Analysis

3.6.1 Quantitative Analysis

Following data collection, several procedures were applied in this research to systematically arrange data and utilize computer software to accurately analyse them. Nominal, ordinal and scales was used in the data analysis of this study. After the data were coded, it was processed through computer software known as IBM SPSS Statistics 22. Through which a set of analyses was conducted.

The data check for missing value and normality test was conducted. Descriptive analysis was conducted to find the background information of the respondents along with the descriptive information of the variables. Moreover, reliability analysis was conducted to find the Cronbach's alpha of the variables. Table 3.5 shows the research question, instrument used, and method of analysis.

Table 3.5: Mapping Research Questions with Instruments and Methods

Research Objective		Method of Analysis
i.	Identifying the MOOC usage profile by Malaysian public universities' students.	Descriptive analysis (percentage, mean, standard deviation)
ii.	Identifying the MOOC usage profile by Malaysian public universities' lecturers.	
iii.	Identifying the students' perception on the quality of infrastructure and info structure provided for MOOC usage.	
iv.	Identifying the lecturers' perception on the quality of infrastructure and info structure provided for MOOC usage.	
v.	Identifying the suitability of curriculum used in MOOC delivery from the students' perspective.	
vi.	Identifying the suitability of curriculum used in MOOC delivery from the lecturers' perspective.	
vii.	Identifying the suitability of learning design in MOOC from the students' perspective.	
viii.	Identifying the suitability of pedagogy in MOOC from the lecturers' perspective.	
ix.	Identifying the suitability of content presentation in MOOC from the students' perspective.	
x.	Identifying the suitability of content presentation in MOOC from the lecturers' perspective.	
xi.	Identifying the suitability of assessment in MOOC from the students' perspective.	
xii.	Identifying the suitability of assessment in MOOC from the lecturers' perspective.	
xiii.	Identifying the lecturers' perception on professional development in their teaching and learning through MOOC.	
xiv.	Identifying the developers' perceptions on lecturers' professional development.	
xv.	Identifying MOOC teaching and learning supports.	
xvi.	Identifying the lecturers' perception on MOOC enculturation at their universities.	
xvii.	Identifying the students' perception on quality enhancement in teaching and learning through MOOC.	
xviii.	Identifying the lecturers' perception on quality enhancement in teaching and learning through MOOC.	

3.6.2 Qualitative Analysis

The data collection methods for qualitative part used in this study comprise of semi-structured interviews.

3.7 Methodological Issue

All the important issues of research methodology was discussed in detail and presented in the 3rd International Conference on Educational Research and Practice 2015 (ICERP2015). The paper published in a proceeding (Habibah Ab Jalil, Norasiken Bakar, Jano, Zanariah. (2015). *Researching MOOC: The Hypes of Theory, the Selection of Methodology and the Struggle of Practice*. E-Proceeding of the 3rd International Conference on Educational Research and Practice 2015 (ICERP2015) (see Appendices).

4

FINDINGS

This chapter is organized into two sections. The first section presents the findings from the online survey both conducted to students and the lecturers involved in MOOC and data obtained from OpenLearning. While the second section describes the findings from the interviews conducted.

4.1 MOOC Usage Profile

This section presents the respondents' profile of MOOC utilization.

4.1.1 Students' Participation Profile by Universities

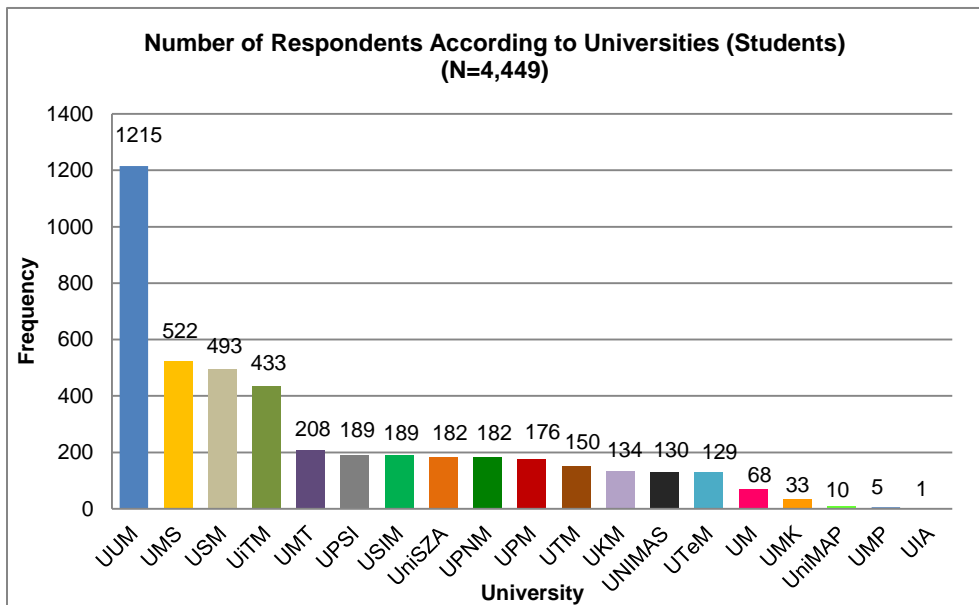


Figure 4.1: Number of students' participation according to universities

As shown in Figure 4.1, a total of 4,449 students participated in the online survey. The numbers of students from UUM were 1,215, followed by 522 students from UMS and 493 students from USM. USIM and UPSI each display a total of 189 students, while the number of students from UniSZA and UPNM were 182. In addition, a total of 176 students were from UPM, 150 students from UTM, 134 students from UKM, while 129 students were from UTeM. Additionally, 68 students participated were from UM, 33 students were from UMK and less than ten students were from UMP and UIA. Not all universities (for example, UIA) are offering similar courses and therefore, the small numbers of participants were expected.

4.1.2 Profile of MOOC Utilization (Students)

A total of 4,449 first years' students from 20 public universities in Malaysia participated in the online survey and Figure 4.2, Figure 4.3, Figure 4.4, and Figure 4.5 display the patterns of MOOC utilizations obtained from the survey.

Registration of MOOC Course(s)
(N=4,449)

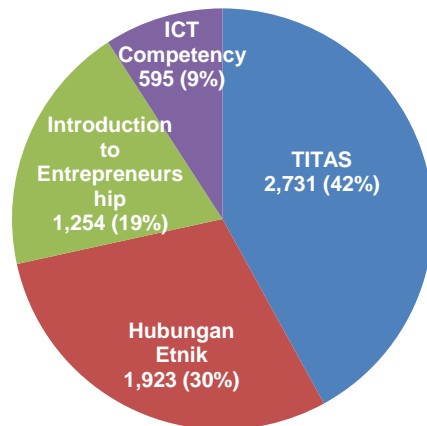


Figure 4.2: Registration of MOOC Course(s)

According to Figure 4.2 which is based on the students' respond, a total of 2,731 (42%) of the students participated in this research have registered for the TITAS course, while 1,920 (30%) of the students registered for the *Hubungan Etnik* course, followed by Introduction to Entrepreneurship course (19%), and a total of 595 (9%) of the students registered for the ICT Competency course.

Frequency of Accessing Malaysia MOOCs
(N=4,449)

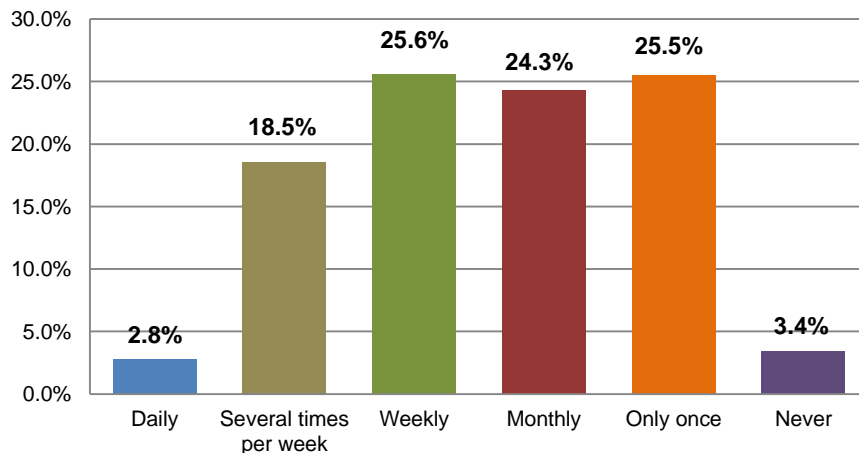


Figure 4.3: Frequency of accessing MOOC

According to Figure 4.3, the result indicates that 2.8% of the students accessed the MOOC on a daily basis, followed by 18.5% of the students accessed MOOC several times per week, while 25.6% of the students accessed the MOOC on a weekly basis. In addition, 24.3% of the students indicate that they accessed MOOC monthly, 25.5% of the students accessed MOOC only once, and 3.4 % of the students never access the MOOC.

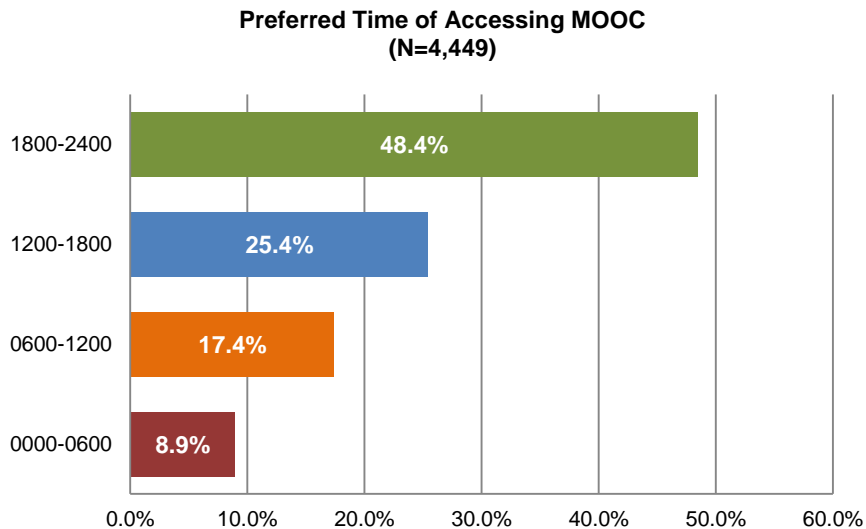


Figure 4.4: Preferred time of accessing MOOC

The result shown in Figure 4.4 indicates the preferred time of accessing MOOC. According to the analysis obtained from the online survey, 8.9% of the students preferred to access MOOC during 0000-0600, followed by 17.4% of the students accessed it during 0600-1200. Meanwhile, 25.4% of students chose to access MOOC during 1200-1800, whereas 48.4% of the students accessed MOOC during 1800-2400.

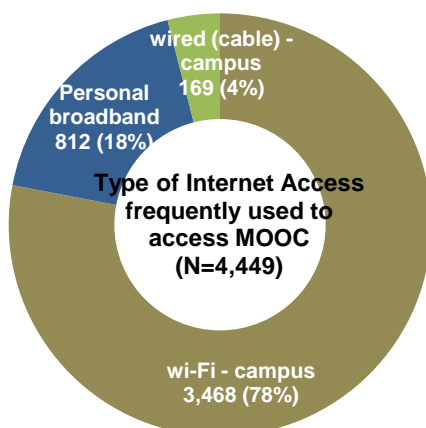


Figure 4.5: Type of Internet access frequently used to access MOOC

According to Figure 4.5, a total of 3,468 (78%) of the students frequently use their Wi-Fi campus to access MOOC, followed by 812 (18%) of the students preferred to use their personal broadband to access MOOC, and 169 (4%) of the students use wired (cable) campus.

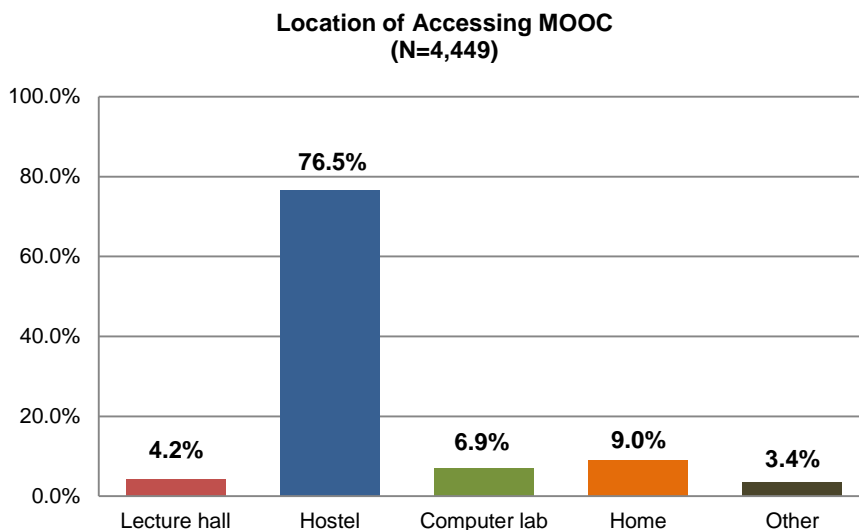


Figure 4.6: Location of accessing MOOC

According to Figure 4.6, 76.5% of the students usually access MOOC from their hostel, while 9.0% of the students preferred to access MOOC from their home. Meanwhile, 6.9% of the students accessed MOOC from the computer lab, whereas 4.2% of the students accessed it from the lecture hall.

4.2 Lecturers

A total of 164 from a population of 1,507 lecturers who taught the four pilot courses participated in the online survey. From the survey, 50% of the lecturers were male, whereas 50% of them were female. Table 4.1 and Figure 4.7 display the results obtained from this survey.

Table 4.1: Number of respondents according to universities (lecturers)

Universities	Population	Respond by lecturers	% by university
		(Sample)	
UM	16	2	12.5
UKM	26	9	34.6
UPM	48	16	33.3
UTM	12	11	91.6
USM	9	6	66.7

UiTM	1178	20	1.7
UPSI	22	11	50.0
UTeM	5	2	40.0
UMT	11	4	36.4
UNIMAS	39	15	38.5
UNISZA	8	5	62.5
UMP	23	8	34.8
UNIMAP	7	5	71.4
UUM	37	22	59.5
USIM	10	6	60.0
UIA	1	1	100.0
UMK	12	7	58
UPNM	7	4	57.1
UMS	19	7	36.8
UTHM	17	3	17.6
TOTAL	1,507	164	

Table 4.1 shows the number of lecturers as the respondents' base on universities (lecturers) obtained from the online survey. Percentages were calculated based on the total number of lecturers involved teaching with the pilot MOOC in each university. From 1,507 lecturers who teach the courses involved with the pilot MOOC, only 164 participated in the online survey.

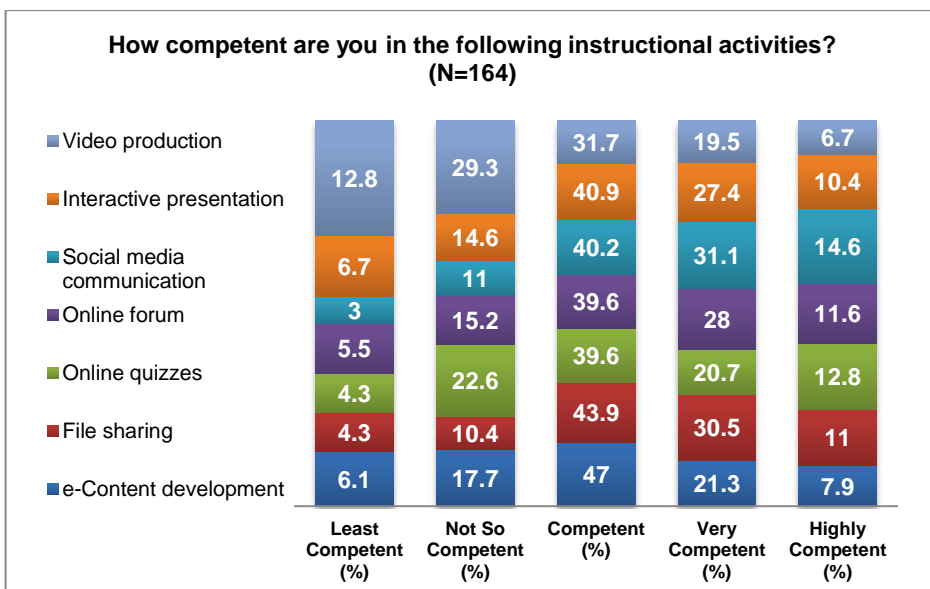


Figure 4.7: Lecturers' competency in instructional activities

Figure 4.7 indicates lecturers' competency in instructional activities. The result showed that 47.0% of the lecturers are competent in e-Content development, 20.7% of the lecturers are very competent in online quizzes and 10.4% of the lecturers are highly competent in online learning task. For interactive presentation activity, 40.9% of the lecturers are competent, 27.4% are very competent and 10.4% are highly competent. Moreover, less than 22.0% of them are not so competent and least competent. Furthermore, more than 40.0% of the lecturers are not so competent and least competent in video production activity, while only 6.7% of them are highly competent.

4.3 Infrastructure and Info structure Quality

4.3.1 Students

Students were asked to answer eight items about Infrastructure and Info Structure that support the MOOC in their individual university with the scale of Strongly Disagree (SD), Disagree (D), Neither Disagree Nor Agree (NDNA), Agree (A) and Strongly Agree (SA) as shown in Figure 4.8 below:

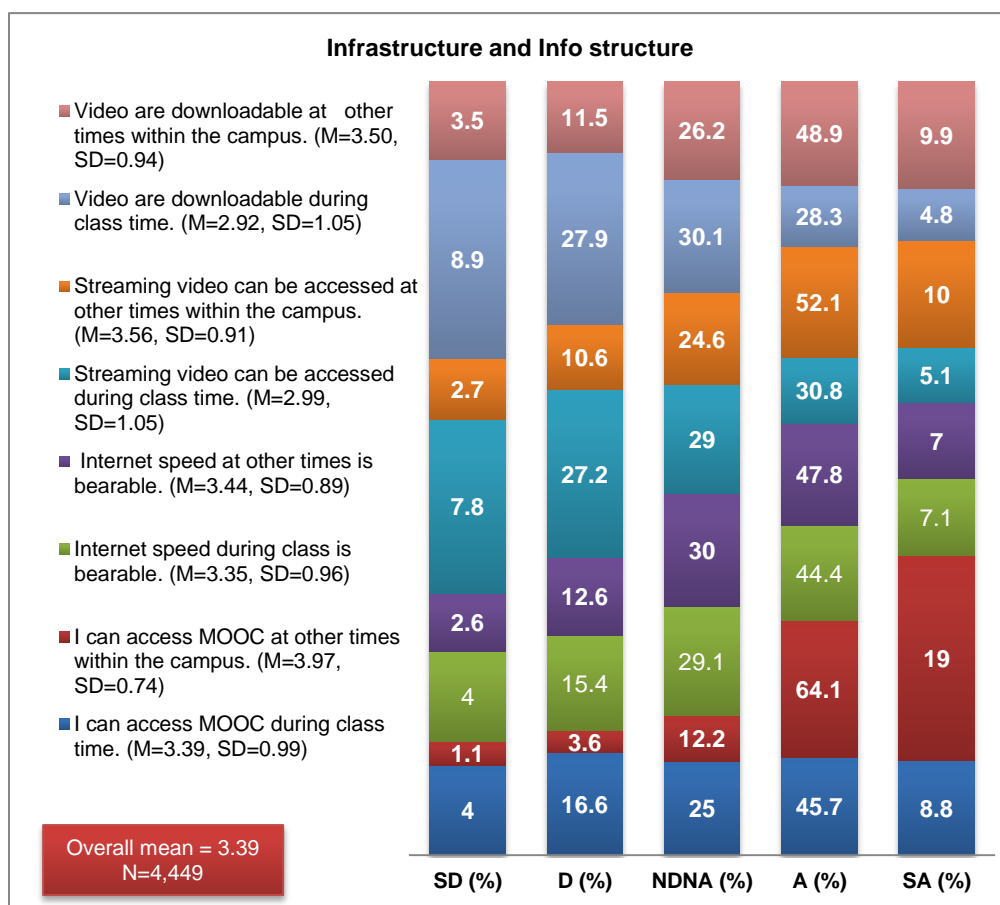


Figure 4.8: Infrastructure & Info Structure

Figure 4.8 presents the percentage distribution of the students by degree of agreement on eight items based on their perception on the quality of infrastructure and info structure provided for MOOC usage. In general, students displayed medium mean scores ($M=3.39$) towards infrastructure and info structure in MOOC. About 83.1% of the respondents agreed or strongly agreed that they can access MOOC at other times within the campus ($M=3.97$, $SD=0.74$). Meanwhile, about 54.5% of the respondents agreed or strongly agreed that they can access MOOC during the class time ($M=3.39$, $SD=0.99$). A total of 51.5% of the respondents agreed or strongly agreed that Internet speed during the class is bearable ($M=3.35$, $SD=0.96$), while a total of 54.8% of the respondents agreed or strongly agreed that Internet speed at other times is bearable ($M=3.44$, $SD=0.89$). About 35.9% of the respondents agreed and strongly agreed that streaming video can be accessed during class time and 29.0% of them neither disagreed nor agreed about it ($M=2.99$, $SD=1.05$). This shows mix evaluation towards video streaming during class time.

On the other hand, streaming outside the classroom within the campus shows that 62.1% of the respondents agreed and strongly agreed, while 13.3% of the respondents disagreed and strongly disagreed ($M=3.56$, $SD=0.91$). Similar pattern of mix evaluation are seen for the capability to download video during class time which were 33.1% of the respondents agreed or strongly agreed, 30.1% of them neither disagreed nor agreed and 36.8% of them disagreed and strongly disagreed ($M=2.92$, $SD=1.05$). On the contrary, the capability to download video outside the classroom within the campus which was higher, i.e. 58.8% of the respondents agreed and strongly agreed, 26.2% of them neither disagreed nor agreed and 15.0% of them disagreed and strongly disagreed. Overall, the aspect of video usage among students was evaluated as lower than the other aspects of infrastructure and info structure.

4.3.2 Lecturers

Lecturers were asked to answer six items about Infrastructure and Info Structure that support the MOOC in their individual university with the scale of Strongly Disagree (SD), Disagree (D), Neither Disagree Nor Agree (NDNA), Agree (A) and Strongly Agree (SA) as shown in Figure 4.9.

Figure 4.9 presents the percentage distribution of the lecturers by degree of agreement on six items based on their perception on the quality of infrastructure and info structure provided for MOOC usage. In general, lecturers displayed medium mean scores ($M=3.56$) towards infrastructure and info structure in MOOC. Based on the result, about 76.8% of the respondents agreed or strongly agreed that they can access the OpenLearning anywhere in the campus ($M=3.82$, $SD=0.93$), while about 72.0% of the respondents agreed or strongly agreed that they can access the OpenLearning anytime ($M=3.75$, $SD=0.90$). As for the equipment to use MOOC for teaching, about 61.0% of the respondents agreed and strongly agreed that they have sufficient equipment ($M=3.47$, $SD=0.95$). A total of 55.5% of the respondents agreed or strongly agreed that they can access OpenLearning from any device ($M=3.48$,

SD=0.87). On the other hand, 45.7% of the respondents agreed that OpenLearning is very difficult to use and 31.7% of them neither disagree nor agree with it (M=3.46, SD=0.87). Overall, the aspect of OpenLearning accessibility inside the campus was evaluated as higher than the other aspects of infrastructure and info structure.

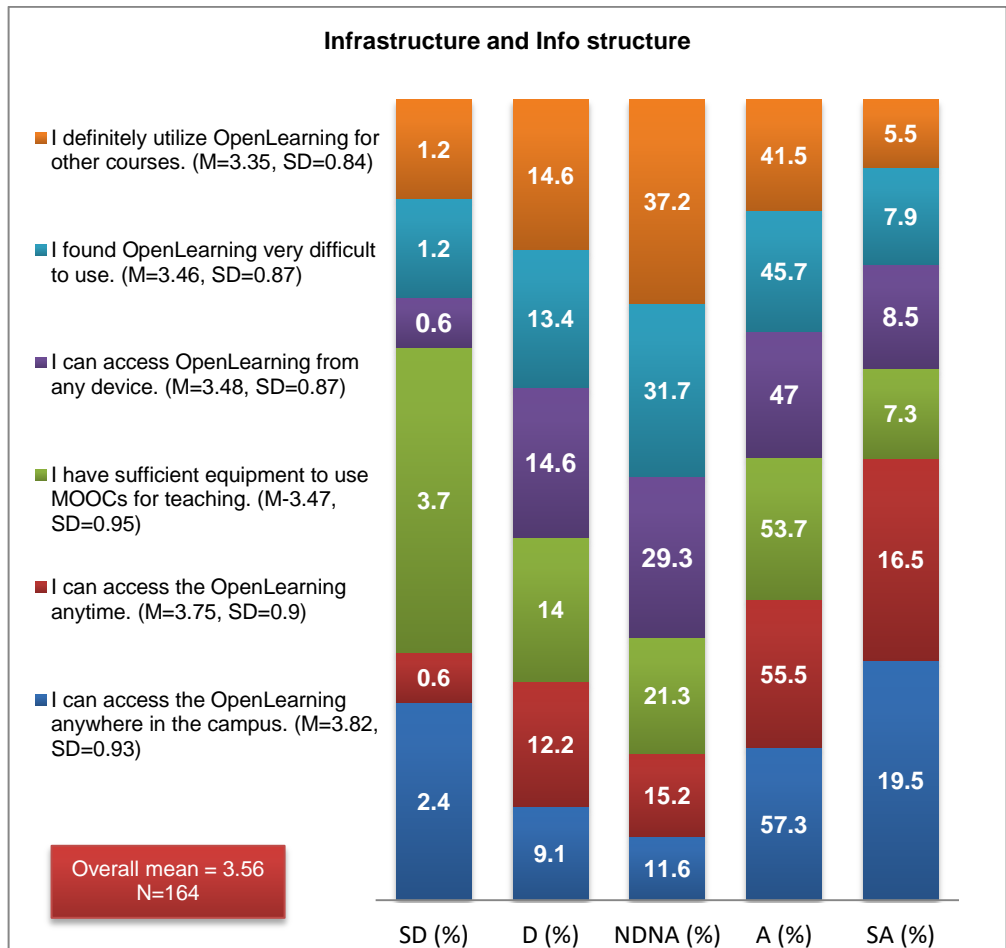


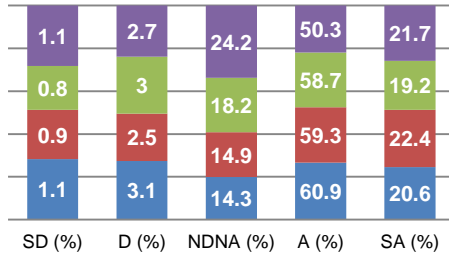
Figure 4.9: Infrastructure & Info Structure

4.4 MOOC Design

4.4.1 Learning Design (Students)

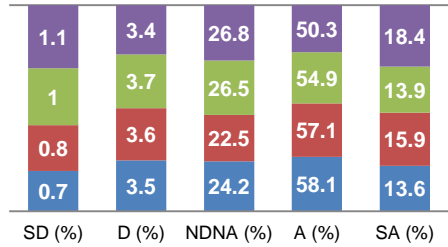
For learning design, the main concerns were on course design and delivery, engagement, assessment and additional reading. There are 10 items in this variable and students were asked to answer 10 items with scale Strongly Disagree (SD), Disagree (D), Neither Disagree Nor Agree (NDNA), Agree (A) and Strongly Agree (SA) as shown in Figure 4.10:

The course is well designed.



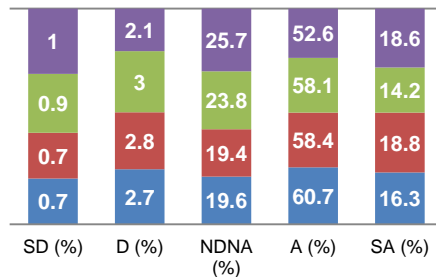
- ICT Competency (M=3.89, SD=0.81)
- Introduction to Entrepreneurship (M=3.92, SD=0.75)
- Hubungan Etnik (M=4, SD=0.74)
- TITAS (M=3.97, SD=0.76)

Learning through MOOC meets my learning needs.



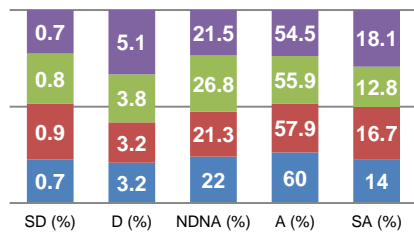
- ICT Competency (M=3.81, SD=0.81)
- Introduction to Entrepreneurship (M=3.77, SD=0.77)
- Hubungan Etnik (M=3.84, SD=0.76)
- TITAS (M=3.8, SD=0.74)

The sequence of learning activities help my understanding of the subject matter.



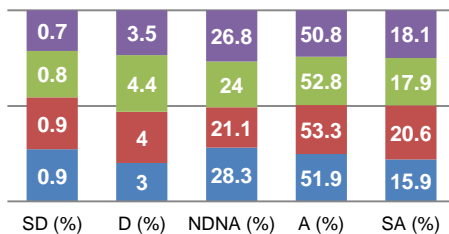
- ICT Competency (M=3.86, SD=0.77)
- Introduction to Entrepreneurship (M=3.82, SD=0.74)
- Hubungan Etnik (M=3.92, SD=0.74)
- TITAS (M=3.89, SD=0.72)

The learning schedule (course plan/lesson plan) suits my learning pace.



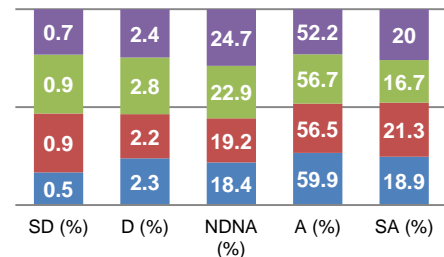
- ICT Competency (M=3.79, SD=0.78)
- Introduction to Entrepreneurship (M=3.76, SD=0.75)
- Hubungan Etnik (M=3.86, SD=0.76)
- TITAS (M=3.83, SD=0.73)

Opportunity to interact with large number of students is beneficial to my learning.



- ICT Competency (M=3.82, SD=0.79)
- Introduction to Entrepreneurship (M=3.83, SD=0.8)
- Hubungan Etnik (M=3.88, SD=0.81)
- TITAS (M=3.84, SD=0.8)

The quizzes enhanced my understanding of the topics covered.



- ICT Competency (M=3.88, SD=0.77)
- Introduction to Entrepreneurship (M=3.85, SD=0.76)
- Hubungan Etnik (M=3.95, SD=0.75)
- TITAS (M=3.94, SD=0.71)

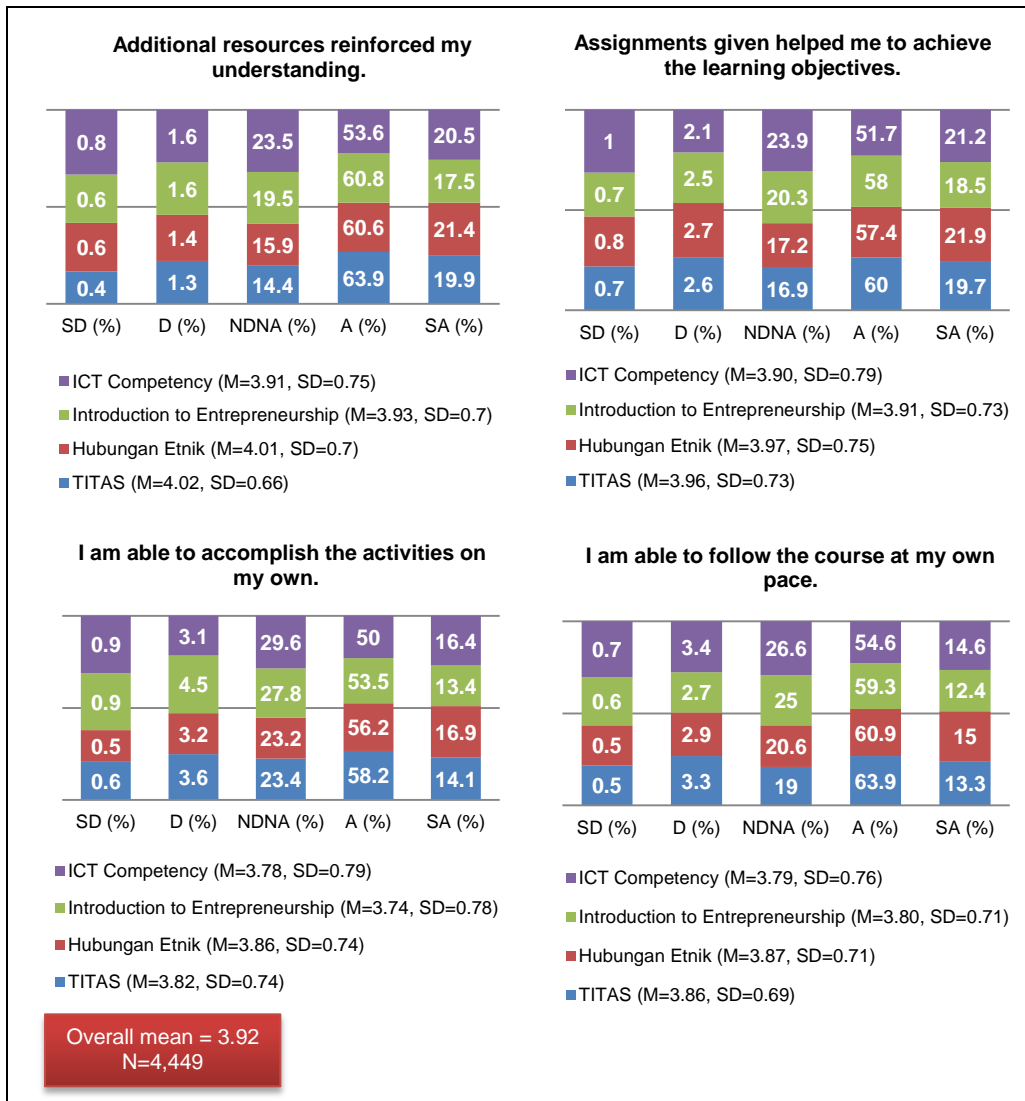


Figure 4.10: Learning design

Figure 4.10 illustrates the percentage distribution of the students by degree of agreement on 10 items concerning their perspective on suitability of learning design in MOOC. Each item shows different mean for four pilot courses (TITAS, *Hubungan Etnik*, Introduction to Entrepreneurship and ICT Competency). The highest mean score was for Additional resources reinforced understanding in TITAS course (M=4.02, SD=0.66), whereby 83.8% of the respondents agreed or strongly agreed that additional resources can increase their understanding. This was followed by the *Hubungan Etnik* course (M=4.01, SD=0.70), with a total of 82.0% of the respondents agreed or strongly agreed that additional resources can increase their understanding. Meanwhile, the learning activities for ICT Competency course and learning schedule *Hubungan Etnik* course had the same mean scores of 3.86, with standard deviation of

0.77 and 0.76, respectively. About 71.2% of the respondents agreed or strongly agreed that learning activities in ICT Competency course were helpful in understanding the subject matter. In term of the learning schedule in *Hubungan Etnik* course, it suits their learning pace, 74.6% of the respondent agreed or strongly agreed about it.

However, the lowest two mean scores were recorded for Activity accomplishment in Introduction to Entrepreneurship course ($M=3.74$, $SD=0.78$) and for the learning schedule suits the learning pace in Introduction to Entrepreneurship course ($M=3.76$, $SD=0.75$). Only 13.4% of the respondent strongly agreed that they are able to accomplish the activities on their own in Introduction to Entrepreneurship course and only 12.8% of the respondents strongly agreed that the learning schedule in Introduction to Entrepreneurship suits their learning pace. Overall, TITAS and *Hubungan Etnik* course for each item shows high mean scores in the learning design construct.

4.4.2 Pedagogy (lecturers)

There are eight items in this variable and lecturers were asked to answer eight items with scale Strongly Disagree (SD), Disagree (D), Neither Disagree Nor Agree (NDNA), Agree (A) and Strongly Agree (SA) as shown in Figure 4.11.

Figure 4.11 illustrates the percentage distribution of the lecturers by degree of agreement on eight items concerning their perspective on suitability of pedagogy in MOOC. In general, lecturers displayed high mean score for overall ($M=3.81$) towards pedagogy in MOOC. About 81.7% of the respondents agreed or strongly agreed that Watching video activity met the objective in their teaching ($M=3.94$, $SD=0.76$), which it is the highest mean score for this construct. Meanwhile, for group activity ($M=3.84$, $SD=0.75$) and interactive presentation activity ($M=3.84$, $SD=0.74$), about 75.6% of the respondents agreed or strongly agreed for both activities respectively, whereas 6.7% of the respondents disagreed on group activity and 6.1% disagreed on interactive presentation activity.

A total of 73.2% of the respondents agreed or strongly agreed that the sequence of course materials supported their teaching approach ($M=3.76$, $SD=0.73$) while a total of 68.3% of the respondents agreed or strongly agreed that activities in MOOC promote student engagement ($M=3.72$, $SD=0.74$). Similar pattern are seen for the item Teaching can be more creative when using MOOC and MOOC are supportive in teaching strategy for students innovative skills, which indicate about 71.4% and 68.3% of the respondents agreed or strongly agreed respectively, while 4.9% of the respondents disagreed or strongly disagreed with this item. Overall, the aspect of MOOC could support the lecturers teaching strategy was evaluated as the lowest compared to the other aspects of pedagogy.

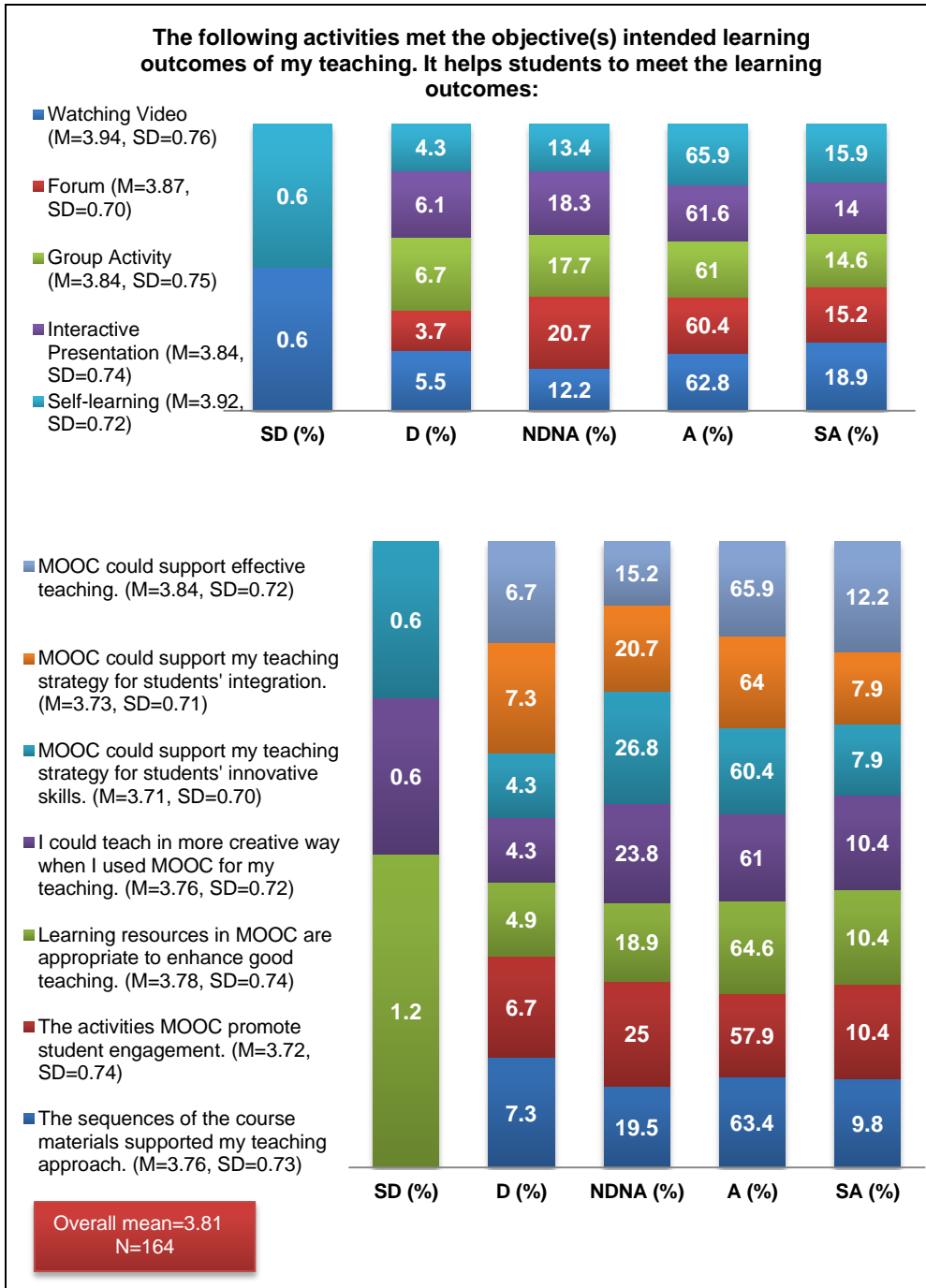


Figure 4.11: Pedagogy (Lecturers)

4.5 Content

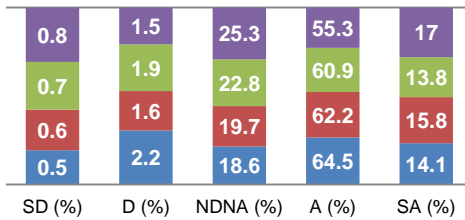
In the content development process, the main focus are level of engagement (interactivity, assessment), presentation of content (colour scheme), media usage (use, quality and range of media), alignment with learning objective, quality of content as a whole, functionality and additional resources. In this variable, the students and lecturers need to rate Strongly Disagree (SD), Disagree (D), Neither Disagree Nor Agree (NDNA), Agree (A) and Strongly Agree (SA) as shown in Figure 4.12 and Figure 4.13:

Figure 4.12 illustrates the percentage distribution of the students by degree of agreement on nine items concerning their perspective on suitability of content in MOOC. Seven items show different mean scores for four pilot courses (TITAS, *Hubungan Etnik*, Introduction to Entrepreneurship and ICT Competency). The highest mean scores was achieved for the additional resources are helpful ($M=4.08$, $SD=0.61$), whereby 87.9% of the respondents agreed or strongly agreed that additional resources such as link to websites, readings and social media outside OpenLearning are helpful. This was followed by the watching video activity ($M=4.05$, $SD=0.69$), with a total of 81.7% of the respondents agreed or strongly agreed that watching video activity is useful in their learning. Meanwhile, the content is well organized for TITAS and *Hubungan Etnik* course had the same mean scores of 3.93, with standard deviation of 0.73 respectively. About 79.2% of the respondents agreed or strongly agreed that the content is well organized in TITAS course and for *Hubungan Etnik* course, 79.1% of the respondent agreed or strongly agreed that the content is well organized.

In term of the content met the learning outcomes, about 78.8% of the respondents agreed or strongly agreed that content in TITAS course met the learning outcomes ($M=3.92$, $SD=0.68$) while 72.6% of the respondents agreed or strongly agreed that content in ICT Competency course met the learning outcomes ($M=3.88$, $SD=0.74$).

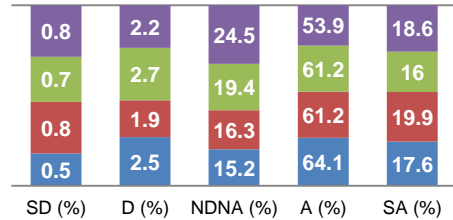
However, the lowest two mean scores were recorded for forum activity ($M=3.67$ $SD=0.79$) and for the content covers the essential aspects of the Introduction to Entrepreneurship course ($M=3.85$, $SD=0.69$). About 57.4% of the respondent agreed or strongly agreed that forum activity is useful for their learning and about 74.7% of the respondents agreed or strongly agreed that the content in Introduction to Entrepreneurship course covers the essential aspects. Overall, in students' perspective, the content in MOOCs is reflected appropriate for them, considering majority of the items were recorded with high mean scores.

The content covers the essential aspects of the course.



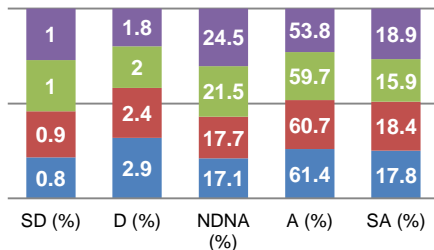
- ICT Competency (M=3.86, SD=0.73)
- Introduction to Entrepreneurship (M=3.85, SD=0.69)
- Hubungan Etnik (M=3.91, SD=0.69)
- TITAS (M=3.90, SD=0.67)

The content is clear and understandable.



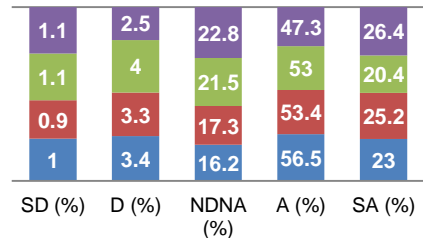
- ICT Competency (M=3.87, SD=0.76)
- Introduction to Entrepreneurship (M=3.89, SD=0.72)
- Hubungan Etnik (M=3.97, SD=0.71)
- TITAS (M=3.96, SD=0.69)

The content is well organized.



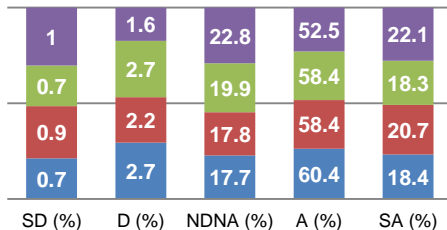
- ICT Competency (M=3.88, SD=0.76)
- Introduction to Entrepreneurship (M=3.88, SD=0.72)
- Hubungan Etnik (M=3.93, SD=0.73)
- TITAS (M=3.93, SD=0.73)

The use of multimedia in the course is interesting.



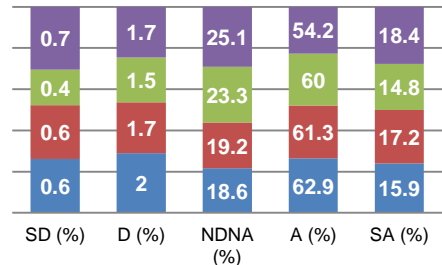
- ICT Competency (M=3.95, SD=0.83)
- Introduction to Entrepreneurship (M=3.88, SD=0.81)
- Hubungan Etnik (M=3.99, SD=0.80)
- TITAS (M=3.97, SD=0.78)

The course activities are useful for my learning.



- ICT Competency (M=3.93, SD=0.77)
- Introduction to Entrepreneurship (M=3.91, SD=0.74)
- Hubungan Etnik (M=3.96, SD=0.74)
- TITAS (M=3.93, SD=0.73)

The content met the learning outcomes.



- ICT Competency (M=3.88, SD=0.74)
- Introduction to Entrepreneurship (M=3.87, SD=0.68)
- Hubungan Etnik (M=3.93, SD=0.69)
- TITAS (M=3.92, SD=0.68)

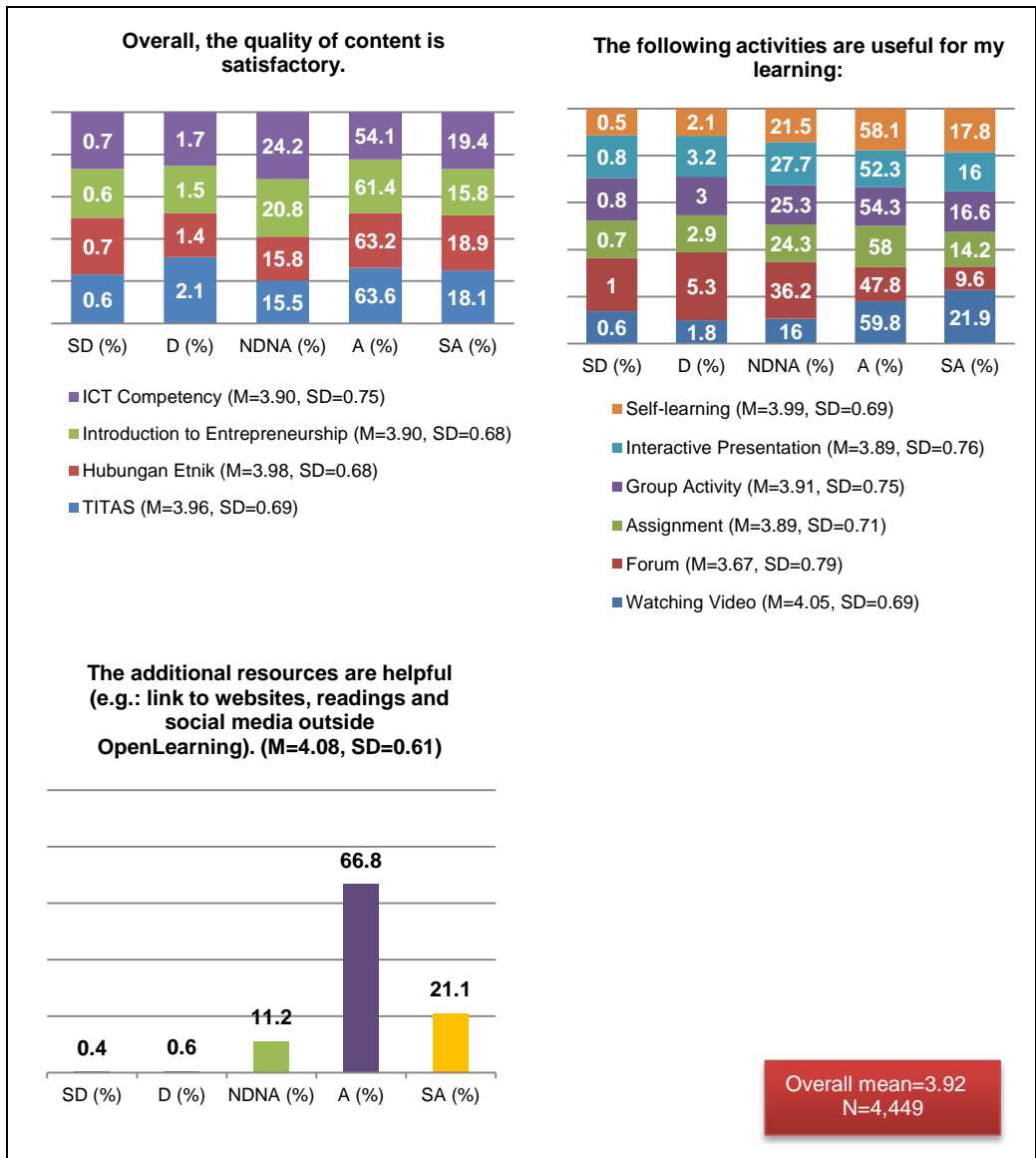


Figure 4.12: Content (Students)

Figure 4.13 presents the percentage distribution of the lecturers by their degree of agreement on eight items concerning their perspective on suitability of content in MOOC. In general, lecturers displayed medium mean scores (M=3.60) towards content in MOOC (compared to students'). About 62.2% of the respondents agreed or strongly agreed that the MOOC content is sufficient for the learning objectives (M=3.47, SD=0.90) while for MOOC content for each unit are adequate, about 56.1% of the respondent agreed or strongly agreed with it (M=3.40, SD=0.93). A total of 62.8% of the respondents agreed or strongly agreed that the media produced are interesting and 29.3% of them neither disagreed nor agreed with it (M=3.62, SD=0.79). In term of quality of

the content, 61.6% of the respondents agreed or strongly agreed that the quality is satisfactory (M=3.55, SD=0.79) and 68.3% of the respondents agreed or strongly agreed that the content was well-organized (M=3.67, SD=0.69). Similar pattern are seen for the MOOC content can easily be blended with the face-to-face activities and the MOOC content sequence is appropriate which were recorded the same mean scores and standard deviation (M=3.70, SD=0.69), whereby 67.7% and 70.7% of the respondents agreed or strongly agreed respectively. Overall, aspects of adequacy of content for each unit and their sufficiency for the learning objectives were evaluated as lower than the other aspects of content.

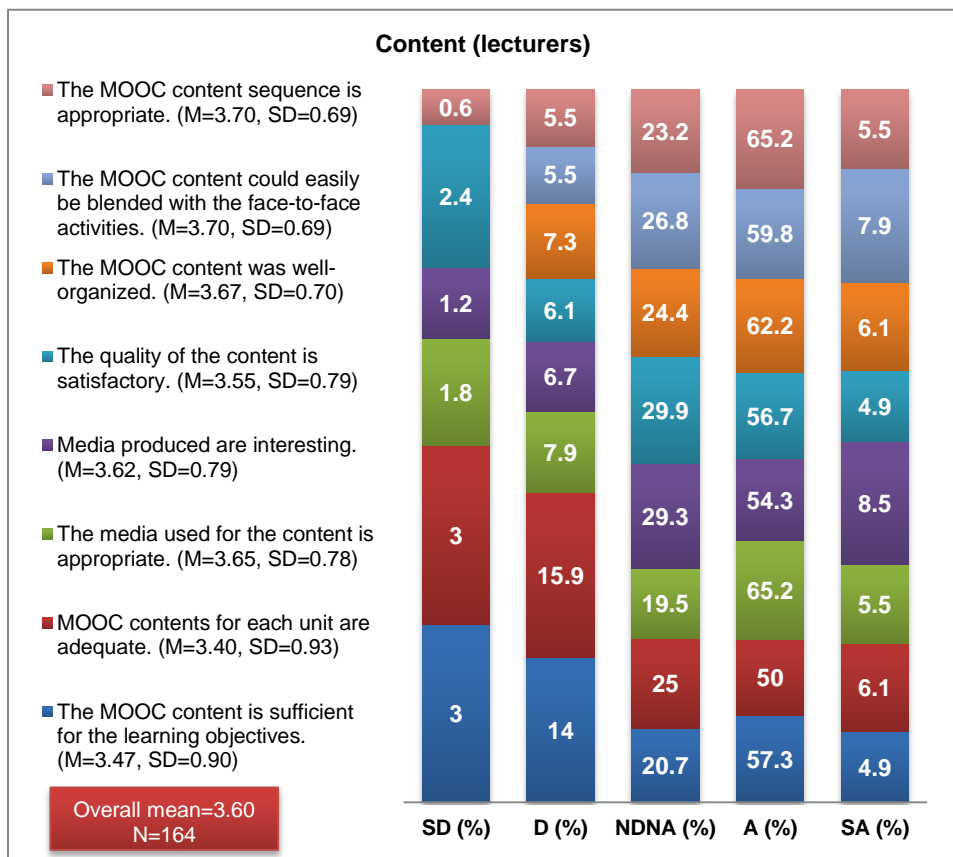


Figure 4.13: Content (Lecturers)

4.6 Curriculum

In this construct, students and lecturers were asked to answer four items with the scale of Strongly Disagree (SD), Disagree (D), Neither Disagree Nor Agree (NDNA), Agree (A) and Strongly Agree (SA) as shown in Figure 4.14 and Figure 4.15:

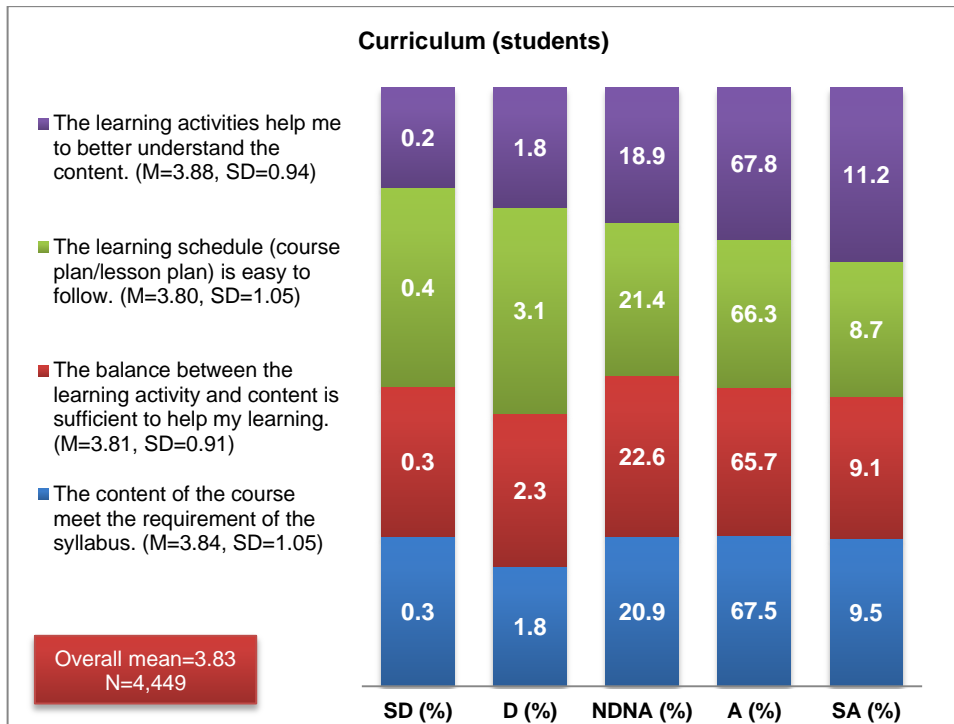


Figure 4.14: Curriculum (students)

Figure 4.14 indicates the percentage distribution of the students by their degree of agreement on four items concerning their perspective on suitability of curriculum in MOOC. About 77.0% of the respondents agreed or strongly agreed that the content of the course meet the requirement of the syllabus while only 2.1% of them disagreed or strongly disagreed with it (M=3.84, SD=1.05).

A total of 74.8% of the respondents agreed or strongly agreed that the balance between the learning activity and content is sufficient to help their learning (M=3.81, SD=0.91). In term of the learning schedule, about 75.0% of the respondents agreed or strongly agreed that learning schedule is easy to follow (M=3.80, SD=1.05) while for learning activities, 79.0% of the respondents agreed or strongly disagreed that learning activities help them to better understand the content (M=3.88, SD=0.94). Overall, all the aspects of curriculum show high mean scores (overall mean, M=3.83) which illustrate that from the students' evaluation, curriculum in MOOC were acceptably suitable.

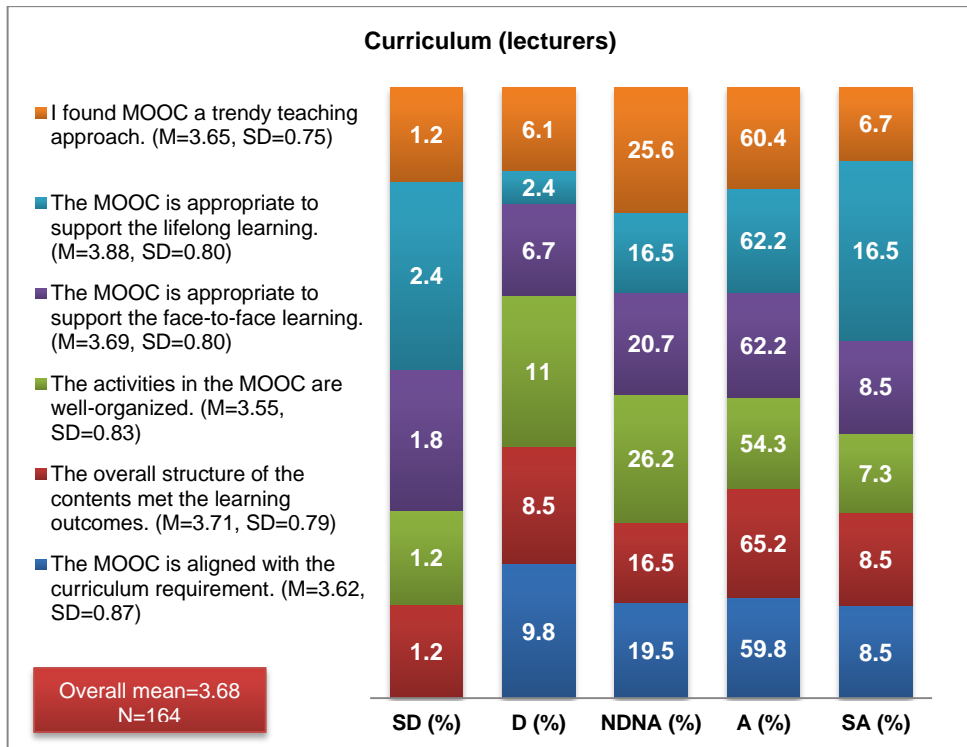


Figure 4.15: Curriculum (lecturers)

Figure 4.15 illustrates the percentage distribution of the lecturers by their degree of agreement on six items concerning their perspective on suitability of curriculum in MOOC. In general, lecturers displayed high mean scores ($M=3.68$) towards curriculum in MOOC. About 78.7% of the respondents agreed or strongly agreed that MOOC is appropriate to support the lifelong learning ($M=3.88$, $SD=0.80$) which indicates the highest mean scores for this construct. In term of the overall structure of the contents, about 73.7% of the respondents agreed or strongly agreed that the structure met the learning outcomes ($M=3.71$, $SD=0.79$). On the other hand, 61.6% of the respondents agreed or strongly agreed that the activities in the MOOC are well-organized and 26.2% of them neither disagreed nor agreed ($M=3.55$, $SD=0.83$). A total of 62.2% of the respondents agreed that MOOC is appropriate to support the face-to-face learning ($M=3.69$, $SD=0.80$) and lifelong learning ($M=3.88$, $SD=0.80$) respectively while about 67.1% of the respondents agreed or strongly agreed that MOOC is a trendy teaching approach ($M=3.65$, $SD=0.75$). Overall, the aspect of activities arrangement in MOOC was evaluated as lower than the other aspects of curriculum.

4.7 Assessment

In this construct, the students and lecturers were asked to answer with the scale of Strongly Disagree (SD), Disagree (D), Neither Disagree Nor Agree

(NDNA), Agree (A) and Strongly Agree (SA) as shown in Figure 4.16 and Figure 4.17:

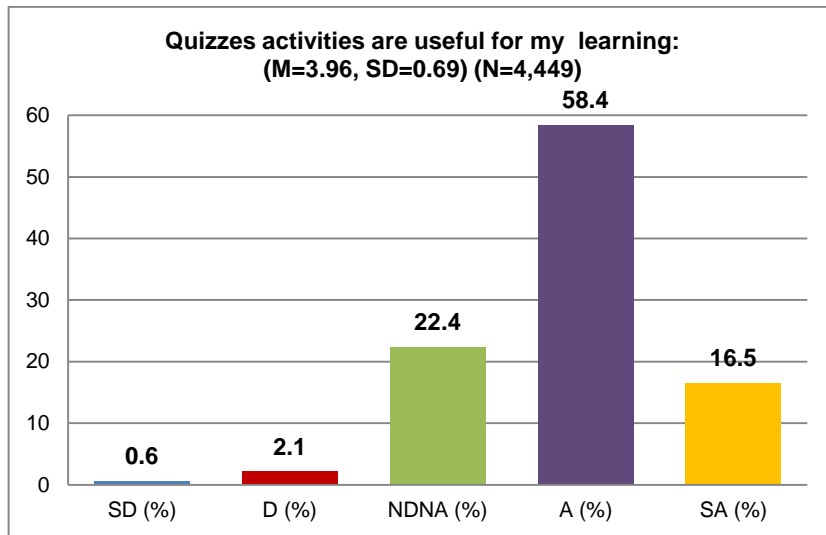


Figure 4.16: Students' assessment

Figure 4.16 illustrates the percentage distribution of the students by their degree of agreement on items concerning their perspective on assessment in MOOC. From Figure 4.16, about 74.9% of the respondents agreed or strongly agreed that quiz activity is useful for their learning. Furthermore, 2.7% of the respondents disagreed or strongly disagreed that quiz activity is useful for their learning (M=3.96, SD=0.69).

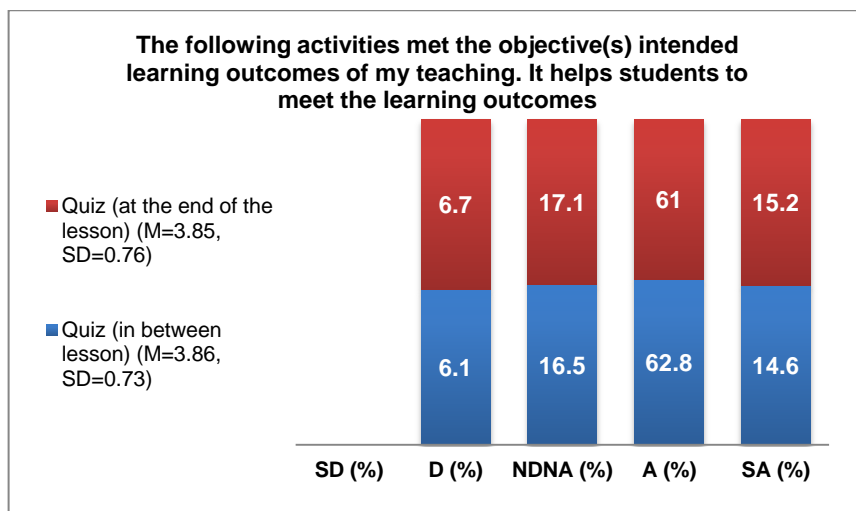


Figure 4.17: Lecturers' assessment

Figure 4.17 demonstrates the percentage distribution of the lecturers by their degree of agreement on quiz activity concerning their perspective on assessment in MOOC. As shown in Figure 4.17, about 77.4% of the respondents agreed or strongly disagreed that quiz activity in between lesson met the objective intended learning outcomes of their teaching while 6.1% of them disagreed with it ($M=3.86$, $SD=0.73$). On the contrary, about 76.2% of the respondents agreed or strongly agreed that quiz activity at the end of the lesson met the objective intended learning outcomes of their teaching while 6.7% of them disagreed with it ($M=3.85$, $SD=0.76$).

4.8 MOOC Learning Experiences

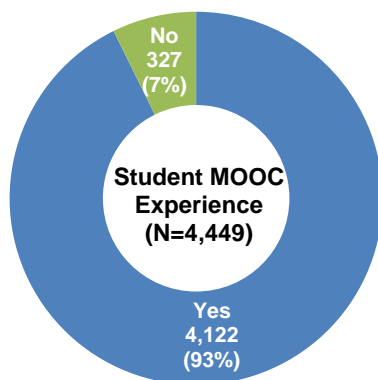


Figure 4.18: MOOC experience

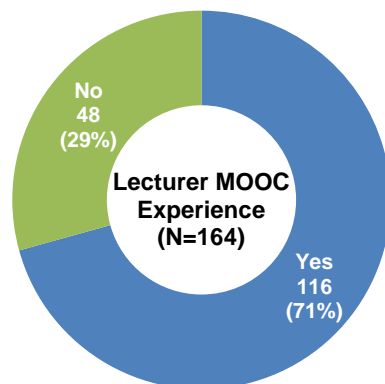


Figure 4.19: MOOC experience

Figure 4.18 indicates the students' experienced learning through MOOC for the first time. A total of 4,122 (93%) of the students stated that this is their first experience using MOOC, while only 327 (7%) of the students stated they have used MOOC before.

Meanwhile, from the Figure 4.19, 70.7% of the lecturers stated that this is the first time they experience teaching using MOOC, while 29.3% of them stated they have used MOOC before.

4.9 Professional Developments

4.9.1 Lecturers' Training

The lecturers were requested to answer six items with the scale of Strongly Disagree (SD), Disagree (D), Neither Disagree Nor Agree (NDNA), Agree (A), and Strongly Agree (SA) as shown in Figure 4.20:

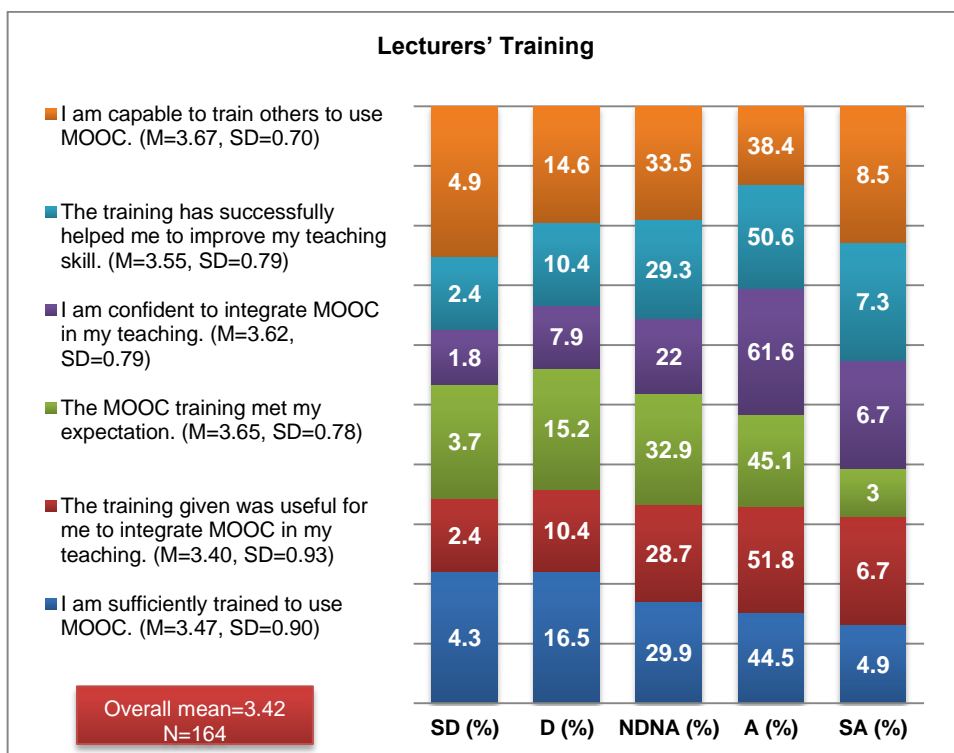


Figure 4.20: Lecturers' training

Figure 4.20 illustrates the percentage distribution of the lecturers by their degree of agreement on six items concerning their perspective on professional development on teaching through MOOC. In general, lecturers displayed medium mean scores ($M=3.42$) towards professional development on MOOC. About 49.4% of the respondents agreed or strongly agreed that they are sufficiently trained to use MOOC ($M=3.47$, $SD=0.90$) while 29.9% of them neither disagreed nor agreed. In term of the MOOC training expectation, about 48.1% of the respondents agreed or strongly agreed that the MOOC training met their expectation ($M=3.65$, $SD=0.78$).

A total of 68.3% of the respondents agreed or strongly agreed that they confident to integrate MOOC in their teaching ($M=3.62$, $SD=0.79$), while a total of 57.9% of the respondents agreed or strongly agreed that the training has successfully helped them to improve their teaching skill ($M=3.55$, $SD=0.79$). On the other hand, about 46.9% of the respondents agreed or strongly agreed that they are capable to train others to use MOOC while 33.5% of them neither disagreed nor agreed ($M=3.67$, $SD=0.70$). This shows mix evaluation of lecturers' capability to train others to use MOOC. Overall, the aspect of training for MOOC integration was evaluated as lower than the other aspects of professional development.

4.9.2 Developers' training

Most of the developers were organized the workshop to train their staff on how to use the OpenLearning platform.

"...The instructor need to be trained how to use OpenLearning to upload their contents and deliver the course. Support staffs (teaching assistant/tutor/postgraduate) to help uploading contents periodically and interaction with students..." (UPM)

"...We organize the instructional design workshop for staff and workshop on web design tools..." (UKM)

"...There are training systems on the website. We upload table when will the training conducted. Every branch has i-Learn committee. A course will be conducted to discuss and giving explanation about MOOC. How frequent the course will conduct is depend on the lecturer population..." (UiTM)

"...Likely, we are from the team, except for video production are in the IT field. So we don't have problem to use OpenLearning platform. Just for lectures that teach the 4 courses, we provide training to them by conducting one day workshop and explain how to use OpenLearning platform..." (UNIMAS)

4.10 MOOC Teaching and Learning Support

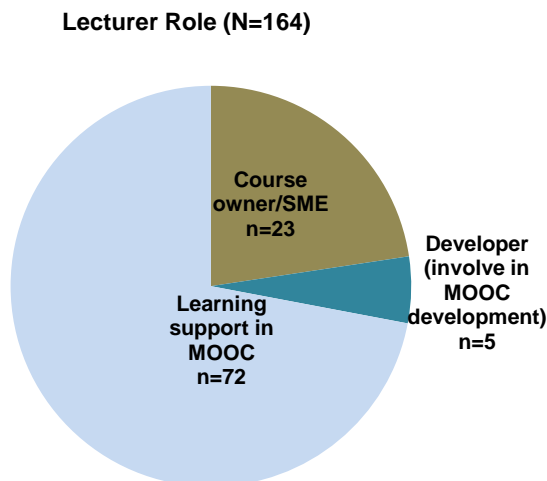


Figure 4.21: Lecturer role in MOOC

As shown in Figure 4.21, a total of 121 lecturers are learning support in MOOC, while 38 are course owner/SME. Only nine of the lecturers were MOOC developer.

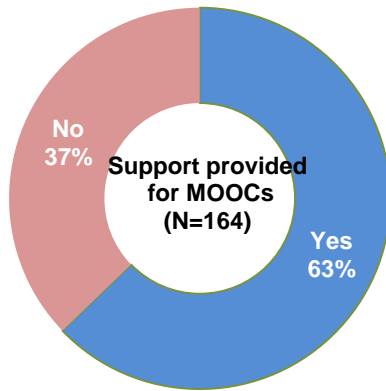


Figure 4.22: Support provided for MOOC

Figure 4.22 indicates any support provided for MOOC. The result shows that 62.8% of the lecturers stated that there are supports provided for MOOC, while the rest stated that there is no support provided.

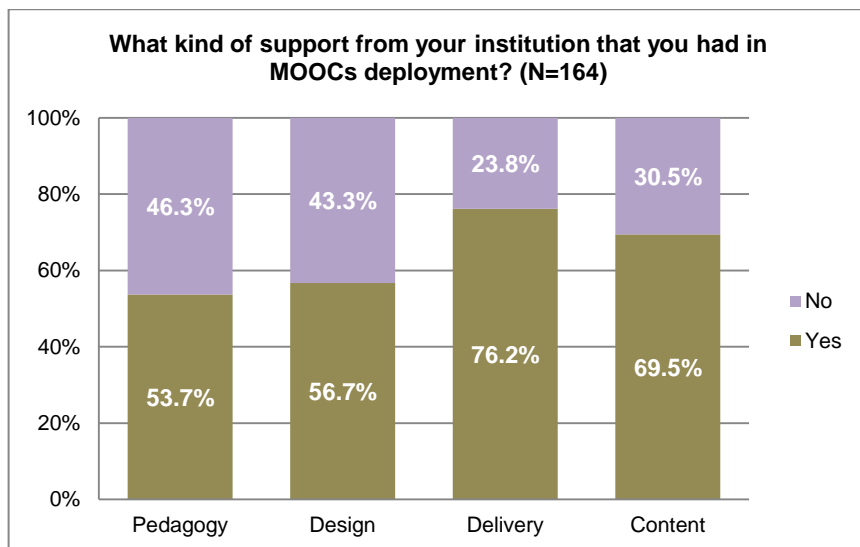


Figure 4.23: Support from institutions

As shown in Figure 4.23, there are four types of support provided known as pedagogy, design, delivery, and content. 76.2% of the lecturers stated that their institutions provided support in delivery and 53.7% support in pedagogy. For

content support, 69.5% of the lecturers said “Yes” that their institutions provide support in content, while 30.5% stated a “No”.

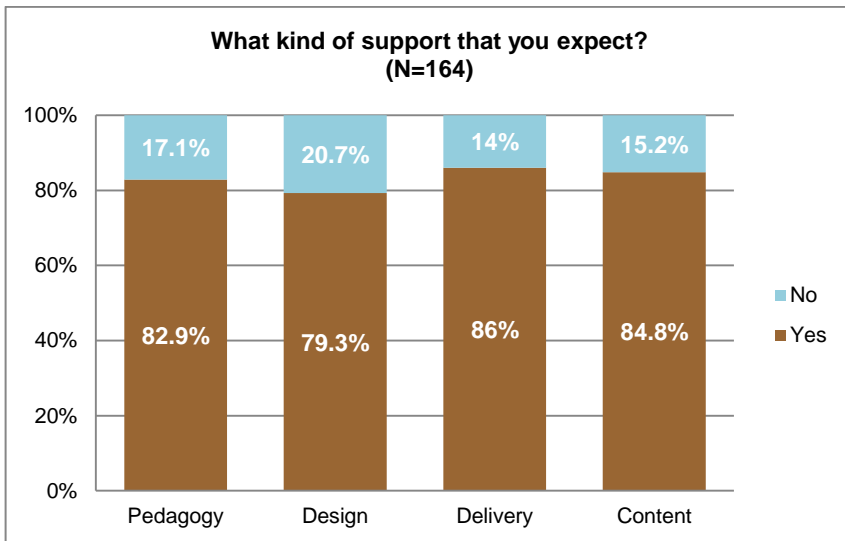


Figure 4.24: Support expectation

As shown in Figure 4.24, there are four types of support expectation known as pedagogy, design, delivery, and content. The result indicates that more than 80.0% of the lecturers stated that they expect the support in pedagogy, delivery, and content. On the contrary, less than 20.0% of the lecturers stated that they did not expect any support in pedagogy, delivery, and content.

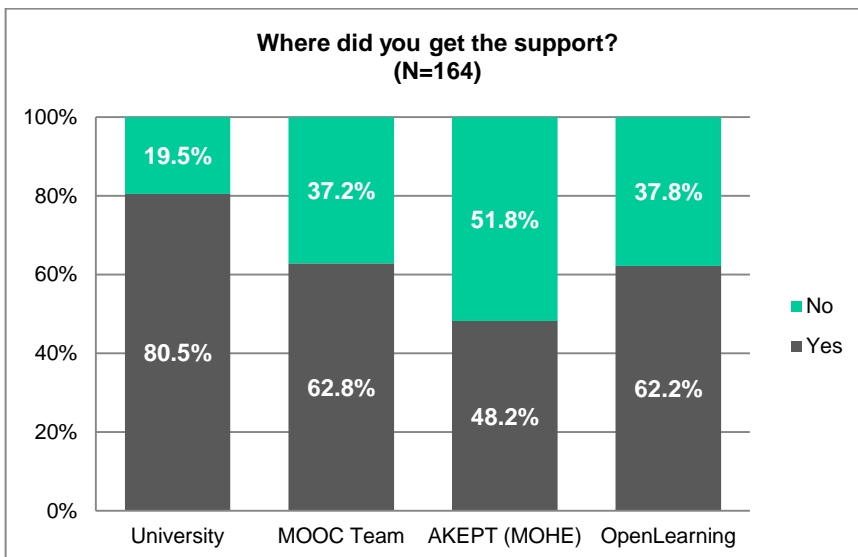


Figure 4.25: Institution support

As mentioned in Figure 4.25, 80.5% of the lecturers stated that they acquired the support from the university, while 48.2% received the support from AKEPT. More 60.0% of the lecturers stated that they got the support from MOOC team and OpenLearning provider, whereas less than 40.0% of the lecturers stated that they did not get any support from the university, MOOC team or the OpenLearning provider.

4.11 MOOC Enculturation

Lecturers were asked to answer three items with the scale of Strongly Disagree (SD), Disagree (D), Neither Disagree Nor Agree (NDNA), Agree (A), and Strongly Agree (SA) as shown in Figure 4.26:

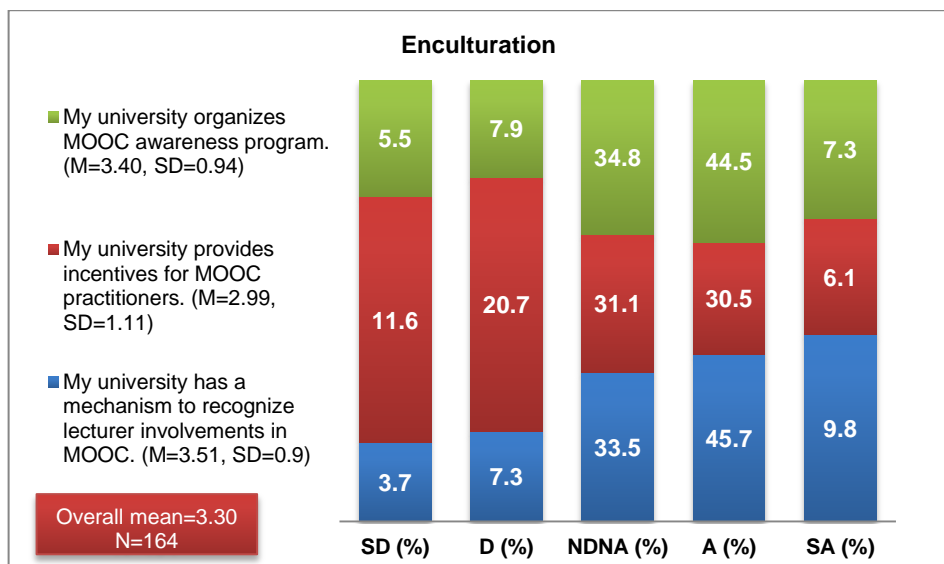


Figure 4.26: Lecturers' enculturation

Figure 4.26 illustrates the percentage distribution of the lecturers by degree of agreement on three items concerning their perspective on MOOC enculturation at their universities. In general, lecturers displayed medium mean scores (M=3.30) towards MOOC enculturation at their universities. From the Figure 4.26, about 55.5% of the respondents agreed or strongly agreed that their university has a mechanism to recognize lecturer involvements in MOOC (M=3.51, SD=0.90). On the other hand, only 36.6% of the respondents agreed or strongly agreed that their university provides incentives for MOOC practitioners while 31.1% of them neither disagreed nor agreed and 32.3% of them disagreed or strongly disagreed (M=2.99, SD=1.11). This shows mixed evaluation towards university incentives for MOOC practitioners. A total of 51.8% of the respondents agreed or strongly agreed that their university organizes MOOC awareness program while 13.4% of them disagreed or

strongly disagreed ($M=3.40$, $SD=0.94$). Overall, lecturers evaluated the enculturation of MOOC in their university as moderate.

4.12 Quality Enhancement in Teaching and Learning through MOOC

In enhancement in teaching and learning, the main constructs are effectiveness, motivation, level of learning engagement, skills (including soft skills such as ICT skill, 21st century skill, collaborative skill, communicating skill, leadership skill, and entrepreneur skill), values and ethics, involvements, learning performance, and teaching improvement.

4.12.1 Students Perspective

There are six items in this construct which examining: the ability of MOOC in enhancing students' learning experiences; the effectiveness of students' learning through MOOC; the enjoyment of learning through MOOC; and observing three main domains namely cognitive, skill and value. Students were asked to rate with the scale of Strongly Disagree (SD), Disagree (D), Neither Disagree Nor Agree (NDNA), Agree (A), and Strongly Agree (SA) as shown in Figure 4.27, Figure 4.28, Figure 4.29, and Figure 4.30.

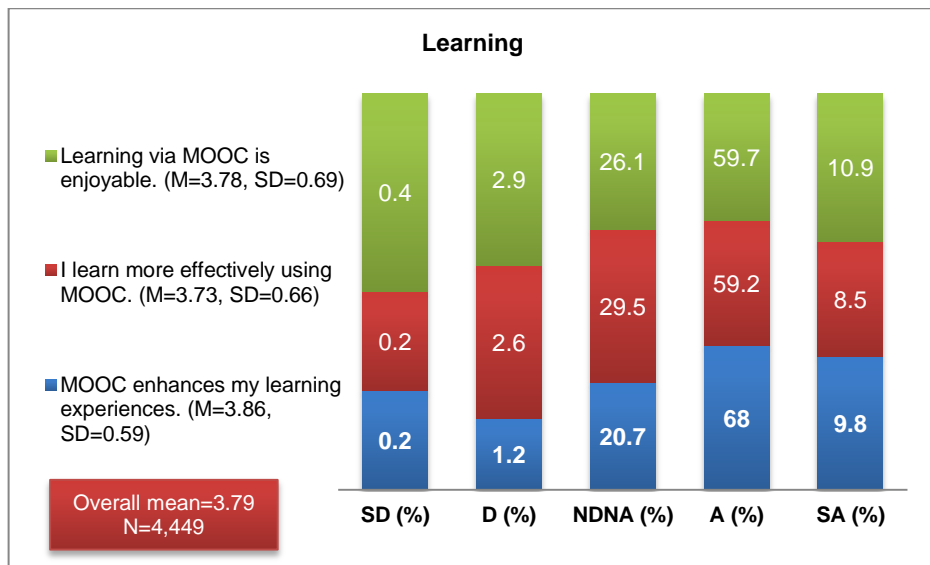


Figure 4.27: Learning

Figure 4.27 illustrates that about 77.6% of the respondents agreed or strongly agreed that MOOC enhances their learning experiences ($M=3.86$, $SD=0.59$), while 67.7% of the respondents agreed or strongly agreed that they learn more effectively using MOOC ($M=3.73$, $SD=0.66$).

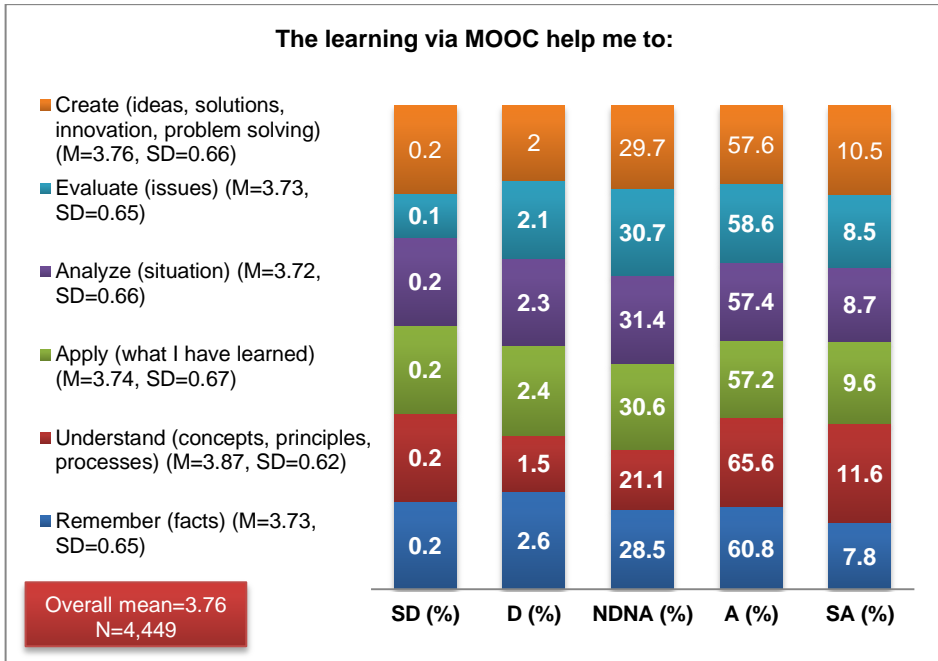


Figure 4.28: Cognitive

Meanwhile, for cognitive domain, six items namely (i) remember (facts); (ii) understand (concepts, principles, processes); (iii) apply (what I have learned); (iv) analyse (situation); (v) evaluate (issues); and (vi) create (ideas, solution, innovation, problem solving) were evaluated and reported as shown in Figure 4.28. Remember (facts) and Evaluate (issues) recorded the same mean scores of 3.73 and standard deviation of 0.65 respectively. About 68.6% of the respondents agreed or strongly agreed that learning via MOOC help them to remember (facts) (M=3.73, SD=0.65) while about 67.1% of the respondents agreed or strongly agreed that learning via MOOC help them to evaluate (issues) (M=3.73, SD=0.65).

The highest mean score in cognitive benefits was achieved for the Learning via MOOC help students to understand (concepts, principles, processes) (M=3.87, SD=0.62), whereby about 77.2% of the respondents agreed or strongly agreed and only 1.7% of them disagreed or strongly disagreed. About 66.1% of the respondents agreed or strongly agreed that MOOC help them to analyse (situation) (M=3.72, SD=0.66), while 68.1% of the respondents agreed or strongly agreed that MOOC help them to create (ideas, solutions, innovation, problem solving) (M=3.76, SD=0.66). The responses on the cognitive domain resulted in an overall mean score of 3.76. Overall, cognitive domain of Understand (concepts, principles, processes) was evaluated as higher than the other domains of cognitive. While the higher level of cognitive domain i.e. Create reported as the second highest score (M=3.76, SD=0.66).

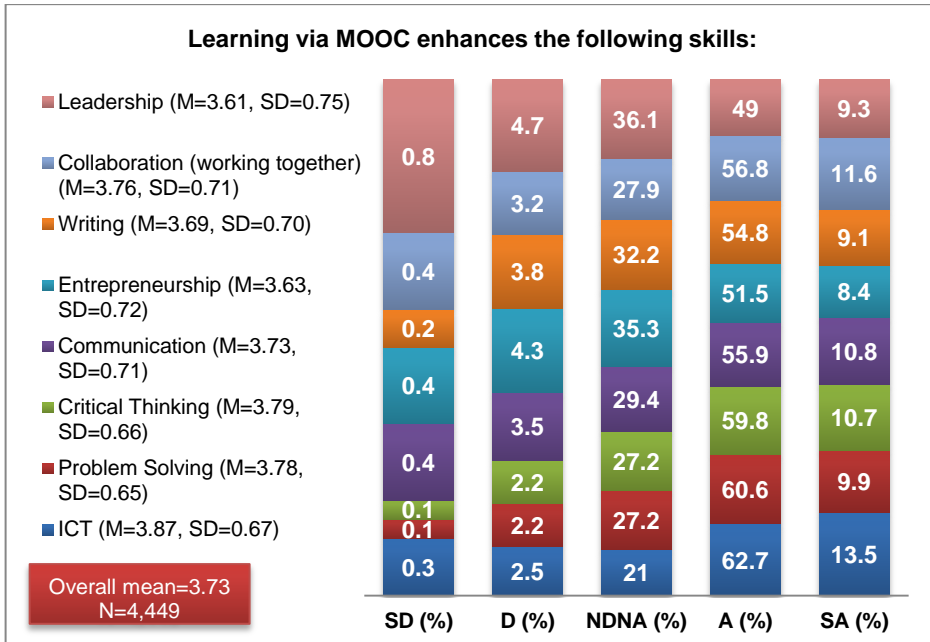


Figure 4.29: Skills

In term of learning via MOOC enhances the following skills, eight items namely (i) ICT; (ii) problem solving; (iii) critical thinking; (iv) communication; (v) entrepreneurship; (vi) writing; (vii) collaboration (working together); and (viii) leadership were evaluated and reported different mean scores as shown in Figure 4.29. The highest mean score was recorded for ICT skill (M=3.87, SD=0.67), whereby 76.2% of the respondents agreed or strongly agreed that learning via MOOC can enhances their ICT skill. This was followed by the critical thinking skill (M=3.79, SD=0.66), with a total of 70.5% of the respondents agreed or strongly agreed that learning via MOOC can enhances their ICT skill.

Meanwhile, writing skill recorded a mean score of 3.69 with a standard deviation of 0.70. About 63.9% of the respondents agreed or strongly agreed that learning via MOOC can enhance their writing skill. Nevertheless, the lowest two mean scores were recorded for leadership skill (M=3.61, SD=0.75) and for entrepreneurship skill (M=3.63, SD=0.72). About 58.3% of the respondent agreed or strongly agreed that learning via MOOC can enhance their leadership skill and 59.9% of the respondents agreed or strongly agreed that the learning via MOOC can enhance their entrepreneurship skill. The responses on the skills domain resulted in an overall mean score of 3.73. Overall, ICT and critical thinking skills were evaluated as higher than the other domains of skill.

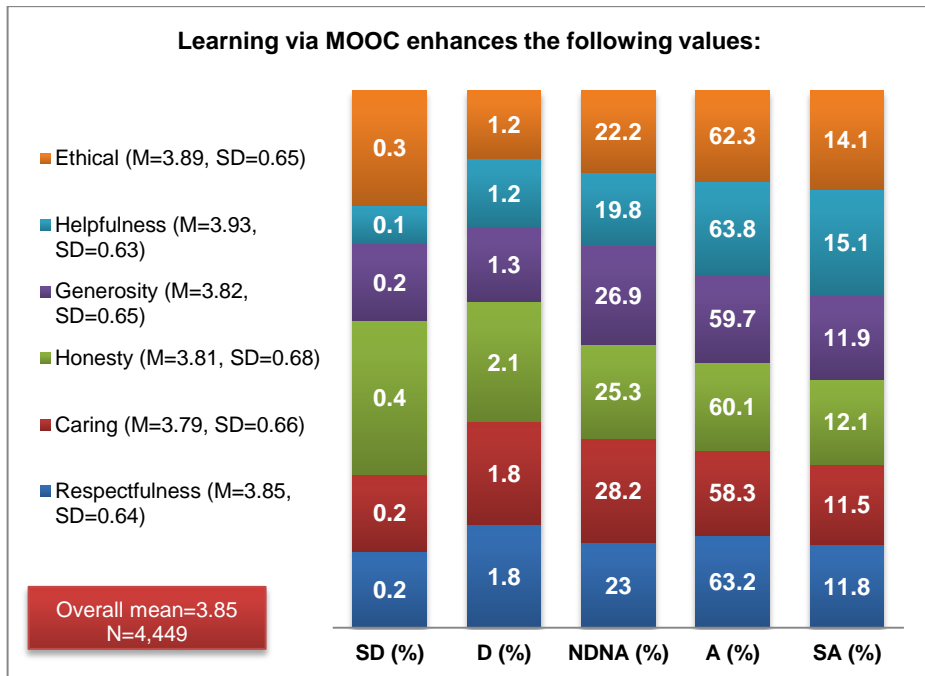


Figure 4.30: Values

Figure 4.30 displays six values known as (i) respectfulness; (ii) caring; (iii) honesty; (iv) generosity; (v) helpfulness; and (vi) ethical were highlighted for values domain and reported the different mean scores. The highest mean score was recorded for helpfulness value (M=3.93, SD=0.63) with about 78.9% of the respondents agreed or strongly agreed that learning via MOOC can enhance their helpfulness value. On the other hand, the mean score recorded for ethical value is 3.89 with a standard deviation of 0.65 while the mean recorded for honesty value is 3.81 with a standard deviation of 0.68. About 76.4% of the respondents agreed or strongly agreed that learning via MOOC enhance their ethical value while about 72.2% of the respondents agreed or strongly agreed that learning via MOOC enhance their honesty value. The lowest mean score was recorded for caring value (M=3.79, SD=0.66) whereby about 69.8% of the respondents agreed or strongly agreed that learning via MOOC can enhance their caring value. Overall, MOOC undoubtedly can enhance students' positive values through their learning in MOOC.

4.12.2 Lecturer Perspective

There are 11 items in this variable with the scale of Strongly Disagree (SD), Disagree (D), Neither Disagree Nor Agree (NDNA), Agree (A), and Strongly Agree (SA) as shown in Figure 4.31:

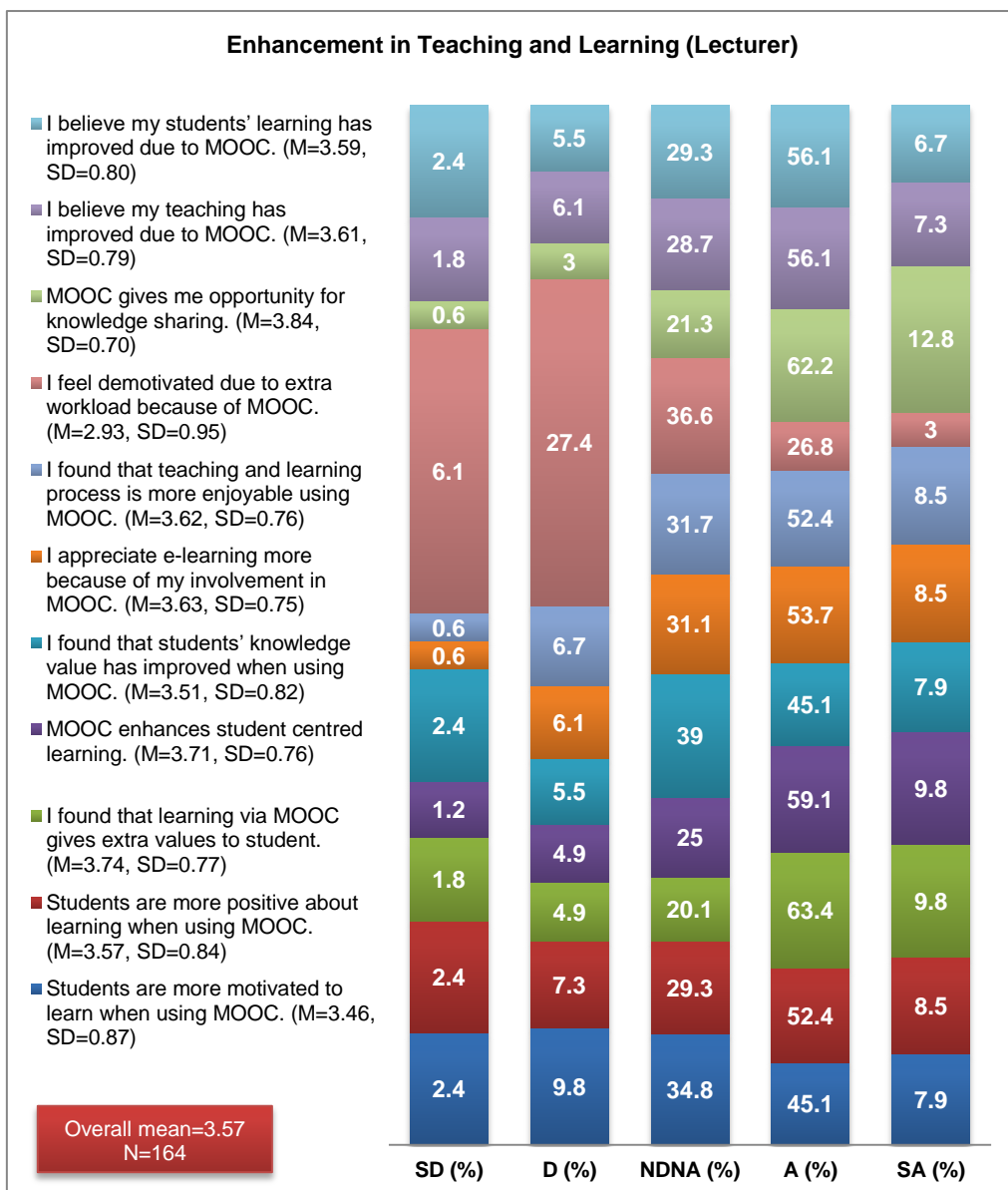


Figure 4.31: Enhancement in teaching and learning

Figure 4.31 illustrates the percentage distribution of the lecturers by degree of agreement on 11 items concerning their perception on quality enhancement in teaching and learning through MOOC. In general, lecturers displayed medium mean scores ($M=3.57$) towards quality enhancement in teaching and learning through MOOC. From the Figure 4.31, about 53.0% of the respondents agreed or strongly agreed that students are more motivated to learn when using MOOC ($M=3.46$, $SD=0.87$) whereas about 60.9% of the respondents agreed or strongly agreed that students are more positive about learning when using

MOOC (M=3.57, SD=0.84). On the other hand, about 73.2% of the respondents agreed or strongly agreed that learning via MOOC gives extra values to student (M=3.74, SD=0.77). Furthermore, a total of 53.0% of the respondents agreed or strongly agreed that students' knowledge value has improved when using MOOC (M=3.51, SD=0.82) while 68.9% of the respondents agreed or strongly agreed that MOOC enhances student centred learning (M=3.71, SD=0.76).

About 60.9% of the respondents agreed or strongly agreed that teaching and learning process is more enjoyable using MOOC and only 7.3% of them disagreed or strongly disagreed that learning is enjoyable using MOOC (M=3.62, SD=0.76). A negative item was recorded which indicates that lecturers feel more demotivated due to extra workload because of MOOC (M=2.93, SD=0.95) whereby about 29.8% of the respondents agreed or strongly agreed that they feel demotivated due to MOOC.

A total of 75.0% of the respondents agreed or strongly agreed that MOOC give them opportunity for knowledge sharing (M=3.84, SD=0.70). Respondents believe that their teaching has improved due to MOOC (M=3.61, SD=0.79) whereby about 63.4% of them agreed or strongly agreed while only 3.6% of them disagreed or strongly disagreed that MOOC has improved their teaching. Overall, the aspect of knowledge sharing in MOOC was evaluated as higher than the other aspects of quality enhancement in teaching and learning from lecturers' perception.

4.13 Developers

The development of Malaysia's pilot MOOC courses were done by four universities. The developers involved in the development were the Subject Matter Expert (SME), IT and technical expert, instructional designer, video production expert, and some others depending on the universities' approaches.

Overall, the development of MOOC includes the aspect of: course curriculum, course materials, activities materials, course assessment, quality assurance, and copyright. There are several practices that need to be addressed in the MOOC development process. These practices are to ensure that the MOOC are complying with the criteria and guidelines set out therein. The developments of MOOC require proper planning. Design and implementation of the planned activities are among the factors that need to be considered by the developer.

There are four public universities that were given mandate to develop the MOOC pilot courses as shown in Table 4.2:

Table 4.2: MOOC developers

Universities (developers)	MOOC pilot courses
Universiti Putra Malaysia (UPM)	TITAS
Universiti Kebangsaan Malaysia (UKM)	<i>Hubungan Etnik</i>
Universiti Teknologi Mara (UiTM)	Introduction to Entrepreneurship
Universiti Malaysia Sarawak (UNIMAS)	ICT Competency

4.14 Exploring MOOC Development

In this section, the descriptions below were based on the interview session conducted with four MOOC developers.

4.14.1 MOOC Enabler

Before the development of MOOC courses, let us take a look at the main enablers for the project to be materialized. Based on the interview findings, majority of the MOOC enablers for these four universities were from top to down management (Vice Chancellor, Deputy Academic Vice Chancellor, teaching and learning center, and SME). For some developers, the enablers of MOOC are divided into two levels – faculty level and university level:

“...At faculty level – Dean, Deputy Dean of Academic and academics (SME) to plan and prepare contents. More than one instructor was involved to bring forward the effort as a team. Involve as many SME as much as we can. Some lecturers have different strategies. So we put them together to discuss what the best way to teach using online. Support staffs (teaching assistant/tutor/postgraduate) to help uploading contents periodically, and interaction with students. Meanwhile at university level, there are two groups known as coordination and technical/operational. The coordination are special group for MOOC development, first two meeting chaired by Deputy Vice Chancellor of Academic, hosted by Centre for Academic Development, members include Dean, Deputy Dean, Course Coordinator. The technical/operational involve people from Information and Communication Development Centre (iDEC) who are in charged in the technical aspect. For instructional design/educational technology experts – we don’t have actually instructional design experts, but we invite educational technology people from faculty of education to help. Language experts – at first we want subtitles for TITAS course. But at the end, we don’t have time...” (UPM)

As for some others, they are divided into top committee, SME committee, and technical committee explained as followed:

“...Vice Chancellor, Deputy Academic Vice Chancellor, and Director of Centre for Teaching & Learning Technologies (Prof. Amin) are top of UKM MOOC committee. Two big entities - Centre for Teaching & Learning Technologies and technical committee from Centre for Information Technology. The revision is Citra UKM because it's Hubungan Etnik. SME is for CITRA UKM, technical committee is from technical committee from Centre for Information Technology and Centre for Corporate Communications for video production.....”(UKM)

“...Entrusted by all IPTAs to develop MOOC module on entrepreneurship in 2014. Handled by Malaysian Academy of SME & Entrepreneurship Development (MASMED), Business Faculty and i-Learning Centre (i-Learn). Resource persons have been identified and appointed. Regular MOOC meeting to determine the contents/topics and designing of the content delivery...” (UiTM)

However, there is a slight difference on the development of ICT Competency. The development for ICT Competency was done from down to top. They have a passionate small dedicated group that gets the work done as soon as possible, and report it to the top management:

“...How does it started - High level discussion at ministry level, which turns into reality after a few rounds of discussion. The objective of the course is to provide a generic ICT course which covers the ICT skills useful for day-to-day activities/tasks for new undergraduate students. Whose responsible – mandate given to Council of ICT Deans (MaDICT) to oversee the development of generic ICT course. The main committees are instructional design (3), production (10) and technical (2). Small dedicated group; things are done really ad hoc. Rather we think for top management to instruct, we actually just send by email what we have done to top management and try to get things done as soon as possible ...” (UNIMAS)

4.14.2 MOOC Planning

The developments of MOOC need a proper planning. Since the developers were from different universities, the development planning were also varies. Some of them developed the MOOC which suite the needs of their university's course and institutional resources:

“...UPM has been in charged in TITAS course. All the content in BM. 2 section: (i) Developing TITAS and (ii) delivering TITAS. For developing: Adopted a model that suited the local skill set available and needs of the course. Plan for instructional was carried out by SME. Based on organic growth of knowledge through interaction. Initial knowledge through (lecture video)...” (UPM)

Meanwhile, for some of them, need analysis was conducted at the beginning. The planning of their MOOC development then was based on the ADDIE model:

“... Use ADDIE Model. At analysis phase: After come back from AKEPT. Call the Ethnic Relations lecturer. Do some briefing and create own content. Have briefing for lecturer. So lucky that those lecturers were so passionate. Identify the 30% of ethnic relation course. We don't call ethnic relations because for the SME. Ethnic relations are the whole 14 weeks, so we called human integration for ethnic relation which covers only the 30%. At design phase: After gathering info from analysis phase, we think how to design the course. At development phase: video shooting session was done, organize workshop on web design tools, interview session with content expert, various way of developing facts and content validation. Implementation phase - September 2014 and Evaluation phase – conducting some research on MOOC...” (UKM)

To facilitate a better planning for MOOC development, the developers conducted regular meetings and workshops for their committee:

“... Appointed project manager. Organize the workshop and briefing in the meeting. Identified the need analysis...” (UKM)

“... We use talaqqi” concept for video production....” (UPM)

“... Resource persons have been identified and appointed. Regular MOOC meeting to determine the contents/topics and designing of the content delivery ...” (UiTM)

There are various strategies were used by the developers, namely implement interactive courseware format, advertise the MOOC usage through poster and obtained the available video from MIT and Stanford:

“... Instead of parked the video in Youtube, we putting the materials in platform, in the format of interactive courseware. For delivering the MOOC for TITAS, we use blended learning. Lecturers use materials from MOOC TITAS to support the teaching and learning in classroom. Support the implementation of flipped classroom. Support the implementation of Student-Centred Learning. Students response – sharing learning materials, discussion on real case scenario and current issues, comments beyond contents, sharing of activities on projects...” (UPM)

“...For MOOC strategies, we concern on openness, diversity, autonomy and students engagement...”

“...We advertise to use MOOC by using poster, at the i-learn website and each branch website. Tackle from the top management, center, branch, students and lecturers...” (UiTM)

“...Rather than we develop our own content, the main video content is obtained from CC sources from MIT and Stanford since they have a lot of videos in ICT...” (UNIMAS)

4.14.3 Development Model

There are various development models been applied by the instructors which they felt to be suitable and appropriate to the course that were developed:

“...Adopted a model that suited the local skill set available and needs of the course. Plan for instructional was carried out by SME. Based on ‘organic growth of knowledge’ (rezo) through interaction....” (UPM)

“...We called it MOOC UKM. To develop it, we apply Instructional Design Model: the ADDIE model...” (UKM)

“...We develop based on Quality Assurance Multi Media Learning Materials (QAMLM) Commonwealth of Learning (COL). Combination with ADDIE model and Gagne model. For the development of course, we implement the ADDIE model and for Gagne model for learning theory....” (UiTM)

“...Used opens source content – the ready-made video from MIT and Stanford. We have the person to find the content, filter it and put creative common (CC). Plan for instructional was out by expert from Faculty of Cognitive Science ...” (UNIMAS)

4.14.4 Course Design

The development of MOOC should be based on robust instructional design principles. Some aspects of the course design were highlighted (for example: identify the learning outcomes knowledge, skill and attitude). They were also concentration on the materials used and delivery. Some developers mentioned that pedagogical design is the biggest challenge in developing MOOCs.

“... Pedagogical design was one the biggest challenge. The material had to be designed to align with a basic level of undergraduate course, outcomes to achieve, multimedia delivery aspects. Initial principle of an xMOOC, which is that all material essential to the course should be located on the platform with

only extra, non-essential activity being housed on external sites such as Youtube. In this approach, learning and teaching is centred on the predefined material i.e. videos and text, pdf file. From an early stage the team decided that the social community aspect should be at the centre of the course; cMOOCs (connectivist courses)...” (UPM)

During the design of the course, most developers have appointed the course expert to provide the teaching materials and delivery:

“...Six SME were responsible to design the course and do MOOC meeting to determine the contents/topics and designing of the content delivery. Techniques of delivery are videos, notes, links, additional readings, constructive activities (searching for answers/information), test/quizzes...” (UiTM)

“...Appointed an instructional design expert from Faculty of Cognitive Science for teaching and delivery materials. Main video content is obtained from CC sources from MIT and Stanford since lot videos in ICT from them...” (UNIMAS)

The model and theory used for course design which were to promote interaction between participants and suited the various types of learners (slow and high achievers):

“...Therefore, the course was designed to allow for maximum interaction points between participants via discussion forums, allowing for a connected network of learners to form organically (Rhizomatic model of learning) since we are from agriculture university. Two main learning styles: Acquisition and participation. ...” (UPM)

“...To design the course, we use educational theories on constructivism, Social cognitive (forum, chat, two way communications), Cognitive Flexibility Theory (have so many material. it for diverse learners. some are slow achiever and some are high achiever) and Modality theory...” (UKM)

4.14.5 Video Production

Videos were the main teaching material in the pilot MOOC. The developers obtained support from the video production unit at their respective institutions and followed a certain steps to produce it.

“...Video production – central media production unit provided by iDEC. The team decided to stick with “talaqqi” concept, where teaching video form a key component of the course. It was rather unclear at the beginning to what extent

this would be and how much resource (time and budget) would be required. The core videos are intended to introduce/summaries and promote the course...” (UPM)

“...Video production is done at development phase. Video shooting sessions, we get cooperation from Corporate Communication Centre specialized in UKM video production...” (UKM)

“...Early stage for video production, we follow the ADDIE model. Do the initial analyses, then upload the first 30% of content because we are running out of time. For the second stage, we deleted the first 30% and do the new one. To know the students perspective, we do the needs’ analysis from qualitative aspect. Identify what the students’ need. For guidelines, we referred guideline from KPM and MEIPTA...” (UiTM)

‘...At the early stage, there are meetings between ID team and video production team...’ (UNIMAS)

During the video shooting, various techniques were used by the developers. One of them used chroma key technology, while the other mentioned about the concept of ‘natural and casual’.

“...Recordings were conducted in the studio and on-site. We have a studio with chroma key technology meaning that at the back is blue or green....” (UPM)

“...During shooting, lecturers have free style to act to make it more natural. The content expert or ID team will explain to the lecturers what need to stress out. The production team comes out with the storyboard. There are a lot of challenges in the video production because the video need to shoot 3-4 times or sections. Every section has its own keyword. To look more natural, we end up using keyword from teleprompter then lecturers decide how to explain their lecture...” (UNIMAS)

“...For video shootings, we have 10-20 dedicated students who were willing to be the actors and actresses. For staffs who are involved in this video production, we conduct workshop on web design tools...” (UKM)

4.14.6 Video Quality

Some of the universities appointed committees to check the quality of the video produced:

“...There is committee in multimedia and teaching expert to specify the video quality from Faculty of Education and Faculty of Computer Science....” (UiTM)

Meanwhile, one of the developers used a proper technology specialized for video production:

“...We have chroma key technology which is blue or green background behind it...” (UPM)

In terms of video loading, one developer said that videos were a bit slow if students open them simultaneously since their institutions have a large number of students:

“...If we said that there are no comment by lecturers and students about video, it's not true. This is because UiTM have a large number of students, if they load the video concurrently, the video are bit slow but no matter how the need to use because it's compulsory...” (UiTM)

Meanwhile, the developers for ICT Competency paid more attention in the size of video to make it compatible with the web content. They went to different locations in the institution to identify download time of the videos they developed.

“...We have decided to set the video not too much large in size. The video are in high quality but cannot be more than 3MB for streaming videos. At first, we want to do in different quality, 1080 pixels per HD but it takes too much time to convert. The shootings were done in HD but later were scale down to 320 pixels only, compatible with web content. One more thing to identify the video quality, we do the test load. We go to the different location in university and try to load the video via web browser and identify how much times take to download the video. The concerns are for students so that they do not need to wait for too long to download the video that makes they bored and stop...” (UNIMAS)

4.14.7 Resources and Copyright Issues

There a committee to identify and filtering the content before it can be uploaded to the platform.

“...We have a panel to identify the material that use are original or not. Usually the materials such as picture will give by them, not the SME. If the materials are not suitable for education use, i-Learn Centre will filter it first. At this moment for a subject we can do it in term of filtering. But in the future, we

don't decide yet in term of picture using. In term of video, if we can't do it, we will put citation..." (UiTM)

"...Just like explained before, we use creative common, use the available video from MIT and Stanford. For video production and general production, the main content are retrieve from open source content and labelled it creative common. There are few person that will go through, find the content, filter it then put the creative common label before the vide can be used..." (UNIMAS)

4.15 Challenges

There are various challenges faced by the developers during the development of MOOC course.

"...For the TITAS development, the challenges ahead: time to plan, time to develop, time to evaluate, time to be involved, obsession/addiction, open door, info & infrastructure support..." (UPM)

"...Lacked in human resource especially in technical expertise..." (UKM)

"...Too complacent with conventional learning. Solely depends on the lecturers, no standard monitoring..." (UiTM)

"...Challenges: Employ well known person (expert in the area vs. good actor?), current structure NOT scalable, dedicated video production unit or "Rambo" style – our e-learning centre don't have a dedicated video production unit, passion also not scalable, agreeing on the content is the major challenge since it's not compulsory for all universities..." (UNIMAS)

4.16 Recommendations

There are several recommendations given by the developers based on their first experience in the process of developing the MOOC.

"...Development of MOOC TITAS has entered a new phase. Improvements to be made in instructional strategies by: (i) Produce videos of talk show, problem-based learning triggers, more on-site recording; (ii) Adding more exciting engagement and participation activities such as video blogging; and (iii) Improving current materials to better quality..." (UKM)

“...Create awareness among lecturers and students involved. Conduct more workshops/training to lecturers involved. Appoint dedicated/specific learning facilitator. Evaluate the impact of MOOC on teaching and learning activities. Emphasize on constructive approach and verities of delivery techniques...”
(UiTM)

“...In the future, we will appoint dedicated team for video production...”
(UNIMAS)

5

DISCUSSIONS

5.1 Introduction

In this section, each objective stipulated in the Introduction chapter will be discussed. The objectives include, (i) identifying the MOOC usage profile by Malaysian public university students, (ii) identifying the MOOC usage profile by Malaysian public university lecturers, (iii) identifying the students' perception on infrastructure and info structure quality provided for MOOC usages, (iv) identifying the lecturers' perception on infrastructure and info structure quality provided for MOOC usages, (v) identifying the suitability of curriculum used in MOOC delivery from the students' perspective, (vi) identifying the suitability of curriculum used in MOOC delivery from the lecturers' perspective, (vii) identifying the suitability of learning design in MOOC from the students' perspective, (viii) identifying the suitability of pedagogy in MOOC from the lecturers' perspective, (ix) identifying the suitability of content in MOOC from the students' perspective, (x) identifying the suitability of content in MOOC from the lecturers' perspective, (xi) identifying the suitability of assessment in MOOC from the students' perspective, (xii) identifying the suitability of assessment in MOOC from the lecturers' perspective, (xiii) identifying the lecturers' perception on professional development in their teaching and learning through MOOC, (xiv) identifying the coordinators' perception on lecturers' professional development, (xv) identifying MOOC teaching and learning supports, (xvi) identifying the lecturers' perceptions on MOOC enculturation at their universities, (xvii) identifying the students' perception on quality enhancement in teaching and learning through MOOC, (xviii) identifying the lecturers' perception on quality enhancement in teaching and learning through MOOC, and (xix) exploring the MOOC developers' perception in developing MOOC. Moreover, at the end of this section, a summary is written in order to illustrate the overall view of the discussions.

5.2 Objective 1: Identifying the MOOC usage profile by Malaysian public university students

In this study, several aspects were taken into account in identifying the Malaysian public university students' MOOC usage profile. The aspects were, (i) distribution of respondents (students) according to Higher Education institutions, (ii) distribution of respondents (students) according to MOOC courses, (iii) frequencies of MOOC access by Malaysian students, (iv) preferred time of accessing MOOC by students, (v) distribution of types of internet access for MOOC usages by students, (vi) distribution of MOOC access according to location by students, and (vii) courses' completions in MOOC.

In total, 4,449 respondents were involved in answering the online survey that was carried out using the *Survey Monkey* software. Among the 20 public

universities, students from UUM contributed most of the number of respondents (1,215), and students from UMK and UMP contributed the least, at less than 10 respondents each. Although UUM contributed quite a number of respondents, this does not mean that the other public universities were not giving their full cooperation during the process of carrying out this study. A plausible reason for this was, since MOOC is rather new to the tertiary settings in Malaysia, and the fact that research universities such as UM, UPM, UKM, UTM, and the APEX university (USM) have had more funding to support any implementation of anything new. UUM chose to adopt MOOC within its campus and getting good support from the coordinator and lecturers, as well as their openness and eagerness in implementing new technologies pertaining to teaching and learning. As for low participation universities, the plausible reason for their least number of respondents was due to lacking of MOOC awareness and the poor internet access within their campuses. It might also due to the strategies taken, which might less effective in promoting the MOOC.

The respondents involved in this study were all first year undergraduate students from 20 public universities, who enrolled for four MOOC courses, of which TITAS, *Hubungan Etnik*, Introduction to Entrepreneurship, and ICT Competency. Statistically, students were found mostly enrolled for TITAS (42%), and very few of them enrolled for ICT Competency course (9%). The high percentage of TITAS enrolment was perhaps due to the strict policy set forth by the public universities that requires students to enrol for TITAS in their first semester, while the low percentage of ICT Competency course was perhaps due to enrolment flexibility. Furthermore, the course was not a compulsory course to some universities.

Moreover, the frequency of MOOC access by Malaysian students was also measured. In the regard, most of the respondents accessed the MOOC weekly (25.6%) and only once (25.5%), and very few of them accessed the MOOC daily (2.8%). A plausible reason for the low frequency in access of MOOC was due to the assumptions that students were mostly revising for the quizzes and tests, as well as completing their group assignments through the university's LMS. As for the low percentage of daily access, it was assumed that, since most lectures provide students with lecture notes, the necessity of using MOOC as the primary source of daily revision was deemed impractical.

As for the students' preferred time to access MOOC, the findings suggested that most of the respondents prefer to access MOOC between 1800 to 2400 (48.4%), and very few of them prefer to access MOOC between 0000 to 0600 (8.9%). The choice of accessing MOOC between 1800 to 2400 was probably due to; it is the only convenient time available for them to access MOOC. On the other hand, the unpopular choice of accessing the MOOC between 0000-0600 was due to the fact that most respondents were already sleeping by the time. Moreover, in relation to the access of MOOC, most of the respondents were using the Wi-Fi connection provided by their campuses, and very few of them accessed the MOOC using the wired (cable) Internet connection provided

by their campuses. The choice over Wi-Fi was perhaps due to its flexibility of access point, as compared to the wired internet connection.

The findings also suggested that, most of the respondents prefer to access MOOC at their hostels (76.5%), while very few of them accessed the MOOC at lecture halls (4.2%). This was due to fact that, respondents accessed MOOC mostly during free time, of which whenever they got back to their hostels. On the other hand, the low percentage of access at lecture halls was due to the fact that, since most lectures were focusing on delivering contents through verbal communication within short period of time, the need of adopting MOOC as a means of content delivery was deemed impractical. This is an evidence that the MOOC is capable to support the learning in providing learning resources and activities outside the classroom and it should also benefiting teaching and learning in the classroom with dependable infrastructure.

As for the completion of the MOOC courses, the study found that almost 50% of the respondents completed at least half of the courses' syllabi. In addition to that, TITAS scored the highest percentage of 100% completion of the syllabus (24.39%), while Introduction to Entrepreneurship scored the lowest percentage of 100% completion of the syllabus (9.53%). The same reason was also speculated for the high percentage of 100% completion of the TITAS syllabus, of which perhaps due to different policies set forth by the public universities that requires students to enrol for TITAS in their first semester, while the low percentage of 100% completion of the Introduction to Entrepreneurship syllabus was also perhaps due to the assumption of its flexibility of enrolment term set forth by the public universities. Additionally, the findings further suggested that 93% of the respondents were first time MOOC users, while 7% of the respondents were experienced MOOC users. The high percentage of first time user was obviously due to the fact that, these respondents were only been introduced to MOOC whenever they enrolled for undergraduate programmes at public universities, while the other 7% of the respondents were probably students that might have had experiences of using MOOC during their diploma studies at public universities. This is a positive indicator that even though MOOC were new to them, but the finding shows positive acceptance of MOOC in teaching and learning.

5.3 Objective 2: Identifying the MOOC usage profile by Malaysian public university lecturers

Several aspects were taken into account in identifying the Malaysian public university lecturers' MOOC usage profile. The aspects were, (i) distribution of respondents (lecturers) according to Higher Education institutions, (ii) lecturers' competencies on carrying out instructional activities in MOOC, and (iii) lecturers' MOOC experiences. According to the findings, 20 Malaysian public universities took part in the research, which a total number of 164 respondents (lecturers) were involved in the online survey and the gender proportion was in balance. As for the lecturers' competencies, the findings showed that 31%-47%

of the lecturers were competent in all types of activity embedded in MOOC (e-content development; file sharing; initiate online quizzes, online forum, social media communication, and interactive presentation activity). However, when the percentages were observed according to each activity, only 10.4% of the lecturers were highly competent at online learning task, 10.4% were highly competent at interactive presentation, 6.7% were highly competent at video production activity, 20.7% were very competent at online quizzes, and 27.4% were very competent at interactive presentation. On the other hand, less than 22.0% of the lecturers were not so competent and least competent at interactive presentation, and more than 40.0% of the lecturers were not so competent and least competent at video production activity. By looking at the percentages of each MOOC activity, an alarming indication towards lecturers' competency in carrying out video production activity was probably due to the lack of skills in producing videos among them. As a result, most of the video production processes need to be handled by the technical expert in each university to support for this task. Other plausible reasons include, (i) technological barrier possessed by the senior lecturers, (ii) little effort was given in producing videos by the lecturers due to the time consuming processes, and (iii) conventional wisdom possessed by the senior lecturers when it comes to teaching and learning. Additionally, the study found that the lecturers involved in this study were mostly first time users (70.7%), while 29.3% of them were experienced MOOC users. It was assumed that, since MOOC is considered relatively new in the Malaysian tertiary education settings, and since MOOC is still at its early stage of implementation (pilot), therefore, most of the lecturers were not been introduced to the technology before.

5.4 Objective 3: Identifying the students' perception on infrastructure and info structure quality provided for MOOC usages

In order to identify the students' perception on infrastructure and info structure quality provided for MOOC usages, it should be bear in mind that there are at least three aspects that inter-related, of which access, equipment, and platform. Pertaining to access, users should be able to access the MOOC easily, wherever and whenever, depending on their preferences. To enable such access, a reliable equipment such as MOOC server should be able to function well at any time, able to cater a large number of users, and able to support simultaneous access by the users as well (Sarasa-Cabezuelo & Sierra-Rodríguez, 2014). In general, MOOC requires a reliable equipment in order to maintain its quality in delivering contents to users (Hochschulpolitik, 2014). Moreover, by having a robust and user friendly platform for MOOC is also vital since it acts as the main medium that interacts with users (López-sieben *et al.*, 2014).

In regards to the quality of infrastructure and info structure provided at public universities, the study focuses on the aspect of: accessibility of MOOC; Internet speed; video streaming; and downloadable video, which indicate reliable access, equipment and MOOC platform. We found that the overall mean score pertaining the matter was $M=3.39$. This indicates that, students evaluated the

quality of infrastructure and info structure provided for MOOC usages as moderate. Specifically, the item "I can access MOOC at other times within the campus" scored the highest mean ($M=3.97$, $SD=.74$), while the item "Video are downloadable during class time" scored the lowest mean ($M=2.92$, $SD=1.05$). As for the first item's mean score, it indicates that students have reached an agreement on the accessibility of MOOC at any time within the campus, while the second item's mean score indicates that students were somewhat disagreed that videos are downloadable during class time. Both of the findings suggested that, although students have reached an agreement towards the quality of MOOC access at any time within their campuses, there was a drawback in regards to the accessibility of videos during lectures. This perhaps was due to some plausible reasons. Firstly, since the allocated time of each lecture is commonly between one to two hours, there is a possibility that most of the time was mostly given to the conventional teaching and learning processes, rather than implementing the MOOC, especially by implementing the MOOC activity that requires students to download videos. Secondly, there is a possibility that, the Internet connection was unreliable due to the overloaded server whenever students logged on to the MOOC and later downloaded videos at the same time. Thirdly, there is a possibility that the platform used, of which OpenLearning was not robust enough to deal with simultaneous downloading activity.

5.5 Objective 4: Identifying the lecturers' perception on infrastructure and info structure quality provided for MOOC usages

The same aspects were also observed in identifying the lecturers' perception towards infrastructure and info structure quality provided for MOOC usages, of which access, equipment, and platform. The study found that the overall mean score for MOOC infrastructure and info structure quality was $M=3.56$. This indicates that, lecturers were somewhat evaluate the quality of infrastructure and info structure provided for MOOC usages as high. Specifically, the item "I can access the OpenLearning anywhere in the campus" scored the highest mean ($M=3.82$, $SD=.93$), while the item "I definitely utilize OpenLearning for other courses" scored the lowest mean ($M=3.35$, $SD=.84$).

As for the first item's mean score, it indicates that lecturers have reached an agreement on the accessibility of MOOC anywhere within the campus, while the second item's mean score indicates that lecturers were somewhat unsure whether they will definitely use OpenLearning for the other courses. This perhaps was due to several plausible reasons. Firstly, since the allocated time of each lecture is commonly between one to two hours, there is a possibility that lecturers were mostly inclined to implement conventional teaching and learning processes, rather than implementing the MOOC. Secondly, there is a possibility that, due to the unpredictable Internet connection within their campuses, lecturers were rather sceptical in using the MOOC in their teaching and learning processes. Thirdly, there is a possibility that the platform used, of which OpenLearning was very new to the lecturers.

5.6 Objective 5: Identifying the suitability of curriculum used in MOOC delivery from the students' perspective

Suitability of a curriculum is another important aspect in order for MOOC to be implemented successfully. In this regard, several components of curriculum should be given the emphasis during the development of a MOOC. The components are, (i) aim, (ii) objectives, (iii) contents (syllabus and lesson plan), (iv) activities, and (v) assessment (Lau, 2014). In this section however the assessment was excluded and discussed in the later section of this report. In order to identify the suitability of curriculum used in MOOC delivery, the students were asked to rate their agreements on the components mentioned above, and an overall mean score was calculated in order to acquire the overall agreement. The overall mean score for this particular objective was $M=3.83$. This indicates that, students have reached an agreement on the suitability of curriculum used in MOOC delivery. Specifically, the item "The learning activities help me to better understand the content" scored the highest mean ($M=3.88$, $SD=.94$), while the item "The learning schedule (course plan/lesson plan) is easy to follow" scored the lowest mean ($M=3.80$, $SD=1.05$).

As for the first item's mean score, it indicates that students have reached an agreement on the helpfulness of learning activities included in MOOC towards the understanding of the contents, while the second item's mean score indicates that students have also reached an agreement on the easiness of following the learning schedule (course plan/lesson plan) included in MOOC. Plausible reasons for such findings were due to; the MOOC developers were carefully designing the activities in MOOC during the process of MOOC development, and they were also carefully formulating the learning outcomes for the learning plan during the process of MOOC's development as well. In the regard, both findings were further affirming Fidalgo-blanco, Sein-echaluce, García-peñalvo and Escaño (2014) statement that suggests, students who have undertaken activities based on informal learning (MOOC activities) will have a better perception of the result of their learning. Moreover, the findings also inclined to the notion portrayed by Boston and Helm (2012) that suggests, learning outcomes should be explicit, measurable, and effectively assessed. Another plausible reason for such findings was due to the prior knowledge possessed by students when they were doing the activities according to the learning plan stipulated in MOOC, hence they perceived that activities and learning plan that they have experienced were easy to achieve and follow (Kennedy *et al.*, 2015).

5.7 Objective 6: Identifying the suitability of curriculum used in MOOC delivery from the lecturers' perspective

The suitability of curriculum used in MOOC delivery was also sought from the perspective of lecturers. Several aspects were observed in order to identify the suitability of the curriculum, of which (i) the alignment of MOOC with the curriculum's requirement, (ii) the alignment between contents and learning

outcomes, (iii) the organization of activities, (iv) the appropriateness of MOOC to support face-to-face learning, (v) the appropriateness of MOOC to support lifelong learning, and (vi) the trendiness of MOOC as a teaching approach. To do so, the lecturers were asked to rate their agreements on the aspects mentioned above, and an overall mean score was calculated in order to acquire the overall agreement. The overall mean score for this particular objective was $M=3.68$, which slightly lower than the students' mean score. This indicates that, lecturers have reached an agreement on the suitability of curriculum used in MOOC's delivery. Specifically, the item "The MOOC is appropriate to support the lifelong learning" scored the highest mean ($M=3.88$, $SD=.80$), while the item "The activities in the MOOC are well-organized" scored the lowest mean ($M=3.55$, $SD=.83$).

As for the first item's mean score, it indicates that lecturers have reached an agreement on the ability of the curriculum used in MOOC towards inculcating the lifelong learning among the students, while the second item's mean score indicates that lecturers have reached an agreement on the properly organized activities in MOOC. Towards the lifelong learning, it was assumable that, since learning outcomes stipulated in MOOC mostly were explicit, measurable, and assessable, lecturer perceived that students were further motivated to learn more, thus in return, it enhances students' lives, aspirations, and ambitions (Boston & Helm, 2012). However, the mean score also shows that there is still room for improvement to this aspect (curriculum).

5.8 Objective 7: Identifying the suitability of learning design in MOOC from the students' perspective

Learning design is paramount to the successful implementation of any MOOC, thus its suitability should be examined. In general, according to Hatzipanagos and Enhanced (2015), the suitability of MOOC learning design should be determined based on its ability to support self-regulated learning among students, as well as accommodating the needs of the learners by satisfying their personal interests and giving the chance to them to further develop their competencies. Therefore, in this section, the study attempts to identify the suitability of learning design used in MOOC from the perspective of the students by examining several aspects, of which, (i) the state of design of the courses in MOOC, (ii) the ability of MOOC in meeting the students' learning needs, (iii) the ability of the learning activities' sequence in helping students' to better understand a subject matter, (iv) the suitability of learning schedule towards accommodating the different learning paces among students, (v) the ability of MOOC in giving the opportunity to students to interact among themselves, (vi) the ability of quizzes in enhancing the students' understanding towards any topics covered in MOOC, (vii) the ability of additional resources included in MOOC in reinforcing the students' understanding, (viii) the ability of the assignments included in MOOC in helping students to achieve their learning objectives, (x) the ability of MOOC in enabling students to accomplish any activities by their own, and (xi) the ability of MOOC in enabling students to learn accordingly to their own learning paces.

The students were asked to rate their agreements on the components mentioned above, and an overall mean score was calculated in order to acquire the overall agreement. The overall mean score for this particular objective was $M=3.92$. This indicates that students have reached an agreement on the suitability of learning design in MOOC. The finding however, was in contradict with Margaryan *et al.* (2014) study, of which stating that majority of MOOCs scored poorly on the instructional design principles. Moreover, when each item was observed individually, the item “Additional resources reinforced my understanding” for TITAS scored the highest mean ($M=4.02$, $SD=.66$), while the item “I am able to accomplish the activities on my own” for Introduction to Entrepreneurship scored the lowest mean ($M=3.74$, $SD=.78$).

As for the first item’s mean score, it indicates that students were agreed that additional resources did reinforce their understanding towards the contents stipulated in TITAS, while the second item’s mean score indicates that students have reached an agreement on their ability to accomplish the activities included in MOOC on their own for the Introductory to Entrepreneurship course. Plausible reasons for these findings were, firstly, a large number of additional resources were included in MOOC for TITAS, and secondly, activities included in MOOC for Introductory to Entrepreneurship might have a drawback, for instance lack of interactive materials.

5.9 Objective 8: Identifying the suitability of pedagogy in MOOC from the lecturers’ perspective

Undeniably, pedagogy is one aspect that needs to be given the emphasis in order to make sure the success of any educational products, including MOOC. According to Stacey (2014), pedagogy in MOOC should include, (i) being as open as possible, (ii) use tried and proven modern online learning pedagogies rather than campus classroom-based didactic learning pedagogies, (iii) use peer-to-peer pedagogies over self-study, (iv) use social learning including blogs, chat, discussion forums, wikis, and group assignments, and (v) leverage massive participation—have all students contribute something that adds to or improves the course in overall. Kop *et al.* (2011) added that it should also supports students in learning through active creation of resources, based on the building of connections, collaborations and the exchange of resources among them, the building of a community of students, and the harnessing of information flows on networks. Ferguson and Sharples (2014) also agreed that in order to develop an innovative pedagogy that is capable of catering thousands of students, it has to be interactive, reflective and collaborative, consists of intervention tutorial and guidance, as well as self-sustainable. In relation to that, since students are vary in age, Chacón-Beltrán (2014) further suggested that the usefulness of courses offered should take into account the pedagogy of the 21th century, of which provides the opportunity to learners in challenging existing knowledge, and move beyond the ‘simplicity of a literal functional description of the dichotomized theme of teaching and learning’ (Male & Palaiologou, 2015). In this regard, this study attempts to identify the suitability of pedagogy in MOOC from the lecturers’ perspective by examining

the aspects of, (i) activities that helps students in achieving the learning outcomes (watching video, forum, group activity, interactive presentation, and self-learning), (ii) the sequences of the course materials that supported lecturers' teaching approaches, (iii) the activities that promote students' engagements, (iv) the appropriateness of learning resources in MOOC towards enhancing lecturers' good teaching practices, (v) the ability of MOOC in promoting creativity among lecturers, (vi) the ability of MOOC in promoting innovative skills among students, (vii) the ability of MOOC in supporting integration among students, and (viii) the ability of MOOC in supporting effective teaching among lecturers.

The lecturers were asked to rate their agreements on the components mentioned above, and an overall mean score was calculated in order to acquire the overall agreement. The overall mean score for this particular objective was $M=3.81$. This indicates that lecturers have reached an agreement on the suitability of pedagogy used in MOOC. Specifically, the item "The following activities met the objective(s) intended learning outcomes of my teaching. It helps students to meet the learning outcomes: video" scored the highest mean ($M=3.94$, $SD=.76$), while the item "MOOC could support my teaching strategy for students' innovative skills" scored the lowest mean ($M=3.71$, $SD=.70$). As for the first item's mean score, it suggests that lecturers have reached an agreement on the helpfulness of videos in achieving the learning outcomes, while the second item's mean score suggests that the lecturers' were also reaching a slightly lower agreement on the ability of MOOC in supporting their teaching strategies towards promoting students' innovative skills compared to other items in the construct.

5.10 Objective 9: Identifying the suitability of content in MOOC from the students' perspective

Content can be considered as the aesthetic component of a MOOC, and its importance is paramount. In this regard, Waard (2013) affirmed that content should be focused vigorously in order to provide effective interactivity, immediate feedback, and small size content to fit contemporary lifelong learning. Moreover, it is necessary to use information sources that are recent, as well as those proven over time and always keeping access to content as simple as possible. Therefore, in general, during the content development, several aspects should be taken into consideration, of which, (i) level of engagement (interactivity, assessment), (ii) presentation of content (colour scheme), (iii) media usage (use, quality and range of media), (iv) alignment with learning objective, (v) quality of content as a whole, (vi) functionality, and (vii) additional resources. Specifically, this study attempts to examine nine aspects of content, of which, (i) the coverage of content towards essential aspects of the courses offered (TITAS, *Hubungan Etnik*, Introduction to Entrepreneurship, and ICT Competency), (ii) the clarity of content, (iii) the organization of content, (iv) the attractiveness of multimedia element, (v) the usefulness of activities towards students' learning, (vi) the achievement of learning outcomes through the content, (vii) the satisfactory of overall quality of

the content, (viii) the usefulness of activities incorporated in MOOC (watching video, forum, assignment, group activity, interactive presentation, and self-learning), and (ix) the usefulness of additional resources (e.g.: link to websites, readings and social media outside OpenLearning) in MOOC. In order to achieve the attempt, the students were asked to rate their agreements on the components mentioned above, and an overall mean score was calculated in order to acquire the overall agreement.

The overall mean score for this particular objective was $M=3.92$. This indicates that students have reached an agreement on the suitability of the content in MOOC. Specifically, the item “The additional resources are helpful (e.g.: link to websites, readings and social media outside OpenLearning)” scored the highest mean ($M=4.08$, $SD=.61$). As for this item mean score, it indicates that students were agreed on the helpfulness of additional resources incorporated in MOOC. Chacón-Beltrán (2014) asserts that, by providing the students with proper guidelines and additional resources, their motivation towards learning will be increased. While the item “The following activities are useful for my learning: forum” scored the lowest mean ($M=3.67$, $SD=.79$). The item mean score suggests that students have reached an agreement on the effectiveness of forum that is slightly lower than any other activities in their learning in MOOC. This might be due to the fact that forum can be less effective when it is out of control especially when it involved with thousands of students in one time. However, findings further confirmed the notion stated by Hoyos *et al.* (2013), of which most of the MOOC users agreed on the importance of social tools (as the mean score is still considered high) to keep in touch with their partners and share information related to a course. Overall, students evaluated the content in MOOC as appropriate for them, considering majority of the items were recorded with high mean scores.

5.11 Objective 10: Identifying the suitability of content in MOOC from the lecturers' perspective

The study also attempts to examine the suitability of content in MOOC from the perspective of lecturers. In order to do so, eight specific aspects were observed, of which, (i) the sufficiency of MOOC content, (ii) the adequacy of MOOC content, (iii) the appropriateness of media used for the content, (iv) the attractiveness of media produced, (v) the satisfactory towards the quality of content, (vi) the organization of content, (vii) the easiness of incorporation of face-to-face activities with content, and (viii) the appropriateness of content's sequence. The lecturers were asked to rate their agreements on the components mentioned above, and an overall mean score was calculated in order to acquire the overall agreement. The overall mean score for this particular objective was $M=3.60$. This suggests that, lecturers have reached an agreement on the suitability of the content in MOOC, which however, is far lower than the students' agreement ($M=3.92$). Specifically, the items of “The MOOC content could easily be blended with the face-to-face activities” and “The MOOC content sequence is appropriate” scored the highest mean ($M=3.70$, $SD=.69$), while the item “MOOC contents for each unit are adequate”

scored the lowest mean ($M=3.40$, $SD=.93$). As for the first and second items' mean scores, they indicated that lecturers have reached an agreement on the ability of incorporating the MOOC content into the face-to-face activities, as well as the appropriateness of sequence of the content. While for the third item mean score suggests that lecturers were somewhat unsure whether the content for each unit was adequate enough. In other words, the aspects of adequacy of content for each unit and their sufficiency for the learning objectives were evaluated as lower than the other aspects of content.

5.12 Objective 11: Identifying the suitability of assessment in MOOC from the students' perspective

As mentioned in section 5.6 above, assessment is one of the most crucial elements in making sure the success of a MOOC (Waard, 2013; Lau, 2014), since a lot of efforts were given by scholars in examining the element (Grimmelmann, 2014). For instances, Guàrdia *et al.* (2013) drawn a set of design principles in MOOC pedagogy from the students' perspective, and assessment was given the emphasis, along with the other design principals. Grainger (2013) identified variations in course content with various assessment methods, while Gamage, Perera and Fernando (2015) revealed their 10 dimensional frameworks for analysing the effectiveness of e-learning in MOOC, along with the element of assessment in them. In this regard, this study attempts to identify the suitability of assessment in MOOC from the students' perspective by examining the aspect of, the usefulness of assessment activities incorporated in MOOC towards students' learning. To do so, students were required to rate their agreements on the matter. The study found that the mean score for the suitability of assessment in MOOC was $M=3.96$. This indicates that students have reached an agreement on the suitability of assessment in MOOC for their learning activities.

5.13 Objective 12: Identifying the suitability of assessment in MOOC from the lecturers' perspective

The agreement on the suitability of assessment in MOOC based on the lecturers' perspective was also sought. Specifically, the study attempts to examine the attainment of quizzes (in between and at the end of the lesson) in achieving the learning outcomes. The overall mean score for 'in between lesson' quizzes was $M=3.86$ ($SD=.73$), while the overall mean score for 'at the end of lesson' quizzes was $M=3.85$ ($SD=.76$). These findings indicated that lecturers have reached an agreement on the suitability of assessment in MOOC, whether by means of giving quizzes in between or at the end of the lesson.

5.14 Objective 13: Identifying the lecturers' perception on professional development in their teaching and learning through MOOC

Professional development (training) of the lecturers – training for MOOC integration in the teaching and learning is vital in order to make sure the implementation of MOOC is attainable. In this regard, Seaman (2009), suggested that sufficient training must be provided to the instructors by the universities and institutions since instructors do play an important role to support a large cohort of students who came from various regions and backgrounds. Therefore, this study attempts to identify the lecturers' perception on professional development (training) in their teaching and learning through MOOC. In order to do so, six specific aspects were examined, of which, (i) the sufficiency of training provided by the institutions, (ii) the usefulness of training given towards the integration of MOOC in teaching practices, (iii) the attainment of MOOC training expectations, (iv) the confidence of lecturers in integrating MOOC with their teaching practices, (v) the successfulness of the training in improving the teaching skills among lecturers, and (vi) the capability of lecturers is giving MOOC training to others. In the regard, lecturers were asked to rate their agreements on the components mentioned above, and an overall mean score was calculated in order to acquire the overall agreement. The overall mean score for this particular objective was $M=3.42$. This indicates that lecturers were somewhat less agreed/unclear that their MOOC teaching and learning skills were adequately developed as compared to other constructs' agreement. Specifically, the item "I am capable to train others to use MOOC" scored the highest mean ($M=3.67$, $SD=.70$), while the item "The training given was useful for me to integrate MOOC in my teaching" scored the lowest mean ($M=3.40$, $SD=.93$). The first item's mean score indicates that lecturers have reached towards an agreement on their capabilities in giving MOOC training to others while the second item's mean score suggests that lecturers were somewhat unsure whether the training given was useful towards the integration of MOOC with their teaching practices. In regards to the finding of lecturers were somewhat unsure whether the training given to them will motivate them to utilize the MOOC in their teaching practices was probably due to MOOC were relatively new to them. However, Butler and Sellbom (2002) suggest that the factors might also came from the lack of institutional support, lack of financial support, lack of time, and lack of basic proficiency in MOOC implementation. Overall, the aspect of training for MOOC integration was evaluated as lower than the other aspects of professional development.

5.15 Objective 14: Identifying the coordinators' perception on lecturers' professional development

Additionally, the study also seeks for the coordinators' perception on the professional development (training) carried out onto the lectures. In order to do so, a series of interview were conducted with the MOOC coordinators at UPM, UKM, UiTM, and UNIMAS. The findings suggested that, most of the coordinators were affirming that they did train their staffs, especially the lecturers on how to use the OpenLearning platform during the teaching and learning processes. Specifically, the UKM MOOC coordinator did organize

workshops on instructional design and tools for web designing. Other MOOC coordinators at UPM affirmed that, lecturers were given the specific training on how to upload their contents periodically. Moreover, a training system was also developed in UiTM in order to coordinate their MOOC workshops. Collectively, the coordinators perceived that lecturers were given the necessary trainings in order to make sure that they were able to utilize the MOOC during their teaching and learning process.

5.16 Objective 15: Identifying MOOC teaching and learning supports

Teaching and learning support is an important element that motivates the lecturers to implement MOOC in their teaching practices. In the regard, Evans and Myrick (2015) suggested that lecturers should be given adequate teaching and learning supports by the institutions in order to overcome the technical problems faced by the lecturers during the implementation of MOOC. Therefore, this study attempts to identify the MOOC teaching and learning supports provided by the institutions by examining, (i) the supports given by the institutions, (ii) the supports that are expected to be given by the institutions, and (iii) the institutions involved in providing the supports. In overall, majority of the lecturers (62.8%) stated that supports for MOOC were indeed given by their institutions. Specifically, there were four types of support provided by the institutions, of which pedagogy, design, delivery and content. In overall, 76% of the lecturers affirmed that their institutions did provide support towards the MOOC delivery, while 53.7% of the lecturers affirmed that their institutions did provide support towards the MOOC pedagogy. As for the expected supports to be given by the institutions, more than 79.0% of the lecturers stated that they expect supports in pedagogy, delivery and content, while less than 20.0% of the lecturers stated that they did not expect supports in pedagogy, delivery, content, and design. Moreover, most of the lecturers were also affirming that they received supports mostly from the university (80.5%), while least of them were affirming that they received support from the AKEPT (48.2%). In overall, based on the findings, it was confirmed that institutions did provide somewhat adequate MOOC teaching and learning supports to lecturers.

5.17 Objective 16: Identifying the lecturers' perceptions on MOOC enculturation at their universities

Another aspect that is worth examining during a MOOC implementation is enculturation. Although enculturation of MOOC at higher education institutions is a long and challenging process, it is regarded as an important process due to its ability to sustain an effective teaching and learning practices within the higher education institutions communities (Balnaves, 2013). In general, universities should have some kind of instruments that provide the mechanisms to recognize lecturers' involvements in MOOC, such as incentive or award for MOOC practitioners, as well as organizes MOOC awareness programs. Therefore, this study attempts to identify the lecturers' perceptions on MOOC enculturation at public universities by examining (i) the availability of a mechanism to recognize lecturers' involvements in MOOC, (ii) the availability of

incentives for MOOC practitioners, and (iii) the availability of awareness program towards MOOC implementation. The lecturers were asked to rate their agreements on the components mentioned above, and an overall mean score was calculated in order to acquire the overall agreement. The overall mean score for this particular objective was $M=3.30$ ($SD=.94$). This indicates that lecturers were somewhat unsure whether the enculturation of MOOC did happen at their universities. Specifically, even though the item “My university has a mechanism to recognize lecturer involvements in MOOC” scored the highest mean ($M=3.51$, $SD=.90$), it is considered as low as the value is close to the value of overall mean in this construct that strikes as the lowest construct. The item “My university provides incentives for MOOC practitioners” scored the lowest mean ($M=2.99$, $SD=1.11$). The mean score of the first item indicates that lecturers were somewhat unsure whether their universities did possess a mechanism to recognize their involvements in MOOC, while the second item’s mean score suggests that lecturers were unsure whether their universities did provide incentives to MOOC practitioners. Collectively, the findings on enculturation of MOOC at public universities were the lowest, and it is an alarming phenomenon since enculturation is indeed an important aspect in making sure the success of MOOC implementation.

5.18 Objective 17: Identifying the students’ perception on quality enhancement in teaching and learning through MOOC

An enhancement of quality in teaching and learning is expected through the implementation of MOOC at public universities. This is due to the fact that, MOOC may enhance teaching practices, encouraging institutions to develop distinctive missions, and provide an opportunity to develop new pedagogy (Daniel, 2012). Moreover, MOOC may also increase access to good teaching and interesting curriculum for new groups of learners, and help attract students into higher education who might otherwise not have ventured there (Knox, *et al.*, 2012). In general, an enhancement of quality in teaching and learning through MOOC can be determined by examining the effectiveness of MOOC in achieving the learning outcomes (Muñoz-Merino *et al.*, 2014), its ability to enhance students’ skills in ICT, problem solving, critical thinking, communication, entrepreneurship, writing and collaboration (Zheng *et al.*, 2015), and its ability to motivate students to engage with learning activities (Gamage, Perera & Fernando, 2015; Chacón-Beltrán, 2014).

In the regard, this study attempts to identify the students’ perception on quality enhancement in teaching and learning through MOOC by examining, (i) the ability of MOOC in enhancing students’ learning experiences, (ii) the effectiveness of students’ learning through MOOC, (iii) the enjoyment of learning through MOOC, (iv) the ability of MOOC in promoting skills, of which remembering (facts), understanding (concepts, principles, processes), applying (what I have learned), analysing (situation), evaluating (issues), and creating (ideas, solutions, innovation, problem solving), (v) the enhancement of ICT, problem solving, critical thinking, communication, entrepreneurship, writing, collaboration, and leadership skills among the students, and (vi) the

enhancement of respectfulness, caring, honesty, generosity, helpfulness and ethical values among students. The students were asked to rate their agreements on the components mentioned above, and an overall mean score was calculated in order to acquire the overall agreement. The overall mean score for this particular domain was $M=3.78$ and is considered high. Overall, cognitive domain of understanding (concepts, principles, and processes) was evaluated as higher than the other domains of cognitive. While the highest level of cognitive domain (to create) reported as the second highest mean score ($M=3.76$, $SD=0.66$). It shows that MOOC allowed different range or levels in gaining cognitive benefits. This is particularly true as the various functionality and tools available in the platform allow the lecturers to initiate different form of tasks that lead to numerous cognitive achievement.

The findings also indicate that students have reached an agreement on the ability of MOOC in enhancing the quality of teaching and learning in terms of skills and values. The highest mean score was recorded for ICT skill, followed by the critical thinking skill and writing skill. Nevertheless, the lowest two mean scores were recorded for leadership skill and entrepreneurship skill. Specifically, the item "Learning via MOOC enhances the following values: helpfulness" scored the highest mean ($M=3.93$, $SD=.63$), while the item "Learning via MOOC enhances the following skills: leadership" scored the lowest mean ($M=3.61$, $SD=.75$). The mean score for the first item indicates that students have reached an agreement on the ability of MOOC in enhancing the value of helpfulness, while the mean score for the second item suggests that students were also reaching an agreement on the ability of MOOC in enhancing the skill of leadership.

5.19 Objective 18: Identifying the lecturers' perception on quality enhancement in teaching and learning through MOOC

The lecturers' perception on quality enhancement in teaching and learning through MOOC was also sought. Specifically, 11 aspects were examined, of which, (i) the ability of MOOC in motivating students to learn, (ii) the ability of MOOC in promoting positivity towards learning among students, (iii) the ability of MOOC in providing extra values to students, (iv) the ability of MOOC in enhancing the student centred learning, (v) the ability of MOOC in improving students' knowledge, (vi) the appreciation of lecturers towards e-learning because of their involvements in MOOC, (vii) the enjoyment of teaching and learning while using MOOC, (viii) the ability of MOOC to demotivate lecturers due to the extra workloads because of it, (ix) the ability of MOOC in giving the opportunity to lecturers in sharing their knowledge, (x) the ability of MOOC in improving lecturers' teaching practices, and (xi) the ability of MOOC in improving students' learning. The lecturers were asked to rate their agreements on the components mentioned above, and an overall mean score was calculated in order to acquire the overall agreement. The overall mean score for this particular objective was $M=3.57$. This indicates that lecturers have reached an agreement on the ability of MOOC in enhancing the quality of teaching and learning. The finding however, was contradict with the claim stated by Sheard *et al.* (2014) that suggested 70% of the lecturers involved in

their study were denying the ability of MOOC in enhancing their teaching and learning practices.

In specific, the item “MOOC gives me opportunity for knowledge sharing” scored the highest mean ($M=3.84$, $SD=.70$), while the item “I feel demotivated due to extra workload because of MOOC” scored the lowest mean ($M=2.93$, $SD=.95$). The mean score for the first item indicates that lecturers have reached an agreement on the ability of MOOC in giving the opportunity to them to share their knowledge, while the second item’s mean score suggests that lecturers have reached uncertainty on the ability of MOOC to demotivate them due to the extra workloads because of it.

5.20 Objective 19: Exploring the MOOC developers’ perception in developing MOOC

The importance of MOOC developer’s role in making sure the success of MOOC implementation is irrefutable. Therefore, their perception towards the development of a MOOC is valuable in order to further improve MOOC development in the future. In the regard, several interview sessions were carried out with four MOOC developers in order to gain insights on the development of their MOOCs. During the interview, the developers were asked on, (i) who are the MOOC enablers for their institutions? (ii) How did the developers plan a development of a MOOC? (iii) What were the development models used in developing MOOCs; (iv) What were the designs used in developing MOOCs? (v) How did the developers produce videos for MOOC? (vi) How did the developers control the quality of the videos produced? And, (vii) how did the developers manage the resources and copyrights issues during the development of a MOOC?

In order to execute the implementation of MOOC at Malaysian public universities, it needs an enabler, of perhaps several enablers, due to the bureaucratic nature of the Malaysian educational system. Based on the findings, in majority, the enablers of MOOC were adopting a top-down structure, of which divided into two levels—university and faculty. At the university level, the MOOC enablers were among the top university’s top management, of which the Vice Chancellor, the Deputy Academic Vice Chancellor, along with the Teaching and Learning Centre, and the academics (SME), while at the faculty level, the enablers were the Dean, the Deputy Dean of Academic, and the academics (SME). Additionally, some developers divided the enablers into three separate entities, of which, top committee, SME committee, and technical committee. In contrast, the ICT Competency course developers were a bit different in pointing out the MOOC enablers. Rather than having a top-down structure of enablers, theirs’ were bottom-up in structure instead. Small and passionate dedicated groups were the main enablers that report to the top management whenever they have produced certain components of a MOOC.

To develop an effective MOOC, a proper plan is crucially needed. However, due to the fact that there is no consensus about which of the actual designs and pedagogical approaches are the most efficient to improve student learning outcomes (Amo, 2014), MOOC developers at each public university formulated their own MOOC planning, thus resulted in various planning schemes among the universities. Some developers planned their MOOC developments according to the needs of the course and local interests, while some carried out needs analyses on their customers, and later plan their MOOC development based on the ADDIE model. Regardless the various planning schemes produced by the developers, they were all however agreed on one thing; in order to have a good plan for MOOC development, developers should meet and carry out series of workshops regularly. Pertaining to the strategies used by the developers in developing MOOCs, they were mostly adopting the format of interactive courseware, obtained the available videos from MIT and Stanford (for ICT courses), and later advertise the MOOC through posters.

Pertaining to the development model, several model were employed by the MOOC developers in developing MOOCs, of which ADDIE model, a combination of ADDIE model and Gagne model, open source model, and a combination of needs analysis and local skills model. As for the course design, the development of MOOC should be based on a robust instructional design principle, and indeed it is not an easy task to do so. In the regard, some of the developers asserted that pedagogy design is the biggest challenge in developing a MOOC. Therefore, during the designing process, some developers appointed content experts in order to help them in providing insights on the most suitable teaching and learning materials to be incorporated in their MOOCs. This is because, the ultimate goal of any MOOC designs is to develop a MOOC that enables interaction among participants, as well as caters various types of learners (slow achievers and high achievers).

Video is one of the most crucial elements in MOOC, and producing it is not a simple task. In order to produce a good video, most of the developers sought for technical supports from the video production unit of their respective universities. So much so, during the video shooting, various techniques were employed by the developers in order to get the best video quality. Some developers employed the chroma key technology (blue/green screen as a background), while some of them employed the concept of natural and casual.

Video quality is another important aspect to be considered during the production of videos for a MOOC. In the regard, some developers appointed special committee to check the quality of the videos produced, while some developers used high-end technology that specializes on video production during the production process in order to maintain the quality. Moreover, the size of videos produced must also be taken into account since ultimately, the videos will be uploaded to the MOOC platform, and later downloaded by the users. In relation to that, developers for ICT Competency paid more attention on the size of the video produced in order to make it compatible with the web

environment. Additionally, the developers also went to several locations within their institution in order to identify the time spent to download the videos produced. Last but not least, the resources and copyright issues are indeed crucial and should be given the emphasis in any MOOC developments. In order to do so, most of the developers formed a committee to identify and filter the MOOC content before it is uploaded to the MOOC platform.

5.21 Summary

Collectively, this study attempts to illustrate the overall picture of the MOOC implementation at Malaysian public universities. In order to do so, several aspects were examined based on the perspectives of the students and lecturers. Specifically, the study found that, (i) students evaluated the quality of infrastructure and info structure provided for MOOC as moderate, (ii) lecturers evaluated the quality of infrastructure and info structure provided for MOOC as high, (iii) students have reached an agreement on the suitability of curriculum used in MOOC delivery, (iv) lecturers have reached an agreement on the suitability of curriculum used in MOOC delivery, (v) students have reached an agreement on the suitability of learning design in MOOC, (vi) lecturers have reached an agreement on the suitability of pedagogy used in MOOC, (vii) students have reached an agreement on the suitability of the content presentation in MOOC, (viii) lecturers have reached an agreement on the suitability of the content presentation in MOOC, (ix) students have reached an agreement on the suitability of assessment in MOOC for their learning activities, (x) lecturers have reached an agreement on the suitability of assessment in MOOC, whether by means of giving quizzes in between or at the end of the lesson, (xi) lecturers were somewhat unsure whether their MOOC teaching and learning skills were developed, (xii) the developers perceived that lecturers were given the necessary trainings in order to make sure that they were able to utilize the MOOC during their teaching and learning process, (xiii) institutions did provide somewhat adequate MOOC teaching and learning supports to lecturers, (xiv) lecturers were somewhat unsure whether the enculturation of MOOC did happen at their universities, (xv) students have reached an agreement on the ability of MOOC in enhancing the quality of teaching and learning, and (xvi) lecturers have reached an agreement on the ability of MOOC in enhancing the quality of teaching and learning.

REFERENCES

- Alario-Hoyos, C., Pérez-Sanagustín, M., Delgado-Kloos, C., Parada, H. A., Muñoz-Organero, M., & Rodríguez-de-las Heras, A. (2013). Analysing the impact of built-in and external social tools in a MOOC on educational technologies. In Hernán-dez-Leo, D., Ley, T., Klamma, R. & Harrer, A. (Eds.) *Scaling up learning for sustained impact* (pp.5-18). Berlin, Germany: Springer Berlin Heidelberg.
- Amo, D. (2013). MOOCs: experimental approaches for quality in pedagogical and design fundamentals. In Proceedings of the First International Conference on Technological Ecosystem for Enhancing Multiculturality, pp. 219-223, ACM.
- Bali, M. (2014). MOOC Pedagogy: Gleaning Good Practice from Existing MOOCs. *MERLOT Journal of Online Learning and Teaching*, 10(1), 44–56.
- Balnaves, K. (2013). Imagining the Enculturation of Online Education, 73–76.
- Butler, D. L., & Sellbom, M. (2002). Barriers to Adopting Technology for Teaching and Learning. *Educause Quarterly*, 25 (2), 22–28. <http://doi.org/10.1016/j.compedu.2009.03.015>
- Campbell, Jennifer et al. A comparison of learner intent and behaviour in live and archived MOOCs. *The International Review of Research in Open and Distributed Learning*, [S.l.], v. 15, n. 5, oct. 2014. ISSN 1492-3831.
- Chacon-Beltran, R. (2014). Massive Online Open Courses and Language Learning: The Case for a Beginners' English Course. *4th World Conference on Learning Teaching and Educational Leadership (WCLTA-2013)*, 141, (pp. 242-246).
- Daniel, J. (2012). Making Sense of MOOCs: Musings in a Maze of Myth, Paradox and Possibility. *Journal of Interactive Media in Education*, 2012(3), 18. <http://doi.org/10.5334/2012-18>
- Daradoumis, T., Roxana, B., Fatos, X., & Santi, C. (2013). *A review on massive e-learning (MOOC) design, delivery and assessment*. 2013 Eighth International Conference on P2P, Parallel, Grid, Cloud and Internet Computing. pp. 208-213.
- DASAR e-PEMBELAJARAN NEGARA Institusi Pengajian Tinggi. Retrieved 19 January 2014, available at: http://www.polimelaka.edu.my/v2/images/stories/pmk/UTM/dasar/aasar_e-pembelajaran_negara_depan.pdf (last accessed 12 February 2014)

- Dikke, D., & Faltin, N. (2015). GO-LAB MOOC – An Online Course For Teacher Professional Development In The Field Of Inquiry- Based Science Education Massive Open Online Courses (MOOCS). Retrieved from http://www.go-lab-project.eu/sites/default/files/files/publications/file/EDULEARN_MOOC_final.pdf
- Eckerdal, a, Kinnunen, P., Thota, N., Nylén, a, Sheard, J., & Malmi, L. (2014). Teaching and learning with MOOCs: Computing academics' perspectives and engagement. *2014 Innovation and Technology in Computer Science Education Conference, ITICSE 2014*, (9), 9–14. <http://doi.org/10.1145/2591708.2591740>
- Evans, S., & Myrick, J. G. (2015). How MOOC instructors view the pedagogy and purposes of massive open online courses, *7919*(October). <http://doi.org/10.1080/01587919.2015.1081736>
- Executive Summary Malaysia Education Blueprint2015-2025 (Higher Education), Retrieved 15 September 2015, available at <http://jpt.mohe.gov.my/corporate/PPPM%20%28PT%29%29%20Executive%20Summary%20PPPM%202015-2025.pdf>
- Gamage, D., Perera, I., & Fernando, S. (2015). A Framework to analyze effectiveness of eLearning in MOOC : Learners perspective, 236–241.
- Guàrdia, L., Maina, M., & Sangrà, A. (2013). MOOC Design Principles. A Pedagogical Approach from the Learner's Perspective. *eLearning Papers*, 33(May), 1–6.
- Grainger, B. (2013). Massive open online course (MOOC) report 2013. Retrieved from http://www.londoninternational.ac.uk/sites/default/files/documents/mooc_report2013.pdf
- Hanan, K., & Ebner, M. (2013). Interaction Possibilities in MOOCs – How Do They Actually Happen. *3rd International Conference on Higher Education Development Future Visions for Higher Education Development*.
- Hatzipanagos, S., & Enhanced, T. (2015). In-depth What do MOOCs contribute to the debate on, (June), 1–10.
- Johnson, R. B. & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher* 33 (7), 14-26.

- Kennedy, G., Coffrin, C., Barba, P. De, & Corrin, L. (2015). Predicting success : How learners ' prior knowledge , skills and activities predict MOOC performance, 136–140.
- Kop, R., Fournier, H. & Mak, J. S. F. (2011). A pedagogy of Abundance or a Pedagogy to Support Human Beings? Participant Support on Massive Open Online Courses. *International Review of Research in Open and Distance Learning*, 12(7), 74–93. Bali, M. (2014). MOOC Pedagogy: Gleaning Good Practice from Existing MOOCs. *MERLOT Journal of Online Learning and Teaching*, 10(1), 44–56.
- Lau, T. (2014). Special Issue on MOOCs. *Journal of Global Literacies, Technologies, and Emerging Pedagogies*, 2(3), 236–240.
- Laurillard, D. (2002). Knowledge Society. *EDUCASE Review*, 37(1), 16–25. <http://doi.org/10.1080/0305792022000007463>
- Liang, D., Jia, J., Wu, X., Miao, J., & Wang, a. (2014). Analysis of learners' behaviors and learning outcomes in a massive open online course. *Knowledge Management and E-Learning*, 6(3), 281–298. Retrieved from <http://www.scopus.com/inward/record.url?eid=2-s2.0-84907853484&partnerID=40&md5=b1aa656651e25f82bbdd13eec95aa810>
- López-sieben, M., Peris-ortiz, M., & Gómez, J. A. (2014). Lessons Learned Through Massive Open Online Courses, 11–21. <http://doi.org/10.1007/978-3-319-04825-3>
- Maitland, C., & Obeysekare, E. (2015). The Creation of Capital through an ICT-based Learning Program : A Case Study of MOOC Camp. *ICTD '15 Proceedings of the Seventh International Conference on Information and Communication Technologies and Development*. Retrieved from <http://dx.doi.org/10.1145/2737856.2738024>
- Male, T. & Palaiologou, I. (2015). Pedagogical leadership in the 21st century: Evidence from the field. *Educational Management Administration & Leadership*, Vol. 43(2) 214-231.
- Margaryan, A., Bianco, M., & Littlejohn, A. (2014). Instructional Quality of Massive Open Online Courses (MOOCs). *Computers & Education*. 80 (2015) 77-83
- Mohamed Amin Embi, Zaidan Abdul Wahab, Abdul Halim Sulaiman & Hanafi Atan (2011) "Introduction". In. Mohamed Amin Embi (Ed.) e-Learning in Malaysian Higher Education Institutions: Status, Trends, & Challenges. Department of Higher Education Ministry of Higher Education.

- Morris, S. M., & Stommel, J. (2015). Global Innovation of Teaching and Learning in Higher Education, 167–180. <http://doi.org/10.1007/978-3-319-10482-9>
- Muñoz-Merino, P. J., Ruipérez-Valiente, J. a., Alario-Hoyos, C., Pérez-Sanagustín, M., & Delgado Kloos, C. (2014). Precise Effectiveness Strategy for analyzing the effectiveness of students with educational resources and activities in MOOCs. *Computers in Human Behavior*, 47(1), 108-118.
- Ostlund U., Kidd L., Wengstrom Y. & Rowa-Dewar N. (2010). Combining qualitative and quantitative research within mixed method research designs: a methodological review. *International Journal of Nursing Studies* (48), 369-383.
- Rizzardini, R.H., Chang, V., Gütl, C. & Amado-Salvatierra, H. (2013). *An Open Online Course with Accessibility Features*. In. Jan Herrington et al. (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2013* (pp. 635-643). Chesapeake, VA: AACE. Retrieved February 12, 2014 from <http://www.editlib.org/p/112023>.
- Sadik, A. The readiness of faculty members to develop and implement e-learning: The case of an Egyptian university. *International journal on e-learning*. 2007; 6(3): 433-453.
- Sandeen, C. (2013) *Integrating MOOCs into Traditional Higher Education: The Emerging "MOOC 3.0" Era*. *The Magazine of Higher Learning*, (45:6) pp. 34-39.
- Bali, M. (2014). MOOC Pedagogy: Gleaning Good Practice from Existing MOOCs. *MERLOT Journal of Online Learning and Teaching*, 10(1), 44–56.
- Seaman, J. (2009). Online learning as a strategic asset. (Volume II: The paradox of faculty voices: Views and experiences with online learning). Washington, DC: Association of Public and Land-grant Universities. Retrieved from ERIC database (ED517311).
- Sharpley, M. & Ferguson, R., (2014). Innovative Pedagogy at Massive Scale: Teaching and Learning in MOOCs. *In EC-TEL 2014 (16--19 September) Lecture Notes in Computer Science*, 8719, 98-111.
- Sheard, J., Eckerdal, A., & Malmi, L. (2014). MOOCs and their Impact on Academics. *Proceeding Koli Calling '14 Proceedings of the 14th Koli Calling International Conference on Computing Education Research*, 137–145. <http://doi.org/10.1145/2674683.2674700>

- Stacey, P. (2014). Pedagogy of MOOCs. *The International Journal for Innovation and Quality in Learning* 2014.
- Zhang, Y. (2013). *Benefiting from MOOC*. In. Jan Herrington et al. (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2013* (pp. 1372-1377). Chesapeake, VA: AACE. Retrieved February 13, 2014 from <http://www.editlib.org/p/112136>
- Zheng, S., Rosson, M. B., Shih, P. C., & Carroll, J. M. (2015). Understanding Student Motivation , Behaviors , and Perceptions in MOOCs, 1882–1895. <http://doi.org/10.1145/2675133.2675217>
- Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal*, 45(1), 166-183.
- Zutshi, S., O'Hare, S. & Rodafinos, A. (2013) *Experiences in MOOCs: The Perspective of Students*. *American Journal of Distance Education*, (27:4) pp.218-227

APPENDICES

QUESTIONNAIRE



Evaluation of Malaysia Pilot MOOC

Dear Students,

This survey is to evaluate the various aspects of the four pilot Massive Open Online Courses (MOOCs) currently being offered to all first year Malaysia public university students via *OpenLearning* platform. The four pilot MOOCs are:

- i. Tamadun Islam dan Tamadun Asia (TITAS)
- ii. Hubungan Etnik
- iii. Introduction to Entrepreneurship
- iv. ICT Competency

The aspects covered are infrastructure, pedagogy, curriculum, content, teaching and learning outcomes.

Data obtained from this survey will help the course developers and university to improve course design, delivery and effectiveness. **Therefore, your participation and honest feedback is highly valued.**

Please take note that, for each course, only 30% of the course content is covered in the MOOC.

Please provide your demographic information.

1. Your ID in *OpenLearning*:

* 2. Gender

- Male
- Female

* 3. Race

- Malay
- Chinese
- Indian
- Other (please specify)

*4. Your university.

- UM
- UKM
- USM
- UPM
- UTM
- UIA
- UMS
- UNIMAS
- UTeM
- UUM
- UPSI
- UTHM
- UniMAP

- UMT
- UMP
- USIM
- UniSZA
- UMK
- UPNM
- UiTM (please specify your campus)

*5. Highest qualification.

- STPM
- Matriculation
- Diploma
- Other (please specify)

*6. Which MOOC course(s) you have registered?

- TITAS
- Hubungan Etnik
- Introduction to Entrepreneurship
- ICT Competency
- None

*7. What is your level of ICT skills?

- Least Competent
- Not So Competent
- Competent
- Very Comptenet
- Highly Competent

*8. Is this your first time taking Massive Open Online Courses (MOOCs)?

- Yes
- No

*9. What is your MUET band?

*10. Frequency of accessing MOOC(s).

- Daily
- Several times per week
- Weekly
- Monthly
- Only once
- Never (please state your reason)

*11. Preferred time of accessing MOOC.

- 0600(am) - 1200(pm)
- 0000(am) - 0600(am)
- 1200(pm) - 1800(pm)
- 1800(pm) - 2400(am)

*12. Type of device I normally used to access MOOC.

- Desktop (PC)
- Laptop
- Tablet
- Smartphone

*13. I use my own device to access MOOC.

- Yes
- No

*14. Type of Internet access frequently used to access MOOC

- Wired (cable) - campus
- Wi-Fi - campus
- Personal broadband

*15. Frequent location of access.

- Lecture hall
- Hostel
- Computer lab
- Home
- Other (please specify)

16. I can access MOOC during class time.

- | | | | | | |
|--------------------------|-----------------------|-----------------------------------|-----------------------|-----------------------|-----------------------|
| Strongly Disagree | Disagree | Neither Disagree Nor Agree | Agree | Strongly Agree | N/A |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

17. I can access MOOC at other times within the campus.

- | | | | | | |
|--------------------------|-----------------------|-----------------------------------|-----------------------|-----------------------|-----------------------|
| Strongly Disagree | Disagree | Neither Disagree Nor Agree | Agree | Strongly Agree | N/A |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

18. Internet speed during class time is bearable.

- | | | | | | |
|--------------------------|-----------------------|-----------------------------------|-----------------------|-----------------------|-----------------------|
| Strongly Disagree | Disagree | Neither Disagree Nor Agree | Agree | Strongly Agree | N/A |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

19. Internet speed at other times is bearable.

- | | | | | | |
|--------------------------|-----------------------|-----------------------------------|-----------------------|-----------------------|-----------------------|
| Strongly Disagree | Disagree | Neither Disagree Nor Agree | Agree | Strongly Agree | N/A |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

20. Streaming video can be accessed during class time.

Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	N/A
--------------------------	-----------------	-----------------------------------	--------------	-----------------------	------------

21. Streaming video can be accessed at other times within the campus.

Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	N/A
--------------------------	-----------------	-----------------------------------	--------------	-----------------------	------------

22. Video are downloadable during class time.

Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	N/A
--------------------------	-----------------	-----------------------------------	--------------	-----------------------	------------

23. Video are downloadable at other times within the campus.

Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	N/A
--------------------------	-----------------	-----------------------------------	--------------	-----------------------	------------

24. The content of the course meet the requirement of the syllabus.

Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	N/A
--------------------------	-----------------	-----------------------------------	--------------	-----------------------	------------

25. The balance between the learning activity and content is sufficient to help my learning.

Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	N/A
--------------------------	-----------------	-----------------------------------	--------------	-----------------------	------------

26. The learning schedule (course plan/lesson plan) is easy to follow.

42. The course activities are useful for my learning.

	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	N/A
TITAS	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hubungan Etnik	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Introduction to Entrepreneurship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT Competency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

43. The content met the learning outcomes.

	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	N/A
TITAS	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hubungan Etnik	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Introduction to Entrepreneurship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT Competency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

44. Overall, the quality of content is satisfactory.

	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	N/A
TITAS	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hubungan Etnik	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Introduction to Entrepreneurship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT Competency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

45. The following activities are useful for my learning:

	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
Watching Video	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assignment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quiz	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
Group Activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interactive Presentation	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

46. The additional resources are helpful (eg: link to websites, readings and social media outside OpenLearning).

Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

47. MOOC enhances my learning experiences.

Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

48. I learn more effectively using MOOC.

Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

49. Learning via MOOC is enjoyable.

Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

50. Learning via MOOC helps me to:

Remember (facts)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understand (concepts, principles, processes)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apply (what I have learned)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Analyze (situation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Evaluate (issues)

Create (ideas, solutions, innovation, problem solving)

51. Learning via MOOC enhances the following skills:

ICT

Problem Solving

Critical Thinking

Communication

Entrepreneurship

Writing

Collaboration (working together)

Leadership

52. Learning via MOOC enhances the following values:

	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
Respectfulness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Caring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Honesty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Generosity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helpfulness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ethical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUESTIONNAIRE



Evaluation of Malaysia Pilot MOOC

Dear Academics,

This survey is to evaluate the various aspects of the four pilot Massive Open Online Courses (MOOCs) was offered to all first year Malaysia public university students on semester 1 session 2014/2015 via OpenLearning platform. The four pilot MOOCs are:

- i. Tamadun Islam dan Tamadun Asia (TITAS)
- ii. Hubungan Etnik
- iii. Introduction to Entrepreneurship
- iv. ICT Competency

Since you are an academic who involved directly in teaching the course, we believe that you could provide us with the information for these aspects: infrastructure and info structure; pedagogy; curriculum; content; professional development; enculturation; and teaching and learning outcomes in MOOC.

Data obtained from this survey will help the course developers and university to improve course design, delivery and effectiveness. Therefore, your participation and honest feedback is highly valued.

Please take note that, for each course, only 30% of the course content is covered in the MOOC.

Please read and answer every question carefully. Click or write your responses where necessary. Items with (*) symbol are compulsory.

Please provide your demographic information.

1. Gender

Male

Female

2. Race

Malay

Chinese

Indian

Others
Please specify

3. University.

No.	University	(√)	No.	University	(√)
1.	UM		11.	UMT	
2.	UKM		12.	UniSZA	
3.	USM		13.	UMP	
4.	UPM		14.	UniMAP	
5.	UTM		15.	UTHM	
6.	UIA		16.	UUM	
7.	UTeM		17.	UMK	
8.	UPSI		18.	USIM	
9.	UNIMAS		19.	UPNM	
10.	UMS		20.	UiTM (please specify your campus) _____ _____	

4. Your role in MOOC development?

Course owner

Developer (involve in MOOC development)

Learning support in MOOC

5. Course(s) that I teach:

TITAS

Hubungan Etnik

ICT Competency

Introduction to Entrepreneurship

None

6. Number of students involve in your MOOC course? _____

7. Teaching experience in university (years): _____

8. e-Learning teaching experience (years): _____

9. This is my first time teaching using MOOC?

Yes

No

10. If yes, indicate the course name: _____

11. How competent are you in the following instructional activities?

	Least Competent (√)	Not So Competent (√)	Competent (√)	Very Competent (√)	Highly Competent (√)
e-Content development					
File sharing					
Online quizzes					
Online forum					
Social media communication					
Interactive presentation					
Video production					
Online learning task					

12. Is there any support provided for MOOCs? (If Yes, you must answer questions 13, 14 and 15)

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

13. What kind of support from your institution that you had in MOOCs deployment?

<input type="checkbox"/>	Pedagogy
<input type="checkbox"/>	Design
<input type="checkbox"/>	Delivery
<input type="checkbox"/>	Content

14. What kind of support that you expect?

<input type="checkbox"/>	Pedagogy
<input type="checkbox"/>	Design
<input type="checkbox"/>	Delivery
<input type="checkbox"/>	Content

15. Where did you get the support?

<input type="checkbox"/>	University
<input type="checkbox"/>	MOOC Team
<input type="checkbox"/>	AKEPT (Ministry of Higher Education)
<input type="checkbox"/>	<i>OpenLearning</i>

At the section below, please indicate to what extend you agree or disagree with each of the following statements by clicking the appropriate answer. Please click one answer only in each row.

Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
1	2	3	4	5

INFRASTRUCTURE & INFO STRUCTURE							
1.	I can access the <i>OpenLearning</i> anywhere in the campus.	1	2	3	4	5	N/A
2.	I can access the <i>OpenLearning</i> anytime.	1	2	3	4	5	N/A
3.	I have sufficient equipment to use MOOCs for teaching.	1	2	3	4	5	N/A
4.	I can access <i>OpenLearning</i> from any device.	1	2	3	4	5	N/A
5.	I found <i>OpenLearning</i> very difficult to use.	1	2	3	4	5	N/A

6.	I definitely utilize <i>OpenLearning</i> for other courses.	1	2	3	4	5	N/A
----	---	---	---	---	---	---	-----

CURRICULUM							
1.	The MOOC is aligned with the curriculum requirement.	1	2	3	4	5	N/A
2.	The overall structure of the contents met the learning outcomes.	1	2	3	4	5	N/A
3.	The activities in the MOOC are well-organized.	1	2	3	4	5	N/A
4.	The MOOC is appropriate to support the face-to-face learning.	1	2	3	4	5	N/A
5.	The MOOC is appropriate to support the lifelong learning.	1	2	3	4	5	N/A
6.	I found MOOC an effective teaching approach.	1	2	3	4	5	N/A

PEDAGOGY								
1.	The following activities met the objective(s) intended learning outcomes of my teaching. It helps students to meet the learning outcomes:	Watching video	1	2	3	4	5	N/A
		Forum	1	2	3	4	5	N/A
		Quiz (in between lesson)	1	2	3	4	5	N/A
		Group activity	1	2	3	4	5	N/A
		Interactive presentation	1	2	3	4	5	N/A
		Self-learning	1	2	3	4	5	N/A
		Quiz (at the end of the lesson)	1	2	3	4	5	N/A
2.	The sequences of the course materials supported my teaching approach.	1	2	3	4	5	N/A	
3.	The activities in MOOC promote student engagement.	1	2	3	4	5	N/A	
4.	Learning resources in MOOC are appropriate to enhance good teaching.	1	2	3	4	5	N/A	
5.	I could teach in more creative way when I used MOOC for my teaching.	1	2	3	4	5	N/A	
6.	MOOC could support my teaching strategy for students' innovative skills.	1	2	3	4	5	N/A	

7.	MOOC could support my teaching strategy for students' integration.	1	2	3	4	5	N/A
8.	MOOC could support effective teaching.	1	2	3	4	5	N/A

CONTENT							
1.	The MOOC content is sufficient for the learning objectives.	1	2	3	4	5	N/A
2.	MOOC contents for each unit are adequate.	1	2	3	4	5	N/A
3.	The media used for the content is appropriate.	1	2	3	4	5	N/A
4.	Media produced are interesting.	1	2	3	4	5	N/A
5.	The quality of the content is satisfactory.	1	2	3	4	5	N/A
6.	The MOOC content was well-organized.	1	2	3	4	5	N/A
7.	The MOOC content could easily be blended with the face-to-face activities.	1	2	3	4	5	N/A
8.	The MOOC content sequence is appropriate.	1	2	3	4	5	N/A

PROFESSIONAL DEVELOPMENT							
1.	I am sufficiently trained to use MOOC.	1	2	3	4	5	N/A
2.	The training given was useful for me to integrate MOOC in my teaching.	1	2	3	4	5	N/A
3.	The MOOC training met my expectation.	1	2	3	4	5	N/A
4.	I am confident to integrate MOOC in my teaching.	1	2	3	4	5	N/A
5.	The training has successfully helped me to improve my teaching skill.	1	2	3	4	5	N/A
6.	I am capable to train others to use MOOC.	1	2	3	4	5	N/A

ENCULTURATION							
1.	My university has a mechanism to recognize lecturer involvements in MOOC.	1	2	3	4	5	N/A
2.	My university provides incentives for MOOC practitioners.	1	2	3	4	5	N/A
3.	My university organizes MOOC awareness program.	1	2	3	4	5	N/A

ENHANCEMENT IN TEACHING AND LEARNING							
1.	Students are more motivated to learn when using MOOC.	1	2	3	4	5	N/A
2.	Students are more positive about learning when using MOOC.	1	2	3	4	5	N/A
3.	I found that learning via MOOC gives extra values to student.	1	2	3	4	5	N/A
4.	MOOC enhances student centered learning.	1	2	3	4	5	N/A
5.	I found that students' knowledge value has improves when using MOOC.	1	2	3	4	5	N/A
6.	I appreciate e-learning more because of my involvement in MOOC	1	2	3	4	5	N/A
7.	I found that teaching and learning process are is more enjoyable using MOOC.	1	2	3	4	5	N/A
8.	I feel demotivated due to extra workload because of MOOC.	1	2	3	4	5	N/A
9.	MOOC gives me opportunity for knowledge sharing.	1	2	3	4	5	N/A
10.	I believe my teaching has improved due to MOOC.	1	2	3	4	5	N/A
11.	I believe my students' learning has improved due to MOOC.	1	2	3	4	5	N/A

----- THANK YOU -----

Researching MOOC: The Hypes of Theory, the Selection of Methodology and the Struggle of Practice

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ABSTRACT

In the effort to expand and improve access to the Malaysian Public Institutions of Higher Education, four pilot courses have been chosen whereby 30% of the overall content was developed in the form of Massive Open Online Course (MOOC). This initiative is a collaborative effort among various parties at all levels to improve the quality of teaching and learning in these institutions. This paper aimed to evaluate the effectiveness of the deployment of the pilot MOOC. Taking advantage of the research experience, this paper analyzes three main concerns pertaining to studies on the Massive Open Online Course (MOOC); understanding the context; appropriate methodology and challenges; and turning research findings into practice.

Keywords: MOOC, Methodology, Practice

Introduction

Due to the diversity and pluralistic nature of the Malaysian society, the liberalisations of knowledge efforts in Malaysia have been largely influenced by national goals, mainly to achieve national education quality, equity and accessibility (48% now to 70% of enrolment in higher education including through online learning by 2025). In light of the philosophical position underpinning MOOC as an alternative learning, the Malaysian context however, is somehow slightly different from contexts in other parts of the world especially in translating MOOC practicality. The importance of leveraging MOOCs for future Malaysian educational landscape is becoming the main focus. It is evidenced that the history of Malaysian MOOC started from a

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continuous development of e-learning initiatives in Malaysian higher education institutions. The institutions' teaching and learning has evolved from just a general use of Learning Management System (LMS) in supplementing the traditional teaching and learning practices to the development of Open Educational Resources (OER), OpenCourseWare (OCW) and now on MOOC to cater a wider community of learner. The focus is on a change of educational cultures more than on mere resource availability.

Although MOOC is still at an early stage of its implementation in Malaysia, the rate of its growth was seen exponentially increased in these past few years. MOOC is an essential medium for Malaysian universities to disseminate knowledge expediently to a larger number of audiences. The MOOC initiative started in November 2013 with a target to deploy four common first year undergraduate courses in September 2014, namely *TITAS*, *Hubungan Etnik*, Introduction to Entrepreneurship, and ICT Competency through an *OpenLearning* platform. As of December 2014, the four courses were successfully deployed using the *OpenLearning* platform and almost 40,000 first year students from 20 public universities took part in the initiative.

The four pilot MOOCs are aimed for international branding targeted to be used by individuals or other universities worldwide. The background for each pilot course is as follows:

Tamadun Islam dan Tamadun Asia (TITAS)

This course focuses on the role of knowledge in civilization as to build a Malaysian society based on civilization principles in order to instill the spirit of mutual respect and interaction in various religious communities. This course is crucial in the development of Malaysian civilization so that societies are aware with the issues of civilization and have positive attitude towards the dialogues of culture and civilization. This course is divided into five main themes: (i) Introduction to Science and Civilization; (ii) Islamic Civilization; (iii) Cornell; (iv) Chinese Civilization and (v) Civilization of India.

Hubungan Etnik

This course focuses on ethnic relations in Malaysia by focusing on social cohesion. The topics covered in this course are scenario ethnic diversity in Malaysia, lens of social cohesion in Malaysia, basic construction of discourse in

understanding ethnic relations and the daily experience in building social cohesion.

ICT Competency

In the 21st century, learners are expected to utilize information and communication technology (ICT) tools to access up-to-date resources and perform essential computing tasks. This course is tailored to equip learners with current ICT knowledge and skills in further enhancing their competency. Through this course, they are able to apply relevant tools and use them effectively for learning purposes. Students are able to access the available videos and documents and exercises for the course content with week-by-week scheduling.

Introduction to Entrepreneurship

This course provides an overview of the requirements for launching an entrepreneurial career and starting up an entrepreneurial venture. After an appreciation of the concept of entrepreneurship, students will be exposed to the critical role of opportunity recognition and evaluation. The course also sheds light on the entrepreneur as the main success factor in the new venture formation and development. The central focus of the course is to prepare the students with the essence of entrepreneurship and business planning skills that are essential for the success of new ventures.

A project partnership has been established between the MOE and the *Open Learning* where both parties agree to develop a collaborative working mission on Malaysian MOOC pilot. As one of the top MOOC providers, *OpenLearning* offers MOE its platform and hosting. In terms of platform performance, *OpenLearning* is a user friendly system in terms of course development and found to be very stable. In addition, other important aspects to the MOE in choosing an online platform are; the services; provision of data and analytics; and the flexibility of *OpenLearnig* to update its' features to conform to the future needs.

Besides researching the context of MOOC, the MOOC development and sustainability are also worth researching. MOOC is a newly emerged learning mediator and it is high time to evaluate how this learning-technology integration is used to support an increasingly diverse student population. This can be done by either conducting evaluation or research. Oliver et al. (2007) state that

evaluation is not a simple, standardised practice; it has evolved to meet the needs of many different groups. Even though the relationship between evaluation of MOOC and research on MOOC is generally remained contested, evaluation can contribute to research as well as provide feedback for a better teaching and learning processes. They further add that the difference between the two is how the findings are used. If they are interpreted by an immediate, local audience and used to support decision-making, the study is probably an evaluation; if findings are interpreted in terms of theories and presented as contribution to knowledge, it is probably a research.

Research challenge

Determine Learning Context

Context of learning or ‘learning environment’ (as described in Phillips et al., 2012) is imperative to be understood and clarified when planning for research on MOOC. This is due to the fact that MOOC research may include various entities. Different aspects of the initiative are seen as necessary or possible to include, as relevant or irrelevant. Figure 1 shows the spectrum of learning context potentially to be researched and what to be preoccupied with in the MOOC settings. As main evidence is mainly situated in virtual environment (people learning behaviour for example), a strategy for describing contexts is to define the parameters that must be addressed to ascertain constituent elements a priori.

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Scope of study for MOOC

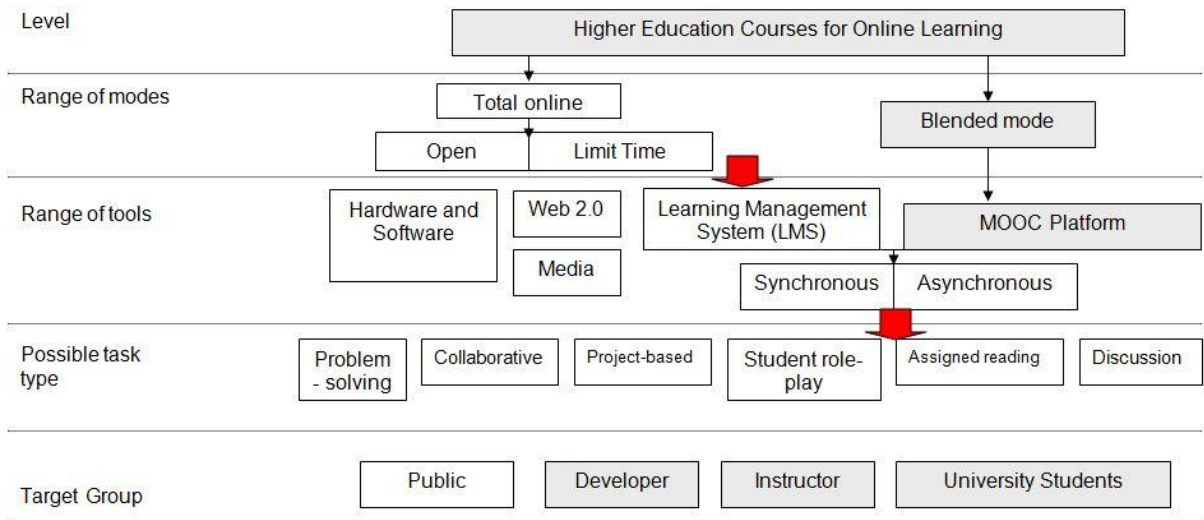


Figure 1: Scope of study

As shown above, the MOOC learning context is mapped to a broad learning landscape and pinned on the aspects involved. Initially, the national and universities e-learning policies and practices that are related to MOOC are gathered and examined. Then, the mode of learning in which MOOC is deployed is identified. Next, the tools used for MOOC especially in describing the platform are determined. After that, the possible learning tasks that take place in MOOC are identified and clarified. Lastly, based on the gathered information, the setting and target group that can provide us with most information are determined. As shown above, even though the public is part of MOOC users, the context of this study is less important. The stakeholders are interested to know how MOOC can boost the university's teaching and learning within the aspects that they need to focus on (Explained in research framework afterwards). Therefore, findings from research with a clear context will be more meaningful and easy to infer.

Nature of Data and Universalism vs. Particularism

Research on MOOC encompass approaches through quantitative, qualitative or both designs. Compared to other research nature, MOOC offers a huge range of data. At some points, when dealing with MOOC research, you are awash with data. The 'M' of MOOC shows for a massiveness of data involved in

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its range. Research which undertaken for such empirical nature usually lead to generalizations of findings. However, there are other potential mean of investigations that is more useful in understanding MOOC. Despite having quantitative data that deal with independent and dependent variables for analysis and manipulation, huge data could reveal further significant insights.

Currently, online communication mostly uses text-based; messages are typed on a computer keyboard and read as texts on a screen, typically by a person(s) at a different location and time. Computer-mediated discourse (CMD) is defined as ‘communication produced when human beings interact with one another by transmitting messages via networked computers’ (Herring, 2003). CMD is a unique form of data, as it is written data produced by authors themselves. The problem which occurs in dealing with a unique form of qualitative data is when the texts of conversation in the MOOC platform are analysed in quantitative means, hence, reducing the quality of evidence of the learning processes. The texts are what Hodder (1998) called ‘mute evidence’. This limitation does lead to some theoretical constraints. The search for theories that are applicable for the idea of teaching and learning behaviour and communication within a narrow form representation (which are the ‘texts’) is a struggle. It is through students’ postings, learning is seen at least possible to occur in such environments. This perspective however shall widen our understanding of a nature of online communities.

Methodological challenges may derive from all angles when researching MOOC. There is clear evidence that even in this context where the MOOC design is somewhat experimental – all are new to the MOOC medium (as shown in Figure 2) – for example there is no clear development of a peer to peer culture, in which the content of student posts is such that there is any possibility that these posts are to advocate learning. However, participation in this network of learning is not universal and continues to contingent upon the tutor as a key actor. Hence, such relationship needs to be addressed well in current research strategy. Perhaps the massiveness of MOOC data could be the main problem that needs a well contemporary crafted methodology to be used. Furthermore, capturing human related factors that lead to their behaviour in MOOC, into binary form and scale down further into dualism notions to ease the generalisation is somehow dangerous.



Figure 2: MOOC Experience – More than 90% of the respondents experienced learning through MOOC for the first time.

To some extent, the debate above is reflected in the discussion on the nature of data in educational research itself. For some, the data is quantitative, and should be able to be collected in an objective manner; all data are presumably similar in their respective contexts. For others, all data is subjective since it is created by human beings; therefore, feelings and interpretations are unique and particular, or relative.

Methodology

Methodology of research is derived from overall aims of a study. Aims of the research itself are actually central to the decision-making of most researchers in the educational field when adopting a principle. Is the outcome of a research to convince the policy makers, or to understand the specifics of an educational situation? The former usually involves a large number of samples in order to generalise, while the latter, the sample is much smaller in number. One position aims to develop objective educational knowledge that can be used in order to make useful predictions and influence policy. A second position aims to develop an understanding of social contexts and processes, rather than having any explicit instrumental function (post-positivist). Another position is in favour of seeing the research as a process of transformation or emancipation (critical and postmodernism), in which the research process becomes the main aim.

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**Table 1: A summary of the characteristics, outcomes and methodology
of research in different paradigm**

	Characteristics	Outcomes	Methodology
Positivist	Research is objective, rational external to the research; focus on deductive reasoning	Generalisation; theory refinement; to laws which enable prediction and control	Focus on accuracy, reliability, validity and inferential statistical analysis
Post-positivist	Maintain the essence and many of the central beliefs and methods of positivist, recognition of researcher subjectivity and bias	Reality is there to be investigated	Deeper understanding
Critical and postmodernism	Action oriented and informed by theoretical idea; ideological and political motivated	Evidence-based change in social practice	Leaning towards critical review and theoretically-informed argumentation

There is considerable diversity in the methods available to the research seeking to access the MOOC implementation quantitatively or qualitatively. However, any process of methodological engagement is constituted by meta-theoretical commitments that have implications for research design. The meta-theoretical assumption shall frames the research design in terms of focus of the study, what data needed, how the data collected and analysed, how to theorize and write the research accounts.

In the present context, the data collection and interpretation rest in accordance with some methodological position. That methodology might not be named, but the assumptions shall be open and processes be claimed legitimate.

The Study

The main objective of this paper is to evaluate the effectiveness of deployment for four pilot MOOCs offered to the Malaysian Public Institutions of Higher Education for first year students in the first semester 2014/2015. The findings were presented to inform the stakeholders and as a baseline to move further to the next stage of MOOC deployment in the Malaysian education.

Different instruments were used for data collection which involved: different set of questionnaires (for students and lecturers); transcription from series of MOOC workshop presentations from universities involved; interview to respective MOOC admins/developers; and data from the platform itself. Descriptive analysis (frequencies, mean and standard deviation), interview transcription, and content analysis were performed and template analyses were used.

A research framework adapted from the overall National Implementation Framework was outlined to guide the research group in the data collection (see Figure 3). The framework consists of Input (Infra & Info, Governance, Pedagogy, Curriculum, Content Development, Professional Development, and Enculturation), Process (MOOCs) and Output (Enhancement in Teaching and Learning, Human Resources Efficiency/Cost Reduction, Branding and Positioning, and Lifelong Learning). Infrastructure/ info structure refers to facilities of hardware and software used for MOOC usage including the platform, computers and the Internet, as well as fixed-line telecommunications, mobile phones, other wireless communications devices, networks, broadband and various specialized digital devices. ICT infrastructure and info structure are basic needs of every institution in order to deploy the e-Learning services. In this study, infrastructure and info structure variable focusing on three constructs; access, equipment and platform. Access refers to the speeds (scale) of bandwidth and network connections were evaluated while for platform, the main focuses are user friendliness, features and functionality and navigation.

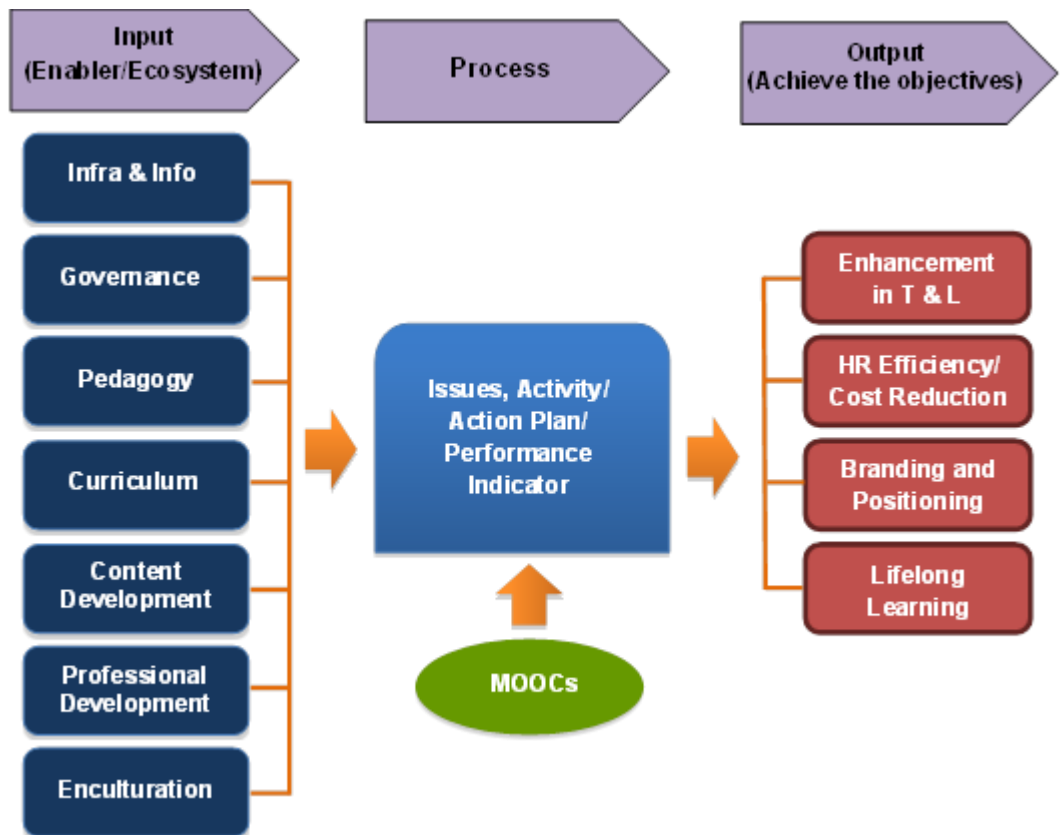


Figure 3: National MOOCs Implementation Framework

Governance of MOOCs refers to plan, coordination, and management of MOOC development and monitoring of the deployment of MOOCs which involves relevant councils and International networking. Pedagogy is referring to the pedagogy used in MOOC. The integration of the Malaysian MOOC in the delivery of courses at university is important. The main concern is on course design and delivery, engagement, assessment and additional reading. On the other hand, the constructs which consist in curriculum variable include alignment of overall structure of MOOC with the original course and learning objectives, delivery approach and learning mode. In content development, high quality content is needed. Therefore, the focus is on level of engagement with the content (interactivity, assessment), presentation of content (color scheme), media usage (use, quality and range of media), alignment with learning objective, quality of content as a whole, functionality and additional resources. For professional development; the appropriate training in MOOC focusing on

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skills, knowledge and attitude is captured. For enculturation variable, the construct covers the existence of enculturation mechanism and publicity. However, not all aspects in the framework can be directly observed. Through our experiences, the complexity in putting real data into perspective has become the real challenge.

Making accounts of the aspects related to MOOC needs a careful attention starting from the process of conceptualizing and in methodology selection. For example, the benefit of MOOC (the output) in the national framework includes the enhancement of lifelong learning among the learners and enculturation of digital learning, which however, the evidences of such experiences are too complex. Each university nowadays is using its own LMS to manage the campus learning as the system could support the student learning anywhere, anytime. LMS is often closed in nature whereby it is meant to be used only by those enrolled in the university programme or courses. However, MOOC platform is not the case. MOOC is open to anyone as long as they are able to register the course. Problems may exist in terms of overlapping of the systems role, instructors' strategies, students' participations and many more. Therefore, drawing the line between MOOC and conventional e-learning within any organisational teaching and learning practices, especially to the institutions that have implemented MOOC, could mislead the symbiosis in both. Hence, to make any claim on effectiveness of MOOC without taking any consideration of how the conventional e-learning take place is problematic.

Turning research into practice

Designing learning in MOOC seems to be the biggest challenge to ensure a successful deployment. Hatzipanagos (2015) states that 'MOOC requires different learning designs from those that work for small student numbers'. 'Progressive approaches' has emerged in recent literature to improve MOOC design based on empirical research. At present, online learning platforms are developed without clear design patterns amidst numerous data on students' interactions with the system (for example through functionalities observed in LMS). Such progressive approach, hence, tends to search for information, deploying one limited process at a time. It involves plan, design, etc. in all aspects of one limited process and followed in a short time later by another platform. A couple of advantages are that the change would not affect too much on the users and also the design risk is small. The disadvantage is that it takes longer time in reporting all the benefits to create the best design practice for

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MOOC. In terms of deployment, the selected approach shall depends on how much the urgency of the organization is in and its risk-tolerance. For example, a methodology called 3D2P (Data-Driven Design Pattern Production) that uses data collected from existing online learning systems is developed to inform the design pattern production processes, direct stakeholders on important design decisions, evaluate the quality of design patterns, and collaborate with other stakeholders to refine design patterns (Inventado & Scupelli, in press). The question here is: Is such research nature could inform us the best of the MOOC design and at the same time influence the revolution of teaching and learning practices for global audience?

From the findings, the role of the teacher/ instructor is another important key to MOOC success. 'E-Moderator' (Salmon, 2000) might not be sufficient enough to describe instructors' roles for MOOC settlement but rather the e-ID – the digital Instructional Designer. They need to have skills in scaffolding students' learning and managing the course. The roles include planning at the beginning and monitoring continuously and taking adequate action throughout the course to fit the learning needs. This is called 'contingency management': It is used by instructors to reward desired behaviours through praise/encouragement, or to control undesirable behaviours through punishment in the form of reprimand/censure (Ab Jalil, 2007; Ab Jalil & McFarlane, 2010; Ab Jalil, 2011). For example, there were patterns that students tend to replicate their responses from others or leave the group at some points. Such behaviour is beyond the control of the system itself but within the instructors' control. At this point the instructors need to put their ID hats to manage the next learning activities and the system administrators should fix the problem accordingly, collaboratively working with the instructors in ways that will benefit the learners most.

In terms of learning experience in MOOC, the key mean for student learning is through discussion which is the central notion of learning that 'occurs through internalising dialogical activity and its signification systems (i.e. language) that occur in the social' (Vygotsky,1978). Either it is face-to-face context or in online environment, discussion is stressed in the higher education teaching and learning process, as it can bring the following benefits:

- helps students become connected to a topic,
- helps students develop skills of synthesis and integration,
- helps students learn the process and habits of democratic discourse,
- helps students explore a diversity of perspectives,

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- shows respect for students' voices and experiences,
- helps students recognize and investigate their assumptions,
- develops habits of collaborative learning,
- increases students' awareness of and tolerance,
- encourage attentiveness,
- develops new appreciation for continuing differences,
- increases intellectual agility,
- attests students as co-creators of knowledge,
- develops the ability in clear communication of ideas,
- develops the skills in negotiating meanings,
- increases expanse and makes students more assertive, and
- spurs transformation.

However, 'discussion' practices in students' learning in the higher education level is not an easy process to be explored especially when networking is integrated in the teaching and learning process. The model of 'learning' with integration of communication tools in the adjunct mode is as highlighted below:

... the curriculum that focuses not on familiarity with pre-defined content, but on the ability to find, analyse and appraise relevant content, and construct coherent, justified views that could be construed as personal knowledge. Here the precise topic is not relevant – although some content clearly remains vital - but the internal coherence and validity of the produced text and conceptual artefacts are paramount. It is easy to see that in this model access to content remains important, but delivery of precise content is not. The tools and skills to locate, analyse, compare, critique and construct are what are needed here. One justification of this model of the curriculum is that this approach to personal knowledge building is the one that is relevant to those who live in the age of the internet, and the necessary knowledge practices are those that will best prepare learners to take an active part in modern economic and social practices (McFarlane, 2006: 136)

At a macro level of an *OpenLearning* platform, we could observe the possibility of students' engagement in discussions through their comments. As

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shown below in Table 2, number of students' comments in each course does not correspond to number of students' enrolment and in fact does not reflect the average number of individual postings. In fact, the number of most comments per student comes from the group courses with lesser number of students. This shows that the number of comments alone is not important as the frequency of comments can merely reflect the quality of discussions. Therefore, there should be other ways to infer the MOOC performance through discussion.

Table 2: Number of students' comment

Course	Semester	Students	Comments	Comments Per Student
Kesepaduan & Hubungan Etnik di Malaysia	Semester 1	17689	83324	4.71
Kesepaduan & Hubungan Etnik di Malaysia	Semester 2	8808	40677	4.618
ICT Competency	Semester 1	5634	45724	8.116
ICT Competency	Semester 2	1609	9412	5.85
Tamadun Islam dan Tamadun Asia (TITAS)	Semester 1	22017	110710	5.028
Tamadun Islam dan Tamadun Asia (TITAS)	Semester 2	5757	60843	10.569
Introduction to Entrepreneurship	Semester 1	10256	32970	3.215
Introduction to Entrepreneurship	Semester 2	3779	8251	2.183
Total	Semester 1	55596	272728	4.906
Total	Semester 2	19953	119183	5.973

Other interesting fact that is found in this study is the completion rate. The rate of students with 100% completion for all courses was not more than 25%

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but almost 50% students completed half of the course content.

Table 3: Completion rate

	10% Completion	50% Completion	75% Completion	100% Completion
TITAS	2.20%	48.12%	36.17%	24.39%
ETNIK	4.97%	42.83%	30.70%	17.22%
ENTREPRE.	3.54%	46.21%	38.62%	9.53%
ICT COMPT.	3.74%	48.91%	38.95%	14.38%

In terms of the Malaysian MOOC, the main audience groups are university students enrolled in Malaysian universities. Ideally, the students have the opportunities to complete the course easily as their learning through MOOC could help them to perform better, but this is not the case. From the survey, the students have positive perceptions towards their learning in MOOC (Example in Table 3). However, it is not necessarily due to or affected by their course completion. In other words, students' perceived learning in MOOC does not reflect their presence in completing the MOOC tasks.

Table 4: Students response to 'MOOC enhances the teaching and learning processes'

Items	Mean	SD
1. MOOC enhances my learning experiences.	3.86	0.59
2. I learn more effectively using MOOC.	3.73	0.66

N=4,449

These patterns of course completions are very helpful in the sense that the course owner could improve their content and strategies accordingly. They can track back the course data to see at what point of the course topic that shows lesser students' involvement so improvement could be made.

Suggestions

The way of looking at how people learn when they are engaging or

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participating in a group is beneficial in understanding the MOOC learning environments. MOOC has the potential as a learning ground in building the learning community of practice (CoP). In the online community, the social fabric is complicated and teaching and learning behaviours are mixed. Participants in online realms regulate self, others and tasks, creating a sense of community of practice. Obviously the 'learning' agenda is often the prime focus. To study the learning process in an online community, we need to understand how students participate in and regulate the community of practice. MOOC platform that could offer mechanism for analysis on the learning in community of practice or at least any analytical tool that could capture such a complexity is an advantage.

For internal improvement, the teaching role should be 'shared' among students to promote peer learning in MOOC. Peer learning in MOOC can be enhanced if assisted performance is provided among the students. However, assisted performance should be monitored properly as sometimes, assistance from students is not necessarily appropriate. However, encouragement would keep the students motivated to be involved in the course.

Conclusion

In conclusion, the MOOC initiatives have changed the landscape of Malaysian higher education online learning positively. Positive and negative insights from various parties on the MOOC pilot, suggest that these initiatives have contributed to the Malaysian MOOC development, curriculum, design, content quality and the impact on the teaching and their learning as a whole. Therefore, MOOC is to be a significant new mechanism of teaching and learning in this era especially for the higher education institutions whereby each institution caters to the massive number of instructors, courses and most importantly the students. Future research should analyse MOOC's development in other countries as to compare and contrast effective strategies in MOOC's management.

References

- Ab Jalil, Habibah. (2007). *Conceptualising Peer Learning as Assisted Performance - The Implications of Task Type and Social Networks in Online Discussion*. Unpublished Thesis, University of Bristol.
- Habibah Ab Jalil & Angela McFarlane. (2010). Open and Closed Mode of Online

The 3rd International Conference on Educational Research And Practice 2015

- Discussion – Does it matter? *Pertanika J. Soc. Sci. & Hum.* 18(1): 105-116.
- Habibah Ab Jalil. (2011). Taking Assistance in Online Learning Activities Seriously – What Counts? *ASEAN Journal of Open and Distance Learning*, 3(1) 50-62.
- Hatzipanagos, S. (2015). What do MOOCs contribute to the debate on learning design of online courses? *eLearning Papers*. n.º 42 . June 2015. ISSN: 1887-1542. www.openeducationeuropa.eu/en/elearning_papers
- Herring, S. C. (2003). Computer-mediated Discourse. In D. Schiffrin, D. Tannen & H. Hamilton (Eds.), *Handbook of discourse analysis*. Malden: Blackwell.
- Inventado, P.S. and Scupelli, P. (in press). Producing Design Patterns from Big Data in the ASSISTments Online Learning System. In Proceedings of the European Conference on Pattern Languages of Programs.
- McFarlane, A. (2006). ICT and the Curriculum Canon: Responding to and Exploring ‘Alternative Knowledge’. In A. Moore (Ed.), *Schooling, Society and Curriculum*. London Routledge.
- Phillips, Rob; McNaught, Carmel & Kennedy, Gregor. (2012) *Evaluating E-Learning: Guiding Research and Practice*. NY: Routledge.
- Salmon, G. (2000). *E-Moderating - The Key to Teaching and Learning Online*. Sterling: Kogan Page.
- Vygotsky, L. S. (1978). *Mind in Society: The development of higher psychological processes*. In Michael Cole, Vera John-Steiner, Sylvia Scribner, and Ellen Souberman (Eds), Cambridge, London: Harvard University Press.

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