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A review of engagement strategies for massive open online courses

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ABSTRACT

The United Nations adopted the sustainable development goal of "quality education" as one of its objectives. In emergency teaching and learning amid the outbreak in 2019, the emphasis has been placed on providing a versatile and easily accessible lifelong learning experience to ensure high-quality education. One type of online e-learning course is the massive open online course (MOOC). It provides a free course that may be taken whenever and anywhere. However, difficulties have come up regarding student performance, course completion, and dropping out as a result of quality assurance of e-learning platforms like MOOC. In order to keep students interested in the course until the end, this study will review and recommend MOOC strategies. The strategies in enhancing for MOOC engagement reveals that they include development, collaboration between educators and students, and evaluation. Self-regulation learning is a crucial motivation in retention from dropping out of the MOOC facilitates participation through the utilization of innovative pedagogies, as well as the interaction between students and educators on both the MOOC platforms and social media platforms according to research. Course information and instructional design are also found to attract learners to complete the course. Giving prizes for completing MOOC assignments and tests is an extra choice in retaining from dropping out the course. The contribution of study is MOOC online learning engagement strategies are introduced. By developing a good course design, collaboration between students and educators and evaluation performance based can enhance students' engagement to completion of the course.

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1. INTRODUCTION

The United Nations (UN) has introduced 17 sustainable development goals (SDGs) in 2015, and one of the goals is quality education (SDG 4). The goal is to ensure that inclusive and equitable quality education and promote lifelong learning opportunities for all. In order to achieve this objective, internet technology has improved over time, which enables everyone in the world to have better education without attending the physical classroom. By introducing open and distance learning (ODL) approach, it has transformed conventional teaching and learning (T&L) to modernize education to be more flexible and accessible to meet the needs of 21st-century learners. The ODL offers numerous ways to learn and flexible educational options for access [1]. Flexible means having options for educational endeavors at all times and in all places. All people should have access to opportunities to learn wherever and whenever they wish to study with self-directed motivation.

Online and computer literacy are beneficial for T&L in the new industrial revolution (IR) 4.0 age. Technology based in T&L has shifted from physical to online classrooms incorporated with artificial intelligence, virtual reality, data analytics, and the internet of things (IoT) for interactive educational materials [2]. The embark of IR4.0 nowadays has introduced massive open online courses (MOOC) which enable learning to be evaluated at any time and from any location, from the traditional classroom to advanced instruction. The goal of a MOOC is to provide possibilities for all students from various backgrounds who sign up for the course both on and off campus to study and learn subjects relevant to their career path. Students that register on the MOOCs site can access the MOOC for free. The learning platform is accessible to students at a cheap cost and at their own pace [3]. It is a free learning platform that incorporates the internet and material resources that are taught through a variety of modalities, including video, forum, discussion, and live chat [4].

However, difficulties have come up regarding student performance, course completion, and dropping out as a result of quality assurance of e-learning platforms like MOOC. To have full learning engagement until completion of registered MOOCs, there is interaction between emotional and cognitive domains among students, which ensures the success of self-oriented motivation in the T&L environment as reported by [5], [6]. Adoptation and adaptation of MOOC environments are influenced by factors such as generation [7], [8], innovative technologies or tools based [9], platform contents [10]–[12] in attaining students' retention from dropping out the MOOCs as well as ensuring academic performance. Ability to utilize computer technologies and online tools as well web-based contents are crucial factors in adaptation and adoption MOOCs environment among learners as known performance expectancy [7], [13]. It believes the use of technologies and tools improve their T&L. Incompetencies to the innovative T&L pedagogies has resulted to drop out from the MOOCs. It is important to evaluate on students' learning engagement and satisfaction towards the T&L in the MOOCs environment in assessing academic performance, minimal number of dropping out the MOOCs and quality offered through online learning [14], [15].

Hence, this study aims to conduct a review and propose MOOC strategies in engaging learners in the course until completion. It intends to provide basic preventive measurement on student performance, course completion, and dropping out as a result of quality assurance via online learning by identifying the MOOC strategies. The strategies are beginning to develop in planning and designing the topic contents and learning outcomes, between collaboration among learners and educators. The final strategy is to encourage students' engagement in the MOOC environment by introducing a reward system based on final evaluation performance. The study has limitation on statistical evidence and empirical studies in evaluating the MOOC strategies proposed and do not include other factors such as role of specific technologies, cultural and contextual in technology acceptance, long-term effects of student engagement strategies towards MOOC and academic outcomes.

2. LITERATURE REVIEW

The teaching and learning can now be evaluated everywhere, at any time, and by anybody who is interested in education due to a certain modernism and flexibility. Flexible learning is T&L is becoming increasingly unrestricted by the time, location, and speed of study [16]. For students, flexibility in learning is the ability to obtain information and have flexibility based on at least one of the following factors—time, place, pace, learning style, content, assessment, or learning path [17]. Meanwhile for educators, it can involve choices concerning the allocation of their time and the mode and methods of communication with learners as well as the educational institution [16]. For universities, it is a means of transitioning their T&L from the traditional physical classroom to an online or offline setting, from on-campus to off-campus settings and offering to young and elderly generations to register for the course. This benefits to working elderly staff who taking course as full time or part time students [14], [18].

The global COVID-19 viral outbreak that began in late 2019 has made it necessary for T&L to adopt more flexible through the ODL and e-learning methodologies [19], [20]. The ODL offers numerous ways to learn and flexible educational options for access [1]. It provides advantages for high-quality education, possibilities for lifelong learning, accessibility, and a welcoming atmosphere for learners, professionals, and communities. E-learning is the T&L method that involves using electronic media, usually the internet to gain material course.

The latest advancement in internet technologies enables online courses to be freely accessed and has positively impacted the T&L, for instance by introducing the development of MOOC. Generally, MOOC is known as an online course aimed at limitless participation and accessibility via the internet browser or webpage. The MOOCs offer core modules and learners from other institutions or practitioners' industries. Anyone can participate in those courses by registering through MOOCs online learning platform. The presence of MOOCs in the T&L landscape have reduced the issues of students debt/education fees and sustaining future employment opportunities [21]. It offers convenience for working staff to pursue study part time without leaving their current job in accessing the course resources thoroughly in MOOC platforms at their own pace [18].

Many past studies have been conducted on MOOCs, from the development of course content in the curriculum [22]; Chan *et al.* [23] to adopt the outcome-based education framework into the course and topic learning outcomes [19], [24], [25], learners motivation and behavior [21], [26] and educators interaction and involvement [24], [25], and flexible information management [10]. There are factors affecting learners' engagement in MOOCs from various aspects of the social, economic, political, and societal need for accessible and sustainable higher education. The success of students' engagement in MOOCs depends on: i) course content, delivery, and assessment; ii) learners' motivation and behavior; iii) educators' interaction and involvement; and iv) the platform and system.

The completion and dropout rate of MOOCs in health and medicine students are influenced by the design and development of a MOOC [23]. In order to promote collaborative and engaging learning experienced by learners, social media platforms such as Facebook group become an important platform for communication. The MOOC design features also play vital role in ensuring the engagement among learners' by providing for the quality of the video production, the type of support material, and the learning activities that were used probably increased students' participation in the MOOC completion. Similar findings to the impact of course design on learner course engagement and behavior [27], learners who are persistent and highly engaged achieve better learning outcomes than those who use course materials infrequently due to not interactive course design. In contrast finding by Hew *et al.* [14] where course structure, major, duration, video, interaction have given no significant roles in pertaining learners' engagement in MOOC.

Mayende *et al.* [28] carried out the impact of course design on peer or group online learning has shown positive results to increase individual participation in groups by having well course organized, well designed group activities, clear instruction to activities and friendly tool to support online learning. Giving feedback among peers is also an important aspect to ensure the completion of MOOC course taken. A peer-assessment methodology improved their learning experience but not in assessment evaluation which students prefer to receive feedback from the educators [18], [28]. The learners' behavior in engaging the MOOCs can be explained through the framework of community of inquiry (CoI) showing the interconnected nature of the three presences in shaping students' online learning experience which is teaching presence, social presence, and cognitive presence [21]. The survey instrument from five MOOC courses gives a summary of online students' experiences which, influenced by the factors, were course organization and design (a sub-component of teaching presence), group affectivity (a sub-component of social presence), and resolution phase of inquiry learning (a sub-component of cognitive presence) [18].

Kovanović *et al.* [21] summarized their findings on factors for the completion and success rate of MOOCs due to shorter duration and limited instructor involvement in open MOOCs negatively impacting reaching higher levels of cognitive presence. The fact that there are many students and few opportunities for interaction between students and educators, as well as the importance of course organization and design as a construct distinct from the rest of the teaching presence, are additional factors contribute to disengage online learning. The huge student cohorts and condensed course duration may also contribute to the difficulty in developing affective expressiveness in student group communication in the MOOC platform.

Lu *et al.* [26] conducted social network analysis (SNA) and inductive qualitative analysis on Chinese students' posts from different MOOC courses registered who discovered the behavior of the students is significantly influenced by their background, the course's characteristics, the teacher's direction, and the roles of both content and non-content posts. The study's main weakness is that its results may not be applicable to English-speaking societies because they are only valid for non-English speakers, and because the use of the crawler technique may result in inaccurate original data. Moreover, the learners' behaviors towards MOOC showed a high level of commitment and motivation to learn about the topic through various innovative educational resources, such as videos, learning activities, and interactive animations [23]. Students' motivation and self-regulation capabilities are critical factors in successful non-formal open learning environments such as MOOCs [29].

Educators play an essential role in ensuring completion and success rate in the MOOC by interacting with students for the T&L activities. The learners' and educators' interactions are a crucial factor to self-determined learning engagement in MOOC rather than the professionality and personality of the educators [18]. Learners prefer to engage with educators who are willing to help and show strong commitment to response and giving feedback when needed.

Self-directed learning, commonly practiced in MOOCs, has given a gap between theory and practice in integrating critical thinking into the classroom. Cáceres *et al.* [24] revealed that teachers try to develop students' critical thinking skills by integrating them into subjects by choosing topics that help them better understand the world from different subject-specific practices. The course contents and assessments of MOOCs are designed by educators who understand the level of difficulties in the topics taught and assessments being assessed which reflect real cases or issues through online course [18]. The T&L delivery method in MOOC is applicable through active learning and is connected primarily to the educational method of connecting course material to pertinent real-world examples or cases for adult learners' in embracing self-directed learning [18].

It is important to keep the self-regulation motivation and behaviors of learners from diverse backgrounds of learners in engaging the course until the end [27].

Zhuhadar *et al.* [10] proposed a new generation of MOOCs using SemanticWeb and online social networks. Collaborative semantic filtering technologies, more flexible information management than the current MOOCs' platforms, use content management platforms where contents are organized in a hierarchical structure. It is more efficient information discovery in MOOCs' platforms where all learning resources for instances information about courses, video lectures, assignments, students, teachers are composed from heterogeneous sources.

3. METHOD

The systematic literature review (SLR) described systematically searches for, appraises and synthesizes research evidence, often adhering to the guidelines on the conduct of a review [30]. It is transparent in reporting its methods to facilitate others to replicate the process. The SLR refers to a few methods or steps in achieving the objective of the study, from identifying the problem, searching, appraisal/screening literature articles, validating the quality of literature articles, analyzing and synthesizing the articles according to bibliometric information and content of subject matter [30], [31].

Three primary stages are involved in the SLR process: planning the review, conducting the review, and reporting the review, as shown in Figure 1. Each group in the SLR process requires systematic planning, conducting, and reporting of the study's outcomes. The SLR began in the planning stage [31]. The researchers identify the purpose/objective for a review and research questions to develop a review protocol. Meanwhile, in the conducting review, the researchers identify and select the primary studies, extract, analyze and synthesize data. In reporting the review, the researchers write the report to disseminate their findings from the literature review. The first stage has two crucial steps: step 1 is formulating the problem, and step 2 is developing and validating the review protocol. Moreover, the next stage two is a process followed by conducting the review with a few steps such as a screen for inclusion, assessing the quality or eligibility, extracting data, and analyzing and synthesizing the data. Lastly, stage three is reporting the review of important findings.

It should also be noted that the literature review process can be iterative in nature [31]. The research question and/or review protocol requires modifications when encountering problems during the review. The problem may arise due to broad research question and inclusion criterion. Different review types and associated methodologies [30] are available in the review protocol, selection of literature, and techniques for extracting, analyzing, and summarizing data [31].

This study utilized the preferred reporting items for systematic reviews and meta-analyses (PRISMA) to conduct a SLR on MOOCs environment. Four main steps for PRISMA include; identification, screening, eligibility, and data abstraction. One additional step was the analysis adopted by Xiao and Watson [31] in the study, as depicted in Figure 2.

3.1. Identification of PRISMA flow process

The first step in the systematic review process is identification, which was performed in December 2020. In this stage, research questions and research objectives were identified. This review uses four leading indexed databases: ScienceDirect, Scopus, Web of Science (WoS), and SpringerLink. These four indexed databases were chosen because of their established indexing systems for citations and to ensure the quality of the articles reviewed in this paper. The research published in peer-reviewed journals also has a good reputation and representation of scholarly research in the particular field of study. By using keywords and search strings of “MOOC” and “strategies,” this process yielded a result of 4,432 articles from ScienceDirect, 3,010 articles from Scopus databases, 18 articles from WoS, and 4,567 from SpringerLink databases.

3.2. Screening of PRISMA flow process

The second step is the screening process that includes or excludes articles according to criteria determined with the assistance of the specific databases. In the screening process, eligibility, inclusion, and exclusion criteria were determined to find relevant articles to be included in the systematic review process, as shown in Table 1. After the identification process, there were 303 articles to be screened. The results presented 85 articles after the screening stage that selected articles published from January 2016 to December 2021 and focused on MOOC implementation strategies. The journals that included systematic reviews or review papers, conference papers, proceedings, book chapters, book series, and books were excluded.

3.3. Eligibility of PRISMA flow process

The third step is the eligibility process, where the articles were included or excluded based on the authors' specific criteria. A total of 52 related articles were excluded in both databases for the next phase,

leaving 85 documents for eligibility. This is screened manually for literature focusing on mining accidents and criteria from the earlier screening processes (inclusion and exclusion criteria). The review managed to obtain 33 selected articles related to strategies in the MOOC.

3.4. Data included and analyses of PRISMA flow process

The final step is data included and analysis. The remaining articles were evaluated, reviewed, and analyzed and 33 selected articles (studies) were discussed in detail in this paper. The reviews were based on specific studies that matched the research questions and objectives of the study. The studies were then extracted to identify relevant themes and sub-themes for the current study by reading the title, then the abstracts, and then throughout the full text of the articles. The summary of the SLR process is shown in Figure 2.

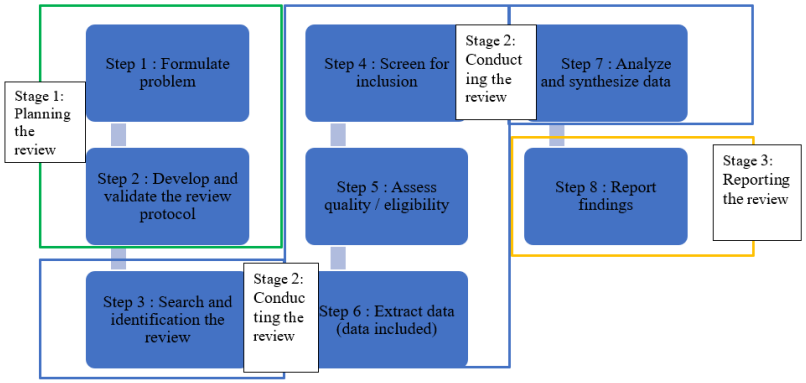

Figure 1. Process of systematic literature review [31]

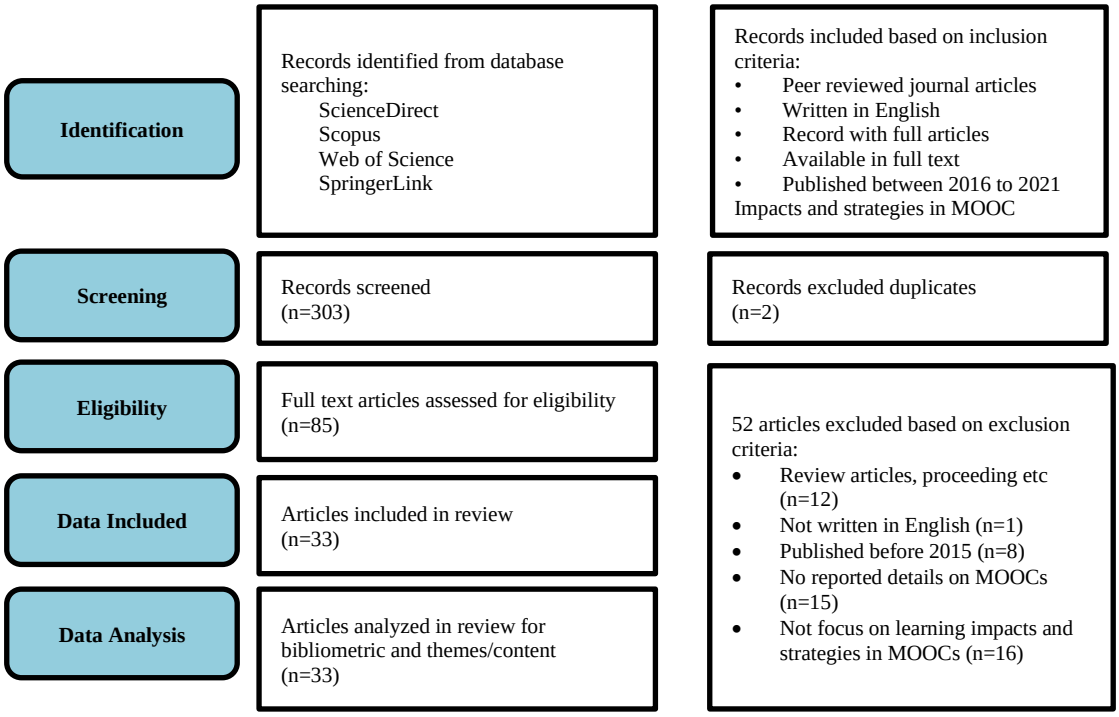

Figure 2. PRISMA flow process of SLR

Table 1. The criteria for inclusion and exclusion

Criteria	Inclusion	Exclusion
Document type	Peer review journal articles (research articles)	Journals (systematic review), review paper, conference proceeding, chapters in book, book series, books
Language	English	Non-English
Publication timeline	January 2016 until December 2021	2015 and before

4. RESULTS

The SLR study is carried out to provide basic preventive measurement on student performance, course completion, and dropping out as a result of quality assurance via online learning by identifying the MOOC strategies. The MOOC strategies proposed comprise of content development, collaboration among learners and educators and evaluation on academic performance until completion of registered MOOC.

4.1. Massive open online courses development

Development of course contents, activities, and assessments are important aspects in the adaptation and engagement of MOOCs learners in accessibility which depends on indicators. Designing educational material and learning technologies can have an implication on students' behavior and performance [32]. Research by Sabjan *et al.* [33] has listed three characteristics in designing quality MOOCs are instructional design criteria, technical criteria and e-assessment. The quality of MOOCs design differs according to course and learner needs. Course content information presentation drives user focus size (behavior), and that cognitive load (a measure of cognitive effort exerted) drives information presentation [32], [34]. Lu *et al.* [26] examined the network structure of different courses in science and engineering, as well as humanities, which is determined by the learners' behavior closely related to the background of the learners or called self-regulation of learning. The self-learning pace showed relationships between the course design factors and learners' intentions for further learning [8]. Retention from dropping out of MOOCs is distinguished by the introductory learning resources and providing scaffolding assessment embedded in the MOOCs [35]. Attention must be given to redesigning quizzes or examinations in open and flexible learning environments for learners.

Lerís *et al.* [11] proposed indicators for implementing an adaptive platform for MOOCs on the promotion of skills related to self-regulation of learning, which is the participant's choice, or on the outcomes in activities previously evaluated, the participant's working pace, which is flexible for accessing contents, or the fact that not all contents are offered at once. Another indicator is that the participant can choose between different difficulty levels in the contents/activities to reach different learning objectives. Thus, study by Barthakur *et al.* [27] introduced six weekly program level learning strategies are intensive, assessment-oriented, highly disengaged, video-focused, moderate engagement, and disengagement in the association between learner engagement and learning outcomes using a new and robust method for assessment of learner online behavior. They found that low and discontinuous use of course components result in inferior learning outcomes compared to persistent and highly engaging learners based on three weekly program level learning outcomes strategies such as consistent, disorganized, and get-it-done.

By introducing a web-based note-taking tool technology on MOOC platform, students self-monitor their learning progress to promote learners' use of self-directed learning strategies [36]. Other factors that brough to the success of self-directed online learning engagement via MOOC are course design, course assessment, course delivery, and course instructors [18]. However, learners' motivation and behaviors that prevent them from finishing the MOOCs are affected by factors such as lack of time, bad classroom experiences with the subject matter, inadequate background, and lack of resources (money, infrastructure, and internet access) [4], [18].

Without instructors and peers, innovative pedagogies used in MOOCs that combined lecture-based and peer-led activities might nevertheless effectively teach [8]. The importance of content and non-content postings in MOOCs on learners' social behavior were highlighted by Lu *et al.* [26] who found that these posts showed heterogeneous differences across science, engineering, and humanities courses. Self-directed learning has become important approach in online learning pedagogy which can enhance learners' digital literacy skill by adopting four elements are input factors, instructional process, output, and feedback. There are also four stages process of self-directed learning are preparation, web-based self-directed learning, post-testing, and certificate approval as reported by Chatwattana [37]. Another important aspect of developing MOOCs is designing student's formative feedback through different formats such quizzes, peer-feedback and simulations. Julia *et al.* [38] conducted qualitative analysis on design theories online learning courses have shown scalable formative feedback and interaction can improve their educational value and quality.

It is profound that the success of MOOCs development in designing the contents, materials, assessments, and feedback so that it offers interaction and collaboration between learner to learner, learner to instructor, learner to platform and learner to content [12]. The quality of MOOCs often relies on interactivity and collaboration supported in the platform however, the MOOCs has mostly lacked interaction among learners and instructors [12], [39]. By appointing experienced instructors to design and develop MOOCs, it hopes to gain more attention from students to interact and collaborate with the contents, materials, assessments, learners, and platforms as well [40]. In addition, an appropriate T&L approach using simulation in MOOCs environment contributes to the growth of users' participation rate, as well as to increase the course completion rate [41].

4.2. Massive open online courses collaboration

Many people from all around the world can access free online courses through MOOCs, where the subject is covered and recorded in advance by academic professionals [42]. By offering learning resources in the form of text, music, and video, collaborative learning sets MOOCs apart from other educational platforms. Twitter, Facebook, and blogs are examples of social networking sites that students use to share experiences and learn from others [4]. Social learning networks would give educators and learners a way to enhance the social learning potential of online learning environments [43]. They formed a group learning in social media networks to discuss and communicate as well as collaborate on specific topics related to course or others [28].

The efficiency of social learning networks in discussion forums accompanying MOOC of a conventional format consists of video lectures and problem assignments [43]. In MOOC, collaboration encourages learning about student-content, student-student, student-teacher, and institutional interactions that may affect course completion and dropout rates [25]. The success of students' academic when there is communication between educators and learners through social media platforms in asynchronous learning environments and live lecture session in synchronous teaching environments [44].

There are personalized characteristics of learners to adapt to MOOC learning based on learning pace, participant preferences, summative assessment performance, interest groups, profiles groups, and social collaboration [11]. Meanwhile, Barthakur *et al.* [27] have categorized the online learner's background into three groups: i) intensive learners; ii) disengaged learners; and iii) selective learners, where diverse groups of learners show different course engagement, motivation, and behavior in MOOCs activities during six weekly strategies. Learners' attitude plays an important role in successful learning of online platform [45]. MOOC learners' social behaviors have related to social engagement and corelated to course completion [46]. However, the learning behaviors changed with interaction to discussion forums in MOOC, which affect epistemic emotions such as the experiences of curiosity, enjoyment, confusion, and anxiety according to Han *et al.* [47] when learning through MOOCs, emotions are present when cognitive equilibrium interacts with new material and prior knowledge. Vorbach *et al.* [39] found that the obstacles in MOOC for digital entrepreneurship education are lack of self-discipline and interaction with others to complete a MOOC.

Despite the self-directed online learning engagement is important on successful of MOOC completion, teaching presence of educators in learners' engagement towards the learning process and completion of MOOCs is part of an important learning process where interaction can be done by responding to content posts such as giving examples, feedback and replying to learners [14], [18], [21]. Learning is reflected in MOOC through automated answers, facilitators, or interactive teachers as reported by Gregori *et al.* [25]. A dynamic teacher engages with students by taking on different roles in commenting modules, remembering resources, promoting social interaction in forums, and giving feedback on students' comments, which promotes self-regulation learning and collaboration among MOOC communities. The interaction and collaboration through forum communication in MOOCs environment have differentiated between visitors and residents as stated by Poquet *et al*. [48], where the range of communication topics discussed by forum visitors seems limited and focused on comparison to the broad spectrum of topics covered by resident posters. Interaction with the instructor of the MOOC is also found to be a significant predictor of MOOC retention [34].

By improving connection and collaboration between academics and NGOs, exploring common fields of work, and facilitating networking among academics, practitioners and students, MOOCs can offer sustainability education for professional learners [49] without leaving their current job for pursuing the study. The same approach by using a MOOC to facilitate attitudinal learning and participation in smart cities in supporting urban change among the organizations and individual's lifestyles [50] with participated in local smart city activities. The strength of collaboration in MOOCs are learners supported each other's, active participation, and positive criticism [51].

4.3. Massive open online courses evaluation

Massive open online courses are an excellent platform to practice student-centered learning pedagogies implementation and evaluation with strong collaboration between evaluators and program developers. Evaluators can gain insight into how they can collaborate with MOOC content developers to create theories of change and use them to focus and prioritize evaluation efforts [52]. A chance to improve MOOC development and evaluation exists when the theory of change is applied. Effective student-faculty communication is directly impacted by MOOCs [42].

Massive open online courses evaluation consists of analyzing the performance of students engaged in the MOOC and rewarding them upon completion of the course. The evaluation is based on learning outcomes such as course completion, engagement with videos and activities, sociability, and learning gains. According to Chesniak *et al.* [52], MOOC evaluation primarily centers on participation, persistence, content-based quizzes and assessments, online engagement, clickstream data, and interactions between participants within the course. Alhazzani [42] found that most of King Saudi University's respondents think that MOOCs directly impact

educational outcomes. The MOOC completers and non-completers concerning the rank of motivators for enrolment and the rank of learning activities for participation as stated by Lan and Hew [18].

In order to increase learners' engagement in MOOCs, Ortega-Arranz *et al.* [53] introduced reward-based strategies and analyzed the effect of rewards in MOOC environments. In the gamification course, there is no significant effect on student retention and behavioral engagement measured through the number of page-views, task submissions, and student activity time with the reward-based strategies. In addition to the strategies, learners can earn a certificate upon completion of contents, activities, and assessments evaluation. By giving motivation and rewarding learners' achievement in MOOCs has ensured that sustainability course offered by providing innovative education strategies such as make use of innovative tools and having digital abilities and skills [48]. The acceptance of MOOCs evaluation is based on application of task-technology fit model, social motivation, and self-determination theory [54], [55] especially in developing countries.

5. DISCUSSION

Massive open online courses have been proven convenient online courses to participate in T&L anywhere in the world providing good facilities and technologies in achieving quality education for SDGs. However, it is difficult to retain learners from disengagement while online or offline learning until achieving completion certificate. Thus, it is impossible to monitor and evaluate academic performance and quality assurance of courses offered. Several studies [7], [11], [20], [22] have focused on different strategies of MOOCs engagement among learners. This present study proposed strategies by grouping attributes for MOOC development contents, collaboration among learners, educators, and platforms and finally evaluation on engagement towards completion all activities given.

As far it is considered that implications towards educational institutions, practitioners, and policymakers, it is found the importance of identifying best practices and strategies to adopt and adapt before developing MOOCs. It is covered like as factors for determining profiles of leaners and educators background, learning outcomes, T&L pedagogies through online platforms, assessment types and rewarding for academic achievement. An interactive contents and innovative technologies have potential to enhance learners in achieving learning outcomes and performing an excellence academic [7]. A guideline for standards is established by policymakers to improve implementation of ODL and MOOCs in educational institutions which providing definitions and instructions to follow as reported by Hasan *et al*. [13]. Apart of it, by giving the rewards, it ensures retention and dropping out from completion the registered courses by learners [9], [54].

Successful of MOOCs engaged in online platforms by ensuring that guidelines are given as well as course description at homepage platforms. Instructors and peers' information are also important for leaners to communicate and engage when needed [25], [44]. It also recommends to educators to provide basic course contents relevant to its assessments according to pedagogies bloom taxonomy with proper design at appropriate weightage with time frame for self-pace learning.

6. CONCLUSION

The MOOC strategies proposed comprise development, learners, educators, and system developers' collaboration and evaluation. The course info and instructional design attract learners to complete the course, self-regulation learning is an essential motivation in retention from dropping out the MOOC, and the interaction between learners and educators via MOOC platforms and social media platforms with innovative pedagogies helps in engagement. In addition, giving rewards for the finishing of MOOC activities and assessments is an additional option. The study's implication is to get feedback from learners who gain experience from MOOC on their thoughts and effectiveness of the course to academic achievement performance. The study has limitation on statistical evidence and empirical studies in evaluating the MOOC strategies proposed and do not include other factors such as role of specific technologies, cultural and contextual in technology acceptance, long-term effects of student engagement strategies towards MOOC and academic outcomes. Future studies could be done by engaging these MOOC strategies for continual quality improvement on MOOC development for better conceptual design on contents, assessments, and learning activities offered.

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