Disruptive Education: Implications for Higher Education in Vietnam

Tung Cu*, M. Ruhul Amin

Higher education (HE) is entering a turning point, as there is a prediction that over half of the U.S. universities will fail within fifteen years due to disruptive innovations of technology-enhanced education in general and the massive open online courses (MOOCs) in particular. Will these innovations change how we teach in the future? The purpose of this paper is to examine the MOOC provision in the context of Vietnamese higher education and propose new business models that integrate MOOC platforms into the institutional platform in response to changing demands of the education market. To this end, we apply the theory of disruptive innovation and perform a comparative case study of a data-driven confirmation model at a national scale. We found that MOOCs teaching and learning platforms play a disruptive role to change the process of higher education significantly and that the theory of disruptive innovation is applicable on a national scale. However, the pattern of radical changes does not exactly follow the theory of disruptive innovation. Disruptive education is scalable but under certain necessary and sufficient conditions. The paper proposes consistent higher education policies, and new business models for the traditional universities to cope with future challenges and gain competitive advantages in the global education market.

Keywords: Disruptive Innovation, MOOCs, Higher Education, E-learning, Vietnam.

1.Introduction

"Online education will only get better, and will only look more attractive relative to existing higher education options"
Alex Tabarrok

Higher education is entering into a crucible rapidly. There is a prediction that over half of the U.S. universities will fail within fifteen years due to disruptive innovations of massive open online courses (MOOCs) (Lucas Jr, 2018). Will these open learning innovations change how we teach in the future? The purpose of this paper is to examine the provision of MOCCs within the context of Vietnamese higher education and propose new business models that integrate MOOC platforms with institutional platforms to respond to the fast changing demands of the education market.

The commercialized Internet was made available to the public in 1995 (Banks, 2008). It had caused massive disruption in everything we do and use in our life. The Higher Education sector (HE) was not an exception. The Internet has transformed the traditional classrooms into a new way of learning via distance education medium.

Although the very first version of distance education/ learning was inferior to face-to-face (F2F) learning, the platform did and still does appeal to certain group of learners who for reasons of personal convenience, did not or still do not favor the option of attending traditional classes (Seaton, Bergner, Chuang, Mitros, & Pritchard, 2014). As this group of learners increases in size, the MOOC platform – an innovation for low-cost online learning technology, continues to receive greater attention from the governments,

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HE institutions and private organizations since its inception in 2011 (Patterson, 2016). However, the quality of early MOOCs was questionable as they primarily focused on the economics of education. In addition, the main criticism of MOOCs stems from the efficacy of the model in meeting the demands of the mainstream (F2F) higher education. Such a criticism is intelligible in the context of more or less rigid (F2F) method of knowledge delivery system continuing over centuries (Compeau & Pevzner, 2015). Resistance to change has been normal state and especially so at the institutions or systems with strong faculty unions (Christensen & Eyring, 2011). As for today and the immediate future, the breakthrough technologies such as Artificial Intelligence and Internet of Things are expected to significantly improve the quality of online learning platforms and, as such, they can (and will) radically change the service of higher education (Waters, 2015).

Recent research shows inconsistencies and gaps in explaining the role of MOOCs. Some scholars provided evidence that new models of MOOCs have produced a wave of disruptions on HE at a number of U.S. universities and have caused enrollment decline especially at small private HE institutions (Gallagher & Garrett, 2013). Others argue that the new paradigm is just a "hype", and not the main change agent (Abel, 2015). In addition, the scholars in support of MOOCs as disrupting change agent solely relied on the volume of enrollment rather than the HE structure. They also fail to provide empirical validation with significance, sustainability, and the magnitude of the changes/disruptions attributed to MOOCs.

To address the inconsistencies and gaps in the innovation research of distance education/online learning, this study uses the theory of disruptive innovation. To suit our scope of research, we extended the application of the theory to the public sector, and on a national scale. According to the theory, a disruptive innovation may initially lack certain features or capabilities and only appeals to underserved learners (Christensen, 1997). However, eventually, the innovative learning service with a higher performance trajectory outperforms the existing learning service to attract mainstream learners and completely redefines the HE industry. This is the main research proposition on which this paper is written.

The theory of disruptive innovation has become a powerful explanatory tool for the significant changes and shifts in various industries. Disruptive innovation has been defined as the process by which a sector previously served by a few complicated, expensive, and inaccessible products and services is transformed into the one characterized by a simple, affordable, and convenient solution (Christensen et al., 2011). The process redefines the solution in a simple and often convenient form at first, and then continuously improves to handle more complicated problems. The new solution gets widely accepted and it continues to gain market share over time (Christensen et al., 2011).

To further validate the inherent logic of the research proposition regarding the nature of disruptive education, we carry out a comparative case study of a data-driven confirmation model at a national scale. The study help us address the main reason for discrepancies in the previous studies – that they failed to identify sophisticated conditions that are necessary and sufficient to articulate a radical innovation. Specifically, **the first step** is a comparison of transformation in both private and the public sector institutions or between systems of institutions in the U.S and Vietnam (VN). This step can identify the impact of innovations in for-profit vs. non-profit business models within the context of diverse governance structures. Critical analyses are also applied to different trending versions of online learning: MOOC, SPOC (small private online course) and MAIT (massive adaptive interactive text). **The second step** is to compare structural and functional scope of changes in the U.S higher education with that of Vietnamese higher education, irrespective of the cultural and policy differences between the two countries.

We have found that the reason for discrepancies in the previous studies is that they failed to identify congenial conditions *necessary* and *sufficient* to articulate a radical or disruptive innovation. In this study, we argue that breakthrough technologies- MOOC Platforms for education can play a disruptive role to change the process of higher education significantly and that the theory of disruptive innovation is therefore applicable on a national scale. However, the pattern of radical change may not exactly follow the theory of disruptive innovation. The disruptive innovation in education although is scalable, but takes place under congenial necessary and sufficient conditions. We propose that congenial higher education policies and the proposed new business models for traditional universities both necessary and sufficient conditions to cope with future challenges and gain competitive advantages in the global education market.

2.Theory of Disruptive Innovation

Christensen and Bower (1995) originally introduced the theory of disruptive innovation while conducting research on innovation. They attempted to explain why do so many incumbents fail to keep their leadership positions from one generation to the next especially when faced with an intrusive new technology? Disruption describes a process whereby the intrusion with fewer resources migrates its business from low-end or unserved to the mainstream markets and is able to successfully challenge the leading incumbent (Bower & Christensen, 1995). The authors classify innovations into two categories: sustaining and disruptive. Most product and service innovations belong to the first category. Sustaining innovations usually rely on incremental improvements to existing technologies. Disruptive innovations, on the other hand, occur when a technological revolution

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unexpectedly replaces an established technology with a completely
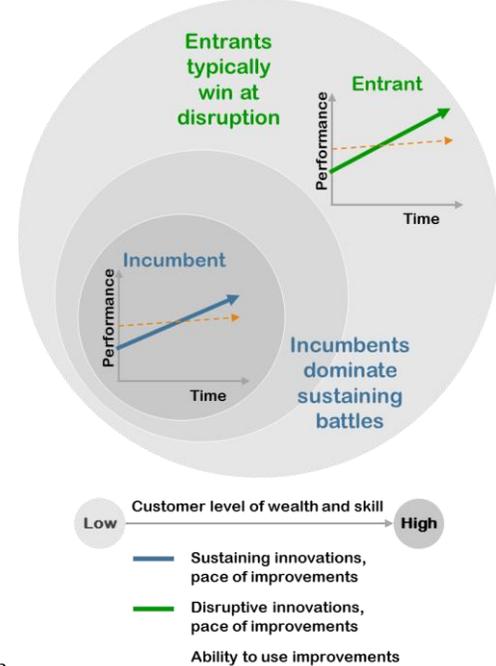
new one.
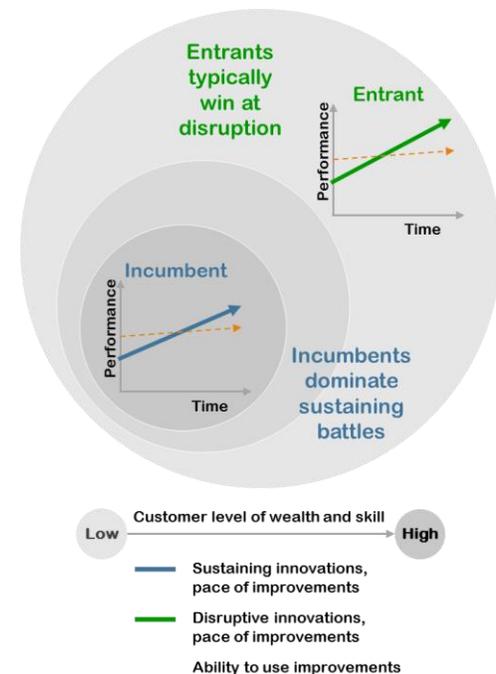Figure **1** depicts sustaining and disruptive innovations.

Figure 1 Sustaining and Disruptive Innovations (Christensen et al., 2011).

In the above diagram, there are several circles indicating customer segments with different levels of wealth and skills ranging from low (brighter) to high (darker). The vertical axes in the graph reflect product performance, which can vary over time (reflected in the

horizontal axes). The model consists two main trajectories of product or service performance. The first trajectory of performance depicted in
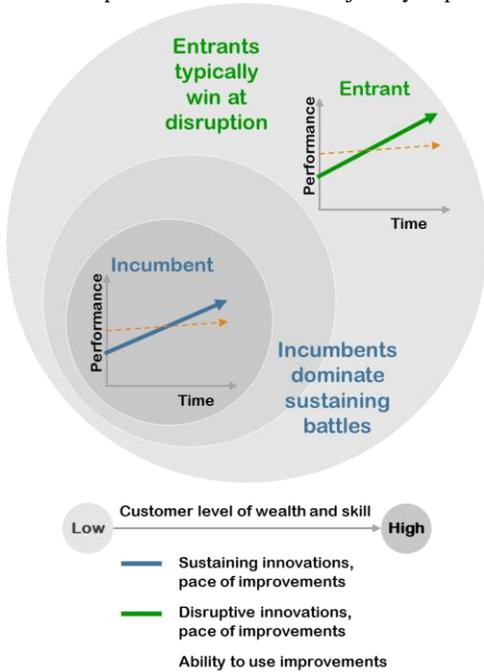

Figure **1** as the dotted line in the graph in the inner circle represents the average customer's ability to utilize improvement in every market over time. The second trajectory in the model is the pace of technological progress in each market. This is represented by the solid line that slopes more steeply upward. It is important to note that the pace of technological progress almost always outstrips what customers want. The intersection point of the dotted line and the solid line marks the beginning of triumph of disruptive innovation in gaining customers' acceptance and moves upwards to the right signifying wide acceptance by the main stream of customers.

This model suggests that the history of most industries can be characterized as a set of concentric circles, where the innermost circle represents customers who have the most money and skill. The outermost circle represents customers that have the least. The initial products or services at the beginning of most industries take root in the innermost circle because they are so expensive, complicated, and centralized that only the best-endowed customers have the money to afford the products, skills and access to use them. Disruption is the process by which such products become affordable and accessible to those in the outermost circles (Christensen et al., 2011).

Sustaining innovations

Innovations can be either incremental or dramatic breakthrough technologies. Conceptually, they are considered sustaining innovations as long as their purpose is to improve existing products or services rather than shift to a totally new one. Companies use these innovations to sustain their leadership positions via their movement upward along the trajectory of performance improvement.

The theory posits that sustaining innovations assists entrants move their performance upward, but they do not challenge the incumbent leaders. In other words, the leading companies are almost invariably still the leaders in their industries when the battles of sustaining innovation are over. It does not matter technologically how difficult the innovations are. As long as the leaders can make better products

that they can sell for better profits to their best customers, the leading companies in the industry invariably find a way to sustain their respective position.

Disruptive innovations

Another type of innovation is called disruptive innovation, which historically proves that the incumbent leaders in the industry find it almost impossible to catch the wave of disruption when it occurs. The term disruption not only represents a radical, breakthrough improvement along the existing trajectory (see the center of
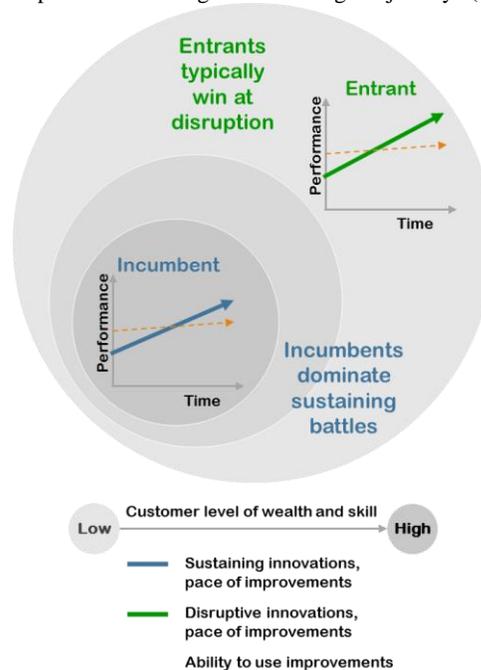

Figure **1**) but also reflects the original complicated nature of the phenomenon.

Typically disruptive innovations combine a new technology that has the potential to evolve rapidly, with an innovative business model. Although the incumbents dominate sustaining battles with better trajectory performance and with more expensive products, but the new entrants typically disrupt the incumbents' dominance with more affordable and simple products. As such, it becomes easy for the new entrants to win a new population of customers in the next larger circle. This new cohort of customers has both sufficient funds as well as skills to buy and readily use the product. Thus, the new companies almost invariably enter and grow to dominate the industry when one of these disruptive innovations takes roots in them.

3.Literature Review

The inauguration of MOOCs in 2011 and the development of other kinds of online education create opportunities and threats from disruptive technologies applied to traditional learning. A common agreement is that the new phenomenon has shaken up one of the oldest industries, education, in a number of ways. On one side, many scholars bring up such questions that will MOOCs change how we teach? Do we need to rethink current HE structures and policies? Will MOOCs destroy academia? On the other side, other scholars are skeptical about the MOOC disruption in higher education. They consider MOOCs a supplemental teaching approach rather than a replacement of the traditional way.

One of the earliest studies regarding this topic is conducted by Christensen and his colleagues (2006). These researchers argue that although traditional learning centers still serve their core student segments well, it is harder and harder for them to reach other groups of learners who would be satisfied by simpler offers (C. M. Christensen, Baumann, Ruggles, & Sadtler, 2006). They predict that three types of educational institutions will be effected by the so-called "catalytic innovation". Public high schools and other small schools have never had enough budget to offer small-size and low-cost classes. They have to give up quite a number of rooms for virtual schools who are able to offer affordable courses. Community colleges used to be a catalytic model of advanced study for underserved students, but now is facing the same problem with online classes. Some state colleges and universities also help this shift by allowing first two-year students to take courses at community colleges.

In the year of disruptive education, Hyman raises a question "How does one authenticate that the person doing the work is the person who signed up for the class?" After witnessing more than 160,000 students signed up one of the most successful MOOC course "Introduction to Artificial Intelligence", some scholars foresees that disruptive or transformative education might growth at a meteoric rate and that the new breed will likely impact on technical majors such as computer science at a university level (Hyman, 2012; Martin, 2012). According to these studies, learners in the developing world, who previously had no access to consistent, quality secondary education at low cost, may benefit most from MOOCs. As presented, of the students who took the MOOC class, one-third were from the emerging economies such as India and Brazil.

Another research stream is to search for new business model for MOOCs. Dellarocas and Van Alstyne propose money models based on two economic and business dimensions: who pays? And what are they paying for? They discuss detailed insights into employee behaviors via the digital platform and foresee digital course syndication emerging in universities (Dellarocas & Van Alstyne, 2013). Cusumano has the same idea of the economic implications that low-cost MOOCs continue growing in effective and creative ways. He applies positive and negative network effects to explain the rapid diffusion of MOOCs. The positive network effects imply that the more contributors, the more valuable the knowledge source becomes, which encourages more users and more contributors. However, there can also be negative network effects that will set a zero price for the industry and seriously undermine the economic models of private institutions (Cusumano, 2013). In turn, these effects send a signal to the world that something may not be worth paying for. Eventually, many colleges and universities find it difficult to subsidize free education. Interestingly, most of the elite institutions now have jumped onto the bandwagon that expands the breadth of MOOC offerings as well as leaves considerable room for traditional university education thanks to a variety of new business models introduced (Cusumano, 2014).

Although MOOCs have increasingly proved to be effective in providing valuable knowledge, MOOCs still lack of many aspects of traditional classes such as small-group discussions and face-to-face time with instructors. Some scholars call for a revision of MOOC platforms to better integrate to traditional academia. They suggest that MOOCs should be used as a supplement to classroom teaching rather than being viewed a replacement for it. They propose MOOC adapted platforms such as SPOC (small private online course) and MAIT (massive adaptive interactive text) to increase instructor leverage, student throughput, student mastery, and student engagement. They consider MOOC, MAIT and SPOC design points in a wider space in

which experiments are possible (Compeau & Pevzner, 2015; Fox, 2013).

Many scholars are skeptical about a significant change to a new paradigm because it is very hard to control quality of MOOCs (Cooper & Sahami, 2013; Vardi, 2012). Others even go farther to argue that the new paradigm is just a "hype", and not the main cause. They review the meaning of innovation, disruption, and revolution in education and use the Gartner Hype Cycle to support their position. They agree that something good has come from the MOOC development.

However, previous studies exaggerate MOOCs' ability to disrupt education much more than they are capable of delivering on (Abel, 2015; Vardi, 2017). According to them, the main reason of MOOC success is that traditional pedagogy has not been effective enough in applying various teaching methods such as active learning, peer learning, flipping the lecture, and the like. Much of academia still depends on professors monologuing to large classes. Another reason is that many colleges and universities have found themselves in trouble after the 2008 financial crisis, triggering a severe blow to these institutions. MOOCs came at the right time and found a right place to quickly fill in territories left by traditional higher education.

Vardi and others clearly position that MOOCs are not the answer to the current pedagogical shortcomings and that it had better to have MOOCs disappeared, rather than letting "the genie out of the bottle" (Vardi, 2012). It seems that the above stand holds true until a new wave of breakthrough technologies have recently come out. It opens up another round of "antagonistic views" in the academic community. Vardi believe that technologies themselves cannot solve systemic social problems and that "the basic MOOC is a great thing for the top 5% of the student body, but not a great thing for the bottom 95%." He posit that "this technology is changing the world, but not always for the better" and "it is time for computing to emerge from its technological cocoon and engage vigorously with social science" (Vardi, 2017). While sharing with Vardi's concern about MOOC dark side, Lucas find it more positive effects on teaching outcomes than negative effects. He urges every university to review the MOOC option because it can provide them both opportunities and threats and it is not clear how different types of schools will be impacted. He pointed out that mixing of fully online classes, blended learning and MOOCs, can create a huge variety of student experiences and that technology-enhanced methods can place more responsibility on the student for learning and thus improve the quality. The greatest threat to universities is when new ventures can provide the same content with the cost structures that are a fraction of the costs of existing universities (Lucas Jr, 2014). As such, "the most vulnerable institutions are small, private colleges with low enrollments, heavy reliance on tuition income, and that are well known only within a 200-hundred-mile radius of their campus" (Lucas Jr, 2018).

4.Methodology

To close the discrepancies in the findings of previous studies as mentioned in the literature review section, the current study applies the theory of disruptive innovation and analyses the case of Vietnamese higher education to illustrate how MOOCs influence colleges and universities in such a developing economy as Vietnam.
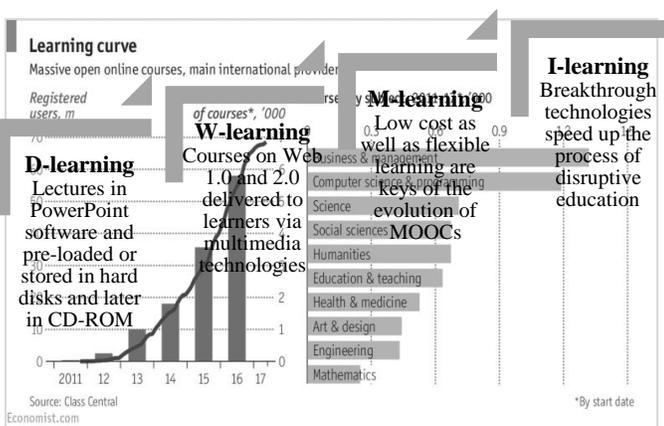
The main methods used for the current case study is observation to collect archival and secondary data from public sources such as national library and mass media. The social context here is higher education in the U.S and Vietnam. The field setting covers all events and artifacts (objects) related to colleges and universities in the two

countries. The observational record is periodically conducted to collect systematic field notes including detailed, non-judgmental, concrete descriptions of what has been observed.

To avoid interference, we make no special effort to have a particular role in the setting so that events, artifacts and interactions are documented and described as what they truly mean to be inferred with or without other sources of information. Observations consist of both highly structured, detailed notations via checklists and more holistic descriptions of events and artifacts. The method usually includes two phases. In the first phase, we write down the purpose of the observing, the phase of the study that can generate fruitful outcome, and the use of field notes, with respect to the research questions. We typically list out the setting with broad areas of interest but without predetermined categories or strict observational checklists. In the second phase, we analyze initial data to discover the recurring patterns of events and relationships. After identifying and describing these patterns through early analysis of field notes, we consolidate checklists to ensure them more appropriate and context-sensitive. Then focused observation is used at later stages to collect data that serves for analytic themes to

explain the theoretical framework in a variety of settings (Yin, 1994).

5. Development of Technology-enhanced Education

Alex Tabarrok, an economist at George Mason University (USA) and co-founder of an online education website, Marginal Revolution University (Huang, 2016), models the future of online education as a showbiz industry in which top professors around the world will one day become as famous as celebrities or superstars in the showbiz industry. While Tabarrok's prediction cannot be dismissed as the generative system of evolution in place. Let's view the historical evolution of Technology-enhanced Education. The figure 2 below illustrates the evolutionary landmarks.

Figure 2 The development of E-learning

The timeline of tech-enhanced education is divided into four different stages: D-Learning, W-Learning, M-Learning, and I-learning.

- The first stage D-Learning is the early days of the digital era (or pre commercial internet era). In 1960, PLATO – Program Logic for Automated Teaching Operations – was the first computer-based training (CBT) program. It offered drills and the ability to skip questions. Years later, lectures were developed in PowerPoint software and pre-loaded in computer. Distance education students learned from lectures stored in hard disks and then a little later in CD-ROM.

- The second stage W-learning began when the Internet publicly became commercialized in 1994. The development of Web 1.0 and 2.0 on the Internet has helped online courses delivered to various groups of learners via multimedia technologies. The idea of openness in education also began in this stage, creating a premise for MOOCs.

- The third stage M-Learning witnesses the influence of the MOOC development. Various open learning platforms have been set up by elite institutions and are able to serve massive number of online learners at the same time. MOOC content emphasizes on learning context and group discussion. Low cost as well as flexible learning are keys of the evolution of MOOCs.

- The fourth stage I-Learning, is the new wave of MOOCs, which is inspired by breakthrough technologies such as Internet of Things, Artificial Intelligence, Virtual Reality as well as online social media networks such as YouTube, Twitter, Facebook, iTunes and the like. Opportunities to connect, share information, and learn from each other are now found everywhere.
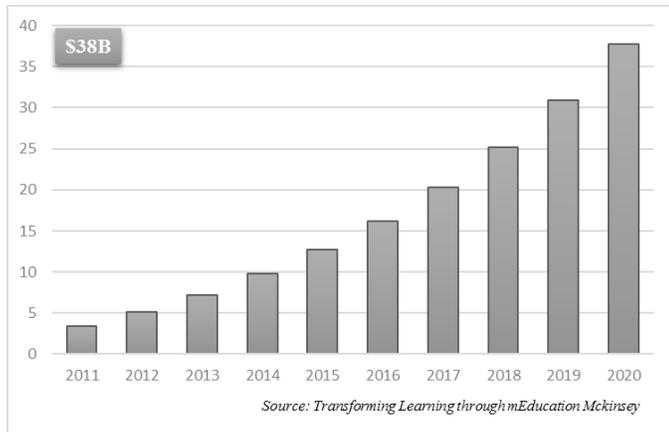
MOOC Development in the World

According to a study by Global Industry Analysts, the size of the global market was estimated to be over USD 165 billion in 2015 and is likely to grow by 5% between 2016 and 2023, exceeding USD 240 billion. The total online enrollment in the world reaches 70 million in 2017 and is likely to reach 80 million in 2018 (Economist, 2017). In 2016, the total amount of investment in E-learning startups was about $8 billion, roughly equivalent to the online game market, although the online education industry was valued more than 50 times of that amount (Adkins, 2018). According to the analysis, factors such as the possibility of allocating a lower budget for tech-enhanced education purposes (compared to traditional education methods,) together with increasing flexibility in learning are expected to drive industry growth. Figure 3 presents the cumulative number of online courses offered by subject matter overtime (Economist, 2017).

**Figure 3** The world market size of online education

According to the figure above, Business and Management, Computer Science and Programming topped the list both in terms of courses taught and the number of total enrollment. In 2014, 46% of the college students reported to have enrolled in at least one online course. MOOC's growth parallels the rapid growth of online courses.
The rapid adoption of mobile technology is expected to play a major role in the way the entire digital experience is valued and consumed. The mobile ecosystem – devices, carriers, app markets and so on – has become the fastest growing industry ever recorded. McKinsey develops a forecast (see Figure 4) that the Global mobile learning Market is likely to grow from $7.98 billion in 2015 to $37.60 billion by 2020, at a Compound Annual Growth Rate (CAGR) of 36.3%. It is worth noting that customers who purchase first-hand mobile learning products are those from the United States, Europe, China, and India. North America is expected to be the largest market in terms of market size, while Europe and Asia-Pacific are expected to experience an increase in market traction during the forecast period. Asia is considered the most vibrant and unique mobile learning market on the planet. Mobile learning revenues in Asia reached $4.5 billion in 2014 and is expected to increase to $7.7 billion by 2019 (Lebraud, Pandit, & Seetharaman, 2012).

are among the first higher education institutions to MOOC platforms (Martin, 2012).

Coursera is currently the largest online education provider in the world, offering 1,700 courses for 24 million students worldwide. Since its inception in 2011, this business has been investing a total of over $140 million and has the largest market share. Similarly, Udacity has invested more than $160 million and is serving around 11,000 students. The company mainly provides online courses in Sciences and Technology. According to a study, Udacity offers its courses at a price of $199, while Coursera plans to switch to a subscription model with fees at $ 39-89 per month (Economist, 2017).

Figure 4 Mobile Learning Market by 2020

Source: Transforming Learning through mEducation Mckinsey

In 2018, the US market is going to account for 51% of the total revenue of the MOOCs industry. While the US leads in sales, Asia will generate the second-highest revenue earning from MOOCs products throughout the period 2013-2018. With the growth rate of 8.9%, MOOCs revenue in Asia will reach $12.1 billion in 2018, up from $7.9 billion in 2013. Here are the top 10 countries with the fastest growth in the industry:

Figure 5: 2013-2018 Top Ten Asia MOOCs Five-Year Growth

Source: Ambient Insight Regional Report
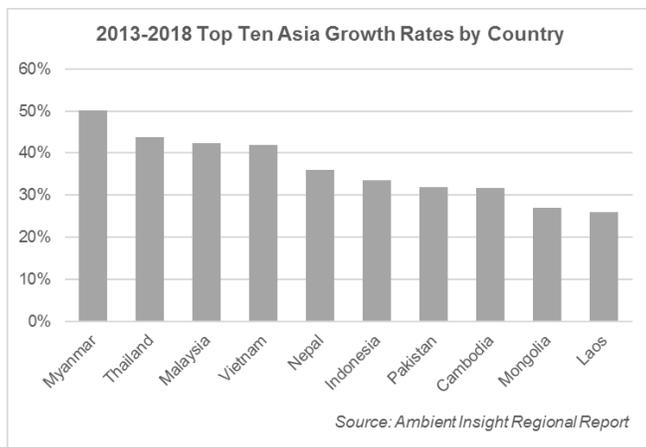
Myanmar has the highest growth rate in Asia at a breathtaking 50.2%, followed by Thailand and Malaysia at 43.7% and 42.3%, respectively. Fourteen countries in Asia have Self-paced MOOCs growth rates above the combined aggregate growth rate of 8.9% in the region. Revenues will more than double in 12 of the 21 Asia countries analyzed in this report. Revenues will more than triple in nine of those countries (Ambient Insight Regional Report) (Adkins, 2014).

With so many prestigious world-class universities as clients, it is not surprising that the United States has the most well-known MOOCs service providers such as Coursera, edX, Udacity, and Udemy. More than 17 leading universities in U.S. and a growing number of institutions in other countries are collaborating with MOOCs companies to offer open online courses. Elite universities such as Harvard University and Massachusetts Institute of Technology (MIT)

MOOC Development in Vietnam

Tech-enhanced education was introduced to higher education in Vietnam quite early. Mr. Nam Nguyen, the founder of FPT Online University (FUNiX), said that before 2010, some start-ups such as Violet.vn, hocmai.vn, and TOPICA made the first move to seek for business models to serve Vietnamese learners. In 2012, the Vietnamese Ministry of Education and Training kicked off a virtual university project. However, the project played as an experimental role for public regulations rather than producing an iconic model for potential investors (Nguyen, 2017).

In 2013, GiapSchool is the first company to open a MOOCs portal that integrated many courses with multiple disciplines. About two years later, FPT joined the market via another start-up project named FUNiX. Hien Nguyen, an online education research specialist, in a statement in 2016 stated that, Vietnam had about 150 MOOCs start-ups in the HE industry (Sang & Tai, 2017).

About 40% of the Vietnamese population i.e. about 39 million are below age 25 and the country boasts about 90% of the young population having Internet connection. Vietnam therefore is a very attractive market for scalable MOOC providers. Vietnam spends roughly $3-4 billion annually for her students studying abroad each year (an indication of Government priority of higher education). The annual sales growth is about 40% and the market size is estimated at $2 billion (Nien, 2015; Trines, 2017). Therefore, the Vietnamese MOOC market is attractive not only to domestic investors, but also to Asian investors from Japan, Korea or Singapore. Currently, the five leading market players are Topica, FUNiX, Kyna, Tienganh123 and eGroup.

During the recent years, Vietnamese Ministry has adopted 309 projects in higher education with a total registered capital of over $767 million. However, only a few MOOC startups received venture capital from the Government. In 2016, only Kyna.vn, formerly Delta Vietnam, specializing in soft-skill and professional trainings received investment from Japanese Cyber-Agent Ventures (Sang & Tai, 2017).

6. Disruptive Education in Vietnam

Vietnamese Universities cannot provide uniform learning experience to all their students. A large portion of prospective college students are not well-catered for by the learning experiences designed for traditional students. These ignored groups of learners are the target of MOOCs start-ups. They begin disruptive education by delivering more-suitable training frequently at a more convenient time and at a lower learning cost. They are also able to win the "ignored" learners and thereby gaining a foothold into the Vietnamese HE market. These startups then move to take advantage of the market by delivering certificates and degrees that the mainstream students require, while preserving their competitive advantages in the unserved and

underserved segments. When mainstream students start adopting the MOOC startups' programs in high number, the disruption in the

Udacity and Udemy platforms are generally employment focused.

Table 1 Comparing business models of MOOCs in VN vs US.

	Collaboration	Degree	Certificate	Tuition	Subscription	Model
United States						
edX	HE institutions	P	Y	Y	N	Teaching & Research
Coursera	HE institutions	Y	Y	Y	N	Teaching & Research
Udacity	Employers	N	Y	Y	Y	Teaching
Udemy	Employers	N	Y	Y	Y	Teaching
Unv of Phoenix	-	Y	Y	Y	N	Solution shop
Vietnam						
GiapSchool	Communities	N	Y	N	N	Teaching
FUNiX	HE institutions	Y	Y	Y	N	Teaching
Topica	HE institutions	Y	Y	Y	N	Teaching
Kyna	Employers	N	Y	Y	N	Teaching

system begins to take place.
Following the theory of disruptive innovation, we propose propositions that the process of MOOCs disruption in VN higher education has occurred in three steps:

1) Building Business Models

MOOCs startups build business models that are very different from existing universities. As incumbent universities focus on the most important group of learners – 2- or 4-year college students, these universities make the best effort for improving their business models to meet or exceed students' demand and ignore other learners' need. Thus, the incumbents' existing business model does not well fit into these learning groups. In their search for a business model, MOOC providers have identified the underserved segments and are able to build up a new learning method that best fits them.

Error! Reference source not found. shows a comparison of business models between VN and US MOOCs providers. Inheriting a wave of innovations in the previous stage of D-learning, the U.S MOOCs are the pioneers to provide MOOCs programs in the world. Some typical MOOCs providers are edX, Coursera, Udacity and Udemy.

Founded by Harvard University and MIT in 2012, edX is the first MOOC provider, partnering with more than 130 global institutions to offer 1900+ courses to 14 million learners worldwide. edX registered 52 million + enrollment across multiple certificates and micro masters programs. edX is the only leading MOOC provider that is both nonprofit as well as an open source. The edX online environment also provides a powerful platform to conduct experiments, exploring students' learning behavior pattern, and how the faculty can best teach using a variety of novel tools and Coursera, the main rival of edX, was founded in 2012 by two Stanford Computer Science professors. This MOOCs platform is partnering with 149 universities and offering 2,000+ courses for 25 million learners. Its content comes largely from the partner universities. But, unlike edX, Coursera is offering full degree programs – at least 10+ online masters degrees connected to the university partners. It also offers short courses (duration intensive learning courses).

In addition, Coursera offers a sequential four course specialization in which the learners pay for assessment and accreditation at the end of the course (Shah, 2017).

Udacity in partnership with employers has launched a series of nanodegree programs in tech-focused courses jointly developed with Google on Android; in self-driving cars using instructors from Mercedes-Benz, on Nvidia and the like. Udacity applies a subscription model in which students pay $199-299 a month for as long as it takes them to finish the course and get a 50% rebate if they complete it within a year. Udemy is operating on a similar business model. However, instead of hiring only instructors from universities or enterprises, the platform opens for every instructor who are knowledgeable in one or more specific areas. Udemy uses a student rating system to evaluate courses and instructors to maintain the quality of its programs (Economist, 2017).

Although entering into the MOOCs industry late, VN providers have quickly adopted successful business models to target the ignored group of learners. Giapschool was launched in 2013, providing what appears to be the first website with a range of MOOCs in Vietnamese. Following the non-profit model, the startup sets a vision to help VN students learn at the same level as students in the US. Unlike other

Note: Y (yes); N (no); P (Partial)

MOOCs startups, Giapschool is much more similar to a community development than a business organization. The purpose is not to make money, rather to build a knowledge infrastructure to educate people. With a focus on becoming a knowledge center, GiapSchool is ready to work with organizations and individuals in and around Vietnam to develop research that benefits the whole society. Kyna is a mixed model between Udacity and Udemy. Since its inception, Kyna has developed a new online MBA program; KynaLingo, and the KynaLiz for online training solution. There are about 400,000 people studying at the company. The company is also experimenting with the introduction of gamification (the introduction of electronic game elements into learning), to boost the student interest in learning (Trines, 2017).

FUNiX and Topica are the VN localization of edX and Coursera, respectively. They are using partnership models to collaborate with elite universities around the world to provide a wide range of high quality programs for local learners. While FUNiX is an affiliate of

the FPT University and is limited to information technology majors, Topica is a member of Topica Edtech Group, a purely online educational organization, and its scope is extended from language to technology, to business majors. FUNiX organizes and manages teaching and learning activities in a completely new way called FUNiX Way which is a comprehensive solution to help learners self-learn via online; learn effectively to tap into the vast knowledge of MOOCs courses; conduct practical projects via one-on-one mentoring sessions; and connect to an ecosystem of the professional communities. This method is expected to increase the completion rate of the online courses as well as the output quality of the trainees. Topica, as a contrast, relies on an educational technology complex of four integrated sectors including Topica Uni devoted to high-quality online degree programs; Topica Native dedicated to online English speech tutoring; Topica Founder Institute specialized in the early-stage startup accelerator; and Topica Ivy focusing on pioneering education technologies.

Irrespective of the effectiveness of the new business models, the reinvented Web-based and MOOC learning methods do matter because they are solving two common problems of all MOOC providers. The first of these is the issue of learning convenience, not

just in terms of money but also in terms of time and space. Despite the high cost of production, online education technology has inherited a special characteristic of IT products viz. it has almost zero flexible cost in replicating online courses, significantly contributing to a reduction of the total MOOC cost. Parallel to this the rapid pace of industrialization in VN. This phenomenon has created a very active workforce who continuously search for new opportunities to grow and move through career ladder. In a credential based society, certificates of skills provide distinctive advantage over peers in the same occupation/profession. Self-learning and training for certification can be preferred strategies to gain qualitative advantage in the employment market. However, balancing learning, working, and family life tend cause enormous pressures and stress for them. Responding to the demonstrated need, VN educational providers are making MOOCs content easily digestible and flexible to individual preferences. Thus degree programs are broken into nanodegrees; nanodegrees into modules; modules into courses; and courses into short segments.

The second problem being solved is the accessible and rich content of MOOC ecosystems. Successful startups usually use lectures of the world's leading professors and post such content in MOOC platforms. Students can access learning materials from any device connected to the Internet: smart phones, desktops, tablets, laptops, and more. Another advantage of the new method over the traditional education is that a large number of students interact and create significant amount of user-generated-content in the discussion forums. This rich knowledge resource of the self-learners weighs high compared to traditional classrooms that lack such an enviable learner created knowledge base. In addition, collaboration among learners and contacts with experts, recruiters, policy makers, and the like inside the educational ecosystems leads to both practical experiences as well as employment opportunities to learners. Therefore, these new practices, i.e. the new business models are in complete contrast to the traditional university models.

2) Starting in Low-end Footholds

Disruptive innovations originate in the low-end or new-market footholds. MOOC startups follow the same norm. By entering into the low-end market i.e. the students whose needs are not met by traditional

universities. Disruptive process occurs because VN universities typically try to provide their current students with ever-improving curriculum, and they pay little attention to non-traditional students. This opens the door for MOOC startups to focus on providing HE to those low-end students with a "good enough" curriculum, at an affordable cost and with flexible schedules.
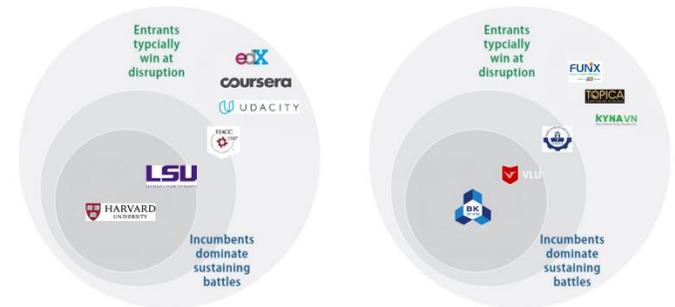

Figure 6: Potentially disruptive forces in HE in US vs. VN

Figure 6 depicts the institutions of higher education in US vs VN. The elite private universities in the U.S. take the innermost circle with the best credential of students at the highest cost of tuition and fees. The next concentric circle comprise of the state universities, typically more affordable and accessible to a larger population of students at the subsidized tuition rate for the in-state students. The third circle represents community colleges with the lowest tuition rate and open admission policies. The outermost circle represents online education, which is accessible to the largest population who cannot attend classes at traditional universities due to time conflict (Christensen et al., 2011). Tuition rates in some of these institutions if they are private may often be higher than the in-state subsidized rates. Likewise, the VN educational system consists of elite universities in the innermost concentric circle, and the 2-year colleges in the outermost circle. However, due to the system's historical development, most of the VN universities are state-owned or managed under the Ministry of Education. Privatization only happened at some sectors in recent years. Therefore, the innermost circle is mostly comprised of national public universities, while private universities usually appear in the third circle and a few in the second circle. Because of state ownership of the national universities and 2-year colleges, the hierarchical cost comparison as in the U.S. is not applicable in VN. It was more a matter of access to higher education by a large group of learners in the national universities. Moreover, inflexibility of traditional schedules of the national university system also poses a challenge of access to this large group of ignored learners. The VN MOOCs startups, at first, position themselves in the outermost circle. During their early days, these startups offered online courses, which might not be as good as face-to-face classes. However, they have provided a learning service at a very convenient time and at a cost lower than national university system. These features help the new players to be attractive to the large population of potential learners who are overlooked or unserved by VN existing universities.

3) Catching on the Mainstream

Disruptive innovations didn't catch on with mainstream customers until also the quality caught up to the mainstream standards. It may be mentioned here that disruptive innovations are very different from sustaining innovations. Product improvements under sustaining innovations can be either incremental advances or major

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breakthroughs, but they usually help leading the incumbents with more resources to outperform a new entrant with the same trajectory of improvement. Only 6% of sustaining entrants successfully compete with leading incumbents (Christensen, 1997). After privatizing some sectors, the VN Ministry of Education allowed private universities to open classes and award degrees in all majors. These institutions have made long strides of innovation in teaching and learning. However, all of their teaching improvements were already applied or have been applied at the top public universities. The private universities keep competing in the outer circles with little or no success to move up in rank to compete with the innermost circle.

Disruptive innovations in education, were initially considered inferior by most of traditional students. Typically, college students were not willing to switch to the offerings of MOOC providers merely because it is less expensive. However, their perception toward online education has changed as MOOC providers are able to raise teaching quality via online courses taught by top professors around the world. Mainstream students then started adopting the new learning method and happily accept its lower tuition rates. More importantly, MOOC innovations have helped E-universities establish their position as viable alternative to the institutions within the inner concentric zone. This move allowed the first crack in the admission of the brightest students, as measured by standardized tests. The result was disruption in HE as summarized in the following statement: "also get the most money, enroll the most graduate students, run the biggest research projects (Christensen et al., 2011).

Disruptive education in VN has begun as a small-scale experiment. During the period of 2013-2015, the disrupters tended to focus on having their business models settled down in the VN market. In recent years, when succeeding with a solid nontraditional student base, HE disrupters start moving from the outermost circle to the inner circles by attracting the mainstream students causing a large crack in the public universities' market share. The disruption process will gradually takes over and change HE in VN. The shock of losing market share and the resistance by the incumbent universities can get quite creative in the defense of their established programs. But the fact is that the disruption can take time helps explain why these universities frequently overlook HE disrupters.

Breakthrough technologies such as Virtual Reality and Internet of Things can speed up the process of "Teleducation" to spill educational technologies over from the outer circle to the inner circle of learners. It is not hard to visualize that the process of disruptive education is applicable on a national scale as bricks and mortar institutions and facilities are no longer necessary for MOOCs to flourish across the nation. As mentioned in the previous section, tech-enhanced education has been increasingly adopted across the world over the last few years. There were only a few countries developing limited online programs during 1990s. Nowadays, with newer technologies and devices, the approach and mode of MOOCs are introduced in almost everywhere from developed to developing countries; from Europe to Asia and to Africa. Predictably, MOOC trends will be even be stronger in the future thanks to educational technologies such as Virtual and Augmented Reality, Intelligent Assistants, Gamification, Adaptive Learning, and the like.

Riding on such technological waves, MOOCs in VN HE is predicted to cause disruptive changes in teaching and learning. However, the pattern of radical changes may not exactly follow the theory of disruptive innovation due to the nature of the VN educational system. It is only a question of time when the national universities begins to

mimic MOOCs and complete the transformation at the national scale. It may be noted that Disruptive innovation in education is scalable, but under certain *necessary* and *sufficient* conditions. Necessary conditions include investments in technological infrastructure and development of appropriate business models. Sufficient conditions include favorable government policies and the transformative learning culture.

Domestic investments in technology infra-structure came from individuals or entrepreneurs who want to participate in online learning industry. International venture capital is still shy in VN MOOCs startups. Current educational providers are inclined to copy successful programs in the world to Vietnam. The localized proportion is too little and yet to be attractive to the major segment of VN population. Thus, it too early to create a vibrant market. In addition, the VN learning culture always emphasizes F2F interaction between a teacher and a student. Many affluent families prefer their children to take face-to-face classes and learn directly from their teachers. As a credential society, the Vietnamese are obsessed with diploma certificates rather than skill-capability. Moreover, due to rigid government policies, many MOOCs businesses are not allowed to "stamp" on the students' diploma after graduation. To date, only Topica and FUNiX have been certified by the Ministry of Education and Training to grant degrees and diplomas.

7. Conclusion

Higher education (HE) is entering a turning point, as there are predictions that over half of U.S. universities will fail within fifteen years due to disruptive innovations of massive open online courses. Will these open learning innovations change how we teach in the future? The purpose of this paper is to outline logical evolution of online learning platforms leading to the MOOCs provision as disruptive innovation. The disruptive innovation theory was discussed in the context of Vietnamese higher education. The paper also reviewed the existing business models and offer a foundation for new business models that integrate MOOC platforms into institutions to meet changing demands of the education market. While the paper indicated the fact the disruptive innovation in Higher Education is scalable under certain necessary and sufficient conditions. Additional case studies in other credential societies in Asia including India, China, Malaysia, Thailand, Japan will provide empirical evidence in support of MOOCs as disruptive innovation in Higher Education and that scalability of such a massive and abrupt changes in one of the fundamental institutions of the society/country.

To address observed gaps in online learning innovation research, this study engages in the theory of disruptive innovation extended to a public sector and on a national scale. According to the theory, a disruptive innovation may initially lack certain features or capabilities and only appeals to underserved leaners.However, eventually, the innovative learning service with a higher performance trajectory outperforms the existing learning service to attract mainstream learners and completely redefines the HE industry.

To validate the proposed research idea, we carry out a comparative case study on a national scale. We found that the reason for discrepancies in previous studies is that they failed to identify sophisticate conditions: necessary and sufficient to articulate a radical innovation. We argue that breakthrough technologies such as Artificial Intelligence and Internet of Things can help "Teleducation", MOOCs in particular, play a disruptive role to change the process of higher education significantly and that the theory of disruptive innovation is applicable on a national scale. However, the pattern of radical changes

does not exactly follow the theory of disruptive innovation. Disruptive education is likely to be scalable, but under some necessary and sufficient conditions. We also propose higher education policies and new business models for traditional universities to cope with future challenges and gain competitive advantages in the global education market.

The paper contributes to the literature of higher education teaching and learning in several ways. First, it extends the current literature by bridging the discrepancies of different viewpoints on MOOCs in higher education. Second, the paper investigates MOOCs in such a developing market as Vietnam, which is totally ignored in past research. Third, the current study extends the disruptive innovation to compare a public section between two countries at a national scale.

Future research should focus on other interesting areas such as the role of state or federal higher education ministries in regulating MOOCs and other learning methods; How MOOCs influence on education across different countries; And how various MOOC platforms integrate into teaching and learning at colleges and universities.

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