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Review

The Power of Using Emerging Technologies in MOOCs: Accelerating Globalization in Higher Education

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ABSTRACT

The purpose of this paper is to present the use of emerging technologies in MOOCs as a practical remedy to facilitate the globalization of higher education by alleviating many of the challenges that institutions encounter while establishing international compatibility and competitiveness. The globalization of higher education is important for 21st-century institutions to build up an international reputation. However, it is not an easy process of beginning an international initiative to become a globalized higher institution. It is crucial for universities to ensure meeting the current needs and demands of national and international students by enhancing the quality of programs, increasing graduate employability and providing contemporary technological infrastructure. There are also various uncertainties that might influence the pace of globalization in higher education. The use of emerging technologies potentially helps higher education institutions alleviate many of the challenges such as cutting the cost of educational expenses without compromising the quality of educational experiences and struggling with the establishment of international educational hubs.

Globalization in Higher Education

Globalization, “an accelerated process of multidimensional changes encompassing the fields of economy, finance, science and technology, communications, education, culture, and politics” (Gacel-Avila, 2005, p.121), has a profound impact on higher education in the 21st century (Altbach, Reisberg, & Rumbley, 2009). The mainstream of international tendencies has always affected universities, e.g. English becomes the dominant language of scientific communication or information and communication technologies are used as a universal means of scientific communication (Altbach et al., 2009). In this sense, universities are able to efficiently respond to contemporary demands of global issues and adapt to their ongoing, changing and evolving environment. Therefore, universities can respond to global changes and lead to the changes in the right direction such as producing greater equity and fairness instead of supporting an imperial system of government (Sumner, 2008). However, globalization arguably has its benefits as well as challenges at issue among academics (Nugroho, 2012).

One of the important difficulties is access to different nations in global education. Global access requires universities to be competitive in many forms of providing education such as international branch campuses, foreign academic degrees, and online programs (Job & Sriraman, 2013). Cooperating with international partnerships alleviates the burden of universities to meet this requirement (Altbach et al., 2009). It is considered as one of the vital requirements to keep up with international trends. Because the globalized universities can recruit students by constituting international educational places and bridges (Braverman, 2013). In addition to that, universities have to satisfy the high demand for hiring globally competitive knowledge, adaptable, and flexible faculty members (Walker, 2009) and providing expanded technological infrastructure for faculty and students (Altbach et al., 2009).

Globalized universities should become compelling, prestigious institutions so they can entice students to attend. To do so, they provide high quality programs and degrees and eliminate such deficits in curriculum, instructional materials and staff (Job & Sriraman, 2013). For instance, Job and Sriraman, (2013) state that although monthly wages of foreign staff are higher than local staff and different wages between them cause a problem, universities should hire competent international staff to reach international students. Also, universities can be competitive in global education by having distinguished academics, outstanding students, and prestigious status (Walker, 2009). Building contemporary facilities including comprehensive laboratories, libraries and innovative information and technology infrastructures is necessary to retain current students and recruit prospective students. Universities of non-English speaking countries meet the demand of establishing programs and degrees in English to draw international students’ attention (Altbach et al., 2009). In this sense, social media marketing skills play an important role to promote the institution for prospective students. Universities need to have updated and lively websites, and active and attractive pages on social networking sites such as Facebook and Twitter in an organized way (Braverman, 2013). Therefore, universities can be recognizable to offer a creditable degree in international education.

In order to constitute international education, there should be national policies to remove all types of governmental restrictions in accordance with a global authority. As cited by the 1998 Paris Conference GATE, governmental legislations are likely to restrict internationalization. As Van Damme (2001, p. 430) points out several categories of governmental legislation as follows:

"(a) National legislation and higher education policy (i.e., discrimination)
(b) Qualifications authorities and policy (i.e., recognizing foreign educational degrees)
(c) Customs (i.e., cross-border educational materials)
(d) Visas (i.e., difficulties with getting visa for students or teaching/administrative staff)
(e) Telecommunication laws (i.e., Internet limitation)
(f) Intellectual property rights (i.e., national policies for Intellectual property rights in accordance with international policies)".

In addition to comprehensive national policies on ensuring the quality of institutions, good governance addresses human rights, free choice of one's own acts, setting consistent budget practices, and close cooperation with other nations. These issues are indicated in The World Bank Task Force on Higher Education and Society's report as cited in Job and Sriraman, (2013, p. 91):

(a) Academic Freedom
(b) Shared Governance
(c) Clear Rights and Responsibilities
(d) Meritocratic Selection
(e) Financial Stability
(f) Accountability
(g) Regular Testing of Standards
(h) The importance of Close Cooperation

Altbach et al. (2009) stated that cost remains one of the biggest obstacles to cope with these challenges. Universities begin looking for new funding opportunities for higher education because of additional monetary responsibilities. Universities, specifically western universities, consider globalized education as a business and focus on making a profit in the ways of providing education (Braverman, 2013; Job & Sriraman, 2013). Because of this reason, programs and disciplines offered in universities are subjected to the pressure of extra responsibilities for commercialization revenues (Walker, 2009). The attempt to increase revenues directly has an impact on increasing tuition and establishing new fees for students. Also, universities seek new ways to reduce cost so they put finding innovative new patterns to improve educational quality on the back burner (Braverman, 2013; Job and Sriraman, 2013). As a result of that, the quality level of education has gradually deteriorated (Altbach et al., 2009).

MOOC

Massive Open Online Course (MOOC) is a new extended and open form of online learning that has been the recent trend in Higher Education. Definition of MOOC can be done by identifying the meaning of each letter of MOOC. "Massive" can be elucidated as courses designed for large numbers of participants; "Open" can be elucidated as accessible and open to everyone who has an internet connection without any restrictions; "Online" can be elucidated as delivering complete course experience online; "Course" can be elucidated as educational content with all course materials (OpenupEd, 2015). The first MOOC was launched with over 2200 registered course participants at the University of Manitoba in 2008 (Mackness, Mak, & Williams, 2010). After its inception, prominent universities such as Stanford, MIT, Harvard and so on, began delivering MOOCs on their own or in partnership with one of the new platform and content providers such as Coursera, Udacity, NovoEd, EdX, and so on. Therefore, MOOCs have become a worldwide phenomenon and attracted thousands of participants around the world. 2012 has been declared as "the year of the MOOC" (Pappano, 2012), which was another great indication of making MOOCs recognizable in the world.

The benefits and challenges of MOOCs are widely debated among academics. Providing free university level education is mostly cited as one of the benefits (Barnes, 2013; Ong & Grigoryan, 2015). The elimination of traditional boundaries enables not only MOOC participants to attend online courses anywhere and anytime, but they can also take advantage of an elite education at famous universities. Furthermore, MOOCs provide free course content such as e-books, PowerPoint slides and even recommended books in addition to offering free registration of courses (Barnes, 2013). MOOCs have a promising future with providing free education to an unlimited number of international participants, which intend to exceed 1 billion learners target to exceed in the next decade (Freitas, Morgan, & Gibson, 2015). Therefore, MOOCs democratize education by reaching enormous numbers of people who look for gaining or broadening learning experiences (Sari, Bonk, & Zhu, 2020).

MOOCs are considered as an intriguing opportunity that enables independent learners, university students and professional learners to support their learning needs (Freitas et al., 2015). They entice learners from a variety of backgrounds by providing high quality learning resources (Anders, 2015). Although learning recourses differ from a MOOC to another course, MOOCs are commonly geared with short video lectures, publications (books and articles), a study guide or syllabus, quizzes, and social interactions through social media channels. While online learning plays important role in supporting lifelong learning, MOOCs, considering the next step of online learning, will positively have a huge impact on lifelong learning with their attractive nature (Steffens, 2015). For instance, MOOCs offer relatively a short term learning adventure in which eager learners can either enhance their knowledge and skills, advance in their professionality, or satisfy their curiosity.

New forms of massive online courses have been embraced by large masses because they promise increasing access to education in response to the expanding demand in higher education (Brown, Costello, Donlon, & Giolla-Mhichil, 2015). Such claim has been verified by Kartensi (2013) who made a review of more than a hundred studies and found that MOOCs can address problems of access to education besides building learning communities. MOOCs' potential related to easy access to education makes difference in the life of millions by giving a chance to strengthen their competence while traditional institutions can impossibly cope with a large number of prospective learners (Schuwer et al., 2015).

MOOCs have been seen as an innovation in education, which can reduce the costs of university education (Pappano, 2012; Brown et al., 2015). Even they can be considered as a new business model by politicians as decreased public funding for universities (Schuwer et al., 2015). In this sense, the economics can be improved by decreasing costs while increasing revenues.

As it has been stated that MOOCs can reach large and diverse international students. Holland and Tirthall (2014) stated that universities can raise their visibility and build their worldwide brand through reaching large national and international prospective students. Universities can make their names recognizable in the global marketplace through being in partnership with a range of global MOOC platforms by offering free various courses (Schuwer et al., 2015). Overall, MOOCs can help the universities create their brand and maintain their names in the global higher education marketplace.

Although MOOCs have been exalted as the latest panacea for higher education, several issues in MOOCs are criticized by many. One of the prominent challenges is the very low course completion rate (Zhang, Bonk, Reeves, & Reynolds, 2020). Even the further criticism is that the minority of MOOCers can complete course among all participants, and those are well educated and live in developed countries (Fischer, 2014; Macleod et al., 2015) although one of the promises of MOOC is to reach people who are deprived of educational opportunities in undeveloped countries because of multiple reasons such as costs of education. Also, MOOCs have another important problem that there is no accreditation upon completion of courses (Steffens, 2015; Freitas et al., 2015) even though MOOCs look for participants with serving free education for everyone without requiring background knowledge and skills through an advertisement slogan "all are welcome!". Another issue is arguably stated that the instructor(s) have to devote plenty of time to designing a MOOC without eliciting extra credit or receiving support (Ong & Grigoryan, 2015). A further criticism is that participants are unengaged, unmotivated and uncommitted in MOOCs (Freitas et al., 2015) because of the challenges of designing MOOCs such as blogs, chats and forums are not well organized (Steffens, 2015). In addition to that, participants have to be autonomous learners (Steffens, 2015) because of lack of interactivity, limited feedback, and ineffective assessment (Freitas et al., 2015). Another concern is the appropriateness of MOOCs for requiring real life experiences. For instance, Ong and Grigoryan (2015) claimed that if learning content requires real life practices such as interacting with types of machineries, instruments, or animals, MOOCs are not appropriate for teaching the content. Furthermore, some argue that the challenge is copy right issues in MOOCs because of their openness and online content (Steffens, 2015).

Emerging Technologies

Technology can be a powerful tool to build a bridge for equity and accessibility gaps, provide collaborative and authentic learning experiences, and meet individual learning needs. Particularly, emerging technologies can provide opportunities to alleviate many of the challenges in the higher education system and reinvent learning approaches to enrich the higher education system (Ahalt & Fecho, 2015). Understanding the benefits of emerging technologies in the higher education system help universities and colleges not only recruit new students but also retain high-quality students. In this sense, these technologies can be employed in higher education and therefore, universities and colleges have extra power to respond to contemporary demands of global education and be competitive among globalized institutions in the world.

Plenty of good reports such as The NMC horizon report (2016), RENCI (2015), and National Education Technology Plan (2016) explore the emerging technologies. Although these latest technologies seem to be endless, some of them can be used in MOOCs and when they are carefully designed and meticulously employed in MOOCs, they can be a potential remedy to help universities and colleges overcome the challenges of globalization in higher education. Table 1 shows these technologies with their concise explanation.

Table.1 Emerging Technologies

Emerging Technologies	
Electronic publishing	Electronic Publishing is the digital publication of quality documents such as e-books containing text, graphics, charts, pictures, etc. and generates a dynamic and interactive learning experience by means of hyperlinks to additional resources (Ustun & Tracey, 2020).
Qualified Self or Wearable Technology	"*Wearables can gather data—from the body of the wearer or from the environment—or provide information, or both*" (EDUCAUSE, 2013). This technology can be used for data acquisition for users to provide them information such as medical help

Telepresence	"*3D telepresence is demonstrated by taking multiple images from one location and transmitting the information via Ethernet to another location where the hologram is printed with the quasi-real-time dynamic 3D display*" (Blanche et al., 2010, p. 80). Virtual reality technology enables using a form of remote conferencing to improve teaching, learning and administrative efficiency. Telepresence supports 2D and 3D.
Semantic Web applications	"*Semantic-aware applications and linked data are intended to assist with searching and discovery, making intellectual or social connections, and advertising*" (Johnson, Adams, Becker, Estrada, & Freeman, 2014). They are used to enable users to find only the most relevant information they search for.
Syndication Tools	Syndication tools enable content producers and readers to automatically access and distribute content in a flexible and powerful manner (EDUCAUSE, 2014).
Digital Badges	Digital badges show a validated representation of a person's accomplishments, skills interests or affiliations containing metadata including links to the context of such activity (Gibson, Ostashewski, Flintoff, Grant, & Knight, 2015).
Learning Analytics and Adaptive Learning	"*Learning analytics is the process of collecting, measuring, analyzing and reporting data on the context of the learner and the learner's engagement with learning with a view to optimizing both*" (Atkinson, 2015, p.2). Adaptive learning is responsive and predictive learning to optimize pedagogies and provide personalized learning through learning analytics.
Mobile Learning (mobile apps)	Mobile learning enables learners to learn anytime, anywhere by taking advantage of mobile and handheld technological devices (O'Malley et al., 2003; Ustun, 2019).
Open Content or Open Licensing	Open Content and open licensing give rights to users to freely utilize materials and software but not necessarily allow modification and redistribution of them (Frantsvog, 2012).
Virtual and Remote Laboratories	Virtual and remote laboratories are designed to provide hands-on learning experiences in a distance teaching environment in which students have opportunities to carry out experiments from any time and any location (Jara, Candelas, Torres, Dormido, & Esquembre, 2012).
Crowdsourcing	Crowdsourcing is any type of Internet-based collaborative activity performed by a large number of people who have different skills or thoughts (Estellés-Arolas & González-Ladrón-de-Guevara, 2012)
Social Networks	Social Networks allow users to share, organize, and find content and contacts in a powerful way (Mislove, Marcon, Gummadi, Druschel, & Bhattacharjee, 2007).
Augmented and Virtual Reality	Virtual reality is "*a computer-generated simulation of a 3-D environment that users can interact with in a seemingly real or physical way using special electronic equipment, such as a helmet with a screen inside or gloves fitted with sensors*" (Zhang et al., 2018, p. 138) and augmented reality superimposes a computer-generated simulation of a 3-D over a real-world environment (Azuma, 1997).
Information Visualization	Information visualization is the interactive graphical representation of abstract data to aid to deepen understanding (Card, Mackinlay, & Schneiderman, 1999).
Affective Computing	Affective computing recognizes, interprets, processes, and simulates users' emotions and dispositions of users during human-computer interactions (Rukavina et al., 2016).
Natural User Interfaces	"*Natural User Interfaces are types of interfaces, which provide the ability to communicate with various devices in a natural way for human beings*" (Jagodziński, & Wolski, 2015, p.18). These interfaces enable human-computer interaction by recognizing and interpreting input from humans such as touching like taps and swipes, hand and arm motions, body movement, and natural language.
Speech-to-Speech Translation	Speech-to-speech translation is a technology for instantly translating conversational spoken phrases from one language to another language to allow persons to communicate with each other (Yun, Lee, & Kim, 2014).

Virtual Assistants	A virtual assistant application is a life-like computerized simulation that is capable of recognizing human voice and serves as assistance (Cooper et al., 2014).
Computerized grading	A software program based on machine learning and artificial intelligence makes computerized grading possible by calculating what a human grader possibly gives a grade for student essays (Strauss, 2013).

These concisely elucidated emerging technologies that can be integrated into MOOCs have a great potential to mitigate many of the challenges encountering today's globalized higher educational institutions and assist faculty to cope with a huge group of students as well. While some of them can reduce educational costs to make getting education accessible for those who have an enormous financial hurdle, others can be utilized to create new international educational hubs for the universities and colleges that desire to be a globalized institution. In this sense, the emerging technologies can be categorized in terms of how each of them can be utilized to deal with the difficulties of globalization in higher education and strengthen the usefulness of it. Table 2 provides an overview of categorized emerging technologies that can be applied to overcome the challenges and enhance the benefits in globalized educational institutions.

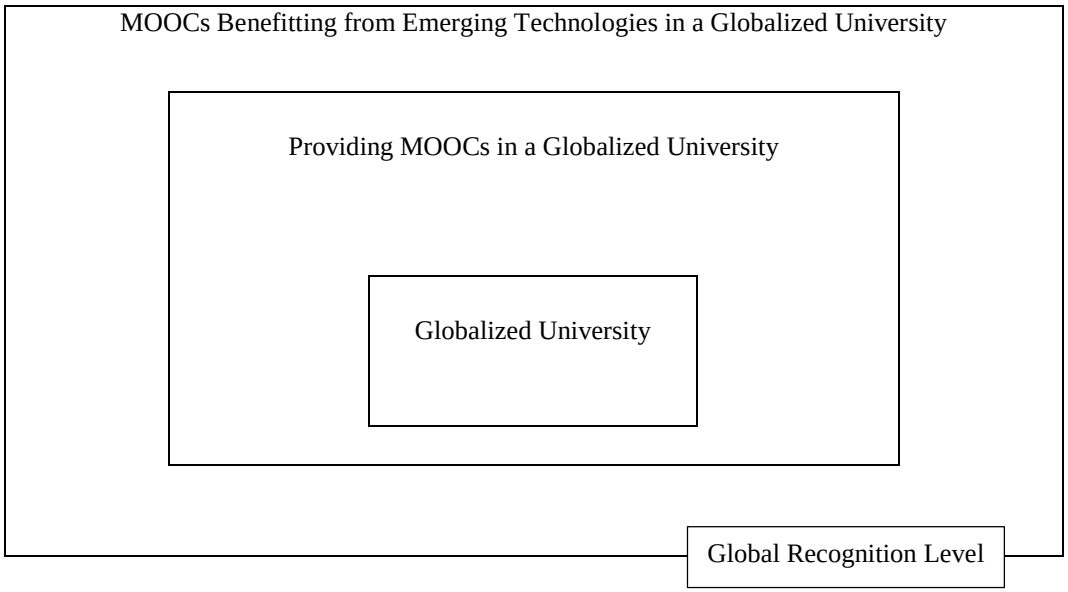
Table 2. The Use of Emerging Technologies in MOOCs to Thrive Globalization in Higher Education

Emerging Technologies	**Globalization in Higher Education**	
	Dealing with Challenges	**Offering Benefits**
Electronic Publishing Digital Badges Virtual and Remote Laborites Telepresence Augmented Reality Information Visualization	• The budget deficit in increasing quality of programs or degrees • Low quality of curriculum, materials and staff • Requirement of ideological, political, economic, and sociological changes • The demand and need for having adaptable and flexible faculty and staff who are able to excel in the global environment • The need for nurturing the students as globally competitive knowledge individuals. • The demand and need for expanded infrastructure • The governmental budget deficit in providing educational resources	• Reducing educational cost to cope with the barriers of accessing education • Shifting old technologies with advanced technologies • Designing and enacting innovative pedagogical approaches for academic support • Distributing knowledge, talent, and wealth around the world
Social Network Crowdsourcing Mobile Learning Syndication Tools	• The need for a larger teaching corps and • Requirement of creating international educational hubs to build foreign academic degrees and online programs, and recruit students • Under the pressure of commercialization and accountability • The need for playing a part in social media marketing • The desire to remain active in social network	• Being competitive to get funding, recruit good students, become a prestigious university in the global environment • Creating updated and lively web pages to entice prospective learners • Designing and enacting innovative pedagogical approaches for academic support • Cooperating with international partnerships

Affective Computing Natural User Interfaces Virtual Assistants Wearable Technologies Semantic Applications Speech to Speech Translation	• The demand for increasing quality of programs or degrees • The demand and need for having adaptable and flexible faculty and staff who are able to excel in the global environment • The need for nurturing the students as globally competitive knowledge individuals. • Under the pressure of little or no time to complete tasks	• Shifting old technologies with advanced technologies • Designing and enacting innovative pedagogical approaches for academic support • Assisting students to able to be responsible for their improvement in the globalized environment
Learning Analytics and Adaptive Learning Computerized Grading	• The difficulties in being an instructor teaching an enormous group of learners • The demand and need for having adaptable and flexible faculty and staff who are able to excel in the global environment	• Designing and enacting innovative pedagogical approaches for academic support • Providing personalized feedback
Open Content and Open Licensing	• Inherit problem of thinking about profit over quality in the globalized environment • Cost cutting practices resulting in a deterioration of quality	• Reducing educational cost to cope with the barriers of accessing education • Distributing knowledge, talent, and wealth around the world

It is easily recognizable to require universities and colleges to be competitive in today's globalized educational market. Institutional strategies have addressed the problems of globalization of higher education such as mitigating the challenges and meeting weaknesses. Also, it is likely to take firm steps toward increasing a global recognition level for a university by reinforcing the benefits of a global university. In this sense, the employing MOOCs may have powerful capability to meet the desire for extending the global recognition level of a university. Furthermore, the integration of the emerging technologies in MOOCs can be the latest panacea to exponentially extend the global recognition level of a university. Figure 1 shows the global recognition level of a university.

Figure 1. Global Recognition Level of a University



As it is seen in Figure 1, a globalized university can be recognized more when it offers MOOCs. It is likely to increase the reputation of universities by employing emerging technologies in MOOCs. For instance, adaptive learning, learning analytics and computerized grading are techniques that can be utilized to design and implement a MOOC in which novel pedagogical approaches can be offered for students to meet their unique learning needs. Computer algorithms can be utilized to regulate interactions between student-content and provide learning activities and resources according to each student's interactions, learning analytics can be used to provide personalized feedback according to addressing each student's learning needs and a computerized grading system effectively and timely gives automated grades for the vast number of participants with less effort (Karaoglan Yilmaz & Yilmaz, 2020; Yilmaz & Karaoglan Yilmaz, 2020). In this sense, the use of emerging technologies is likely to meet students' immediate and growing demands, provide a more meaningful learning experience, heighten the quality of MOOCs and increase the course completion rate. Therefore, the enhancement of MOOCs with emerging technologies potentially attracts more students from across the globe, helps

universities become a widely recognized and reputable institution and makes universities more competitive among globalized institutions in the world.

CONCLUSION

This article presents the potential of using emerging technologies in MOOCs to accelerate the globalization of higher education. Educational institutions have the opportunity to apply emerging technologies in MOOCs for increasing reputations, enticing talented students and recruiting intellectual academics over the globe. The use of these technologies helps institutions alleviate many of the challenges such as cutting the cost of educational expenses without compromising the quality of educational experiences and struggling with the establishment of international educational hubs. Besides, the use of them provides several benefits for institutions to become globalized institution. For instance, it is likely to distributing knowledge, talent, and wealth and meeting the educational needs of all societal classes around the world through MOOCs reinforced with these technologies. Therefore, Offering MOOCs with utilizing emerging technologies have great power to bring equity and fairness for national and international students. As indicated by Sumner (2008), sustainable globalization can be achieved by taking advantage of using emerging technologies in MOOCs.

Ethics and Consent: Ethics committee approval is not required as it does not involve clinical researches on humans as well as it does not contain Retrospective studies in accordance with the Law on Protection of Personal Data

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