

Trends in Instructional Technology

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Abstract: Mobile devices which were earlier used for personal communication has now evolved to become an integral part of education today. Technology has evolved from the use of visual media like videos to the use of technological tools like Cloud and mobile devices. This has made instructional technology to go beyond the traditional boundaries to allowing learning to take place whenever and wherever one wants. These technologies are focusing on transformation of education in the future.

Keywords: Mobile learning, instruction, technology, trends.

I. Introduction

Education and training have moved from traditional classroom teaching to a virtual environment with the wake of new technology. This technological revolution has changed the way instruction is designed and delivered. This global technological advancement requires instructional designers to follow a systematic process for planning, organizing, and developing the learning process. An Instructional Design model needs to be organized in a way where the instructors learners to can collaborate and navigate the system successfully. Instructional Design also requires the development strategies that serve as the theoretical underpinnings and criteria for this process (Mercadal, 2015). The history of instructional design goes back to the days of World War II when the educators with training and experience were asked to develop training material for the military (Dick, 1987). The training materials were created based on instructional principals from theory on instruction, learning, and human behavior. In the 1940's and 1950's psychologists began to see training as a systematic process creating more detailed analysis, design, and evaluation procedures. (Reiser, 2001). In 1956 Benjamin Bloom introduced his famous taxonomy that consists of three domains of learning: Cognitive – defined as what one knows or thinks, Psychomotor - what one does, physically and Affective, what one feels, or what attitudes one has.

Though introduced back in 1950's, these taxonomies still influence the instructional design. In the 1970s, many instructional design theorists began to adopt an information-processing-based approach to the design of instruction (Instructional Design, 2012). Later in the 1980s and throughout the 1990s cognitive load theory began to find empirical support for a variety of presentation techniques. This period brought a focus on computer --based instruction and the constructivist theory that required learners to collaborate with one another, solve real and complex problems, view different perspectives, and be more responsible for their own learning. The twenty first century gave rise to eLearning, online learning and now mobile learning. (Instructional Design, 2012). A variety of Instructional Design theoretical concepts exist to guide instructors and educators in developing the learning system. Cognitive theories were introduced in 1980's which focused more on learning processes by incorporating problem-solving, conceptualization, and processing information. Toward the end of the twentieth century, constructivist and systems theories developed further and became more holistic or encompassing (Mercadal, 2015). Since technology is a guiding force behind the instruction these days , computer-mediated learning are developed in a theory of Connectivism developed by George Siemens (2004) , which emphasizes personal knowledge as individualized and within a network that both feeds and is fed by institutional and organizational systems, in a continuous loop of feedback and information.

II. Instructional Technology

Instructional Design and Technology is a rapidly growing field concentrated in instructional strategies and learning theories. Gustafson and Branch (2007) described instructional design as a “systematic process that is employed to develop education and training programs in a consistent and reliable fashion” (p.11). The authors further state several strategies of instruction that include different methods of providing instruction, and learning to the intended learners. In addition, Instructional Design include both passive and active learning methods. Passive learning methods include the basic instructor lecture method, as well as computer based instruction or training. Active learning include any activity where the learner takes an active role in the learning activity, such as an interactive computer program, classroom role playing activities, or activities that simulate real world activities (Chow, Howard, & Lambe, 2008). Instructional design develops new models to promote understandings of Instructional Design reality and guide Instructional design performance. As the number and diversity of ID practices grows, implicit doubts regarding the reliability, validity, and usefulness of ID models

also grows. Therefore, there is a need for methodological guidance that would help to generate ID models that are relevant and appropriate to the ever-changing design challenges in today's global world. The uses of mobile devices and related technologies have increased significantly in the recent years. The mobile devices are becoming popular in education too. Teachers and students all around the world are increasingly using the mobile technology to access learning materials, internet and facilitate learning in new and innovative ways. mLearning is the next form of e learning that support learning anywhere and anytime with the use of mobile devices mlearning is considered the next step of e learning by the use of wireless mobile devices (Almaiah, & Abdul Jalil, 2014). Higher education today aims to produce graduates who could become global citizens with intercultural communication skills and sensitivity to cultural differences. To achieve this goal the students need to widen their knowledge. Bacon and Kischner (2002) suggest that to achieve these students should collaborate and exchange the ideas with people from different cultures.

To create such opportunities the instructional designers are working on using many technological tools and one of them is with advanced networking technology. Technology is a great tool to increase access to learning opportunities in globalized educational context. What better technology than mobile learning and social collaboration can be? Mobile learning has made its mark by blending into e learning. The concept of mobility actually makes the concept of m-Learning even more revolutionary than e learning. Mobile learning has the flexibility for the learners to control their learning by deciding about what to learn, when to learn, and where to learn. The learners in mobile learning are not restricted to prescribed materials, a physical classroom, or even a particular time (Kukulka-Hulme&Taxler, 2005). Networked learning occurs when information and communications technology (ICT) is used to promote connections: between one learner and other learners, between learners and tutors; between a learning community and its learning resources (McConnell, Hodgson, & Dirckinck, 2012). Merchant (2012) stated the social networking has fostered online collaboration for learning. Open and closed social networks and social networking sites are rapidly becoming the places where learners and workers intertwine the formal and informal dimension of learning and collaboration, mainly from the perspective of smoothing over the boundaries between them.

Today's students and educators live in the world of Facebook, Twitter, Wikipedia and YouTube. Social media applications are part of the Social Web (i.e., Web 2.0); best characterized by the notions of social interaction, content sharing, and collective intelligence. Prensky (2001) referred to today's learners as digital natives who spend most of their time on computers, game consoles, digital music players, video cameras, cell phones, and on the internet. As students are constantly engaged in multitasking in their day-to-day activities, students need a high level of social and creative engagement in learning. Traditional teaching approaches favor passive content consumption, therefore, are becoming less popular. Therefore, traditional ways of instruction have to be substituted, or at least complemented, with highly interactive learning processes.

III. Evolution Of Mobile Learning

The premise of mobile learning itself is complex and challenges traditional, conventional classroom methods of teaching. Mobile learning relies on the desire for the students and the instructors to engage with one another in virtual environment. The mobile learner is not apathetic to interaction; instead, the mobile learner must actively engage in the learning process by seeking to communicate and interact with his or her peers and instructors. This virtual learning environment is almost exclusively collaborative and communicative, relying heavily on social media formats to serve and foster the learning dialogue (Lundin, 2013). The education in a society is influenced by transforming social networks into those networks, which are capable of revolutionizing the process of knowledge creation and dissemination. Sampangi, Viswanath, & Ray, (2010) state that when distance education was introduced initially it was an informal means of education, but with new technological developments, the distance learning was overtaken by other learning concepts. With availability of cheaper hardware components, E learning filled in and a more formal learning made its way for internet-based learning. Now with the growth of mobile devices worldwide, the education all over the world is headed for a new and broader framework of education called Mobile learning.

Adoption of online learning or electronic learning by education providers around the world has revolutionized the education industry in recent decades. Online learning has become popular as it offers flexibility and interactivity to learners and educators beyond the limits of time and space. The popularity of online learning extends to mobile learning as it not only inherits flexibility and interactivity from e-learning but also offers portability, connectivity, context sensitivity and collaboration. From e-learning, mobile learning is a step forward in achieving a higher degree of flexibility in learning (Imtinan, Chang, & Issa, 2012). The education through mobile can be made easy by introducing interactive learning modules and educational games, which have the ability to enhance the involvement of students. The mobile device manufacturers are developing devices with embedded educational content to enhance mobile learning experience. Mobile learning theories and implementation trials have been carried out in developed countries. However, developing countries are in need of mobile learning research as the growth in mobile users and mobile technologies is significant, but these

countries need to upgrade educational information and computer technologies in order to progress. The reason for developing countries struggle to introduce mobile learning is that these countries lack access to current technologies, experience a lack of uninterrupted power supply and poor computing facilities. According to Traxler (2009), various mobile learning pilot projects have been tested in India, Kenya and South Africa. The result of these trials are encouraging and one can expect that learning environments-at elementary and higher education levels-in developing countries can utilize the potential of mobile learning for informal and mainstream education.

Mobile learning can be made a success in developing countries, if careful planning is carried out to make it a success (Traxler, 2013). Information and computer technology has become the new device for education, and keeping this revolutionary development in mind the developing countries, are making every effort to incorporate these technologies in their socio-economic development policies (Sampangi, Viswanath, & Ray, 2010). As people around the world embrace high-end communication technologies, they are bound to feel the influence of technology on society.

Future of Mobile Learning

The next generation of mobile learning will go one-step further in revolutionizing education. The smart devices everywhere will enhance the learning experience. Learning will come from multiple resources rather than using one device. In addition, the next generation of mobile learners will be capable to use new technologies with better capabilities. The use of mobile technology allows for cloud teaching where access to people, resources and information will float freely regardless of location (Sutch, 2010). Learners in different time zones and locations will access the information and contact the tutors when needed. Mobile learning allows learners to access resources across time zones, this makes location and distance irrelevant to the learner. Mobile learning has transformed pedagogy to meet the requirements of the learners belonging to new and future generations. The learners can choose their own way of learning to get better results. When the learners choose to learn in their own context, it results in higher-level learning (Cochrane, 2013). Mobile technology allows learners from different places and cultures come together and exchange ideas and information. Educators are encouraging learning environments, which will make the students participate in the activities that will involve creativity and collaborative learning with digital tools. Mobile technologies as stated by Pierce, (2015) make students work together in groups to solve problems or challenges. In mobile learning, the lessons are tailored to meet student requirements.

Impact of Mobile Learning in Instructional Design and Technology

The world is changing with the revolution of technology in many ways that seemed an impossibility few decades ago. One of the biggest revolution in this field is the popularity of computers, laptops, mobiles and tablets. Mobile devices have taken over our lives by providing an unparalleled access to communication and information. With the new additions to the power, functionality and affordability of these devices, it has made it possible to support learning in many new ways. This popularity of using mobile devices in learning process ,and innovative mobile learning initiatives from around the globe have shown this potential in mobile learning. (Hylén, 2012). The cloud and mobile technologies are influencing the instructional design and technology tremendously. These technologies have changed the way students learn and the teachers teach. Students can be responsible for their own learning when they are using mobile devices. This gives them the freedom to choose when and where to learn. The use of technology also allows the teachers on the other hand to be more innovative with their teaching styles. As we look ahead, it is clear the future of mobile learning would be a success a world where technology is accessible, affordable and has a better connectivity. However, technology alone will not determine if mobile learning will benefits more learners in future. Remington (2015) suggests that designing effective mobile learning interventions requires a holistic understanding of how technology can be integrated with social, cultural and, increasingly, commercial factors. All the industries are looking for the ways to train their employers or students using such technologies where the time and money invested is less and the outcome is more. Mobile learning and cloud computing is a topic which has been discussed around the world as this kind of training and learning has shown some potential for future learners. Mobile Learning increases the flexibility of instructional designers to implement meaningful, real-life learning scenarios. It allows designers to think out of the walls of the classroom and bring in the outside world by delivering content when and where students need it the most.

Structure of Mobile Learning and Role of Instructional Designers.

The cloud computing and mobile technology call for many changes to the instructional design and technology field. Cloud storage and mobile devices gives the users the flexibility to use any application easily whenever they want. The future learning will need such applications and resources where instructional designers can design educational courses and training, which can be accessed on mobile devices in future. It is expected

that mobile technology is going to become a preferred method to access educational resources. In many technologically advanced countries, students prefer using mobile technology to purchasing a computer. The instructional designers are developing the strategies that can be implemented in mobile learning not only by educational institutions but also by other organizations (Ally, 2012). As ideas and technology flow across borders, there are many opportunities for instructional designers to design collaboratively some online modules with international teams. Opportunities for partnerships that promises to produce high quality online learning will be in demand. The demand of such opportunities are increasing as developing countries , governments, and educational institutions look to online learning as an efficient and motivating approach which are helpful in developing better skills. Regardless of the country where the mobile learning will be used, instructional design teams will face many challenges in designing perfect course (Porcaro, & Carrier, 2014). As online technologies have narrowed the learning on a global level, designers should undertake more useful context analysis, and must make cultural considerations a priority (Perkins, 2008). Therefore, one has to be aware of international or cross-cultural contexts when designing online learning.

In the next few decades, technology will change in numerous ways and the way it will influence the education sector. The educators will have to adapt to these innovations rather than just discussing the pros and cons of technology. Technology and education will evolve and one will have few options not to adapt to this new revolution. Technology will be more accessible, affordable and functional, and will be available at lower costs. As the technology and mobile devices will be easily available, it will open up a world of new possibilities for mobile learning solutions (The Future of Mobile Learning, 2013). As education is the primary concern of the governments ,the instructional designers will have to make sure the ways information can be accessed at all times through mobile devices and from anywhere through the use of the cloud. This is a challenging task, and as the demand for new mobile learning will increase, the role of instructional designers will evolve.

Cost of Instructional Design

Instructional designers are responsible for creating the educational content and material get in touch with subject matter experts, meet the standards set for the course design; serve on curriculum committees; review and revise curriculum content; and collaborate with technology departments, administrators, teachers, students, principals, deans, and more (Rafferty, 2014). However, since the technology is evolving the instructional designers will have to brace themselves and be up to date with the new. In addition to this, the educational institutions will also need to upgrade to the latest technological advancements. Ally (2012) states that some major reasons for students to be unable to access receiving an education is the lack of funding for hiring and training new teachers, and the inability to find the funding necessary to build new schools and maintain them. If the schools could invest in hardware, software, and IT resources by using the cloud, it will free up more funding for teacher training and other educational resources. In future, mobile learning will be integrated along with mainstream education. Mobile technologies usage will be a common practice in education and many other fields. As the links between technical and pedagogical innovations improve, mobile technology will take on a clearly defined but increasingly essential role within the overall education ecosystem (Regin&Haeng, 2014). The applications that learners will be able to access and work with easily using mobile devices and cloud will be in high demand. Instructional designers will need to focus on new strategies of designing instruction that can be accessed using mobile devices and cloud technology.

Impact on Return on Investment

“It is difficult to imagine a world of learning and development without technology, and investment in technology continues to grow at astonishing rates. Its growth is inevitable and its use is predestined. But these investments attract attention from executives who often want to know if they’re working properly (Elkeles, Philips, & Philips, 2015,p.1).Not all the teachers around the world are technologically savvy, therefore, teachers need to be trained in order to provide them with the necessary skills to implement mobile learning. The price of mobile devices is coming down, as there are many companies that claim are offering better technology than the others are. As the competition gets higher, the prices are going down. The demand for mobile technology will increase in the future as mobile devices become cheaper and the cloud continues to grow (Hinchcliffe, 2011). The increased use of mobile devices and the cloud in educational institutions promise to get an excellent return on investment and the same will be true for other organizations implementing these technologies. (Gartner, 2013). This will make the use of mobile devices more popular in coming times. Additionally, the use of the cloud saves a lot of money since it does not require the organizations to purchase extra hardware and software or to hire IT professionals to maintain it. Cloud storage saves organizations more money, and the returns are better (Hinchcliffe, 2011). Gutierrez (2014) suggests that mobile learning fits into even the busiest of schedules, as it requires lesser time than instructor-led training or lengthy eLearning programs. Mobile learning is convenient for the fact that vital information can be easily accessed without spending much time. Learners can take just the

required training modules themselves that reduce the amount of time needed to dedicate to training by minimizing both productivity losses and lost opportunity costs.

Instructional Design and Practices

There exists many theories and models for the instructional designers to understand and design instruction. As this field is interdisciplinary, the models are based on different learning and psychological theories. These theories do not belong to the same period, but are developed in different decades, by different educators and designers. Designers have to work towards developing and synthesizing the information used in designing the instruction. Instructional design as defined by Marcadal (2015) needs to be planned in a systematic way including the material and tools necessary for the learning experience. One do witness an instructional design theory and practice gap at times. Theories help to provide the instructional designers an insight in to the field (Reigeluth&Reigeluth&CarrChellman, 2009). In addition Cross (2011) indicates different theories and models influence instructional designer's decision. No one theory can be termed as the best of all. Designers want to use the best out of many available theories and models. With practice and experience, instructional designers often exhibit tacit design knowledge based more on conjecture than on analysis.

Evolution of Practices, Models, and Theory

As the instructional design and technology is evolving by the day, the designers are adding and integrating additional procedures, models, and strategies to meet educational outcomes. The focus of instructional design these days is on training and performance (Wilson, 2005). Answering the questions about the evolution of practices, model and theories D.Sanchez (personal communication, April 1. 2016) further revealed that IDT practices are combined according to the needs of the learner. It depends on if the learner is in high school, or an adult learner. No one theory will be applicable in all the cases. Therefore, it is always a blend of different models and theories. Reiser and Dempsey (2012) state "The field of instructional design and technology encompasses the analysis of learning and performance problems, and the design, development, implementation, evaluation and management of instructional and non-instructional processes and resources intended to improve learning and performance in a variety of settings, particularly educational institutions and the workplace." (p. 5). Moreover, as this "field is constantly changing. New ideas and innovations affect the practices of individuals in the field, changing, often broadening, the scope of their work" (Reiser& Dempsey, 2012, p. 1). The instructional design field is evolving and the new generation designers are looking for new strategies, as Chen (2006) has acknowledges that instructional technology field is finding ways to incorporate authentic learning activities, to prepare future instructional technology leaders who are grounded in both theory and practice.

Evolving IDT Practices in Education and Other Industries

The designers offer new ways in learning to new global communities of learners by implementing new practices, along with the existing theories. Instructional designers do draw on conventional techniques, and theories, but their practices do varies widely according to context. This is also emphasized in the conversation while D. Sanchez (personal communication, April 1, 2016) pointed out that whenever a designer works on the instructional design they are in close contact with subject matter experts, who provide them with more insight into the curriculum and required material. Based on the ideas from experts they design the activities Instructional designers do take in consideration the ides and thoughts of faculty teaching a particular subject, as this gives them an idea about the needs of all learners.(Campbell, Schwier& Kenny, 2009). Therefore, instructional design is not simply as a technical methodology to be applied to design situations, but also as a socially constructed practice. D. Sanchez (personal communication, April 1. 2016) further stated importance of quality in designing in instruction. He discussed the importance of social media and mobile technologies and the importance of using technology and social media. On the other hand, he also said using too much multimedia is not the only way to integrate technology.Different learners have different learning styles, so there are other ways should also be considered to deliver the instruction. This technological evolution requires the instructional designers to have more instructional technology resources to keep pace with changing times. Mobile technologies and cloud computing are playing a major role in affecting the way instruction is designed. Therefore, in future the designers are expected to be technologically advanced to meet the learner needs (Shaw, 2012).The designers can base their designs on many models and theories available for a long time. In addition, the mantra to be successful designer is to keep abreast of the changing technologies, new design models and theories.

The Effects of Changing IDT Practices on Learners

Mobile technology has not only changed the way students gather information, learn new things and communicate, but also it has become an integral part of their life and learning. The way mobile revolution has

changed the life around with the introduction of better internet connectivity, cameras and GPS, mobile learning has great potential to provide students with an enriched learning experience. Learners do not have to be confined to a classroom setting anymore. The students can collaborate with their peers and instructors and discuss issues and new gained knowledge using mobile technologies. The ever-growing mobile landscape thus represents new opportunities for learners both inside and outside the classroom (Chengjiu, Yanjie, Yoshiyuki, Hiroaki, & Gwo-Jen, 2013). Therefore, the mobile devices can be useful in developing both distance and classroom learning. Bedall-Hill (2010) suggests that mobile devices can be used as learning instrument, and for fostering relationship between faculty and students through personal interaction. The integration of new apps into the Learning Management Systems (LMS) can be used in a collaborative way to develop curricular content by the educational institutions. These apps can be developed to improve on the ways of developing generic and specific competencies of educational degrees. Since the students are exposed to mobile learning in every aspect of life, this experience can very well be used towards academic achievements. Mobile devices experience and practice can be complemented with text documents in different formats, audiovisual contents with mini-videos, microblogging applications, and social networks like Twitter, Facebook, LinkedIn, etc. (Vazquez, 2014). Smartphones have evolved from merely a device to communicate to becoming an integral part of people's social and work life, and possibly, and a powerful instrument in education too. Johnson, Adams Becker, Estrada, and Freeman (2014) stated this is the reason that middle and higher education in developed and developing countries are working towards adopting the use of mobile devices in the learning process from different perspectives and teaching methods.

Mobile devices connect users globally instantly, increasing accessibility to information and enabling users to interact with one another. This revolution is another reason for mobile technology to become popular for teaching, learning and areas of educational research (Johnson, Means, & Khey, 2013). These are some of the reasons, for the educational institutions to consider mLearning as an avenue for content distribution, and as a basis for developing and deploying mobile games based on learning. As new technological tools have the capacity to encourage collaboration and reinforce real world skills, educational institutes are experimenting with digital policies that allow for more freedom in interactions between students, as they work on projects and assessments (Johnson et al., 2014). These are the reasons for educational institutions to encourage and implement mobile learning by using mobile devices.

Instructional design and technology field is ever evolving and will continue to do so in future too. Instructional designers do not stick to one model or theory but incorporate different models and theories based on the needs of learner (D.Sanchez, personal communication, April 1, 2016). The reason why instructional designers mix and match theories and models is because the instruction designed in a particular design model has an impact on student learning. The technologies used for instruction and student learning will affect the learners. Once the eLearning and mobile learning is implemented across different nations its effectiveness will increase. The new technology provides learners with diverse experience and access to information at any time. Designers work with subject matter experts and faculty to work together so the game element can be integrated with specific outcomes in curriculums.

IV. Summary

Learning has definitely seen a great transformation since the introduction of mobile technology and cloud computing. The increased demand for these technologies means that one will witness greater growth in the usage of these technologies. The reason is one can access his or her school, educational resources and information from anywhere and at any time. Since the information is readily available, it allows students not to wait until they are in school or classroom to access information. As one sees the new developments in the advancement of new apps and advanced mobile devices, one can predict that mobile technology is here to stay and will keep on evolving in the coming decades all over the world. The demand of mobile devices is increasing in developing countries too, where mobile devices are becoming popular because of these devices' low and affordable prices.

Mobile technology is providing educators an opportunity globally to bring along individuals from around the world to access educational resources to enable education for all. Mobile technology has changed the way learners and educators look at learning. It has made it easier to grab more and more opportunities for learners to gain global learning experience along with accessing the global educational resources, and multimedia capabilities of mobile technologies, educational resources are becoming more game-like to motivate learners to learn (Ally, & Prieto-Blázquez, 2014). New education and learning opportunities are coming along with mobile learning, and educators around the world are welcoming these opportunities offered by mobile learning. To conclude in the words of Brown, & Mbatia, (2015) the emergence of mobile learning has occurred in congruence with the disruption of hierarchical teaching and learning structures. Educators have also incorporated the pedagogical approaches by introducing new ways of learning using current and future learning environments.

References

- [1]. Almaiah, M. A., & Abdul Jalil, M. M. (2014). Investigating Students' Perceptions on Mobile Learning Services. *International Journal Of Interactive Mobile Technologies*, 8(4), 31-36. doi:10.3991/ijim.v8i4.3965.
- [2]. Ally, M., & Prieto-Blázquez, J. (2014). What is the future of mobile learning in education? *RUSC: Revista De Universidad Y Sociedad Del Conocimiento*, 11(1), 142-151. doi:10.7238/rusc.v11i1.2033.
- [3]. Bacon, N., & Kischner, G. (2002). Shaping global classrooms. *Educational Leadership*, 60(2).
- [4]. Brown, T. H., & Mbatia, L. S. (2015). Mobile learning: Moving past the myths and embracing the opportunities. *International Review of Research in Open and Distributed Learning*, 16(2), 115-135.
- [5]. Campbell, K., Schwier, R., & Kenny, R. (2009). The critical, relational practice of instructional design in higher education: an emerging model of change agency. *Educational Technology Research & Development*, 57(5), 645-663.
- [6]. Chen, P. (2006). Learning by building knowledge with peers. *Journal of Instruction Delivery Systems*, 20 (2).
- [7]. Chengjiu, Y., Yanjie, S., Yoshiyuki, T., Hiroaki, O., & Gwo-Jen, H. (2013). Developing and Implementing a Framework of Participatory Simulation for Mobile Learning Using Scaffolding. *Journal of Educational Technology & Society*, 16(2), 137-150.
- [8]. Chow, A.F., Howard, J.C., and Lambe, N. (2008). Teaching variation using an interactive classroom activity, *Decision Sciences Journal of Innovative Education*, 6, pp. 297 – 303
- [9]. Cochrane, T. (2013). M-Learning as a catalyst for pedagogical change. In Z. L. Berge & L. Y. Muilenburg (Eds.), *Handbook of mobile learning*. New York, NY: Routledge.
- [10]. Cross, N. (2011). *Design thinking: Understanding how designers think and work*. London: Berg Publishers.
- [11]. Dick, W. (1987). A history of instructional design and its impact on educational psychology. In J. Glover & R. Roning (Eds.), *Historical foundations of educational psychology*. New York: Plenum.
- [12]. Elkeles, T., Philips, P., & Philips, J. (2015). ROI Calculations for Technology-Based Learning. *TD: Talent Development*, 69(1), 42.
- [13]. Erichsen, E., & Bolliger, D. (2011). Towards understanding international graduate student isolation in traditional and online environments. *Educational Technology Research and Development*, 59(3), 309–326. Doi: 10.1007/s11423-010-9161-6.
- [14]. Gartner (2013). Gartner special report examines how media tablet market will continue to evolve. Retrieved from <http://www.gartner.com/newsroom/id/1800514>.
- [15]. Gustafson, K. L., & Branch, R. M. (2007). What is instructional design? In R. A. Reiser & J. V. Dempsey (Eds.), *Trends and Issues in instructional design and technology* (2nd ed., pp. 16–25). Upper Saddle River, NJ: Merrill-Prentice Hall.
- [16]. Hinchcliffe, D. (2011). The "big five" IT trends of the next half decade: Mobile, social, cloud,
- [17]. consumerization and big data. Retrieved from <http://www.zdnet.com/blog/hinchcliffe/the-big-five-it-trends-of-the-next-half-decade-mobile-social-cloud-consumerization-and-big-data/1811>
- [18]. Hylén, J. (2012). Turning on mobile learning in Europe: Illustrative initiatives and policy implications. Paris, UNESCO.
- [19]. Hung, D. (2001). Design principles for Web-based learning: Implications from Vygotskian Thought. *Educational Technology*, 30(3), 33-40.
- [20]. Instructional design history and timeline. (2012). Retrieved from http://www.instructionaldesigncentral.com/htm/IDC_instructionaltechnologytimeline.htm
- [21]. Imtinan, U., Chang, V., & Issa, T. (2012). Characteristics of mobile learning environments in developing countries. *International Journal of Learning*, 18(5), 163-173.
- [22]. Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2014). *NMC horizon report: 2014 higher education edition*. Austin, Texas: The New Media Consortium
- [23]. Kukulska-Hulme, A., & Traxler, J. (2005). *Mobile Learning: A Handbook for Educators and Trainers*. London: Routledge.
- [24]. Lundin, L. L. (2013). Mobile learning. *Salem Press Encyclopedia*.
- [25]. McConnell, D., Hodgson, V. & Dirckinck-Holmfeld, L. (2012). Networked learning: A brief history. In L. Dirckinck-Holmfeld, V. Hodgson & D. McConnell (Eds.), *Exploring the Theory, Pedagogy and Practice of Networked Learning*. (pp. 3-24). New York: Springer.
- [26]. Mercadal, T. (2015). Instructional Design. *Research Starters: Education (Online Edition)*.
- [27]. Merrill, M.D. (2002). First principles of instruction. *Educational Technology, Research and Development*, 50(3), pp43-59.
- [28]. Pierce, D. (2015). 3 Ways mobile technology is transforming learning spaces. (Cover story). *T H E Journal*, 42(5), 10.
- [29]. Prensky, M. (2001). Digital Natives, Digital Immigrants: Do they really think different? *On the Horizon*, 9(6), 1-6.
- [30]. Rafferty, J. (2014). The essential instructional designer: The job e-learning can't live without.
- [31]. Retrieved from <http://digitalpedagog.org/?p=1772>.
- [32]. Reigeluth & A. Carr-Chellman (Eds.), (2009). *Instructional-Design theories and models – building a common knowledge base* (Vol. 3). New York, NY: Routled.
- [33]. Reiser, R.A., & Dempsey, J.V. (2012). *Trends and Issues in Instructional Design and Technology* (3rd Ed.). Saddle River, NJ: Pearson Education.
- [34]. Remington, K. (2015). Mobile learning's impact on instructional design. Retrieved from <http://lpd.nau.edu/mobile-learning-impact/>.
- [35]. Siemens, G. (2004). A learning theory for the digital age. Retrieved from <http://www.elearnspace.org/articles/connectivism.htm>
- [36]. Sampangi, R., Viswanath, V., & Ray, A. (2010). Reaching the unreached: A study on mobile learning in India. *Proceedings of the European Conference on E-Learning*, 350-357.
- [37]. Traxler, J. (2009). Current state of mobile learning. Mobile learning: Transforming the delivery of education & training. M. Ally, AU Press: 9–24.
- [38]. Traxler, J. (2013). Mobile learning across developing and developed worlds: Tackling distance, digital divides, disadvantage, and disenfranchisement. In Z. L. Berge & L. Y. Muilenburg (Eds.), *Handbook of mobile learning*. New York, NY: Routledge
- [39]. Porcaro, D., & Carrier, C. (2014). Ten Guiding Principles for Designing Online Modules that Involve International Collaborations. *International Journal of Education & Development Using Information & Communication Technology*, 10(2), 142-150.
- [40]. Perkins, R. A. (2008). Challenges and questions concerning "culturally-sensitive design." *TechTrends*, 52(6), 19–21. Doi: 10.1007/s11528-008-0212-3.
- [41]. The future of mobile learning. Implications for policy makers and planners. (2013). Retrieved from <http://unesdoc.unesco.org/images/0021/002196/219637E.pdf>.
- [42]. Vazquez Cano, E. (2014). Mobile distance learning with smartphones and apps in higher education. *Educational Sciences: Theory & Practice*, 14(5), 1505-1520. doi:10.12738/estp.2014.4.2012
- [43]. Yanchar, S. C., & Hawkley, M. N. (2015). Instructional design and professional informal learning: Practices, tensions, and ironies. *Journal of Educational Technology & Society*, 18(4), 424-434.