

INVESTIGATING THE COMPLIANCE OF ETHNIC RELATIONS MOOC TO GAGNÉ NINE EVENTS OF INSTRUCTION

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Abstract: Teaching and learning have witnessed a rapid development of Massive Open Online Courses (MOOC) especially during the pandemic of Covid-19. Many courses have been produced and received participation worldwide. These have generated unprecedented massive educational resources including videos, subtitles, lecture notes, quizzes etc. for teaching, and forum contents, Wiki, learning behaviour logs, homework logs etc. for learning. The problem that guides the study is the vulnerability towards exploitations such as incomplete dissemination of knowledge and violation of learning principles especially if monitoring activities are neglected. Thus, the present paper aims to report on the current development of MOOCs for the general studies subject (MPU) – particularly, Ethnic Relations course and explore the strengths and weaknesses as a subject in MOOC. The significance of the study is it may assist others in developing MOOC contents that suit students demand better and also manage to achieve its learning objectives based on Gagné’s Nine Events of Instruction.

Keywords: Ethnic Relations, MOOC, Nine Events of Instruction, weakness and strengths

Introduction

Massive Open Online Courses (MOOC), an online learning platform has emerged as one of the latest learning trends. According to Malaysian Qualifications Agency (MQA) (2016), Taylor’s University was the first to initiate MOOC in Malaysia in 2013 and it generated a fresh concern for Higher Education Providers (HEPs) to re-examine knowledge transfer mechanism along with the teaching and learning representations. Therefore in keeping abreast with this trend, in the September 2014, the Ministry of Higher Education (MoHE) propelled the first four Malaysian MOOCs comprising of first year undergraduate communal obligatory courses from Universiti Kebangsaan Malaysia (UKM), Universiti Putra Malaysia (UPM), Universiti Teknologi MARA (UiTM) and Universiti Malaysia Sarawak (UNIMAS). MoHE has taken the initiative to launch several compulsory subjects in MOOC such as Islamic Civilization and Ethnic Relations. This action is paralleled to the Malaysian Education Blueprint 2015-2025 (Higher Education); Shift 9: Globalised Online Learning (GOL) (MQA, 2016). However, Li et al. (2014) reported that there are over sixty MOOC platforms around the world. By 2017, MOOC has over nine thousand courses with more than eight hundred universities (Shah, 2018). These numbers are alarming and demands regulation and inspection.

MQA (2016) also specified that the term “massive” is “to serve a large number of learners” from few hundred to beyond fifteen thousand people. MQA (2016) also defined “open” as “to offering learning experience to a large number of participants globally regardless of their age, location, income, level of education, and ideology without any pre-requisite, or course entrance fees in order to have access to high quality education.” The fuzziness of definition is when the term “online” is said to allow “synchronous and/or asynchronous interactions between the participants (instructors and learners) and content of the course.” This leads to enabling self-directed learning and students-centred instructions which many MOOC students did not anticipate.

The initial purpose of MOOC was to provide free tertiary education access to a wider mass (Yuan & Powell, 2013). MOOC has not only boosted learning opportunity but also expanded multi-disciplinary research opportunities where MOOC is concerned. MOOC allows free learning and encourages self-development. Learning has become more interactive, encourages social networking among users and enforces ethical professional expressions with great openness (Perifanou & Economides, 2014). These are the expectations in a MOOC platform.

Perifanou, (2016:390) warns “the need for the design and creation of successful MOOCs is high because most of the evaluated MOOCs still do not offer successful platforms for learning.” Educators are invisible and students are frustrated (Kellermann, 2021; Perifanou & Economides, 2014). This shows that after almost a decade, learning through MOOC learning platform is still a concern. The call for MOOC auditing is loud. Smith (2017) has stressed on the need for regular MOOC inspection to certify MOOC effectiveness. This shall encourage developers to be more vigilant and responsible to the success of a MOOC platform. Therefore, to ensure the effectiveness of MOOC, its complicated learning pedagogy demands attentiveness (Bayne & Ross, 2014).

Problems like incomplete dissemination of knowledge and violation of learning principles is proving that MOOC is venerable towards exploitations especially if it lacks monitoring. Thus, the present MOOC providers for Ethnic Relations course have to uphold two vital issues, that are, ensuring interactive learning principles are achieved and maintaining attraction for its users.

The present study assessed the achievements of Ethnic Relations MOOC as an interactive and interesting learning platform based on the Gagné Learning Theory as it is still relevant as a mechanism to inspect such learning platforms. Gagné (1985) stated that distinct leaning environments have discrete outputs. Therefore, an effective learning will transpire if learning is associated to the learners’ innate knowledge, guided learning is materialized and memory boosting activities are implemented.

Literature Review

Transitioning from traditional face to face (F2F) teaching experience to teaching on Learning Management Systems (LMS) then to flip classrooms on LMS was no easy task. Educators have to adapt to these changes and keep abreast with these digital demands. Zhao et al. (2016) noted that flipped classroom adopts basics such as conditioning and collaboration to enable in dynamic student involvement in teaching and learning progress where it allows asynchronous downloading of course materials and self-viewing of lecture videos at any given time. A survey, involving 168 Nigerian first year Accountancy students, inferred that flipped classroom on LMS model is more effective than the F2F method in better students’ attentiveness and academic accomplishment (Ugwoke et. al, 2018). Thus, a whole list of MOOCs and free online courses are available at <https://www.mooc-list.com/> for grabs yet do not offer university credits though some may be supported by universities.

Self-search and self-reliance are among other characteristics suggested in order to excel (Zare et al., 2016) in e-learning. E-learning as a self-directed learning mechanism can boost learning for Chemistry students (Zare et al. 2016). Most studies conform to this finding too. Therefore, to be successful in MOOC, self-directed and self-determination in learning are two essential characteristics that students should possess.

Aside from being a free platform (Yuan & Powell, 2013), MOOC is often equipped with communication platforms like chatrooms so that peers and educators can provide interactive support for participants. Computer mediated communication (CMC) has managed to accelerate students’ interest, motivation and confidence in learning as it boosts frequency in teacher-students’ communication (Salleh et al., 2010).

Malaysian Qualifications Agency (MQA) (2016) has certified that verification of learning achievements comprised of oral assessment, written assessment, product assessment and performance assessments. These assessments are verified through course completion whether to be on-site proctoring or online proctoring. Yet, on verified courses completion, it may be applied with evidences of (i) Certificate of Achievement/Accomplishment, (ii) Statement of Accomplishment, (iii) Statement of Participation, (iv) Certificate of Completion, and (v) Honour Code Certificate.

Globalised Online Learning (GOL) is intended to enhance “the quality of course-delivery, lowering the cost of delivery, bringing Malaysian expertise to the world, enhancing the branding and visibility of Malaysian HEPs as well as fostering lifelong learning among Malaysians” (MQA, 2016:1). The issue at hand is, in order to fulfil GOL objectives, MoHE leveraging “on the expertise available in the respective institutions and establishing mutual recognition of courses to develop MOOC (MQA, 2016:2)” which should have been a group effort between supporting roles and intellectuals. These experts are not to be content developers (Kellermann, 2021).

Dewey (1938) emphasised that an educational experience necessitates a cognitive attendance (the learner), a societal manifestation (the learning public) and an existence of teaching (the educator) - these

are The Community Inquiry. Williams (2017:91) further elaborated Dewey suggesting schools that backs Dewey's theories "are harder to find in this 21st century of testing." Depressing outcomes appear when such education is no longer interaction-based as it used to be during the educators' f2f presence as "the soul of education begins to die" and "the community of inquiry must be reinvented for the digital campus" (Kellermann, 2021). This cry for investigation of our MOOC platforms is justified.

According to Gagné Nine Events of Instruction theory, the first step is to gain the students' attention. Teachers need to prepare a set induction to succeed, which may be in forms of videos, animated cartoons, songs or poems related to the given topic. The second step is to inform the learners of the objective of the topic. The purpose of stating the learning outcome (LO) is to ready the thinking mind regarding the topic ahead. The students can recall their prior knowledge and stimulate a well-prepared mind. It may assist in the comprehension of learning process that may influence and accelerate teaching and learning processes. This is the third stage. Hyoung Seok Shin & Jeong (2021) made video investigation that can be used to classify the workings, and code developments of how students rationalize their thoughts while using computer-based devices to build causal maps which later uses a path analysis to conclude which and how exact procedures influence the excellence of students' causal maps and to decide in what way students' former knowledge on the specified difficulties affect students practise processes. The research concluded that students unveiling the inclination to use "more backward than forward processing" and use "more breadth than depth-first processing" formed sophisticated worthy causal maps, and that the effect of prior content knowledge can be determined (Hyoung Seok Shin & Jeong, 2021). Therefore, one of the activities that can be included is to ask students to also create mind maps to encourage induction of prior knowledge.

The fourth stage is to present the information on the topic. Based on this theory, interactive teaching has to be fun and effective. These may encourage knowledge transfer especially when effective teaching materials are adopted. The fifth stage is to provide guidance. This, if done online, has to be done in a manner of virtual availability of the teacher. In other words, the teacher might need to give instruction or information as if he/she is talking to the students f2f in a proper sequence. The sixth stage demand the teachers to elicit performance from the students. Activities are usually given to induce this. Yong Nie (2020) has suggested several newer techniques using data mining related mechanism to monitor or track students online activities. Google Meet has also enabled Google extensions that allow teachers to generate attendance worksheet.

The seventh stage is to provide feedback to the students based on the given activities. Teachers can either give immediate feedback through provided chat platform/room or provide it later through personal messaging or by marking and returning the worksheet online.

The eighth stage is to assess the students understanding of the given information through tests and examinations which are also given online in MOOC. The tests and assessments can be open-book, time-based, summative or formative. These assist in unfolding students' comprehension of the topic.

Lastly, enhance retention and transfer. At this stage, teachers are to boost students' willingness to stay on the course through motivation for the purpose of transferring the information gained from the course into their daily walks of life. For example, the Ethnic Relations course has a topic on understanding cultural differences. This topic encourages learners to know cultures from different ethnicity and understand why they act and do things differently from their culture. This understanding may spark better intercultural communication. Van Genegam et. al. (2021) found based on a study of several levels analyses on the International Study of City Youth data, consisting of 2,354 students in 30 secondary schools in Ghent (Flanders), revealed a negative correlation between grade retention and academic self-concept, which was facilitated by feeling of belonging." This is relevant to the study of Ethnic Relations.

In guaranteeing the design framework is formulated with advanced interaction levels, the Gagné Nine Events of Instruction theory is integrated in the Ethnic Relations subject in MOOC. This may strengthen the students' cognitive learning processes. Other than that, comparative to traditional learning methods, it may generate creativity through its mobility and flexible application alongside its wide interactive users' coverage. Figure 1 shows the Nine Events of Instructions (Gagné, 1985) flow.

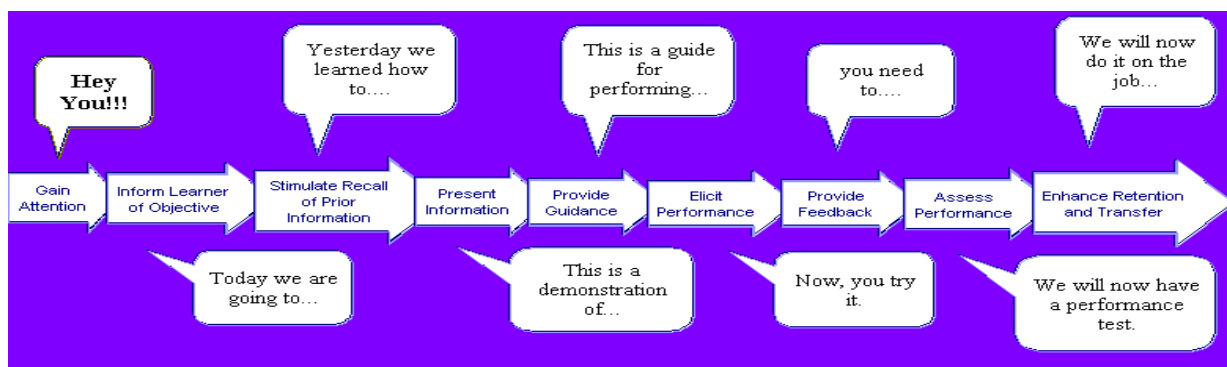


Figure 1 Nine Events Of Instruction (Gagné, 1985)

Method

There are ten biological learning notes and activity binds (BAB) in the Ethnic Relations subject which encompasses a variety of activities and information resources in form of videos and related pictures which fulfil interactive learning criteria. These BAB are developed by lecturers from major local universities who have vast experience in teaching the Ethnic Relations subject via face to face. Therefore, building MOOC contents such videos and animations can be a challenge that they shared.

Data is accumulated from UTeM students who enrolled in the Ethnic Relations subject for a semester. The present study also adopted qualitative interview method with several conveniently selected students. A questionnaire (Gagné et al., 1992) was also constructed based on the Gagné Nine Events of Instruction theory and distributed among the students to identify the level of the subject's compatibility to Gagné's suggestions. The theory was conveniently selected as a margin to measure the present MOOC as it is a well-established tool and covers learning instruction enquiry.

Findings

Figure 2 below shows that students are able to engage with the introductory of the teaching and learning section. This contains lesson and expected outcome. It also consists of video clips, pictures, scenes and story lines, elaborations with embeded sounds and technical animations. Almost all stipulated learning notes and activities (BAB) have managed to gain satisfactory mark of a 3 point being the inserted pictures gaining the most appraisal. Yet, sound and technical; elaboration and animation are less satisfactory for BAB 9 at 2.5 point. Overall, based on Figure 2 below, the students suggested that the introductory teaching and learning activities in MOOC managed to attract their attentions. In reference to Gagné (1985), this shows that the first attention stage has been obtained.

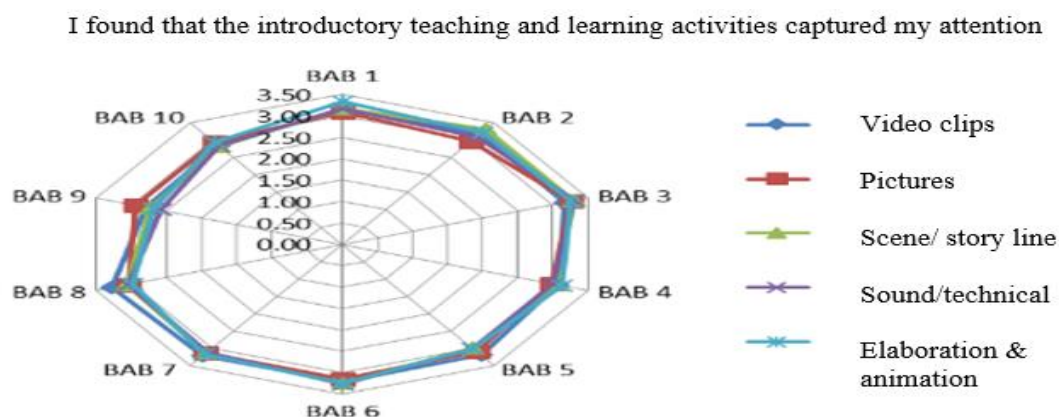


Figure 2 Introductory teaching and learning activities in MOOC

Figure 3 shows Ethnic Relations MOOC platform has managed to clearly specified the LO for the students' comprehension (second stage). This is attainable by generating detailed explanations. Nonetheless, there are always room for improvements. BAB 9 seems to gain the least point for

providing enough detail description of the chapter. This shall distract students' flow of learning. The third stage of Gagné (1985) is to "stimulate recall of prior information" which is demonstrated through these video clips, pictures, scenes, and animations. Ethnic Relations MOOC has managed to contain and disseminate sufficient information on theories and practices related to the conducts in a multi-ethnic environment.

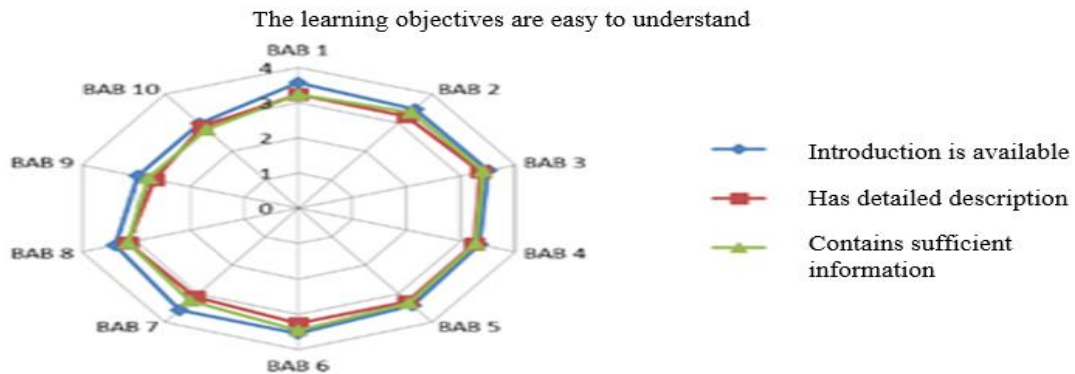


Figure 3 The subject objective in MOOC

Figure 4 show unpleasant findings where students found Chapter Nine and Ten do not furnish them with mind maps or conceptual maps. In addition, there are no other assisting navigation link provided to suggest other supplementary information. Here, the Gagné's (1985) stage 4 (presenting information) was not attained. Jiang et al. (2017) emphasised on how keywords and navigation is essential in any digital platform to ensure ease of use.

Stage 5 demands for guidance to be provided. The previous failure of compliance in stage 4 has created a domino effect onto stage 5. Learning maps and navigation merely achieved a neutral 3.0, which means students are not happy with the navigation tool. Thus, these unfriendly user interface may lead to failure in accomplishing MOOC's purposes.

The Ethnic Relation MOOC platform has uses easy materials and provided easy means to get connected with the lecturers

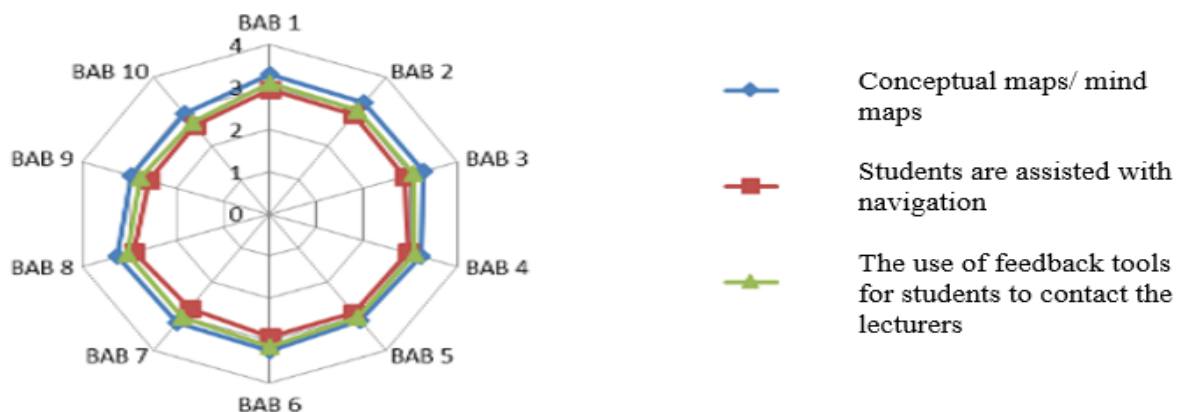


Figure 4 MOOC enables easy communication access between students and lecturers

Stage 6 requires elicit performance i.e. lecturers to encourage students to try out the activities and exercises provided. This is executed in the instructions for material sharings. However, this needs to be further improved as students feedback do not seem to show encouraging achievements. Figure 5 shows, in BAB 1 materials sharing is highly practised, but not in BAB 5, 7, 9, and 10.

Students may also face difficulties in obtaining lecturers' feedback (Gagné's stage 7). The figure 5 below highlights hurdles confronted by students' in sharing learning materials especially for Chapters

Nine and Ten. The highest point achieved is barely 3.6 point. Assignments feedback is also poor for BAB 5, 9 and 10. In addition, other BAB do not show satisfactory feedback. This agrees with Ross et al. (2014) where teachers' feedbacks have to be of easy access to the students in any MOOC environment.

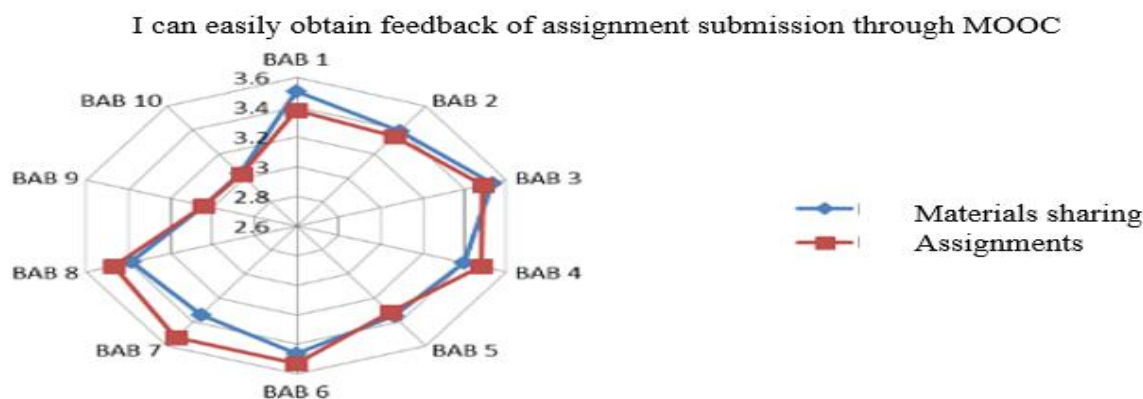


Figure 5 The students feedbacks on assignment submissions and activities executed through MOOC

Ethic Relations MOOC platform has enabled a self- and group assessments mechanism (Gagné's Stage Eight). This is another challenge. Forming these assessments encountered several hurdles comprising "feeling uncertain." Bisquolm (2021:4) noted digital users can "restrain their own digital consumption to some degree, but about one in five doesn't use any protective measures or consciously disconnect at all." In this case, it includes subject comprehension evaluation which students gave below a 3.6 mean.

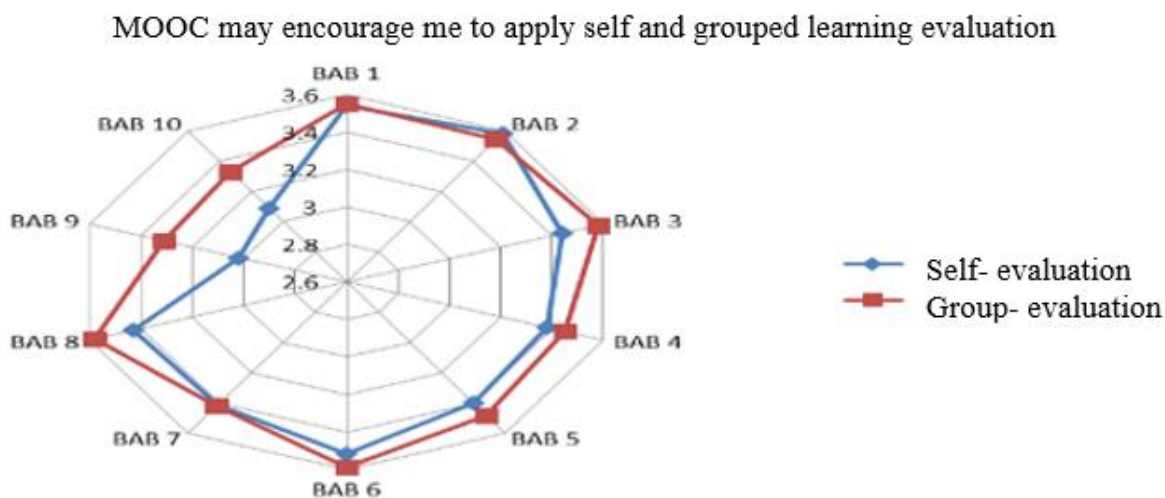


Figure 6 MOOC encourages self- and group assessments

The last stage of Gagné (1985) emphasises on the "entrance retention and transfer." Group evaluation has been encouraged through out all BAB. Highest score is at 3.6 mean by BAB 1, 2, 3, 6 and 8. BAB 4 and 5 are at mean 3.5 while BA 7 is 3.4. Yet, in BAB 9 and 10, the encouragement for self-evaluation among students dropped to mean 3.3 to boost group evaluation. As these are the two final BAB, the students have to work together and experience Ethnic Relations. However, this is merely highest at 3.6 to 3.4 point in BAB 7. Being at a neutral point, encouragement for assessment still demands a boost. Overall, this may increase if the MOOC interface is user-friendly.

Overall, the subject of Ethnic Relations can be taught using MOOC as the development has corresponded to the Gagné Nine Events Of Instruction (1985). However, it needs better and friendlier

inter-face to ensure user-friendliness. This warrants ease of navigation which will encourage conformity of other stages of instructions.

Discussion

The question of how interactive learning principles can be achieved in MOOC Ethnic Relations subject has been answered by unfolding students' feedback of the platform. Respondents of the study suggested that the Ethnic Relations MOOC platform demands great improvements especially in paying attention to student's feedbacks. Communication with the lecturers is deemed a mandatory factor to succeed in learning. Thus, lecturers must make themselves available synchronously or asynchronously.

MOOC has detached learning from traditional teaching methods such as lectures, seminars and tutorials. Its wide acceptance has greatly contributed to this paradigm leap. This should encourage the involvement of many future MOOC contributors. Abreast with changes, these contributors are to build more interactive learning platforms on MOOC.

To recap, distance learning atmospheres have distinct outputs (Gagné, 1985). Therefore, an operational learning will materialise if:

- a. Education is supplementary to the students' innate knowledge.
- b. Directed learning emerges.
- c. Retention boost accomplishments are employed.

Whether Ethnic Relations MOOC is successful as a learning platform is still debatable. Advancement in upgrading to a more user-friendly interface is much cherished and appropriate credit recognition is still much awaited. Based on the present findings, there are a few enhancements that may be indispensable:

- d. Each video screening has to be intertwined with suitable explanations from the lecturers in order to strengthen comprehension. Without such detailed explanation, the students may fail to fully grasp the subject content.
- e. Text screening in videos of every chapter has to be minimized. For factual memorization purposes in the Ethnic Relations subject, adequate powerpoint presentation is encouraged. The usage of point forms may also assist in better delivery as opposed to full texts.
- f. To intensify understanding and prolonging learning interest in MOOC, furnishing simplified, stimulating and appealing mind maps are essential.
- g. Some areas of improvements include simplifying assignments submissions and retrieving lecturers' feedback.

Therefore, to determine if Ethnic Relations is effectively learned or suitable to be taught through MOOC is still questionable. Students' ability to handle cross cultural social communication and environment are still problematic as immediate feedbacks like questions from students and instantaneous response from lecturers' to correct or to praise is rather challenging to be obtained. This MOOC platform requires the developer to pursue greater efforts in bringing it to a higher mark.

Conclusion

MOOC learning platform is a revolutionary and innovative learning medium. Many improvements have been adopted to ensure its acceptance and success. It has also encouraged research collaboration in several aspects. This initiative has warranted MOOC relevancy and acceptance. However, as previous studies (Perifanou, 2016; Perifanou & Economides, 2014; Annabi & Wilkins, 2016) have agreed to the present study, MOOC has to be beyond a teaching and learning platform as it cannot replace teachers-student immediate interactions to ensure successful learning.

Future study may undertake means to improve teachers' feedback in MOOC. If MOOC can be made available with virtual reality or augmented reality, then perhaps these may improve MOOC as a learning medium parallel to Gagné Nine Learning Instructions rule. This can then be investigated in terms of its effectiveness in replacing a teacher and solving the issue of having immediate feedback to encourage learning on MOOC platform.

In brief, the study found that the Ethnic Relations MOOC has potential to be further improved. The improvement needed are in areas of obtaining feedbacks, better e-learning materials and assessments like giving assignment and material sharings. Lastly, Malaysian public university's common subject

Ethnic Relations MOOC platform is at an average compliance to Gagné Nine Instruction, thus, further improvements need to be accomplished.

References

- Annabi, C. & Wilkins, T. (2016). The Use of MOOC in Transnational Higher Education for Accreditation of Prior Learning, Programme Delivery, And Professional Development. *International Journal of Educational Management*. 30 (6) 959-975, <https://doi.org/10.1108/IJEM-05-2015-0057>
- Bayne, S., & Ross, J. (2014). The pedagogy of the Massive Open Online Course (MOOC): the UK view. Higher Education https://s3.eu-west-2.amazonaws.com/assets.creode.advancehe-document-manager/documents/hea/private/hea_edinburgh_mooc_web_240314_1_1568036979.pdf
- Bisquolm, S. (2021). The Digital Challenge – On How We Live and Cope with Digital Dangers. Unpublished PhD Thesis. University of Zurich. URL: <https://doi.org/10.5167/uzh-197578>
- Dewey, J. (1938). *Experience and education*. New York: Macmillan. <http://www.schoolofeducators.com/wp-content/uploads/2011/12/EXPERIENCE-EDUCATION-JOHN-DEWEY.pdf>
- Gagné, Robert M. (1985). *The Conditions of Learning and Theory of Instruction* (4th Edition). New York: CBS College Publishing.
- Gagné, R. M., Briggs, L. J., & Wager, W. W. (1992). *Principles of instructional design* (4th ed.). Fort Worth, TX: Harcourt Brace Jovanovich College Publishers.
- Li, K.C., Wong, B.T.M., Chok, E.W.S., & Lee, T. (2014). Profiling the characteristics of MOOC platforms. In D. Wong, K.C. Li & K.S. Yuen (Eds), *Proceedings from the 28th Annual Conference of the Asian Association of Open Universities*, pp. 476-485. Hong Kong: OUHK.
- Hyoungh Seok Shin & Jeong A., (2021). Modeling the Relationship between students' prior knowledge, causal reasoning processes, and quality of causal maps. *Computers & Education*. 163, <https://doi.org/10.1016/j.compedu.2020.104113>.
- Jiang, Z, Miao, C & Li, X, (2017) Application of Keyword Extraction on MOOC Resources, *International Journal of Crowd Science*. 1 (1) 48-70. <https://www.emerald.com/insight/content/doi/10.1108/IJCS-12-2016-0003/full/html>
- Kellermann, D. (2021). Academics aren't content creators, and it's regressive to make them so. *The Times Higher Education*. <https://www.timeshighereducation.com/opinion/academics-arent-content-creators-and-its-regressive-make-them-so>
- Malaysian Qualifications Agency. (2016). Guidelines On Credit Transfer for MOOC. <http://www.mqa.gov.my>
- Perifanou, M., & Economides, A. (2014). MOOCs for foreign language learning: an effort to explore and evaluate the first practices. In *Proceedings of the INTED2014 conference held in Valencia, Spain 8-12 March 2014*. <http://library.iated.org/view/PERIFANOU2014MOO>
- Perifanou, M. (2016). Worldwide state of language MOOCs. In S. Papadima-Sophocleous, L. Bradley & S. Thoušný (Eds), *CALL communities and culture – short papers from EUROCALL*. 386-390. <https://doi.org/10.14705/rpnet.2016.eurocall2016.593>
- Ross, J., Sinclair, C., Knox, J., Bayne, S., Macleod, H. (2014). Teacher Experiences and Academic Identity: The Missing Components of MOOC Pedagogy. *MERLOT Journal of Online Learning and Teaching*. 10 (1). https://jolt.merlot.org/vol10no1/ross_0314.pdf
- Smith, N., (2017) A Comparison of MOOC Development and Delivery Approaches, *The International Journal of Information and Learning Technology*. 34 (2) 152-164. <https://www.emerald.com/insight/content/doi/10.1108/IJILT-09-2016-0047/full/html>
- Shah, D. (2018). By the numbers: MOOCs in 2017. *Class Central MOOC Report*, <https://www.classcentral.com/report/mooc-stats-2017/>
- Ugwoke, Ernest O.; Edeh, Nathaniel Ifeanyi; and Ezemma, Joseph C., (2018). Effect of Flipped Classroom on Learning Management Systems and Face-to-Face Learning Environments on Students' Gender, Interest and Achievement in Accounting. *Library Philosophy and Practice*. 1875. <http://digitalcommons.unl.edu/libphilprac/1875>
- Van Canegem, T., Van Houtte, M. & Demanet, J. (2021). Grade retention and academic self-concept: A multilevel analysis of the effects of schools' retention composition. *British Educational Research Journal*. <https://doi.org/10.1002/berj.3729>
- Williams, K.M. (2017). John Dewey in the 21st Century. *Journal of Inquiry & Action in Education*, 9(1). <https://files.eric.ed.gov>
- YongNie.(2020). On-line classroom visual tracking and quality evaluation by an advanced feature mining technique. *Signal Processing: Image Communication*. 84 <https://doi.org/10.1016/j.image.2020.115817>
- Yuan, L., & Powell, S. (2013). MOOCs and open education: Implications for higher education. Centre for Educational Technology & Inoperability Standards, Bolton. <https://publications.cetis.org.uk/wp-content/uploads/2013/03/MOOCs-and-Open->

- Zhao, Y. Deng, X and Zhai, S. (2016). The analysis of flipped classroom mode of CIMA financial operation course. 6th International Conference on Electronic, Mechanical, Information and Management. <https://dx.doi.org/10.2991/emim-16.2016.278>
- Zare, M., Sarikhani, R., Salari, M., & Mansouri, V. (2016). The Impact of E-Learning On University Students' Academic Achievement and Creativity. *Journal of Technical Education and Training*. 8 (1). 25-33. <https://publisher.uthm.edu.my/ojs/index.php/JTET/article/view/1152/894>