EDUCATING THE 21ST CENTURY LEARNERS: ARE EDUCATORS USING APPROPRIATE LEARNING MODELS FOR HONING SKILLS IN THE MOBILE AGE?

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ABSTRACT

The world of the 21st century learner is full of boundless possibilities for the use of multimedia and interactive technologies in the learning process. However, many educators seem to be 'foot-dragging' in regards to embracing of modern ICT in the classrooms. This paper points out two distinctive needs in order for educational systems to overcome the existing challenge: the need for a new learning theoretical framework, and the need to continuously educate teachers on new ICT use in classrooms. In return to these needs the UNESCO ICT-CFT Model is presented, which from the authors point of view covers the requirement for a robust framework, while also highlighting salient issues pertinent to the 21st century learner generation. We propose the 'flipped learning' model as an alternative for more engaging and impactful learning. Entrepreneurship education programs can serve as prominent avenues to actualize this proposal.

Keywords: Entrepreneurship Education, Learning Theoretical Framework, Flipped Learning

INTRODUCTION

"Today the world of the learner is almost unbounded"~Frederick Devereux, 1933.

Imagine a room full of young people. Amongst them are some of the brightest minds in digital trends and ardent users of information and communication technology-ICT. Their social environment is characterized by unprecedented technology innovations and new social trends. Their future is thrilled with promises of an unbounded digital landscape. Yet, they have come to seek competences that will prepare them for future career in the unfolding digital society. How will you go about instructing them?

ICT Considered as a Disruptive Force in Learning?

The scenario presented in the above paragraph is perhaps a tip of the iceberg of what is facing many 21st century educators in various educational levels, and perhaps most obvious in higher education institutes (Flumerfelt & Green, 2013). The past few decades have witnessed massive technological advancement and socio-structural changes (Sharples et al., 2007). Modern technology trends and the infiltration of computers into almost every facet of the society is having tremendous influence on the socio-cultural fabrics of the modern society, and this is orchestrating several behavioral changes taking place in the 21st century learners' world (Oparaocha et al., 2014; Mishra, Koehler & Kereluik, 2009). Yet, it is not uncommon to find various educational policies and instruction delivery practices at odds with the reality of the

digital era and the unfolding societal trends. For instance, it is often the norm for educators to forbid the use of mobile gadgets and social media in the classrooms. Indeed, it seems obvious that such restrictions are founded on the argument(s) that a pristine learning environment (i.e., free from 'unwanted distractions') should be in the best interest of both the learner and the educator. Thus, when some educators forbid the use of mobile devices and social media in the classrooms, they are presumably eliminating the nuisance caused by such ICT platforms. However, an important issue here is for educators to go beyond anecdotal evidence to garner deeper insights on whether the use of ICT per se or how ICT is used brings about the undesirable nuisance (Cheng, 2015; Sharples et al., 2007).

Problem Statement

Despite the growing number of publications assessing (often in retrospect) the advantages and disadvantages of the application of ICT in selected subjects (Belk, 2006); however**,** how the methods of adoption of modern ICT tools in higher education could interplay with the benefits and learning experiences has surprisingly been underexplored. Therefore, critics and advocates agree the interplay between modern ICT adoption methods and the associated learning outcome in higher education is a practical and much needed discussion in the current mobile age (Bates & Gary, 2003; Abdal-Haqq, 1995).

The extant paper aims to [at least] initiate a scholarly debate on alternative approaches for ICT adoption in classrooms and upgrading of the teachers' ICT skills or perceptions on how modern technologies are introduced in instruction design and delivery. We contend that the 'flipped learning' approach to modern ICT can deliver a sound practical and pedagogical infrastructure that serves higher education curriculum development and supports the teacher's transition. This will in turn facilitate the honing of students' career skills in the mobile age. In this paper, modern ICT is used as an umbrella word that includes mobile phones, tablet PCs, laptops, and other related interactive mobile technologies (Christensen, 2002; Fabry & Higgs, 1997).

The rest of the paper proceeds as follows: the next chapter presents the literature and theoretical underpinning of the study. It introduces the conceptual background of flipped classroom and also provides a selective overview of historical development of ICT within educational setting. The purpose of which is to highlight the historical linearity of introduction of new ICT concepts into the study curriculum. Next, we proceed with the differentiation of educational levels, highlighting their complexity and differing needs of students and teachers in the use of ICT tools. Then, we delve deep into the current discussion about the need for a new learning theoretical framework in order to capture the value of new ICT introduction. This part is followed by the UNESCO's ICT-CFT model discussion, which contributes to the need of a robust framework identified earlier. Lastly, we discuss some key challenges and we highlight the implications.

LITERATURE BACKGROUND

"Those who cannot remember the past are condemned to repeat it"~George Santayana, 1905.

The Flipped Classroom and Flipped Learning Strategy

Unlike the earlier learner generations, the 21st century learners are increasingly 'demonstrating decreased tolerance for lecture-style dissemination of knowledge' (Roehl et al., 2013). Thus, their learning preferences often follow the technological landscape and social trends of the mobile age rather than the conventional classroom models. Therefore, as educators struggle to carter for the learning needs and preferences of the mobile age, new pedagogical models have emerged. The flipped classroom has emerged as one of the recent novel learning strategies being experimented by some institutions (Milman, 2014; Jamaludin & Osman, 2014; Davies et al., 2013; Flumerfelt & Green, 2013; Horn, 2013; Berrett, 2012).

According to (Jinlei et al., 2012), a flipped learning method can be understood as an educational system that swaps the arrangement of learning and dissemination of knowledge as compared to the traditional classroom model. In the flipped classroom, the roles of teachers and students have been redesigned and the class time is reframed to accommodate key elements in active knowledge assimilation and knowledge internalization. The teacher is not the 'sage on the stage', but a guide on the side (Bergmann et al., 2011). Information technology and activity modules such as quizzes, group discussions, practical demonstrations, peer-to-peer learning, and mentorship (among others) pave the way for a cooperative and engaging learning environment for learners and teachers. This creates new learning culture and enthusiasm for learning.

There are different versions of the flipped or inverted classroom model. In this paper we focus our attention on the flipped learning method. The flipped learning method is derived from, and may in certain instances overlap with, the flipped classroom concept. However, the former differs from the latter in that it entails only the application of some principles of the flipped classroom to a particular aspect or context in the instruction design and delivery process in order to facilitate knowledge flow and parity. The aim is to foster basic level of understanding (if and when needed) between parties in a learning engagement (Abeysekera & Dawson, 2015; Kim et al., 2014; Roach, 2014; Sams & Bergman, 2013).

A Brief Historical Insight

Here we present a selective overview of some important historic milestones on how technology adoption has impacted education and learning for several generations. This brief insight should not, in any way, be considered as a chronological account or complete historical overview of educational technologies. Our intention, however, is just to highlight a few accounts in the history of educational technology to provide to the reader a backdrop of our conceptual viewpoint. Please refer to (Reiser, 2001) for a more detailed history of instructional media.

The use of technology and visual instruction design in education is not a new phenomenon (Cuban, 1986; Kennedy et al., 1997). Perhaps, one of the earliest forms of educational technology is the "Abacus" which is an instrument used as a counting machine as early as 2700 BC (Ifrah & Georges, 2001; Laffey & Musser, 1998). Abacus or Abaci served as an important educational instrument in different prehistoric cultures of Europe, Middle East, Asia and Africa for educating children and traders on number literacy and simple calculations. Even in modern times, some scholars have linked the origin of the subject of accounting, mathematics, and quantum computing to Abacus (Laffey & Musser, 1998). By 1892, the use of stenograph and postal offices made higher education accessible via correspondence (Casey, 2008). The deployment of such modest technology made it possible for universities to [re]produce several typed copies of educational materials in shorthand, which could subsequently

be distributed to learners and scholars far and wide. For instance, University of Chicago used postal agencies for assignment submissions as early as the late 1890s (Levene, 2012). The motion picture projector was developed during the late 19th century (Reiser, 2001) and as its multi-purpose usage [i.e., its capability to serve as an entertainment and instruction machine] got massive public attention at the beginning of the 20th century; several institutions of higher learning in USA and across Europe appropriated it by 1910 as an instrumental technology used to incorporate films, slides, and photographs for use in school instruction delivery. According to Levene (2012), as the acquisition of motion picture projectors skyrocketed in schools, trainings on how to use visual instruction became introduced in teacher education institutes as a way to ensure the optimal use of such technology in the classrooms.

Furthermore, towards the 1950s, the tides turned towards television and radio programmed lectures. And it all began to gather momentum at the beginning of the era of consumer electronics in the late 1970s. Customer electronics became increasingly available to households, and as such the proliferation of access to TVs, radio, video devices and similar popular media technologies largely changed the social system, and impacted learning styles. Suddenly, teachers had to start modifying their teaching techniques and tools in order to fit in the new learning perceptions in accordance with the increased use of technology. This appeared to already then contradict with the perceptions of many education providers. Already in 1980 Gioia and Brass pointed at the strong need of education providers to adapt to societal changes. The contradiction in between the emergence of new learning perceptions and conventional teaching techniques appeared to gain its speed: as described by Gioia and Brass (1985) in their paper, in a matter of decade, the 'TV generation' was followed by the 'Virtual generation' of learners, whose learning perceptions developed even further (Proserpio & Gioia, 2007). In recent times, we have witnessed the massive influence of personal computers, the worldwide web, and modern ICT tools on instruction delivery and learning in higher education institutes across the globe (Reiser, 2001; Levene, 2012). Yet some scholars are still questioning whether we are using the right technologies and for the right purposes. Are the models/frameworks of technology adoption in education right?

It is important to notice from the above brief overview that educators have largely been responsible for the introduction of new technologies into the classrooms throughout the history. While there is absolutely nothing wrong with this approach, however, a key concern here regards to what happens to the technologies which the educator(s) are not familiar with? We think that in order to unfold this dilemma, we first need to identify different levels of education and distinguish their specific needs and requirements. We do this in the following subsection in order to lay a background for further discussion with specific emphasis on tertiary education level.

Differentiating the Learning Requirements in Various Education Levels

For a better understanding of the issue at hand, it is important to clarify the differences between different levels of education. Following the UNESCO's International Standard Classification of Education ISCED (2011), we identify nine distinctive educational levels as shown in the Table 1.

These levels can be largely divided into two major groups. The range of 0-4 is aimed at the provision of basic skills the use for which and the point of which the student [does not fully yet] know." (MacInture & Dunne, 2002). This includes socialization, numeracy, speech and other relevant skills taught in the primary schools and developed further during the secondary phase. It is important to note that in many countries the universal basic education ends after the

lower secondary education level. Thus, upper secondary and post-secondary education are in most educational systems aimed at the pursuance of, or further development of technical competencies, specialized skillsets, and personal interests. The tertiary levels of education (i.e., level 5-8) emphasize the development of professional and scientific skillsets and competences aimed to increase knowledge and prepare individuals for a specific career path. Thus, the tertiary phase of education provides the learners with advanced capabilities to survive and manage their careers after graduation. And for this reason, our focus for the rest of this paper is on learners at the tertiary education level.

Table 1
A CLASSIFICATION OF EDUCATION LEVELS AND COMMON OBJECTIVES

Level	Description	Common objective
Level 0	*Early childhood education*	Improve readiness for school at school age. Develop basic interpersonal skills such as self-control, ability to interact with others, paying attention (Bowman, 1993; Currie, 2001).
Level 1	*Primary education*	Emotional and cognitive development, literacy, numeracy and general knowledge (Shuayb & O'Donnell, 2008).
Level 2	*Lower secondary education*	Acquire generic skills needed for basic survival in society and industry. Identify interests, abilities and foster personal goal setting and decision making (Hadley, 1902).
Level 3	*Upper secondary education*	Pursue technical skills and deepen personal interests in specific knowledge areas. Preparation for post-secondary and tertiary education.
Level 4	*Post-secondary non-tertiary education*	Further developments and search for specialized competencies and/or applied skills.
Level 5	*Short cycle tertiary education*	Development of professional and managerial competencies. Character and career development.
Level 6	*Bachelor's or equivalent education level*	Similar as in above. Increase scientific knowledge absorption, synthesis and interpretative use in professional manner. Discipline-based competencies (Barnett, 1990; Watty, 2006; Chen et al., 2014).
Level 7	*Master's or equivalent education level*	Scientific and professional knowledge deepening, knowledge creation, critical thinking and self-awareness (Entwistle & Peterson, 2004).
Level 8	*Doctoral education*	Advanced scientific know-how, intellectual contribution to a scholarly community, knowledge creation and dissemination. Promotion of specialized knowledge and research (McArthur, 2011; Watty, 2006; Chen et al., 2014).

In line with the differences in the learning requirements and patterns between the two educational levels described above, they also entail distinct needs in the ability of teaching personnel. Consequently, it is thus not surprising that the need for a teacher's ICT competency level tend to increase in the higher education level as compared to the basic level. The secondary level is believed to be where the breakthrough in popular technologies tends to happen amongst students. At the higher education level most of the students might already be proficient users of various ICT gadgets and platforms. At this stage the majority of the students have acquired versatile knowledge and enthusiasm on the use of ICT for a variety of purposes (this includes but

not limited to the application of ICT for social, entertainment and educational purposes). Therefore the 21st century learners' decreasing tolerance for the conventional lecture-style learning starts to become more noticeable (Roehl et al., 2013). And if the ICT competence level of the educators are lacking far behind, or ICT is pushed aside from the formal learning environment (Brown, 1992; Vie, 2008), then our educational systems risk becoming either obsolete to the mobile age, or undermining a potential influencer of the learning process (Oparaocha et al., 2014). Le Roux (2002) have opined that effective education is a culture relevant education. Furthermore, Sharples et al., (2007) have urged that the convergence between the main technological influences on a culture and the contemporary educational theories/practices should be aligned when formulating pedagogical strategies relevant to the mobile age. In the next section we take a closer look at the 21st century learners and the potential root cause of their learning preference dilemma.

The Mobile Generation: The 21st Century Learners

The 'mobile generation' (i.e., 21st century learners)-defined as those born between 1995 and 2009 (Geck, 2007), have been growing up with tablet PCs, smartphones and a vast array of social media platforms being commonplace in their everyday life (Oparaocha et al., 2014). The evolution of global digital communications and interactivity present different practical and conceptual milieu for their educational enquiry and learning as compared to the established educational conventions of the earlier generations (Mishra et al., 2009; Ikeguchi, 2008; Sharples et al., 2007). According to (Roehl et al., 2013) "a sense of urgency to adapt to millennial learning preferences is heightened as educators increasingly struggle to capture the attention of today's students". As we highlighted earlier, unlike the earlier learner generations, the 21st century learners 'demonstrate decreased tolerance for lecture-style dissemination of knowledge' (Roehl et al., 2013). This begs the question why?

It seems evident that the processes and standards of learning have remained almost unchanged in the vast majority of schools over the past decades (Oparaocha et al., 2014). For instance, (Sharples et al., 2007) lamented that even though 'many theories of learning have been advanced over the 2500 years between Confucius and the present day, but almost all have been predicated on the assumption that learning occurs in a school classroom, mediated by a trained teacher.' Moreover, ICT is considered an unwanted distraction in the classrooms (Brown, 1992; Vie, 2008). (Belk & Kozinets, 2005) observed that a very small percentage of business major course teachers allow their students to submit term papers in other form(s) other than the traditional written documents. In view of the current trends and eminent changes in the society, it is perhaps obvious that instruction design and methods of curriculum delivering needs (re)alignment if educators want to cater for the current and future needs of the mobile generation (Starkey & Tempest, 2009).

NEED FOR AN APPROPRIATE THEORY

The Role of Education System in Meeting Changing Requirements

Technology and higher education have supported each other for centuries. Indeed, the adoption of social and technological trends in formal educational establishments is not without controversy regarding its perceived advantages and limitations. However, even in the current digital era many contradictory views and paradoxes abound on the issues of whether the use of

modern ICT and social media in classrooms supports or hampers learning. Furthermore, (Sharples et al., 2007) have argued that:

> *"Today, we are experiencing similar social and technological disruption, with the Internet and mobile technologies providing global access to information and mobility of knowledge […]. Every era of technology has, to some extent, formed education in its own image. That is not to argue for the technological determinism of education, but rather that there is a mutually productive convergence between the main technological influences on a culture and the contemporary educational theories and practices. Thus, in the era of mass print literacy, the textbook was the medium of instruction, and a prime goal of the education system was effective transmission of knowledge through the printed texts as the canons of scholarship. During the computer era of the past fifty years, education has been re-conceptualized around the construction of knowledge through information processing, modeling and interaction... Now, as we enter a new world of global digital communication, it is no surprise that there is a growing interest in the relations between mobile technology and learning. What we need, however, is an appropriate theory of education for the mobile age (Sharples et al., 2007)."*

Sharples & colleagues (2007) acknowledge the 'disruptive' potency of mobile technology in the education system. The authors, however, suggest that the 'appropriateness' of the theory-(i.e.) the fundamental assumptions and conceptual models upon which the education is built on is what matters. In other words, a relevant education system should:

A) Understand/integrate and be aligned with the characteristics of the real world of its learner generation.
B) Emphasis the models/theoretical underpinnings of instruction design and delivery (including technology adoption models) as a mutual determinant of learning outcome rather than blame technologies as unwanted distractions in the learning environment.

In our opinion, the lack of such "appropriate theory" aligned with key technological influencers of the mobile age is definitely one of the major reasons for the current challenges in our educational system. The UNESCO ICT-related learning framework appears to be a good response to this need. Hence, next we provide an overview of this framework.

The UNESCO ICT-CFT Model

The United Nations Education, Science, and Cultural Organization-UNESCO Institute for Information Technologies in Education launched the "Guidelines on Adaptation of the UNESCO's ICT Competency Framework for Teachers" (Hooker et al., 2011; Midoro & Vittorio, 2013). This competency framework for teachers-CFT defines the methodological approach to establishing national or local standards for teachers' ICT proficiency as an important policy building block. This move is especially important today for two reasons:

a) Pedagogies rather than modern machines bring about educational reforms and change (Watson, 2001).
b) When new instructional technology is introduced, then teachers must receive accompanying training in order for them to be able to make effective leverage of the new medium (Brand, 1998; Laffey & Musser, 1998).

The ICT-CFT supposes there are six main aspects in the teacher's activity: understanding the ICT role in education, curriculum, pedagogy, technology use, organization, and professional development. Hence, it can be understood that the deployment of such technology adoption framework establishes a new awareness about core role of ICT in every aspect of the learning process. Furthermore, the ICT-CFT framework has 18 modules which emphasize the mutual dependence of the three well established approaches (i.e. technology literacy, knowledge

deepening, and knowledge creation) to instruction should be based on human capacity building with the six aspects of the ICT-CFT highlighted above (Hooker et al., 2011; Midoro & Vittorio, 2013). In the UNESCO's ICT-CFT model presented in Table 2, there are three vertical pillars and six horizontal blocks of interacting components necessary for achieving a holistic result with ICT integration in the educational design.

Table 2
THE UNESCO ICT COMPETENCY FRAMEWORK FOR TEACHERS (MIDORO & VITTORIO, 2013)

	Technology Literacy	**Knowledge Deepening**	**Knowledge Creation**
Understanding ICT in Education	Policy awareness	Policy understanding	Policy innovation
Curriculum and Assessments	Basic knowledge	Knowledge application	Knowledge society skills
Pedagogy	Integrated technology	Complex problem solving	Self-management
ICT	Basic tools	Complex tools	Pervasive tools
Organization & Administration	Standard classroom	Collaborative groups	Learning organizations
Teacher Professional Learning	Digital literacy	Manage and guide	Teacher as model learner

In our understanding, the UNESCO's ICT-CFT model reflects linearity, the age-old traditional patterns of technology adoption in the educational system-when new technologies/instructional media are introduced, teachers must receive training on how to leverage the use of the technology (Levene, 2012). It is thus understandable why the UNESCO's ICT-CFT model emphasizes the teacher's cognitive and professional development in order for effective leverage of ICT in the classrooms to be achieved. Moreover, existing studies have emphasized the paramount role of the teachers' ICT competency. (Brand, 1998) has opined that "if technology is to be used by students, then teachers must possess the confidence, understanding, and skills to effectively incorporate technology into their teaching practices. This will only occur by providing adequate training and development of teachers". Such conceptualization, however, seems contrary to the flipped classroom ideology. It subscribes to the notion that 'knowledge resides in the head of the teachers whose duty is to impact knowledge on the students (i.e., passive learners). Meanwhile, the flipped learning method advocates the active role of students in knowledge dissemination and internalization (Cheng, 2015; Roehl et al., 2013).

The UNESCO's ICT-CFT model has made many great contributions to our understanding of the building blocks of holistic ICT adoption framework for educational institutions. Being primarily focused on the teachers, it thus reinforces existing assertions that the development of teachers overall ICT-knowhow is the key starting point for effective adoption of ICT in the classrooms (Levene, 2012; Brand, 1998). As evident in the table presented, the UNESCO's model also underlines emancipatory policy approach and befitting pedagogical underpinning as important factors if ICT is to be used to achieve the three main objectives (i.e. knowledge creation, knowledge deepening, and technology literacy). While we acknowledge the contribution of such grand models as the UNESCO framework, however, such models require an encompassing implementation strategy covering from policy to the provision of appropriate practical tools for its implementation and as well as measuring of outcomes. This requires significant investments in different areas to be able to reach the holistic goals. However, we know that such is rarely the case in practical terms. So, the dilemma remains! We will further unravel some reasons for the persistence of the dilemma before discussing our suggestion.

The Problem Still Exists

Despite the existence of such profound framework, the problems surrounding the wider adoption of modern ICT into the classrooms appear to persist. Indeed, the lack of appropriate theory might not be the single reason for this dilemma. As can be deduced from the brief history of ICT adoption in educational settings, the introduction of new technologies into the classroom largely followed rather linear development: first teachers identified or were introduced to the new tools, then they learned how to use the technology and about its possibilities to support learning activities. Thus, only after the new technology has been learned and accepted by the teacher, would it then be applied in classroom settings. Such approach is plagued with the problems of path dependency (Oparaocha et al., 2014) for a more detailed discussion on path dependency in educational system). In today's mobile age and the fast paced technological environment, such linearity has become obsolete or even turned around. The students are often the first ones to know about, and immerse themselves in new technologies. Thus, the introduction of new technologies under such circumstances appears to be problematic if we try to follow the established conventional approach. This is due to the fact that the students (in many cases) have more profound knowledge of ICT and social media trend than the teachers. Also, the unprecedented fast-paced or shorter technology cycles means that if we follow such linear technology adoption models advocated, the teachers' ICT skills are likely to be outdated even before they are able to apply it in the classrooms. Thus, there is obviously urgency for our educational systems to adopt alternative methods (Cheng, 2015; Roehl et al., 2013). Thus, scholars have argued that:

Millennial students drive change in learning environments around the world. The technology, with which digital natives matured, has induced today's students to "think and process information fundamentally differently from their predecessors (Roehl et al., 2013).

Proposing the Flipped Learning Method

As renowned academic and artist-professor Adler ones noted, today's world has become dynamically globally connected beyond prior imaginations (Adler, 2006) and modern ICT in particular have dramatically changed different aspects of everyday life (Hidalgo & Albors, 2008; Proserpio & Gioia, 2007; Tejeda, 2008). Not only have modern ICT transformed the work environment, how people live, and the way people interact (Baker & Baker, 2012; Clemens & Hamakawa, 2010; Geck, 2007; Sharples et al., 2007), it has indeed orchestrated new ideological movements and psychological frames that are increasingly distant from that of the earlier generations. Such dramatic shift is vividly exemplified in the persisting dilemma between the traditional pedagogical models and the learning preferences of the 21st century learner.

"Although educators bemoan this generations' inability to focus. […] it is not the students' attention capabilities that have changed, but rather their tolerance and needs [...]. This characteristic actually validates the urgency to adopt alternative methods of instruction, and many teachers are incorporating active learning strategies as a better way to engage these students." (Roehl et al., 2013).

In response to the issue at hand, bearing in mind the contemporary ideological and technological landscape of the mobile age, we propose the flipped learning method. The proposed pedagogical strategy takes the flipped classroom pedagogy a step further. And it has the potency to play a significant role in modern instruction design and delivery. Thus, it could [at

least] be part of the solution for how modern ICT is perceived, adopted and utilized in the higher education classrooms.

The application of the flipped learning method in the 'ICT-for-classrooms' perspective will entail for instance, swapping the arrangement of learning and dissemination of knowledge in some particular aspects of a classroom design or learning context. As we explained in section 2.1, this will allows the parity in knowledge of both sides (i.e., students and teachers) new technology to be involved in a learning engagement as compared to the conventional classroom model. For example, in a flipped learning arrangement, the roles of teachers and students could be redesigned when it comes to ICT know-how and its introduction for a learning purpose. This means in practice that through closer cooperation, teachers will allow the students to introduce and help upgrade the teachers' skills on new ICT and social media trends so that such technology can be effectively leveraged by the teachers for effective classroom learning. It also commendably serves the goals and objectives of the column in the UNESCO's ICT-CFT framework. Moreover, even though the existing flipped classroom method has been hailed as a great classroom innovation of the 21st century for the K-12 (Horn, 2013), however, its application has been mostly limited to educational levels 1-4 as presented earlier. Thus, following the UNESCO's ICT-CFT framework, it can be identified with no doubt that the flipped classroom concept may serve the objectives of the first two columns in Table 2-that is, 'Information literacy' and 'Knowledge deepening.' However, we argue that the flipped learning pedagogy which we have proposed will better serve the objectives of the third column of the UNESCO's ICT-CFT framework-it is more suited for 'Knowledge creation' and the six underlying key components-knowledge society skills, self-management, pervasive tools, learning organization, and teacher as a model learner. Therefore, the flipped learning pedagogy is a promising fit for the tertiary education level.

Existing literature discussions have found the 21st century tertiary education students very technology savvy. The learners of the mobile age are believed to be much more ahead of the earlier generations in the speed of technology acceptance and overall immersion in digital and social trends. Therefore, the students are in an excellent position to support their teachers' ICT transition and at the same time improve their own learning experience.

DISCUSSION

Higher education has come a long way; and technology has long been part of the higher education process and has contributed immensely to the various developments in the area of learning. In our proposition of an alternative pedagogical approach, the goal is not for the use of the flipped ICT learning model to replace the venerated classroom traditions. However; we contend that its use will bring significant additional value (Reiser, 2001; Zaltman, 1997). Therefore, we strongly believe that such 'new cannons of scholarship' will be instrumental in capturing various aspects of technology adoption in educational enquiry and human behavior in the mobile age (Larkin & Simon, 1987; Munoz et al., 2011). Modern ICT provides value-added tools for reframing the learning experiences into playful, fun-filled and exciting journey instead of work-as such creating a positive impact on students' increased motivation and learning outcomes (Caldwell et al., 2010). As tomorrow's digital landscape unfolds, educational disciplines and institutions that are left behind will arguably struggle for relevance to the needs and ways of life of the future society.

In the front page of this paper, we began with the "timeless" quotation: "Today the world of the learner is almost unbounded."-The quote is just a tip of the iceberg of Devereux's address to the educational systems of the early 20th century. Frederick Devereux further asserted:

> *"[…] he [learner and teachers] must acquire appreciations of far-reaching relationships. The curriculum and methods of teaching must undergo a continuous appraisal. New subject matter and new devices for instruction are being scrutinized for their potential contribution to the learning process" (Frederick Devereux, 1933).*

According to (Mishra et al., 2009), the 'new technological advance' that thrilled Frederick Devereux to make these statements in the first page of his essay in 1933 was the "talking picture". At the time, copying sound to motion images was the next big thing in technology which its adoptions by educational institutions was expected to revolutionize the world of education (Mishra et al., 2009). In the present day society, it is evident that modern ICT and socio-structural changes in the society have unbounded the horizon of the 21st century learner beyond what Devereux could image at his time; however, even after almost a century, his core message still resonates with us. Today, we join forces with Devereux in call for our higher education institutions to adapt to modern technological trends and utilize alternative pedagogies to synthesize and synergize the vast array of knowledge in our modern society in order for higher education to fulfill the changing needs of the society. In our call, we do not presume ICT or the flipped learning model as the next big thing; but rather we position these as a "timeless" instrument that resonates with the mobile age and permeates multiple arrays of the cognition, sensory, and learning preferences of the mobile age.

Interestingly, some scholars have referred to the mobile generation as the 'most entrepreneurial' (Kuratko, 2005). In today's technology-led world, the technology savviness of this mobile generation acts as a major trigger for promoting innovation, realizing business ideas, and changing economic structures, and, as such, one of the aims of modern education is to facilitate the development and nurturing of these entrepreneurial attributes (Radovic-Markovic & Salamzadeh, 2012) including, but not limited to creative decision-making and problem solving (Lautenschlager & Haase, 2011) innovation and personal initiative (Charney & Libecap, 2003). We feel that entrepreneurship education programs can serve as a great venue for the actualization of the flipped learning approach to ICT adoption in the 21st century's learning environment.

CONCLUDING REMARKS

In this paper we have identified and expatiated on the peculiar scenario facing higher education sector in the mobile age. Our discussion has focused on ICT adoption as an exemplar to demonstrate the need for appropriate new theory of education and alternative pedagogical models that resonate with the 21st century learners' world.

According to Mishra and colleagues, "throughout history new technologies have been hailed as the next big thing" (Mishra et al., 2009). New technologies often carry exciting expectations and promises to have revolutionizing impact on different aspects of the society. (Sharples et al., 2007) and (Mishra et al., 2009) have argued that education is a key aspect of the society in which the promises and expectations of the adoption of new technologies is believed to bring about revolutionary impact (Cheng et al., 2009; Hunt, 2001). Learning processes in higher education have for many generations interfaced with developments in technology (Mishra et al., 2009; Sharples et al., 2007; Starr & Fernandez, 2007; Hobbs, 2006). Yet, in today's society, for many educators, modern ICT trends present both elusive promises and complex

challenges (Cheng et al., 2009; Hobbs, 2006; Hunt, 2001; Starr & Fernandez, 2007). Hence, for various reasons some institutions and/or educational disciplines are trying to curtail the use of modern ICT gadgets and social media in classrooms rather than embracing them. They want to maintain the existing orthodox academic conventions, whereas the 21st century leaner's world seems to be quite distant from such orthodoxy in many aspects (Brown, 1992; Vie, 2008). Indeed, many of such concerns are valid and in most cases cannot be easily brushed away. However, it is well known that one of the common goals of higher education is to produce an enlightened society-well-equipped individual who will take care of the economic, social and intellectual needs of the society (Brown, 1992; Smith, 2012; Zaltman, 1997). In view of this important mission, a relevant question is whether adherence to the circumscribed tools of yester-years academic traditions are the most relevant instruments for solving the socio-economic and intellectual challenges of the mobile age.

If we restrict the proactive use of modern ICT and social media in the classrooms for fear of distraction and lack of knowledge on how to take care of the potential concerns, then we might actually be setting up for the negative usage of these tools. (Kinder, 2002) has pointed out that ICT both enhances and delimits pedagogical choices. That is why the pedagogical underpinning behind any ICT adoption in classrooms is crucial in defining the outputs. According to recent propositions put forward by (Oparaocha et al., 2014) and (Sharples et al., 2007), a prime goal of the education system should be the use of effective transmitters of knowledge for more impactful education for the mobile age. Therefore, in this unfolding dilemma, what educators and instruction designers consider as the canons of scholarship will have a far reaching implication for tomorrow's labor force.

As we identified in the earlier discussions, the challenges facing the higher educational system in terms of embracing ICT in the classrooms is not only the lack of appropriate learning theory. Rather, we contend that it also has to do with the pace of technology change and the accompanying learning preferences of 21st century learner generation compared to the earlier generations. A key solution to these problems is the need for higher education providers to recognize this dissonance and accept it instead of hiding from it. We hope that this would in-turn promote the interest and openness of teachers to accept that students may have better technological knowledge, and as such introducing them to a new role of education developers and "technological consults".

The main point of this paper could be the refinement of Brand's (1998) original quote: "if technology is to be used by students, then teachers must possess the confidence, understanding, and skills to effectively incorporate technology into their teaching practices. This will only occur by providing adequate training and development of teachers". Bearing in mind the aspects of social and societal changes, we posit that: "if technology is used already by students, then teachers must possess the openness and confidence to consider incorporating the students' knowledge of technology into their teaching practices. This will mainly occur through an entrepreneurial approach to the teachers' competence training and increased cooperation with students and understanding of common benefits of such cooperation".

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