

Why Generation Z' Digital Literacy can be Improved through Digital Storytelling?

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Abstract

This article addresses the impact of the rapid development of disruptive technologies which will impact every life in an unimaginable way. While impacts of these disruptive have been felt, causing the emerging of new business models such as net jobs and the sharing economy. In addition to this, the skill disruption within an occupation has also shifted in a meaningful way e.g. new job categories and new required skill sets for future business are invented. In order to overcome these challenges effectively, supporting current work force through re-training and adequate planning for future workforces, generation Z, to become better prepared and fully equipped with digital knowledge, i.e. digital literacy, would be a good strategy. Digital storytelling can support Generation Z and their learning of digital literacy by familiarizing with computers, utilizing different multimedia formats and combining them to create something meaningful which are a sample of digital literacy's desired outcome.

Keywords: Generation Z, Digital Literacy, Industry 4.0; 21st Century Skills, Skills for Future Workforce, Digital Storytelling

1. Introduction

Countries across the world continue to develop economically, utilising technological resources and enhancing their capabilities in order to continually advance themselves. As a result, we find ourselves in an increasingly competitive atmosphere. As these changes continue to occur in our society, the question of survival for the next generation becomes evermore important; how do we ensure that we, whether that be in terms of people, corporations, or countries, are able to with stand the competition and thrive in new and untested environments? To solve this, countries need to improve their competitiveness in various ways, from developing their infrastructure, to their educational systems and overall capacity for innovation and harnessing digital tools, a task that is especially difficult for countries that are still developing in these areas. Achieving this requires a lot of forethought and effort, and is an issue that has the potential to affect countries on a global scale - Thailand is no exception.

The Ministry of Digital Economy and Society, introduced Thailand Digital Economy and Society Development Plan in which aimed to transform toward Digital Thailand in order to increase country competitiveness by taking full and creative advantage of digital technology to develop infrastructure, innovation, data capability, human capital, and other resources (Pooparadai, 2016). In addition to this. the implementation of Thailand 4.0 policy is a new economic model aimed at developing a value-based economy (Kasichainula, 2017), therefore puts a huge emphasis on everything 'digital', and in order for this initiative to truly succeed, it must be enforced in the education system first and foremost, to ensure that children of the next generation have enough digital knowledge to be able to live and work in the digital work cohesively.

In an interview with Dr.Suvit Maesincee, Deputy Minister of Commerce, Government of Thailand (Aim-Aiam, 2016), he explains in-depth, the details of Thailand 4.0, stating that it is about equipping its citizens with enough knowledge to propel the country forwards. Therefore, one of the aspects of education that must be addressed is that of digital and technology-based education - i.e. improving digital literacy. The effort to modernise education, especially in Thailand, has in a few cases, been referred to as Education 4.0 (a reference to both Industry 4.0 and Thailand 4.0). Dr.Puncreobutr (2016), a professor teaching in Thailand, refers to Education 4.0 as something that is imperative for learners to ensure that they're able to thrive in and be competitive and responsive to the multitude of social changes. He expands on this, stating that one of the key outcomes that Education 4.0 needs to foster is creativity and innovation amongst students. This, he explains, is achievable through harnessing the right learning models to suit this new generation.

2. Workforce of the 4.0 Era

According to the Bangkok Post (1 November 2016), from now through to 2020, global industrial sectors will invest \$907 billion per year to embrace Industry 4.0, which digital technologies, for instances, sensors or connectivity devices, software and application e.g. manufacturing execution systems will be a primary investment. Employee training and organizational changes will also be a priority.

Recent market research conducted by McKinsey comprising of 300 experts from relevant industries in 2015 on operational effectiveness revealed that most companies consider labour, quality, and development as key areas for improvement. These improvements are expected to be implemented and driven through the digitalization of knowledge work, advanced analytics, and touch operation/interfaces. These findings clearly illustrate that in order to tackle the challenges of Industry 4.0, enterprises need to build relevant digital capabilities through attracting digital talent who possess knowledge of basic processes and IT systems. This is to ensure that they are able to link the digital world back to the physical world, as well as potentially being able to design new products and services through cross-functional insights and broad knowledge gathered from various elements of the enterprise's activities. (McKinsey & Company, 2015)

According to a World Economic Forum (2016) report, entitled “The Future of Jobs”, disruptive changes to business models will have a profound impact on the employment landscape over the coming years. Many transforming drivers currently affect global industries and as a result are going to have a great impact on jobs, ranging from significant job creation to job displacement, and from heightened labor productivity to widening skill gaps. It is estimated that 65% of children entering primary school today will end up working in completely new jobs that don’t currently exist. Under this circumstance, it has become an important agenda for businesses, government entities and individuals to anticipate and prepare for future skills requirements, job content and the aggregate effect on employment.

These changing environments will undoubtedly shape business models and drive rapidly improving computer power. Demand for new skill sets will simultaneously arise. In particular, the ability to work with data and make data-based decisions will become a vital skill across many job families. Employers will need to build a workforce with solid skills in data analysis and presentation (e.g. through visualization), especially considering that potentially useful digital information generated continuously increases in the digital era. Additionally, the increasing ubiquity of mobile internet, combined with the Internet of Things, further illustrate the rising demand of a higher, more sophisticated level of technology literacy than in the past.

3. Generation Z

According to McCrindle (2015, 2016), Generation Z are the largest generation ever, comprising around 20% of Australia’s population and almost 30% of the world’s population. Globally there are almost 2 billion of them. They are the first fully global generation, shaped in the 21st century, connected through digital devices, and engaged through social media.

Gen Z is loosely defined as those born after 1995 and who now 18 are and under. It’s a big group: two billion worldwide, and one-quarter of the North American population. Gen Z is already being branded as a welcome foil to the Millennials, born between 1980 and the mid- or late 1990s, who have been typecast as tolerant but also overconfident, narcissistic and entitled. They’re smarter than Boomers, and way more ambitious than the Millennials”. (Kingson, 2014)

They are the first children of the 21st century who have grown up in an entirely digital world. A few call them “digital integrators”, others the Facebook Generation. (Parker, 2013)

4. The 21st Century Skills and the Digital Literacy

4.1 Framework

A framework created by Partnership for 21st Century Learning (P21), see Figure 1, details the necessary components for 21st century learning; in essence, a framework of the skills that need to be taught to students to prepare them for a drastically different 21st century (P21, 2015). The green arc at the bottom represents key subjects; these subjects encompass a range of subjects traditionally taught at the primary school level - English, Mathematics, History, Art, Science, Economics, World Languages, etc. Life and career skills, the red arc at the top, represents thinking skills and social and emotional competencies needed to navigate complex life and work environments, namely Flexibility & Adaptability, Initiative & Self Direction, Social & Cross-Cultural Skills, Productivity & Accountability, and Leadership & Responsibility. The last two arcs on the rainbow are the two probably most relevant to digital storytelling and literacy. The yellow arc on the top represents Learning and Innovation Skills, the 4Cs: critical thinking, communication, collaboration, and creativity. The last arc, the purple part of the rainbow on the top right-hand side, represents Information, Media, and Technology Skills, which P21 state as being important

as: “to be effective in the 21st century, citizens and workers must be able to create, evaluate, and effectively utilize information, media, and technology.” They list these types of literacies as being Information Literacy, Media Literacy, and ICT Literacy, all of which are things that digital storytelling helps students achieve - as well as creativity, the main purpose of the yellow arc.

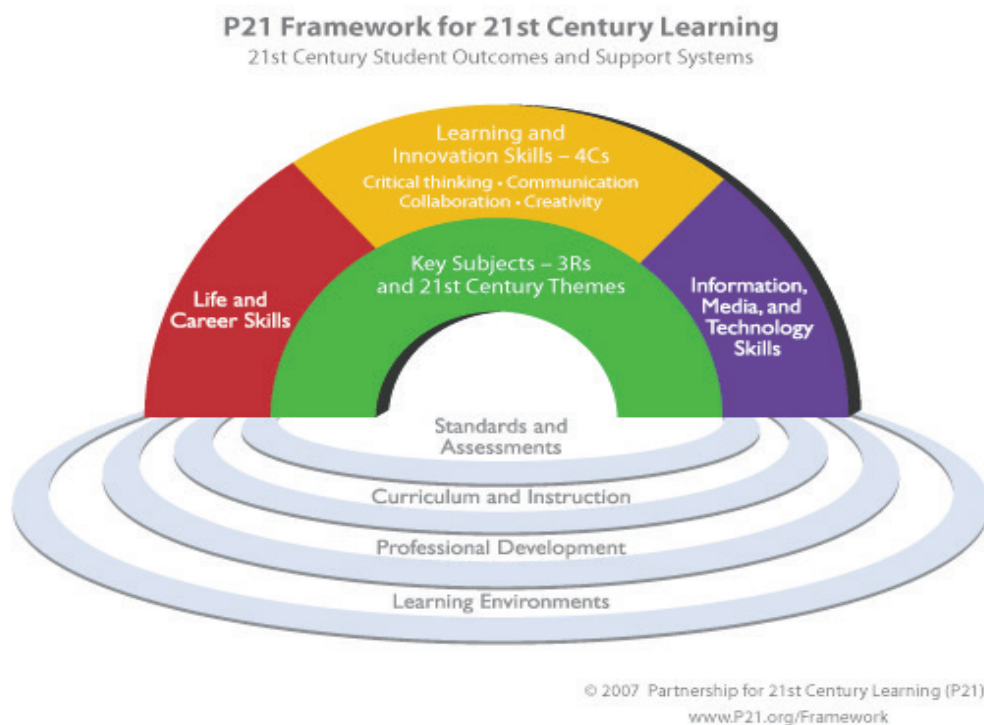


Figure 1: Framework for 21st Century Learning (P21, 2015)

4.2 Definition of Digital Literacy

The Oxford English Dictionary defines ‘literacy’ as simply “the ability to read and write”, but when used alongside other contexts refers to “competence or knowledge in a specified area”. Digital literacy, therefore, pertains to being literate in a globalized world; being competent and having enough knowledge to communicate using digital tools – for instance, computers.

UNESCO (2011) stated that the origin of the word literacy refers to the ability to read and write. Later on, at the UNESCO June 2003 Expert Meeting in Paris, it was expanded to “the ability to identify, understand, interpret, create, communicate, compute and use printed and written materials associated with varying context.”

According to UNESCO (2011), digital literacy has become a general concept for an important set of skills: ICT literacy, technology literacy (previously called computer literacy) and information literacy. The differences among these three literacies are defined below:

- ICT literacy – user skills that can actively participate through computer-support and socially associated with another on the internet.
- Technology literature (previously known as computer literacy) – consists of both user and technological computing skills with a more in-depth knowledge of digital technology.
- Information literacy – focus more on Knowledge Society: an ability to recognize when information is required, to locate, evaluate, and use digital information optimally.

4.3 Why it's important/needed?

Digital literacy is not only about the ability to handle computers, but it comprises of a set of basic skills starting from the production of digital media, information accessing, processing, retrieval, participating in social networks for creation and sharing of knowledge to professional computing skills.

Digital literacy was also recognized as a gate skill; an essential skill for the future workforce that has relationships with other basic skills and competences. It would enable the acquisition of other important life skills that most employers would firstly look for in a job applicant. It has penetrated all areas of life, and therefore, has become one of the most important life skills in the digital world. (UNESCO, 2003, 2004, 2011)

In Thailand, the issue is compounded by the lack of ICT education and a lack of supporting infrastructure to properly develop ICT education. (OECD/UNESCO, 2016) This issue has become increasingly important in Thailand, as research from multiple sources have found that the country needs to focus on developing and harnessing technology, as well as building its capacity for innovation.

4.4 How digital literacy related to Gen Z?

To effectively demonstrate what digital literacy is and the connection it has to Generation Z, refer back to the aforementioned explanation: "digital literacy is not only about the ability to handle computers, but it comprises of a set of basic skills starting from the production of digital media, information accessing, processing, retrieval, participating in social networks for creation and sharing of knowledge to professional computing skills". These skills are becoming paramount to survival in the 21st century, illustrating that digital literacy is especially relevant to Generation Z, perhaps more so than any other generation; Gen Zs are the ones who will need to adapt to technological advancements more so than any other generation. This is true when considering various dimensions of their lives; it ensures that they are able to adapt to their ever evolving technological surroundings, as well providing them with a more impressive and competitive profile when applying for jobs - a critical point in this competitive market, especially considering that computer science majors often earn considerably more than their non-IT major counterparts (Code.org, 2017).

The need for understanding digital literacy is already evident in our current environment and how quickly people have had to adapt – just ten years ago, smartphones had not been invented yet. Today, the technological landscape is filled with them, with screens getting bigger, brighter, and more advanced every year, demonstrating not only how fast technology is evolving, but how it continues to do so at an alarming rate. All of this suggests that the digital world is, and will become even more of, a core component of Generation Zs lives. But beyond that, if these students begin to grasp how technology works through enhancing their digital literacy skills, they might eventually be able to work with these tools to shape the technology of the future.

5. Digital Storytelling

5.1 Definition

Meadows (2003) described digital stories as "short, personal multimedia tales from the heart". The beauty of this digital expression can be created by people everywhere, on any subject, and shared electronically all over the world".

Ohler (2008) describes digital storytelling as a creative process in which a traditional story is combined with personal digital technology, such as a computer, video camera, and sound recorder.

Robin (2008) explained digital storytelling as being a process of creating short stories that allows students and educators to enhance their information gathering and problem-solving skills, and to, facility the ability to work in a collaborative team.

5.2 History of Storytelling

Mendoza (2015) described a key intrinsic characteristic of human beings as the nature of telling stories, sharing our life events with others and experiences in which the way to communicate with others has changed overtime. The storytelling originated with visual stories, e.g. cavemen and hieroglyphics, dating 30,000 years back. The Chauvet cave in France, for example, displayed the way ancient societies would survive, with details of their survival created with a stick in mud or in clay. After the cavemen and hieroglyphics era, dating back 9,000 years, the first written story was manually transcribed in a form of written symbol on paper, stone or clay. The writing began as drawings, and changed overtime into script, e.g. the Phoenician alphabet, which derived from older forms of writing, followed by ancient Greece where the earliest inscriptions date from 770 to 750 B.C. Then the mass printing was invented by Johannes Gutenberg in the 15th century, which made news and information more available for all.

In 1,800 when the new way of storytelling had emerged through various creation of technology output, e.g. photography, motion pictures, digital media, mobile media. Now, in the 21st century, the most influential channel is social media; this is done on different media platforms such as Facebook and Instagram, that allow us all to freely express thoughts, emotions and empathy in a public manner.

5.3 Learning Process



Figure 2: Digital Storytelling Process (Morra, 2014)

The process of digital storytelling can, according to Samantha Morra, be summed up as an eight step process. The first step begins with an idea, which is the first concrete step to creating a digital story. This can be done in various forms; a proposal, a mindmap, etc. The second step is to research, explore, and learn, essentially to build up a wealth of knowledge on their interested topic from which they can draw upon when crafting their story. The third step is to write, or to create a script – an outline of the story. It's the stage where details like which tense to write from, or whether first, second, or third person perspective will be used. The fourth step is to create a storyboard, where the script will be translated into a visual media plan, incorporating the use of audio and visuals into the plan. The fifth step is to begin gathering the necessary visuals from the plan in step four. Step six is to combine all of these elements together, with step seven being to share your digital story, which leads into the final and eighth step, step eight, whereby feedback is received that can be used to reflect upon the created piece.

This learning process ensures that students have a clear foundation to begin constructing digital stories, and the process of sharing work and obtaining constructive feedback allows for the cycle to be repeated and for the learner to strive to improve on their creations. The build up from creating a written script first before incorporating digital elements allows for students to use multimedia to enhance a story they already want to tell, teaching them how to best utilize technology to get their point across.

5.4 Obtaining Digital Literacy through Digital Storytelling

One of the ways to achieve this, is through digital storytelling; essentially the idea of combining storytelling with different computer-based tools. The use of various multimedia tools improves digital literacy through giving students first-hand experience with using computers for a specific purpose, teaching them how to shape technological tools to create their desired output. This is particularly effective because there's such a personal element to these stories, allowing students to express themselves through digital means, a form of self-expression that has the potential to be appealing across generations. This is an important point to keep in mind because students of different generations tend to have different learning methods - Generation Z, for instance (an increasingly popular name for the generation of children after Generation Y) are characterised by a shorter attention span and a dislike of traditional learning environments.

Using digital storytelling could appeal to these students in particular because they're already so absorbed in the digital realm. Researcher and digital culture consultant, John Seely Brown described digital storytelling this way: "I'm particularly interested in Digital Storytelling, in new ways to use multiple media to tell stories and in the ability of kids, who are now growing up in a digital world, to figure out new ways to tell stories. They have the ability to build interpretive movies very simply and to lay sound tracks around the content. They condition or "sculpture" the context around the content." (Robin, 2017). Additionally, according to the research done by Smeda, Dakich & Shara (2014), digital storytelling is a powerful tool to integrate instructional messages with learning activities and can help students improve their technical skills and information literacy. In addition to this, Miller (2009) suggested that digital storytelling is the best application for teachers to encourage students to increase their use and technological knowledge and technical skills.

This illustrates the versatility of digital storytelling - students can use it to explore any topic that interests them, from history to robotics, giving them the ability to teach others certain topics through various media forms as well. Digital storytelling can also be used as an introduction to computers so that students can begin to learn more complex skills, such as computer programming; developing an initial interest in computer multimedia tools could increase students' interest in the behind-the-scenes aspect of computers and how they work functionally. And beyond digital literacy, digital storytelling also teaches students to be creative and innovative in telling the stories they want to tell, skills that are incredibly important to thriving in the 21st century.

5.5 How Digital Storytelling support Gen Z' digital literacy and Thailand's competitiveness?

Digital storytelling can support Generation Z and their learning of digital literacy in many ways. Firstly, it teaches familiarize students with computers and teaches them how to utilize different multimedia formats and combine them to create something meaningful. Learning this provide students with a duality to their understanding whereby they can use production techniques to put together various images and sounds to create a story, as well as write programs that allow them to take advantage of the complexity of a computer at an in-depth level. Learning this inevitably link to digital literacy skills, once again described as a gate skill that does not only about the ability to handle computers, but it comprises of a set of basic skills starting from the production of digital media, information accessing, processing, retrieval, participating in social networks for creation and sharing of knowledge to professional computing skills. (UNESCO, 2003, 2004, 2011)

This tool can also be used to effectively teach digital literacy skills to a young population, for instance, Generation Z students. A characteristic of Generation Z students is that they have shorter attention spans and need learning environments that are varied and interesting to sustain their interest. Digital storytelling can be an

effective way to do so; digital storytelling provides enough forms of media to be varied and allows for an element of personalization in the scope of its storytelling and its outcomes can be linked to topics Gen Zs find interesting – such as creating a personal blog through different multimedia creations they’ve learned, or using a platform like creative online community to create and share their stories or experiences.

Creativity and innovation are areas that Thailand needs to prioritise in order to effectively position itself as a competitive player in the global market. A report that discusses innovation and countries’ innovative capabilities is the Global Competitiveness Report 2015-2016, an annual report by the World Economic Forum that aims to analyse countries’ competitiveness based on a variety of factors (World Economic Forum, 2015). Throughout the report, competitiveness is defined as “the set of institutions, policies, and factors that determine the level of productivity of a country”.

According to the World Economic Forum (2015) report, Thailand’s scores are lowest in the areas of innovation and business sophistication, indicating that Thailand needs to work on these two factors (in conjunction with improving the other pillars) in order to become an innovation-driven country. Therefore, one of the key issues Thailand needs to address is how they’re going to foster innovation. Improving the education system is paramount to achieving this, as it would create innovative, creative children who grow up with that mentality ingrained in their beliefs and actions. Teaching students to use digital storytelling as a platform of expressing themselves, as an outlet for innovation and creating something new can help improve digital literacy rates and overall competitiveness in Thailand.

6. Conclusion

Technology disruption will cause significant impacts to companies, government and individuals in many ways. Changing environment, rapid development of advanced technologies, business sophistication and model with value added and innovation-driven to maximize the operational effectiveness will simultaneously require new skillsets as well as new job creation. Though we are still at the early stage of the Industry 4.0 era, adequate preparation of the next generation for a more competitive environment that values innovation must be proactively taken in action and anticipated.

Becoming digitally literate is not an option, and this applies to Thailand as well. The implementation of Thailand 4.0 emphasises heavily on everything ‘digital’ by improving the education system to ensure that the next generation have adequate digital knowledge and literacy for the digital century, however, it might not be easy to implement in a short period of time due to limited infrastructure and technological challenges. The use of technologies in meaningful ways, i.e. digital storytelling, as an effective educational digital tool for preparing future workforce, digital professional development, and reskilling current workforce’s which require new skill sets for the Industry 4.0 might be a viable solution.

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8. References

- Aim-Aiem, V. (14 October 2016). “Interview with Dr. Suvit Maesincee, Deputy Minister of Commerce, Government of Thailand on Thailand 4.0.” *A Day Bulletin*, Issue 431, page 10-15.
- Code.org. (2017). *Promote Computer Science*. Available from : <https://code.org/promote>
- Local Tech News. (1 November 2016). [serial online]. “Industries embrace digital innovation. Business section.” *Bangkok Post*. Available from : <http://www.bangkokpost.com/tech/local-news/1124057/industries-embrace-digital-innovation>

- Kasichainula, S. (26 January 2017). [serial online] "Understanding the Journey to Digital Thailand." *The Nation*. Available from : <http://www.nationmultimedia.com/news/opinion/30304913>
- Kingston, A. (2014). *Get ready for Generation Z – They're smarter than Boomers, and way more ambitious than the Millennials*. McClean's. Available from : www.macleans.ca/society/life/get-ready-for-generation-z/
- McCrindle. (2015). *Gen Z and Gen Alpha info Graphic Update*. Available from : <http://mccrindle.com.au/the-mccrindle-blog/gen-z-and-gen-alpha-infographic-update>
- McCrindle. (2016). *Generation Z Defined; The 5 Characteristics of Today's Students*. McCrindle. Available from : http://mccrindle.com.au/the-mccrindle-blog/tag/gen_z/
- McKinsey & Company. (2015). *Industry 4.0 How to navigate digitization of the manufacturing sector*. Available from : <http://www.mckinsey.com/business-functions/operations/our-insights/industry-four-point-o-how-to-navigae-the-digitization-of-the-manufacturing-sector>
- Meadows, D. (2003). "Digital storytelling : Research-based practice in new media." *Visual Communications*. Vol. 2 : 189-193
- Mendoza, M. (2015). *The Evolution of Storytelling*. Available from : <http://reporter.rit.edu/tech/evolution-storytelling>.
- Miller, E. (2009). *Digital Storytelling in Department of Curriculum and Instruction*. Available from : <https://icss.uni.edu/researchhelps/miller.pdf>
- Morra, S. (2014). *8 Steps to Great Digital Storytelling*. Available from : <http://www.edudemic.com/8stepstogreat-digitalstorytelling/>
- OECD/UNESCO. (2016). *Education in Thailand: An OECD-UNESCO Perspective*. Reviews of National Policies for Education, OECD Publishing, Paris. Available from : <http://dx.doi.org/10.1787/9789264259119-en>
- Ohler, J. (2008). *Digital storytelling in the classroom*. Thousand Oaks, CA : Corwin Press.
- Parker, P. (2013). [serial online] "Do you know how Generation Z pupils learn?." *SecEd*. Available from : <http://www.sec-ed.co.uk/blog/do-you-know-how-generation-z-pupils-learn/>
- Partnership for 21st Century Learning (2015). *Framework for 21st Century Learning*. Available from : http://www.p21.org/storage/documents/docs/P21_Framework_Definitions_New_Logo_2015.pdf
- Pooparadai, K. (2016). *Digital Economy Development Plan*. Available from : http://www.mict.go.th/assets/portals/1/files/590613_1DE_27-5-59-Dr.kasititorn.pdf
- Puncreobutr, V. (2016). [serial online] "Education 4.0: New Challenge of Learning." *St. Theresa Journal of Humanities and Social Sciences*, 2. Available from : <http://www.stic.ac.th/ojs/index.php/sjhs/article/view/Position%20Paper3/47>
- Robin, B. (2017). *What is Digital Storytelling?*. Available from : <http://digitalstorytelling.coe.uh.edu/page.cfm?id=27&cid=27>
- Robin, B. (2008). *The effective uses of digital storytelling as a teaching and learning tool*. In J. Flood, S. Health, & D. Lapp (Eds.), *Handbook of Research on Teaching Literacy through the Communicative and Visual Arts* (2) (pp. 429-440). New York : Lawrence Erlbaum Associates.
- Smeda, N., Dakich, E. and Sharda, N., (2014). *The Effective of Digital Storytelling in the Classroom : A Comprehensive Study*. DOI 10.1186/s40561-014-0006-3
- UNESCO. (2003). *Report on Activities Related to the Five Areas of the Information for All Programme*. Report on the Intergovernmental Council for the Information for All Programme Meeting, Paris, France., 22-24 April 2003.
- UNESCO. (2004). *Role and Focus of the Intergovernmental Council for the Information for All Programme*. Paper presented at the Intergovernmental Council for the Information for All Programme Meeting, Paris, France., 4-6 May 2004.

UNESCO (2011). *Digital Literacy in Education, Policy Brief*. Institute for Information Technologies in Education Policy Brief. Available from : <http://unesdoc.unesco.org/images/0021/002144/214485e.pdf>
World Economic Forum. (2015). *The Global Competitiveness Report: 2015-2016*. Available from : http://www3.weforum.org/docs/gcr/2015-2016/Global_Competitiveness_Report_2015-2016.pdf

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