IMPACT OF TECHNOLOGY DRIVEN LEARNING
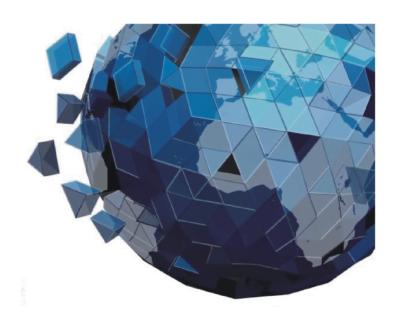# ON STRUCTURE AND MODELS
OF HIGHER EDUCATION

IMPACT OF TECHNOLOGY DRIVEN LEARNING ON STRUCTURE AND MODELS OF HIGHER EDUCATION

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ABSTRACT

Historically, the chalkboard and face-to-face delivery-based education model have been used by universities worldwide in the last 100 years. In the last decade, the disruption of communication and the internet has been changing the game of higher education. Social net worlds, wikis, blogs, YouTube, interactive websites, and integrated hand-held communication technologies have taken over face-to-face meeting for education. Virtual campuses, Massive Open Online Courses (Moocs), and Coursera have already been delivering virtually every possible course through e-learning modes. There is a shift from teaching to learning, from faculty to students and from instructional driven instruction to learner-centered instruction. Twenty-first century learners demand high quality learning experiences outside the traditional provisions of the campus-based environment. These learners are demanding education on a 24/7 basis that is accessible anywhere. The above changes in education delivery modes are significantly transforming the roles of professors, students, and administrators. Such change will have a dramatic effect on future models of education. This paper discusses how e- learning, with the use of current communication and internet technologies, will have an impact on the structure and model of higher education.

KEYWORDS: Higher Education, e-learning, chat boards, chalkboards, massive open online course (MOOC), lifelong learning, personalized learning.

INTRODUCTION

The key assets of the new knowledge-based economy of the 21st century are human capital and the knowledge. Education and knowledge have become the determinants of the social and economic prosperity of a nation. As society becomes more and more knowledge intensive, the significance of colleges and universities that offer education and training to impart knowledge have been far greater than ever before. The present education system worldwide has been based on the needs of the industrial society of the past. The demographics and profile of today's college-going population is much different than it used to be decades ago. A high percentage of students are older, working professionals, and more diverse than their peers of the past. Their needs, expectations, and learning styles are also different from their peers in the past.

The internet and other digital technologies have not only made education opportunities available around the world on an almost 24/7 basis, but also provided opportunities to choose programs and degrees from multiple institutions with innovative curriculum and teaching pedagogies. Online learning, or e-learning, has gained a firm foothold in universities around the world. The internet and other digital technologies continue to have a significant impact on higher education. These technologies are helping universities reach a student base beyond their geographic boundaries. Social-networking tools are helping build strong connections with alumni and potential donors as online marketing campaigns are expanding the reach and success of recruiting and fundraising efforts (Sharma, Palvia and Kuma, 2017).

The perception of the college campus from a one-dimensional (physical) concept to a multi-dimensional (physical and online) one is a reality. Twenty-first century learners' learning styles and expectations are much different from 20th century learners. Twenty-first century learners demand high quality learning

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experiences outside the traditional provisions of the single campus-based environment. Twenty-first century learners' expectations may not be met within the traditional model of higher education. Today's learners seek degrees and programs based on the anytime/anywhere mantra. MOOCs and Coursera have added further impetus to multi-access learning to meet their expectations. The use of social net worlds, wikis, blogs, YouTube, interactive websites, and integrated hand-held communication technologies for classroom learning have become common and have significant implications for higher education. These technologies allow students to become much more engaged in constructing their own knowledge and enhance their learning. The massive open online course (MOOC) has already started impacting higher education (Daniel, 2012; Friedman, 2013; Harden, 2013; Kolowich, 2013). These learners are demanding education on a 24/7 basis that is accessible anywhere. They are demanding instructional approaches for problem based learning (PBL), inductive teaching and learning, problem solving, and inquiry skills in real world contexts (Jurewitsch, 2012; Klegeris & Hurren, 2011; Salvatori, 2000; Prince & Felder, 2006). These changes in education delivery modes are significantly transforming the roles of professors, students, and administrators. Such changes will have a dramatic effect on future models of education (Castle & McGuire, 2010; Jean-Louis, 2011; Siemens, 2005). These technology-driven courses pose new challenges to university administrators, policy makers and faculty members in order to redesign the curriculum as per the needs of 21stcentury learners.

THE WEB AND E-LEARNING TRAJECTORY

The World Wide Web (commonly known as the web) introduced by Tim Burners-Lee in 1989 is the major breakthrough of the 20thcentury, which allowed people and systems to connect for information exchange and collaboration (Berners-Lee, & Fischetti, 2000). The web has been evolving and has gone through various stages from Web 1.0 to Web 4.0, which has had a direct impact on communication, collaboration, and education. Web 1.0 terminology refers to the first implementation of the "read-only web" stage where individuals or organizations could display static information. Organizations created their web sites during this era to display their information (Rubens, Kaplan, & Okamoto, 2011). In the next stage, the web evolved to Web 2.0,as defined by Dale Dougherty in 2004,where the web had a capability to read and write and was defined as the "read-write web". In this era, the web became capable of enabling two-way communications for any interaction or transaction (Richardson, 2006; Fuchs, et al., 2010).Social network platforms such as Wiki, blogs, Twitter, Facebook, Flickr, and YouTube are all examples of Web 2.0. (Dominic, Francis, & Pilomenraj, 2014; Singh, Debi, & Gulati, 2011). In its evolution to the next stage, it became Web 3.0, also known as the "read-write-execute web" (Maria & Negrila, 2012). Web 3.0 technologies include artificial intelligence, Semantic text, web, Semantic Wiki, and software agents. Web 3.0 is also known as the "smarter web" or the artificially intelligent web. This era is transforming web interactions and making online lives easier and more intuitive with the use of smarter applications(Rubens, Kaplan, & Okamoto, 2011; Singh, Debi, & Gulati, 2011;Rego, Moreira, Morales, & Garcia, 2010). In its next evolution, it is expected that Web 4.0 may be a "read-write-execution-concurrency web" with intelligent interactions. Web 4.0 may also be known as the symbiotic web where human mind and machines can interact in symbiosis (Sharma, Palvia and Kuma, 2017).

The web evolution has a direct impact on education and particularly on e-learning. E-learning has been evolving alongside the World Wide Web advancement (Hussein, 2014; Rubens, Kaplan, & Okamoto, 2011). E-learning 1.0 evolved along with Web 1.0. During this phase, various universities worldwide started adopting Learning Management Systems (LMS) or Learning Content Management Systems (LCMS) to offer course content online (Hussain 2014; Rubens, Kaplan, & Okamoto, 2011).E-learning 2.0 evolved with Web 2.0. As Web 2.0 made two-way communication possible, traditional LMS 2.0 were augmented with social software tools such as discussion boards, blogs, wikis, podcasts, and other virtual world tools toenhance interaction and participation (Hussain, 2014; Singh, Debi, & Gulati, 2011). This era was known as e-learning 2.0, where learners and instructors could engage online on an almost real-time basis. With the evolution of Web 3.0, traditional LMS are further integrated with more collaborative and artificial intelligence-based tools. This era, termed as E-learning 3.0, incorporates cloud-based distributed computing, extended smart mobile technology, collaborative intelligent filtering, 3D visualization, and interaction (Hussain, 2014, Hussain, 2014; Rubens, Kaplan, & Okamoto, 2011). Most universities have still not adopted E-learning 3.0 tools for their course delivery. It is expected that in the next phase of evolution to Web 4.0, E-learning 4.0 may combine a three-dimensional environment (Web 3D) to create interactive virtual worlds, such as those currently found in gaming (Sharma, Palvia and Kuma, 2017).

PUSH TOWARDS PERSONALIZED AND LIFELONG LEARNING

As we are progressing along the e-learning trajectory, we will see a convergence of personalized and lifelong learning as a new expectation of learners from the traditional university. Online-collaboration tools and Web 2.0 technologies, such as wikis, instant messaging, and social networking software which supports self-paced learning, have already been adopted by many universities in their pedagogical approach. Some institutions have also started offering courses which are based on online gaming and simulation. Accordingly, faculty members and administrators are exploring how advanced web applications and freeware tools could be used in their course and program offerings to enhance-learning. E-learning will evolve around student-driven personalized or customized lifelong learning. In such an environment, learners will be able to control their learning and contribute to their learning through discussions and collaboration using online platforms. The closed learning environment of traditional campuses is going to be increasingly challenged as universities have to prepare themselves to offer Personal Learning Environments (PLE). The personalized learning approach will put pressure on universities to create new curriculum and adopt different pedagogical approaches. Preparing learners and instructors for this new phenomenon is going to be a challenge for universities. Learners and instructors will need to utilize a variety of skills in technology, social networks and other virtual engagement tools, and newer pedagogical methods, along with high-tech supporting infrastructures. Collectively, such advances are leading to profound changes in teaching, which is becoming more outcome-based and student-centered. Instructional paradigms are shifting to the application of knowledge to real life problems, instead of focusing on the memorization of material by their students. Universities will be forced to find ways to tailor and align curriculum and supporting learning infrastructures to match the personalized demands of students (Gallagher & Garrett, 2013;Petegem, 2008; Kirkwood & Price, 2014; Irvine, et al., 2013). Multi-access learning is becoming a norm of the day for 21st century learners due to several reasons. Multi-access learning modes enable students to combine their face-to-face traditional campus-based college experience with online environments to create their personalized learning experiences(Irvine, 2009; Irvine & Code, 2011, 2012; Irvine & Richards, 2013, Sharma, Palvia and Kuma, 2017).

IMPACT OF MASSIVE OPEN ONLINE COURSES (MOOCS), COURSERA, AND OTHER DIGITAL LEARNING

MOOCs, EdX, Coursera, Udacity, and other digital forms of learning have allowed universities to widen and increase access to higher education. These digital forms of learning have provided an opportunity for students to learn outside their classrooms. Currently, most students in MOOCs, EdX, Coursera, and Udacity classes are adult learners focused on lifelong learning, but an increasing number of traditional students are using it for their degree completion. MOOCs, EdX, Coursera, Udacity, and other digital forms of learning are making an impact on higher education in several ways. These digital forms have allowed universities to broaden their student enrollment base and have allowed students from all parts of the world to sign up for classes outside their country, region, and campus. These forms have also enforced offering more blended and active learning models. Universities are not constrained with physical classroom sizes and can enroll hundreds of students, thus enhancing their capacities and reach. These changes are forcing universities to offer a more adaptive learning and competency-based education, which may better suit the business world. Working professionals, who need to upgrade their skills to keep them current, are helped enormously with MOOCs, EdX, Coursera, Udacity, and other digital courses. This demographic may not need a degree but a skill set matched to the needs their company. This need has allowed companies to suggest their employees take these courses and reduced their own corporate training costs. Udacity and Coursera are also enabling employers to connect with graduates and discover their employability (Finkle & Masters, 2014).

CONCLUDING THOUGHT

The rapid and explosive growth of e-learning worldwide poses a tremendous challenge to the traditional campus face-to-face delivery-based education model. The decline in enrollments and shrinking state and federal funding are raising very real questions about the sustainability of the current higher education business model. Due to the high cost of education, students, and their parents, are demanding a return on their investment. It seems the current university model is antiquated and is undergoing significant change because of technological innovations. (Mehaffy, 2012). MOOCs, Coursera degrees, and similar programs will become more common as part of degree completion. Virtual technologies and social media sites, such as Facebook, Twitter, and others, could become the primary forum for "instantaneous idea sharing, tutoring, learning and training." In an era of open courseware, university classrooms are not the

only, or necessarily the best, places for learning. Drivers of change, such as large-scale demographic shifts, have inevitable consequences in how students approach education. Attracting, retaining, and engaging students in a technology-based environment requires universities to redesign their existing higher education models.

The above changes in education delivery modes are significantly transforming the roles of professors, students, and administrators. The role of a professor is changing from a "sage on the stage" to a "guide on the side". A professor is becoming more of a facilitator, enabler, motivator, and resource provider than a traditional classroom face-to-face teacher/preacher. The definitions and roles of classroom, student engagement, library, class interaction, and college campus are changing. In an online classroom, students may enroll from anywhere in the world and break the traditional classroom's physical boundaries. Chalkboards are getting replaced with chat or discussion boards.

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