DIGITAL "TSUNAMI" IN HIGHER EDUCATION:
Democratisation Movement towards Open and Free Education

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ABSTRACT

The result of the digital "Tsunami" changes in education in the 21st has been huge. Recall that in the year 2000 there was no such thing as internet broadband, Facebook or iTunes which is now a daily commodity. No doubt changes in technology will continue to accelerate. Education is about learning. Learning happens everywhere and technology creates a platform of almost limitless opportunities for better learning. With the recent digital development of Open Education Resources (OER) and Massive Open Online Courses (MOOCs), these emergence towards free and open resources and courses has a tremendous potential to democratise education. There is no denying that it's one of the biggest discussions being had in education and around the world. Will the digital 'tsunami' phenomenon revolutionise the landscape of education? Some believe that this new medium will revolutionise both online and conventional education. This paper attempts to explore the hype issues that surround the notion of democratisation movement that gears towards open and free education. This paper looks into the impact and the types of evidence that are being generated across initiatives, organisations and individuals in order to make a summative analysis and recommendations. Finally, this paper hopes to provide some insight into the dynamics of the evolution of digital 'tsunami' in present higher education.

Keywords: Theory of disruption innovations, democratisation in higher education, industrialisation of education, 0pen Education resources (OERs), MOOCs

INTRODUCTION

The changes in education of the 21st century as a result of the digital 'tsunami' have been huge. In the context of education, open and free education has become the watermark for recent and fast growing number of free learning materials and associated digitalise online platforms and practices from a variety institutions and enterprises. Recall that in the year 2000 Internet broadband, Facebook or iTunes, where not readily available and are now an integral part of our daily lives. Changes in technology will continue to accelerate at a greater speed; the shift to digital needs to be adaptive in par with the educational landscape. Open Education Resources (OER), Massive Open Online Courses (MOOCs), and more recently, initiatives such as *OERU*, *Coursera*, *Udacity*, *EdX* are technology-enabled platforms that have a tremendous potential to democratise higher education.

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As stated by Kanwar (2012), globalisation in the context of education is "the reality shaped by an increasingly integrated world economy, new information and communications technology (ICT), the emergence of an international knowledge network ...and other forces beyond the control of academic institutions.

Sethy (2008) noted that the ability to produce outputs via collaboratively in global networks is more appreciated by the present market than an academic degree fixed in space and time.

Technologies open up new opportunities for education. The information and communication technologies produced an era of digital 'tsunami' and are driving the restructuring of academic by forcing educators to re-align and re-design their academic work dramatically. The Open and Distance Learning (ODL), for instance, with the assistance from technologies has given access to higher education to those who would otherwise have been unable to have access to education due to the lack of formal qualifications or the inability to combine traditional studies with work or personal family matters. This result according to Sethy (2008) is to open the boundaries between education and work. In this regards, Peters (2010) wrote that "throughout history, education has been constrained by the iron triangle of quality, access and cost. The author further noted that in the case of ODL, through the division of labour, specialisation and the economies of scale created by media and advance technology, the access-quality-cost triangle ideology can actually be re-configured.

There is a flux of rising problem in education, including, the rise of private, for-profit provision of education coupled with rising higher tuition fees, shrinking of public funding and investment in education. Technological innovations can now be applied to widen access to content and resource materials to achieve economies of greater scale than several decades ago (Kanwar, 2012).

The digital technologies gave rise to many new providers of higher education and increased the competition in the academic globalise market; we witness a growing trend of collaborations and convergence of academic practices enhanced by the new media. The growth of nonconventional higher learning institutions, such as the distance education institutions, ODL universities, free and open online courses has, especially in recent years, been on a continuous rise.

The fact that these institutions have been able to develop courses produced on an industrial scale has made it possible to offer educational opportunities to a greater number at a lower or no costs. What started with MIT's OpenCourseWare (OCW) project has now been replicated to reach more countries in the world. A recent development of Massive Online Open Course (MOOC) or know for its open virtually access of quality course to anyone, provides a way of connecting instructors and learners across a common topic or field of discourse may have proof as one of the new digital technology innovation in our present time. Webley (2012) wrote that MOOC may be a silly-sounding acronym, but this new breed of open and free online classes have been heralded as *revolutionary*, the *future*, the single most important *event* that will democratise higher education and end the era of overpriced higher educational cost.

Still, the question remains, as to what extent the emerging movement of Open Education Resources (OER) and MOOC, have as a potential to democratise the higher education landscape?

At the same time, how does this democratisation movements impact the educational institutions. In this article, we will attempts to review the development of the democratisation movement, its primary role and the impact it has on higher education. The article set forward as an exploratory paper that we hope to gather evidence, across from initiatives, organisations and individuals in order to make a summative analysis to provides some insight into the strategies higher education institutions could adopt and to better understand its dynamic roles of the evolution of digital 'tsunami' that has the capability to transform and democratise the future higher education openly and freely for all.

THE INDUSTRIALISATION OF EDUCATION

The progress and expansion of distance education was made possible according to Peters (2010) by the *industrialisation of education*. *Industrialisation* implies the massive productions of goods that may be manufactured at a lower cost than products manufactured by craftsman.

Table: 1
Industrialisation in the production of goods and Industrialisation of Education

Criteria	Description (Industry)	Identified in "distance education"
Specialisation/ Division of labour	Work processes are no longer performed by generalists, such as craftsmen, but by specialists responsible for one part of the process only.	Persons are no longer generalists as teachers in the classroom but trained specialist. Teaching is divided into several functions : authors, instructional designers, media specialists, tutors, counselors, course coordinators etc.
Mass production /distribution	Standardised products are mass produced. Mass production Or distribution is capital and energy intensive and enables the acceleration of production and ships the goods to customers wherever they may live.	The carefully and expensively developed high quality distance teaching course is the standardised and the self instructional learning material may be distributed to students living everywhere in the country (or abroad).
Concentration	Concentration causes the agglomeration of manpower, capital, revenue and the trend towards monopolised markets. Concentration of power makes for greater profitability.	Distance teaching institutions, especially open universities, often become the biggest in the country. This leads to a concentration of funds, experts, teachers and technical equipment. When open universities produce more graduates than conventional universities they have also the tendency to monopolise higher education.

Adapted from Peters (2010).

Thus, these products can be more widely distrusted and sold at a much lower price making them accessible to a larger number of people.

During its infancy stage, the main goal of distance education may have been to reach out to those students for whom, and for whatever reasons, it was impossible to be physically present in a classroom. This is no longer the case as "distance education", mainly because of technology, is now trying to reach as many people as possible. In order to meet this goal, it has become necessary to produce teaching and learning materials that can be made available to a large number. Peters goes on to suggest that "...industrialised education may help to pave the way to an information-driven educational system that might be more adequate to our rapidly changing information and knowledge society" (Peters, 2010).Peters' *industrialisation of education* theory is not a proposition as to how education may be made available to a greater number at an affordable cost. Peters' theory was developed by analysing the evolution and presents the status of "distance education". Peters established a list of criteria that explain the parallel between the industrialisation of consumer products and education.

Due to their significance in understanding the evolution of distance education and the implication of the industrialisation process in education three of these criteria are retained presented in Table: 1.

As demonstrated in Table: 1 distance education has developed measures and procedures that correspond to the *industrialisation* of consumer products. This is not to say that the *industrialisation of education* has produced, or is producing, a lower quality of standards. That discussion will be presented in the sections that follow. What is described is that education has, in certain settings, been transformed bringing about changes as to how and who produces educational material and how it may be dispensed and consumed. The teacher, in this scenario, is no longer the only one involved in transmitting knowledge to students. The roles of educators and of learners are also being transformed. The traditional teaching and learning process, in a closed interactive setting, face to face interaction, is replaced by a greater emphasis on self learning.

The consequences of these changes may also have bearing on the role of traditional institutions themselves. A fundamental question that will have to be considered, as put forward by Peters', is the idea of *concentration*, in that along with the process of democratising education a new form of *monopolisation of education* may be taking place.

ERA OF DIGITAL "TSUNAMI" IN EDUCATION

During the last decade a perfect storm of capacity, distribution and need has created the conditions that have spawned an exponential increase of free, accessible and open educational resources. This storm of free accessible and open educational resources, or known as Open Educational Resources (OERs), started as a grassroots movement to make education available to everyone. It all started when Massachusetts Institute of Technology (MIT) made its historic announcement to make its courses open and fully accessible, known as MIT OpenCourseWare Project in 2002. Over the next few years many other institutions followed MIT's lead (Matkin, 2013). The OER movement has then become an institutional movement in higher education communities. Other prestigious educational institutions, such as Harvard, Yale, Stanford, Carnegie Mellon, and U.C. Berkeley had made some of their educational content freely available online as well.

Atkins, Brown, and Hammond (2007) define OERs as "teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others". In a simpler term, the OER resources, in any type and form, may be freely available for use, adapt, share, and reuse without any legal obligation.

As of today there are approximately *281* universities, from around the world, in more than 30 countries that are creating (or using OERs), and OER material is available in multiple languages. Large-scale open "utilities" tools such as the *YouTube* and *iTunes* U have been used by OER educational institutions to promote open and free education (Matkin, 2013). Initially completion of an institution's OER material did not allow those who successfully complete the material to receive any course credits, exceptionally the Khan Academy, first created in 2006, does awards academic *badges* and *points* to those who complete various tasks on the studied course. The *badges* provide learners outward rewards (extrinsic) for achievement and completion (Khan Academy, 2013).

One could expect that the proliferation of OER began to have a gravitational pull. The learning community began to wonder how OER could be more effective in helping and reaching out to more learners, improving the teaching and learning process, and potentially lowering the cost of education.

However, the uses of OERs typically are much less structured, and prominently for informal and self-directed learners engaged in self-study. Additionally, the vast majority of OERs resources are for the purpose for enhancing personal knowledge and perhaps exploring interests outside of one's professional field (Masterman & Wild, 2011).

In 2008 with the OER movement, an idea and practices synchronous known as "open online course" was introduced by George Siemens and Stephen Downes in Canada. The first ever open course scheduled in a more fluid structure, made it possible for 2300 learners, from the general public, to participate in the online class, free of charge.

Dave Cormier and Bryan Alexander introduced the term Massive Open Online Course (Daniel, 2012). Stanford and other prestigious institutions in the US followed their lead in 2011 and 2012. Markoff (2011) noted that tens of thousands of users from over 150 countries signed up for the first free computer science classes offered by Stanford University in 2011.

The creators of this course, Sebastian Thrun, David Stavens, and Mike Sokolsky, have since then founded *Udacity*, a private educational organisation offering massive open online courses (MOOCs). In about the same timeframe, MIT undertook a similar MOOC open course approach that subsequently developed MITx, which as MIT explains "will offer a portfolio of MIT courses for free to a virtual community of learners around the world" (MITx, 2012).

In May 2012, MIT and Harvard (with the addition of UC Berkeley) announced EdX, a larger in scale learning platform that awards "Certificate of Accomplishment" to people who demonstrate mastery of EdX course material.

Since then similar initiatives from other prestigious institutions have come thick and fast in joining the MOOCs lead in the fear of being left behind (Daniel, 2012).

Other companies are following suit in institutions across the US, including the for-profit *Coursera*, which has almost 2 million registrants, presently offering more than 200 courses (Coursera, 2012). What is new about MOOC is the *scale, scope* and *pace* of the ventures and the *disruption* innovations that we will discuss in the following section. MOOCs represents a new generation of online education that is freely accessible on the Web and geared towards a very large numbers of learners from all over the world (Boxall, 2012).

Platforms of MOOCs appears to be separated into two distinct types that serves different purposes: those that emphases the connectives philosophy such as creation, creativity, autonomy and social networking learning carry the terms "cMOOC" while those that use video presentations and short quizzes such as those offered by Coursera and EdX is terms as "xMOOC" (Siemens, 2012). The phenomenon of *Open and Online Free Education* (OOFE) for all has revolutionised education landscape and as expressed by the President of Standford University and quoted by Boxall (2011) created 'a digital tsunami' potentially threatening to sweep aside conventional university education.

A LOOK AT OOFE LEARNERS' SOCIO-DEMOGRAPHICS

Much has been said about the new education innovations; however, few reliable statistics have been published about OOFE learners. The following Table 2 was taken and derived from the data available online (Jordan, 2013).
OOFE providers. The duration of these courses has been between one and three months.

The period covered is between October 2010 and April 2013. The data covers 26 individual courses made available by four different

The total number of students who enrolled in the courses during October 2010 and April 2013 (covered period) is 1,662,236. However, the completion rate is only 7.4 percent for a total of 113,096 recorded as completion.

The vast numbers of enrolments does strongly indicate an interest in OOFE and MOOCs.

The numbers also show that courses produced on an industrial scale can be made accessible to a large number. The most striking example is the *Coursera* course that enrolled 180,000 students. No conventional university could even imagine enrolling such a large number of students, *at one time*, *in one place*, for one course. It also seems to indicate that, with mass production of courses and the adequate technology, high enrolment is not a deterrent in course offering. To have a better understanding of the impact OOFE courses may have in the higher education industry it is imperative to have, at the very least, a general understanding of the learners' social-demographics. Details as to who these MOOCs' learners are, is also very limited.

One available report, with a very limited number of 2350 learners, who enrolled in two courses, concluded that the mean age of the students was 35 with the youngest being 16 and the oldest 88. The highest education achievement of the learners were: PhD roughly estimated about 7 percent, those with a Masters Degree approximately 42 percent, College degree qualification approximately 36 percent, High School qualification roughly estimated to account for 14 percent and for those with no formal school approximately 1 percent (Balch, 2013).

In comparison to distance education insitution, for instance the Open University of UK (OU), the average age of new undergraduate OU learners is about 31 years old, less that 10% (~ 9%) of new learners are over 50 year olds. It is estimated about 27% of new OU undergraduates are under 25 this year (19,982 registered learners). In the total enrolment learners' count, over 31,000 learners who are under 25 year of age.

Table: 2
Compiled Statistics on MOOCs' Enrolment and Completion

	Providers	Period	Enrolled	Completion (%)	Total # Completion
1	Coursera	2012-09 to 2012-10	50000	19.2	9600
2	EdX	2013-02 to 2013-04	52661	15.5	8163
3	Udacity	2011-10 to 2011-12	160000	13.8	11594
4	Coursera	2012-09 to 2012-10	50899	12.6	4039
5	Coursera	2011-10 to 2011-12	104000	12.5	8320
6	Coursera	2011-10 to 2011-12	60000	10.8	6480
7	Coursera	2012-07 to 2012-09	46000	10.1	4554
8	Coursera	2012-08 to 2012-10	81600	10.1	8241
9	EdX	2012-10 to 2013-01	28512	7.3	2081
10	Class2go	2013-01-15 to current	64127	7.6	4873
11	Coursera	2012-05 to 2012-06	50000	7	3500
12	EdX	2012-09 to 2013-01	46000	6.5	2990
13	Coursera	2012-12 to 2013-02	66800	6.6	4408
14	Coursera	2012-07 to 2012-08	36295	8.6	3221
15	Coursera	2012-10 to 2012-10	33000	5.2	1726
16	Coursera	2012-10 to 2012-12	53205	4.8	2553
17	Coursera	2013-01-22 to current	102000	5.4	5508
18	MITx	2012-03 to 2012-06	154763	6.4	9904
19	Coursera	2012-09 to 2012-10	15930	4.7	748
20	Coursera	2012-09 to 2012-12	55000	4.5	2475
21	Coursera	2012-11 to 2013-0	180000	1.7	3060
22	Coursera	2012-09 to 2012-11	12000	2.6	312
23	Coursera	2012-05 to 2012-07	29105	2.7	785
24	Coursera	2012-06 to 2012-07	40000	3.2	1280
25	Coursera	2012-11 to 2013-02	60000	3.5	2100
26	Coursera	2012-09 to 2012-11	83000	0.7	581

Analysis question: What this statistics telling us?
Total enrolment = 1,662,236
Average Completion Rate = 7.4 (113,096)

Adapted from Jordan (2013)

The majority of these learners (~89%) choose this mode of learning and studying to further their career advancement above other aims. Over 71% of OU learners either work full or part-time during their studies (The Open University, 2012). There thus appears to be socio-demographic simillairties between OU learners and MOOC learners**The real success and impact of MOOC is difficult to evaluate and measure; enrolment rates are unusually high but so are attrition rates. Students completion rates is always an issue in any type of higher education institution. Though conventional institutions seem to have the highest retention rates in comparison to Open and distance institutions.**

Comparing the exact *impact* OOFEs on the former institutions is not a simple task where presently there is limited available information on students in OOFE courses. The only comparative data is from the growth of Open Universities. To illustrate, we will use the Open University of UK (OU) and other online providers as references. When OU first opened in 1971 it had 25,000 students registered. The OU reports having over 210,000 enrolled in 2012. There were approximately a total of 2.5 million students enrolled in UK conventional universities (Wikipedia, 2013). The OU enrolments were 8.4 percent of the total university enrolments. A study done in the United States in 2011, *Going the Distance Online Education in the United States*, indicates 6.1 million students were enrolled in 2010, in at least one online university course being provided by one of the 2,500 higher education institutions offering online courses. According to this study the numbers grew from 1.6 million in 2003. It is further stated that this represents a growth rate of 18.3 percent during that time period. During the same period, the overall university enrolled has only grown by 2 percent (16.6 million in 2002 to 19.6 million in 2010). The total enrolments in distance education in 2010-2011, represent 31 percent of the overall university enrolments (Seaman, 2011).

In an attempt to better understand learner's behaviour and the goals of learners in registering in OOFE courses, Kizilcec, Piech and Schneider (2013) did a longitudinal study of those learners who enrolled in three MOOC courses. Examining the trajectories from enrollment to completion, the researchers came up with a prototype of learners as summarized in Table: 3.

Table: 3
MOOCs Learners Prototypes

Completing	Learners who completed the majority of assessments.
Auditing	Learners who followed the course for the majority of its duration but did few assessments.
Disengaging	Learners who did assessments at the beginning but who eventually only watched some videos or stopped following the course.
Sampling	Learners who watch a single video or explore the material once the class is underway.

Adapted from Kizilcec, Piech, & Schneider (2013).

According to Kizilcec, *et al* (2013) findings, the greater part of the enrollees are samplers, followed by auditors, those who disengage and lastly the completers. A visual demonstration of this is presented in Figure: 1
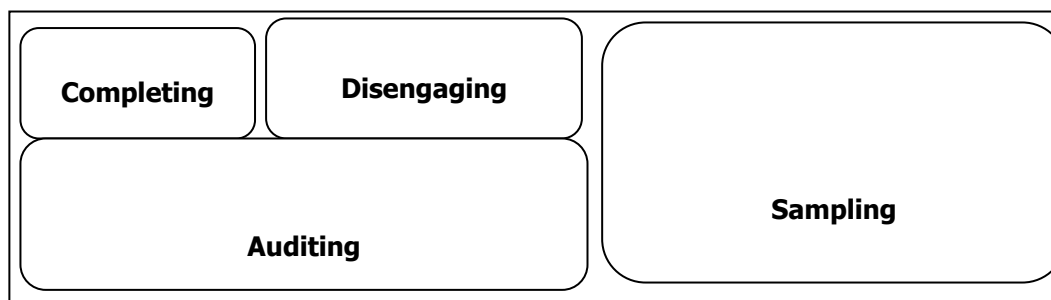
Adapted from Hill (2013)

Figure: 1
Prototypes of Enrollers

In terms of knowledge prolification it is possible to assume that the two most significant prototypes are the ones who complete the course and the auditors. The main reason for enrolling in the three courses being discussed is primarily because they find it challenging and have interest in the topic. Enrolling for enhancement of resume is more prevalent with completers than amongst other groups, varying between15% to 33% depending on the course. Other interesting fact is that there are a significantly higher proportion of US learners and UK learners who completed the courses then there are from other countries.

For the most part interest in the subject matter seems to be the most important reason for enrolling for completers as well as for the auditors and the samplers. (Kizilcec, Piech & Schneider, 2013)

In an attempt to further understand the trends, Hill (2013) has made a hypothetical categorisation of four types of learners. These categories are described in the following Table: 4. Hill (2013) redefines the typology described by Kizilcec *et al*. in the following terms:

Table: 4
Four types of learners

Completing	Learners who are active participants
Auditing	Learners who are passive participants
Disengaging	Drop-outs or people moving from active participant to passive participant to Observer
Sampling	A combination of Observers and Drop-Ins

Hill observations are further summarised in into Figure: 2 on determining the emerging patterns of the learners in *Coursera's* MOOC courses.
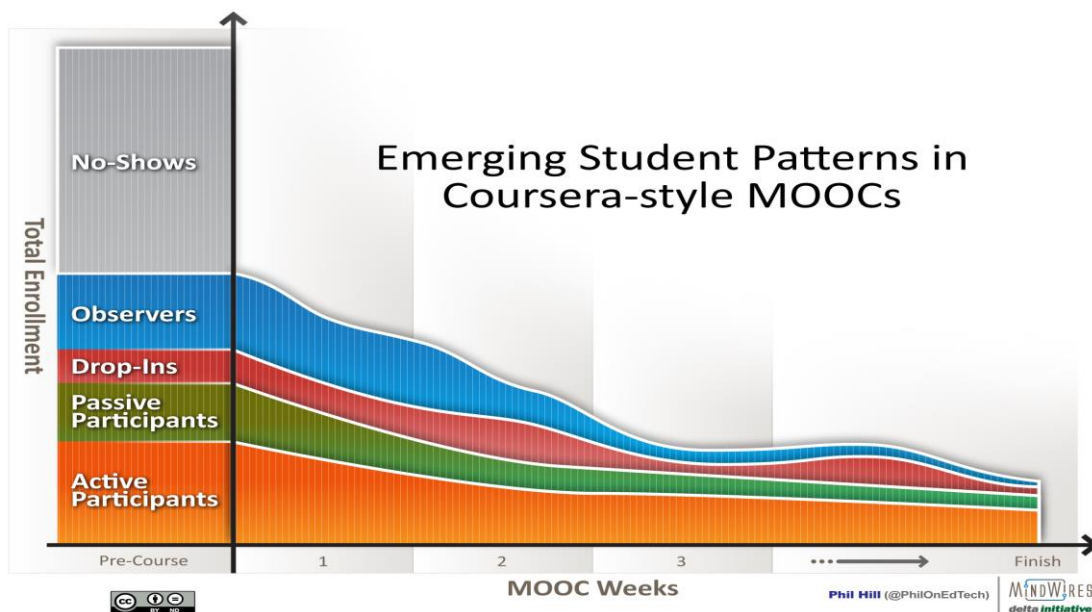

Figure: 2
Emerging Pattern of *Coursera*'s learners
Source: Hill (2013)

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From Figure: 2, it is possible to observe that the numbers drop drastically after the initial enrolment. The numbers continue to drop as the weeks go by. However, the learners who do make it to the finish line do not include only learners who completed all the assignments and all the course obligations. This graphical representation simply represents trends being followed by the learners who enrol in MOOCs. Hill (2013) and Kizilcec, *et al* (2013) reflect on the estimation that there is no static pattern. Learners may move from one type to another. Hill adds that passive participants may become active participants and/ or simply drop out. Learners may also be motivated by specific goals and register for courses following these goals which may be as simple as sampling the course, getting information, retrieving the content from the course or completion of the course. There are no official statistics as to the numbers considered in these studies.

However, going back to Table 2 which shows that 113,009 did complete the courses and the trends that are represented in Figure 1 and 2 there is no denying that an overwhelming number of people, in a short period of time, have benefited, to varying degrees from the availability of MOOC courses. It may then just be too simplistic, in terms of the idea of democratising of education, to try and determine the impact of OOFEs' by looking at completion rates alone. Nevertheless, one thing that is for sure is that access to knowledge is being made possible to an impressive number of learners.

DEMOCRATISATION OF EDUCATION IN A MARKET ECONOMY

It is well accepted that democratisation in education, making education available to all, is an obvious way to reduce social inequalities and create greater opportunities for all (Duru-Bellat, 2005). All share the idea that knowledge is socially constructed and should not be the sole possession of a few (Davenport, 2007).
Conventionally, higher education has been regarded as a public good providing a wide variety of benefits to individuals as well as all of society. Public goods are defined as goods that "cannot be provided exclusively to some: others cannot be excluded from consuming them … their consumption by some does not diminish other people's consumption levels of the same goods" (Tilak, 2009). The ideology, that has driven the concept of higher education as a public good, rest on the following premesis proposed by Tilak (2009):

> - First, higher education drives the absorption and dissemination of knowledge.
> - Secondly, higher education provides people with professional, technical and managerial skills necessary in the growth of knowledge economies.
> - Thirdly, universities are institutions that assist in building character and morals and thus protecting and enhancing societal values.
> - Fourthly, higher education contributes to the building of strong nation-state, producing citizens who can take an active part in civil, political, social, cultural and economic activities of society.

Presently, the idea of higher education as a public good is being contested (Altbach and Knight, 2007). According to Altbach and Knight, there are three factors combined to make this happen: the increase cost of higher education, the shortage of funds for higher education and the liberalisation in economic policies, which include higher education. The liberalisation of economic policies in higher education is part the World Trade Organization (WTO) Agreement on Trade in Services (GATS*).*

Robertson (2006) describes GATS as "hostile to public goods and social services, including specifically higher education".

This shift in thinking and the forces at play are having an increasing impact on higher education being transformed from a public good to a commodity to be bought and sold like any other commodity in the market. In Robertson evaluation of the GATS agreement, Knight (2002) outlined four modes of supply on how cross border services can be traded. The four ways in which this can be done are present in the following Table: 5. The first column categorise the mode of supply. A brief explanation on how the service is provided is given in the second column "Explanation". The third column describes how each of these four modes is applied to the education sector. The last column covers the size of the market. The parematers outlined in the above Table: 5 make it clear that cross border suppy of education can be done via distance education, students attending university in a foreign country, universities setting up branch campus, including twinning or franchising, and professors working abroad.

Table: 5
GATS Cross Border Education

Mode of Supply According to GATS	Explanation	Examples in Higher Education	Size/Potential of Market
1. Cross Border Supply	-the provision of a service where the service crosses the border (does not require the physical movement of the consumer)	- distance education - e-learning -virtual universities	-currently a relatively small market -seen to have great potential through the use of new ICTs and especially the Internet
2. Consumption Abroad	-provision of the Service involving the movement of the consumer to the country of the supplier	-students who go to another country to study	-currently represents the largest share of the global market for education services
3. Commercial Presence	-the service provider establishes or has presence of commercial facilities in another country in order to render service	-local branch or satellite campuses -twinning partnerships - franchising arrangements with local institutions	-growing interest and strong potential for future growth -most controversial as It appears to set international rules on foreign investment
4. Presence of Natural Persons	- persons travelling to another country on a temporary basis to provide service	-professors, teachers, researchers working abroad	-potentially a strong market given the emphasis on mobility of professionals

Adapted from Knight (2002)

The GATS agreement simply reflects what is happening in the market place and may be considered as an attempt to standardise international trade in education. Trade in education services is rapidly becoming a huge industry. As a demonstration of this phenomena education, in Australia alone, are the third largest export services creating revenue of AUS$4.1 billion.

Foreign students in the UK, in the same year, contributed GB£3 to the economy. As for the United States more than half a million foreign students spend an estimated US$9 billion each year (Robertson, 2006). In 2002 there were over 200 degrees granting international branch around the world (Altbach, 2002). The number of institutions offering their services in the International market continues to grow (Altbach & Knight, 2007). The main focus of such institutions is to generate revenue (Sean & Garrett, 2012). Students studying in a foreign country is thus a big generator of revenue for the host country.

On the other hand, for the user countries this can provide knowledge and language acquisition and enhance the curriculum with international content and also provides access to higher education in countries where local institutions cannot meet the demand. (Altbach & Knight, 2007).

Internet is now spawning a new set of technologies build upon user generated and created content that is freely available, that once again promises to expand educational opportunity and in a disruptive fashion challenge the role and function of existing open and distance education suppliers.

Anderson (2012) wrote that "disruptive technologies demand structural adaptation and many of our open universities seem resistant to such innovations, celebrating their past accomplishments rather than our current opportunities.

The market potential contained in Table 5, Consumption Abroad and Commercial Presence have been, up to now, the two principle modes of providing cross border educational services while e-learning had a relatively small market but was estimated to have potential for growth.

As discussed in the previous section *Era of Digital "Tsunami" in Education,* online distance learning is taking an unprecedented place as a form of providing education. The interest created by OOFEs may just launch e-leaning as a viable contender in higher education in general and in the cross border education market.

According to Sean *et al* (2012), American elite universities have invested over $100 million in OOFEs in order to further globalise themselves and that is an indication of the future of online education. It is presently estimated, by Global Industry Analysts, that online distance education will be a highly competitive market worth $100 Billion worldwide, by 2015 (Boxal, 2012).

THEORY OF DISRUPTIVE INNOVATIONS

The survival of Open and Online Free Education (OOFE) ventures, in the market place, depends on their possibility to attract and maintain customers: students. How and where open and distance education institutions and OOFE ventures fit into the general scheme of education, their implications and consequences, may be better understood in the light of the *Theory of Disruptive Innovations* as put forward by Christeen, Horn, Caldera and Soares (2011).

The theory has sufficient explanatory power to make the role played by these new providers, in the higher education industry, comprehensible. The general definition of the theory is as follows:

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"...innovation is the process by which a sector that has previously served only a limited few because its products and services were complicated, expensive, and inaccessible, is transformed into one whose products and services are simple, affordable, and convenient and serves many... The new innovation does so by redefining quality in a simple and often disparaged application at first and then gradually improves such that it takes more and more market share over time as it becomes able to tackle more complicated problems.
(Christeen et al., 2011, p. 2)

The theory stipulates that the industries previously providing the service or product tend to improve upon the product rendering it more specialised and expensive. The product, at one point, exceeds the needs of the consumer, becomes expensive and affordable only to the high end of the consumer scale: to those who have the money to buy it and the expertise to use it. The *Theory of Disruptive Innovations* further states that disruptive innovations have two key elements that enable them to evolve. The first one of these is technology. In early years of distance education postal services served the purpose, the technology has evolved to include internet technologies. The disruptive innovation, at first, provides a lesser product and serves people who are not being served. As the product and the technology improve, the disruptive innovation draws clients from the original provider and provides a product that is sufficiently acceptable to meet the needs of the consumer and gradually replace the original provider. The authors point out that low cost is defined by the amount the university spends per student (Christeen *et al.*, 2011).

The second element that allow disruptive innovative to evolve is the business model. Disruptive innovations thrive to serve the need of customers, provide the client with what is needed for the client to achieve the goal being sought at a lower cost and in a manner that is convenient to the client*.* This is being achieved by online higher education providers.

This is not to say that substandard products and substandard content are being provided. The open and distance education industry is growing and its success can best be described by its focused approach in providing teaching and learning opportunities to meet the requirement of the clients. Christeen *et al.*, (2011) noted that "... focused on highly structured programmers targeted at preparation for careers - has meanwhile given several organisations [i.e online education providers] a significant cost advantage and allowed them to grow rapidly". There are three factors that are important to retain at this point: the available technology can provide greater accessibly to a greater number, the focus of these universities is on knowledge proliferation and lastly low cost does not necessarily equate to "*cheap*" but "meaning the amount the university spends per student" (Christeen *et al.*, 2011).

The online distance education industry is growing and its success can best be described by its focused approach in providing teaching and learning opportunities to meet the requirement of the clients "focused on highly structured programs targeted and preparation for careers has given several organisations a significant cost advantage and allowed them to grow rapidly (Christeen *et al.*, 2011, p. 3).

There is another important element to qualify where quality can only be measured relative to what customers' value in their own context (Christeen *et al.,* 2011). Opportunity cost being that students can take courses anytime and anywhere.

The *Theory of Disruptive Innovations* states that new innovations thrive to serve the need of customers and provide the client with what is needed for the client to achieve the goal being sought. In doing so the new innovations tend to operate in areas that do not put them in conflict with regulations and that eventually, once customers have migrated to the unregulated system, regulators respond to "the fait accompli". Internet is now spawning a new set of technologies build upon user generated and created content that is freely available, that once again promises to expand educational opportunity and in a disruptive fashion, challenge the role and function of existing traditional, open and distance education suppliers. There are, of course, many major challenges for OOFEs to become a disruptive force in the higher education market place.

THREAT (OBSTACLES) OR OPPORTUNITIES IN DEMOCRATISATION MOVEMENT

Development of democratisation in higher education is closely related to the availability of OERs and MOOCs. The OOFE ventures come with certain interrelated obstacles and potential opportunities. There are some present persistent questions enthusiastic researchers try to answer. Will this OOFE have disruptive effects while creating new opportunities? Perhaps, OOFEs is one of the major breakthroughs in education for one and for all?

We have identified the following characteristics that might be obstacles and opportunities in this democratisation movement.

Demand for Higher Education
Along with globalisation comes increase competition creating a greater demand for specialized skills and interdisciplinary knowledge demanding also lifelong learning; however, universities seem unable to meet the growing and changing world demand (CISCO, 2010). The history of "correspondence education" dates back to 1728 in Boston with lessons being send by mail (Infographic, 2013). The world's first open distance education institution, The Open University of the UK (OU) opened to its first students in 1971. The first course taught online was in 1995. In 1996 Jones International University was launched and claims to be the first fully online university accredited by a regional accrediting association in the US (Wikipedia, 2013). MOOC is the new generation giving itself a new mandate in the world of online and free education. In the next decade the technological requirement for jobs will rise from 50% to 77%. By 2014 the number of college students taking at least one online course is expected to go from 4.6 million to 18.65 million and by 2015 is expected to increase by another 37% [these stats are US stats] (Infographic, 2013). While there are numerous countries who have set up their own Open Universities, for the most part the focus is on nationals although most do accept international students. The practice of satelite campus has been a buiness move to make education more offordable to local populations and thus increase the competitive edge of foreign institutions (Knight, 2002). However, the OOFE ventures are open to students from across the world thus lanching e-learning as one of the possible major providers in the national market and in the cross border education market. World population demographics show that by 2020 half of the world's tertiary students will be in India, China, the US and Indonesia with another 25% in Pakistan, Bangladesh, the Philippines and Vietnam (Sean & Garrett, 2012). The chalanges are great, to give an example, to meet the growing demand in China, India and Indonesia, it is estimated an additional 10 million teachers will be needed (CISCO, 2010).

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Technology

The technology to produce the MOOC courses setup by the OOFE venture seems not to be a problem but an advantage. MOOC embodies a convergence of technology that is creating new energy especially around the online learning communities. On the technology side, the platforms enabling web-based instruction are more effective and reach greater scale of learners than ever before. Technologies that are widely used usually include high-quality indexed videos, data capture and analytics and interactive delivery platforms that combine the qualities of social networking sites with the content delivery, discussion and automated testing and grading functions of the traditional learning management system, adaptive learning platforms (i.e. Khan Academy and Knewton) do offer massive online material. This adaptive technology platform tracks and correlates data generated as students work's progresses – from time of day to clicks and response patterns – to personalise instruction. Ultimately all platforms may use data to adapt instruction to the learner (EDUCASE, 2012). In fact, many technology-driven solutions are now available to the aspiring OERs educators to use, including tools for improving discoverability through search engine optimization and metadata; for publishing content and assessing learning (McAndrew, 2012). Technology will define where online and distance education goes next (Regalado, 2012). All those millions of distance learning students clicking online can have their progress tracked, logged, studied, and probably influenced. Just perhaps in the *near* future, with the advance development of technology it will create software that maps an individual's knowledge and offers a lesson plan unique to him or her.

Language

Most OERs and MOOCs originated in the United States where the prominent language being use is English. Bund (2013) wrote that "... MOOC is …. Internationally accessible, however, the language barrier remains a key obstacle. Efforts to overcome this obstacle are being made by some service providers, such as *Coursera* in collaboration with *Amara,* a subtitling non-profit crowd-sourced platform, to provide translation (Weredacdemic, 2012). *Coursera* boast that it has enrolled over 1 million students from 196 countries. A closer look at the statistics reveals that of the total number of students 38.5% are from the United States. This number goes down significantly for the second largest number of enrolments by country with 5.9% of the students enrolled residing in Brazil. All other students enrolled, 61.5%, are spread throughout 195 countries equating to a small fraction of enrolments per country (Coursera.org, 2012). In order to have a clearer understanding of the language issue the English Proficiency index developed by English First was used as a reference (English First, 2012)*.* In its 2012 report they established the English Proficiency of 54 countries on a five level scale from *Very High Proficiency* to *Very Low Proficiency*. Countries with a *Very High Proficiency* rating are Sweden, Denmark, Netherlands, Finland and Norway. Based on the report by Coursera the total of enrolments for the above mentioned countries is 2 percent of the total enrolments.

There is another group of 7 countries who are classified as by English First as *High Proficiency*. The total enrolment in Coursera courses, for these countries, is 4.6 percent of the total enrolments. China is classified as a *Low Proficiency* country but counts for 4.1 percent of the enrolments. Brazil which is classified as a *Very Low Proficiency* country counts for 5.9 percent of the total enrolments. Canada and the UK which are English speaking countries only account for 4.1 and 4 percent of the enrolments. These statistics alone do not establish causality between enrolment and language proficiency.

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There is a conscious awareness that language proficiency may be an obstacle on the other hand these statistics seem to indicate the possibility that English language proficiency is not necessarily a drawing card for enrolment.

Accreditation

Many have framed accrediting agencies as one of the most significant barriers that prevent innovation from occurring in higher education. Accreditation plays a significant role in higher education today. Universities and higher education institutions that are not accredited do not have access to funding from governments or funding agencies. Furthermore, accreditation is seen as a stamp of quality - such that if a university is not accredited, the assumption is often that there is something subpar about it. Rossi and Mustaro (2012) note that quality is no longer a characteristic merely measured or inspected to identify problems in the services or defects in the products, but its edification has to be prioritised during product development. This is realised in the same way for educational products and services, especially for educational products supported by technology. The move for accreditation off MOOC courses is in process at varying levels. This process in taking shape either through direct accreditation for courses offered by OOFE or through collaboration with institutions that can provide credits. For instance, EdX is planning what it calls the "flipped-classroom" in an experiment with a community college in the United States.

The experiment is to combine MOOC courses with traditional campus instruction. On the other spectrum, the American Council on Education is considering recommending college credits for some of the completed free courses (Mangan, 2012). Subject to certain conditions, some traditional universities already grant credits for certain MOOC courses such as in San Jose State University and Penn State University. Cooperation between degree granting institutions is also growing.

Coursera recently announced that 69 schools had already signed up to offer their courses. The newest partners include Northwestern University, IE Business School in Spain and National Taiwan University (Korn, 2013). The University of Toronto has recently launched its own OOFE venture. Students who enrolled in classes were from Indonesia and Tunisia, Lithuania, Sudan and Kyrgyzstan and the United States, the United Kingdom, China and Canada (Bradshaw, 2012). Most recently in June 2013, Udacity in collaboration with Georgia Tech and AT&T now offers an online, Master Degree in Computer Science for a fee of 7,000$US, the free non-credit cerificates is available and open to for learners all over the globe (udacity, 2013).

Job Market Value

There is an increasing demand for *credentialed* as "proof" of knowledge in the job market. The acceptable practice is that university degrees are an integral part of the labour market (Craig, 2012). The *Chronicle of Higher Education* released data from a study of professors, who teach MOOC courses, a majority of them do not believe that credit should be awarded, yet believe that the courses play an important role in the changing face of education and have inherent value (Thadani, 2013). Previous research has demonstrated that candidates with online degrees are usually viewed as less desirable then candidates with traditional face-to-face institutions degrees; candidates holding these traditional degrees have a better chance of finding employment (Adams & Defleur, 2005; 2006). According to Columbaro and Monaghan (2009), potential employers reported some concerns in regard to online degrees which include lack of rigor, risk of cheating, lack of commitment and concerns over degree mills.

These perceptions have serious implication for OOFE courses where potential job seekers may hold only certificates of completion as proof of knowledge. Some researches argue that there is no significant different in the learning outcomes of students in online and traditional face-to-face settings (Astabi, 2010). A particularly important aspect is that employers with online experience had a more positive attitude towards hiring online learners than those without online experience. The numbers who have this experience is on the contestant rise as demonstrated by the growing number of enrolments in OU and OOFE courses. There lies a paradox between the need for credentials as proof of knowledge, how knowledge will be defined in the market place and the growing demand for knowledgeable individuals to fill the needs of the economy. The question then becomes, do we prioritise the interests of tuition-paying, credit-earning students over other students? (Bruff, 2013).

DISCUSSION AND IMPLICATIONS FOR HIGHER EDUCATION

There is no imperical evidence that this new innovation (OOFE) towards open and free education movement is, at this time, disrupting established institutions of higher education. There is no evidence to demostrate that students who are enrolling for courses are students who would of otherwise enrolled in conventional, open distance or other institutuon of higher education. Collaboration between the new innovation and the traditional providers appears to be the norm, at this point of time. The United States has approximately 2,500 institutions offering online distance couses. The new consortium has improved the product with advanced information communication and technology (ICT), brought in some of the worlds prestigous universities (such as Yale, Stanford, Carnegie Mellon, and U.C. Berkeley) has partenerships with [at the time of writing] some 69 institutions from different parts of the world and made it available to a bigger market, at a lower cost. The evidence does also show that via collaboration between the OOFE providers and conventional providers, both in the United States and outside the United States, show a tremendous growth and interests. Established prestigious institutions from other parts of the world higher are getting involved by offering free courses or/and collaborating in the process. The reasons for this collaboration may not be clear at glance. As stated by Sethy (2008), one of the reasons may be *a fear of being left behind*.

This may be a cause for concern, as noted by Peters (2010), when Open Universities produce more graduates than conventional universities there is a great potential for higher education to be monopolised by the first. The vast number of enrolments with OOFEs may be an indication of such a potential as well. No conventional face-to-face university has such the potential to enrol as large a number of students, at one time, for one course as can be done with online distance education. At the present time, we believe that OOFEs need to cross some barriers as discussed in the previous section. However, depending on the extent of collaboration between OOFE providers with other major higher institutions across the globe the barriers may not be insurmountable.

According to Sean *et al* (2012), the $100 million invested in OOFE ventures is one of the strong indications that online distance learning is part of the *future* of higher education. Conventional universities that heavily relied on face-to-face teaching will have to decide how to get involved, how to face the competition, and how to best manage this new innovation of digital "TSUNAMI" in higher education that provide education for free [or lower cost] in present educational landscape.

As the Theory of Disruptive Innovations basically states that new innovations thrive to serve the need of customers and provide what is needed to achieve the goal being sought. It also states that new innovations tend to operate in areas that do not put them in conflict with regulations and that eventually, once customers have migrated to the unregulated system, regulators respond to "the fait accompli".

Customers may be defined by the increasing demand by individuals (customer) to have access to quality higher education and secondly the need in the marketplace (customer) for highly qualified people to fill jobs that demand new skills.

The fact that OOFEs are cooperating with world class higher institutions, in the proliferation of knowledge, making it possible for these universities to compete in national and cross border markets, could come to be accepted and comparable to a degree obtained from lesser institutions (Sean & Garrett, 2012). As Sethy (2008) rightfully pointed out collaboration in global networks is more appreciated in the marketplace than a degree obtained in the conventional manner. Thus addressing the needs of both customer groups or as put forward by the President of Stanford University with the creation of "A DIGITAL TSUNAMI" threatening to sweep aside conventional university education whereas education would become defined, by the marketplace, in terms of knowledge and not uniquely in terms of degrees per se. Considering what is going on in the marketplace, we analyse the current *existing* educational providers and re-defined the types of educational providers into three specific categories, as describes in Table 6.

Table: 6
Re-defined Types of Educational Providers

Provider Types	Specific Type	Descriptions
Conventional (traditional) Face-to-Face Learning (CFFL)	All inclusive (both Accreditation & Knowledge driven)	• Heavily involved in research and knowledge development. • Personal and social development of students through direct participation in university life. • Degree granting with limitations for customers (prerequisites required) • High in cost, available at ONLY specific time and place (usually in specified campus) • Provides specialised services to society and industry (advisory, research and consulting)
Open and Distance Learning (ODL)	Accreditation provider	• May provides some specialized services to society and industry (advisory and consulting) • Some knowledge development in research, but limited. • Degree granting with few limitations to customers (few or no prerequisites required) • Low in cost • Available anytime anywhere (usually at National reach level)
Open and Online Free Distance Learning (OOFDL)	Knowledge driven provider	• Knowledge proliferation • Highly flexible in time and place (global reach level) • Minimal or at no cost

The history of OOFEs so far is one of cooperation with established traditional universities. Where, resources are pulled together, in alliances, to make existing knowledge and higher education available, with fewer restrictions in cost, time and place. It may not be, as stated by Peters (2010), that education as such is being monopolised by one particular type of institution but that the mode of providing education has the capability to change and of gaining greater monopolisation. In a nutshell, the OOFEs are making an inroad both nationally and in the cross border market. The conventional (traditional) universities therefore face at least two identified challenges as the following:

> First, the conventional (traditional) universities must decide how to get into the MOOC venture (game) to remain competitive, either by producing their own MOOCs where they are in competitive advantages, or alternatively integrating best of breed MOOCs into their educational offering,

> Second, the conventional (traditional) universities must re-focus on the *value proposition* of a costly on campus learning, when free or at lower cost, yet quality options, are made available everywhere in the world.

Additionally, as what Caudill (2013) notes that from the business model perspective, MOOCs and OOFE venture are very much a traditional business model concepts; they are low cost production sold for low prices but at extremely huge volumes that potentially generate substantially incomes while delivering a quality product to a large audience of learners across the globe.

In brief, we would like to offer perspectives scenarios that perhaps seem pertinent, at this point of time, regarding the providers described in Table: 6.

Scenarios

Could the OOFDL, in its collaboration with the CFFL, disrupt the ODL?

Scenario (a)

OOFDL   CFFL   ODL   →   ODL

Higher Education Providers Landscape   Outcast
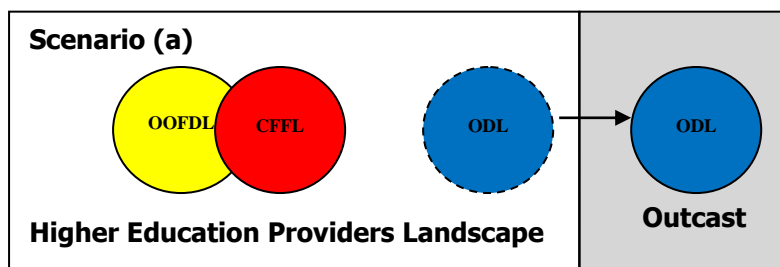
Could the CFFL[2], who are established institutions choose not to cooperate, or who are not capable of doing so, with the OOFDL be disrupted by the major players in the CFFL[1] and the OOFDL?

Scenario (b)

CFFL[1]   OOFDL   CFFL[2]   →   CFFL[2]

Higher Education Providers Landscape   Outcast
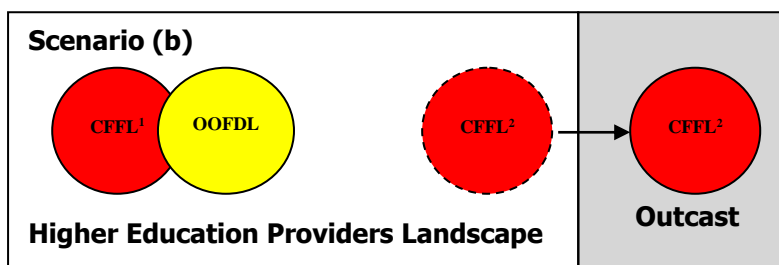
Can the ODL, in developing partnerships with the CFFL remain a strong force in the market and disrupt the OOFDL?
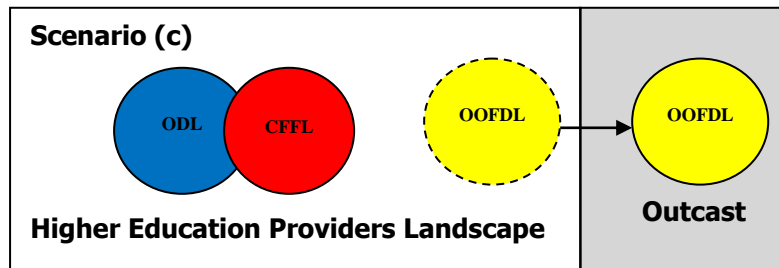
CONCLUSION AND RECOMMENDATIONS

No doubt that this democratisation movement has the potential to impact higher education across the world. The development and democratisation movement towards open and free education may be a solution to the existing problems in the ever rising cost in education. With the rise of all types of OOFE ventures, the future of higher education is perhaps one step closer to a "for all" people, everywhere, to have affordable, accessible education opportunities. Yet, it is premature to predict the prominent impacts on all types of educational providers. Many universities and private venture funds investing in this area have openly acknowledge the high level of experimentation and testing involved.

Perhaps, the year 2013 is the *infancy* stage of democratisation, the coming years will tell the story of what OOFE venture will become, but one thing is affirmed, that this movement is simply too great for educators, and any enthusiasts, to ignore and disregard. As presented in the three potential scenarios presented above, this evolution has the potential to undermine and replace the existing business model of all educational providers; institutions that depend on recruiting and retaining students for location-bound, proprietary forms of campus-based learning or distance-based learning.

OOFE innovation is causing a lot of stir. Individuals all *over the world* are either completing courses or checking on the possibilites [for those who enrolled but did not complete the course]. Establised institution from major parts of the world are also getting involved by offering courses or/and collaborating in the process. Although accreditation and language continues to be obstacles for this new innovation to distrup the higher education industry, what the disruptive innovation theory does state is that "...the disruption first prospered in a completely independent space outside the reach of regulators" (Peters, 2010). The process makes it possible for the new innovation to enter the market place and compete, first at the low-end user, with satisfactory products to meet the customers immidate need.

As noted by Peters (2010), once the new value network has proven itself to be viable and better and the bulk of the customers have migrated to the unregulated system, its regulators responded to the "fait accompli". In many parts of the world efforts are being made in to ensure greater collaboration amongts higher education institutions.

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In the United Statas, leaders in the field of higher education are looking at simplifying the accreditation rules so that the online market can enroll students from around the country (Anderson, 2013).

Agreement like the *Seoul Accord of 2008* involving eight countries that includes Republic of Korea, USA, Australia, UK, Canada, Hong Kong, Taipei and Japan, who have agreed to the mutual recognition for accredited academic computing programs is one example of international cooperation in accriditation. (Accreditation.org, 2013).

In March 2013, according to the recent Europe Higher Education Area (EHEA) announcemnt (2013) there were about 35 European countries and regions who agreed to the need of ensuring a more comparable, compatible and coherent systems of higher education in Europe.

Democratisation movement towards open and free education has opened up new frontier of higher education that provides the fast-track route for learners from all over the world to take up universities courses for free or at a low cost. It is undeniable that the recent hype of MOOCs and OERs attracts a great deal of attention from higher education institutions and OOFE service providers are seeking opportunities to build their brand and to enter the education market.

Towards this end, we would like offer and recommend that higher education institutions [regardless in conventional (traditional) mode and distance learning mode] need *to learn* and perhaps *look more closely* at the present development of OOFE, that seems to be revolutionising the educational frontier in creating new breed of online class, new innovation, new business model, new learning pedogogies, new financial and revenu models that are able to meet the different needs of new groups of learners in an open higher education marketplace.

At national and international levels, the democratisation movement towards open and free education, being brought about by OOFEs, is still in its *infancy* stages. But its growth has serious implications for all higher education providers and policy makers. While quatity assurance is necessary, used as protective measure, nationaly and localy, accreditation may just be offset by cost defined in terms of fanancial cost as well as quality and accesibility cost as discussed earlier.

The notion of education as a public good as opossed to a consumer good is also being re-defined in terms of cost. Access to knowledge, and gradually to deplomas is being ofered cheaper through the market place then it is through government funded institutions.

The cost of providing education is also becoming economically more feasable through the maketplace then through higly subsidised government funded institutions.

The measures used to determine quality through accreditation may also have to be re-examined to meet the marked needs of education: the simple paradox of supply and demand at a affordable cost.

With the growth of the industry in the marketplace traditional institutions and distance learning institutions may need to consider how to re-position themselves in order to remain competitive

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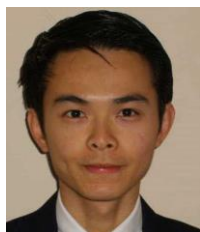
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