

21st Century Education and Information Skills

*Mohd Fareiz Adzmi, Saiful Farik Mat Yatin, Farah Waheeda Fathy Mohammad,
Hasnah Shuhaimi, Saidatul Akhmar Ismail and Shaharom T.M. Sulaiman*

Faculty of Information Management, Universiti Teknologi MARA (UiTM) Selangor, Malaysia

Abstract: 21st. Century Skills offers the advantages of using technology to enable and improve learning at all levels, in all places and for the people of all backgrounds. Whoever involves in education such as educators, policymakers, administrators, teacher and professional development programs now should embed these tools and resources into their practices. It offers a platform for collaboration with families, researchers, cultural institutions and all other stakeholders so that these groups can eliminate inefficiencies, reach beyond the walls of traditional classrooms and form strong partnerships to support 24/7 anywhere, everywhere, all-the-time learning. This paper describes a skills of the 21st. century education and the needs and important of information skills to be considered as a skills in this 21st century education. This is vital because all knowledge started from education. Educations starts as early as in the womb. Education is a delivered information. Teachers are the first point that need to have more information skills to nurture 21st. century generation. An implementation of basic information skills ought be consider in this 21st. century education in order to meet the requirements of having an informed society or information society. The educational organization should transform a new pattern of process learning that empower the information skills in terms of a creative thinking, flexibility in problem solving, collaboration and innovative skills that will assist them to succeed in their life.

Key words: 21st century education skills information skills information literacy

INTRODUCTION

The term 21st. century skills refers to a broad set of knowledge, skills, work habits and character traits that are believed by educators, school reformers, college professors, employers and others to be critically important to success in today's world, particularly in collegiate programs and contemporary careers and workplaces. Generally speaking, 21st. century skills can be applied in all academic subject areas including information management field and all social setting in all career and phases of life.

Knowledge itself is now becoming significantly more specific and expanding exponentially. Information and communication technology is a kind of innovation of changing the way of learning and working process and so the significance of social relationships. There are top five of essential elements in today's enterprises which includes shared decision-making, information sharing, collaboration, innovation and speed.

Today, we have achieved huge success in terms of innovation of information and communication technology ranging from being able to communicate, share and use information to solve complex issues, enable in adapting and innovating towards new demands and different current situations as well as enable to command and expand the power of technology in order to create a new knowledge. Technological literacy 21st. century learning initiatives, informed by emergent research on how people best learn, leverage emerging technologies (e.g., computers, smart phones and Web 2.0 tools) and embraces the collaborative, participatory learning made possible through Web 2.0. that enables users to produce and share content in new ways and in real-time: user-generated content creation and 'remixing' [1] become creative and engaging practices that challenge the traditional relationships between teachers and students in providing information and content for learning. Carroll [2] argue that 21st. century Learning Skills, are critical for accomplishing the necessary transformation.

Definition of 21st. Century Learning Skills: The Partnership for 21st. Century Skills (www.21stcenturyskills.com) has developed a framework for 21st. century learning, which describes the skills that students need to thrive in today's global economy. A framework of 21st. century skills which has been identified by The North Central Regional Education Laboratory (NCREL) and the Metiri Group are comprised of four (4) categories which includes the digital age literacies, inventive thinking, high productivity and effective communication.

Educational Testing Service (ETS) [3] defines 21st. century learning skills as the ability to gather and/or retrieve data or information, sort out and manage the information, assess the quality, relevance and usefulness of information and create precise information via the existing resources. NCREL on the other hand identifies it as reaching learning process by digital age education, critical thinking, effective communication and high productivity.

Six key elements for fostering 21st. century learning which is emphasize core subjects, emphasize learning skills, use of tools to develop learning skills, teach and learning context and content and use assessments measure skills are identified by The Partnership for 21st. century.



Fig. 1: 21st Century Education Framework

Table 1: 21st Century Education Skills

Learning and Innovation "The 4 C's"	Digital Literacy	Career and Life
Critical thinking & problem solving	Information literacy	Flexibility & adaptability
Creativity and innovation	Media Literacy	Initiative & self-direction
Communication	ICT Literacy	Social & cross-cultural interaction
Collaboration		Productivity & Accountability
		Leadership & responsibility

As western economics have upgraded from industrial-based to service-based, trades and vocations have smaller roles. However, specific hard skills and mastery of particular skill set, with a focus on digital literacy (the use of digital and communications technology), are elevated in demand. People skills which are associated with interaction, collaboration and managing others are increasingly vital. Skills that encourage the people to be flexible and capable in adapting in different roles or in different fields, those that involve in processing information and managing people more than manipulating the facilities in an office or a factory are in higher demand. These are also referred to as 'applied skills' or 'soft skills', including personal, interpersonal, or learning-based skills, such as life skills (problem-solving behaviors), people skills and social skills.

Due to so many aspect in discussing this 21st. century education, this article only focus on the area in information management which is information literacy (IL) and to relate it to information skills that significant to all level of society for life long learning.

Information Literacy (IL) and Life Long Learning (LL):

In the wider context, information skills training is important because it helps to increase IL. It is the adoption of appropriate information behavior to identify, through whatever channel or medium, information well fitted to information needs, leading to wise and ethical use of information in society. It forms the basis for LL, common to all disciplines, learning environments and all levels of education. It enables learners to master content and extend their investigations, become more self-directed and assume greater control over their own learning.

In order to thrive in a digital economy, students will need digital age proficiencies. It is important for the educational system to make parallel changes in order to fulfill its mission in society, namely the preparation of students for the world beyond the classroom. IL is "the ability to recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information" [4]. IL skills include: accessing information efficiently, evaluating information critically and using information accurately and creatively. These literacies form the basis for LL [5]. They are common to all disciplines and to all learning environments. Information literate individuals are able to:

- Determine the extent of information needed

- Access the needed information effectively and efficiently
- Evaluate information and its sources critically
- Incorporate selected information into one's knowledge base
- Use information effectively to accomplish a specific purpose
- Understand the economic, legal and social issues surrounding the use of information and access and use information ethically and legally

Since the expanding volume of information accessible, educators, students and any other of stakeholders are confronted with assorted and tons of information choices. Moreover, an individual receive an information in unfiltered formats, bringing up the issues on its credibility, legitimacy and unwavering quality. The unsure quality and expanding quantity of information pose large challenges for the effectual application of relevant information. The negligible plenitude of data will not itself make a more educated citizenry without a related necessary abilities to use information effectively.



Fig. 2: Information Literacy

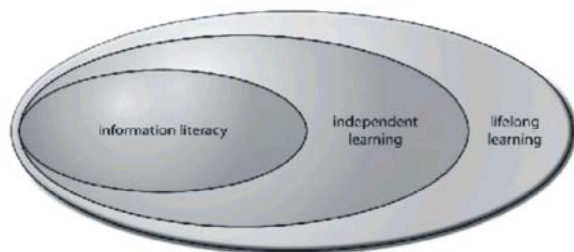


Fig. 3: Information Literacy in the context of Lifelong Learning [6]

Our world is changing rapidly as technology evolved around and so many changes demand us to follow the flow as there goes also with the IL skills. Adequate skills should be improved from time to time to capable for

student to compete effectively in the employment world or still can use in their daily life. Kibby [7] firms that literacy is fundamental as it is the foundation of learning and the greatest relationship to continued LL. Acquiring and maintain literacy skills is major importance to successful LL. IL is not only empowering the student in education field but as the necessary tools for social networking. It is as an instrument to uplift a life of students as nations today actively participate throughout discussion, event participation, economic activities and politic freedom. Therefore, the skills of IL is granted and treasured to overcome challenge the impossible with unrealistic hopes and dreams. According to ANZIL the Australian and New Zealand Information Literacy framework, the context of LL in IL consists of IL, independent learning and then LL. IL and independent learning is the key to the LL. The figure below shows the relationship between IL, independent learning and LL. Based on Figure 3, the context of IL and LL are related to each other as literacy as the medium to support the independent learning. The knowledge of IL has driven the desired to perform the independent learning and becoming LL. According to Kibby[7], the expanding interest for education in the course of the most recent century and apparently interminable era of new information make it evident that the present perusing complexity of most understudies should be articulated up a few scores to meet tomorrow working environment needs.

BIG6 Model: The Big6 Model is the popular model known for decision making and being use on how to solve a problem through the 6 competencies and also the systematic approach to the problem solving which relies on critical thinking. The competencies were Task Definition, Information Seeking, Location and Access, Information Use, Synthesis and Evaluation. It can be used in learning and teaching as well as personal life. Based on previous study by Foo[8]found that the combination of Big6 Model of IL improves the ability of students in assessing the IL skills through the six competencies referring to. The Big6 Model encourage students to explore the information and make use of information for better purposes either in learning environment as well as daily life.

The Need of Information Skills in 21st Century Education: Information skills are almost the same as information technology skills. Although information

technologies are usually vital to enable users to access information resources, but both concepts are different to one another. Information technology skills are focused with the capability in handling computer hardware, software and applications such as email and the internet. However, information skills are worried with the ability of users to locate information sources and to evaluate, navigate, organize and communicate the information that they find. With information available in various formats and of varying quality, it is essential that students have the skills to enable them to exploit the wide range of information resources available and to retrieve, evaluate and use that information effectively. By empowering these skills, we can boost to their academic success and help ensure that they become independent and successful lifelong learners.

Information professionals have long provided assistance and instruction to their clients, but many now experience rising demands for information skills training. A number of factors are encouraging a move towards greater self-sufficiency. Technological developments enable health services employees and students to access information resources at a time and location convenient to their needs. In addition, "new approaches to working, such as evidence-based practice, place an emphasis on information and knowledge". Evidence based practice (or evidence based medicine) "is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients". Those working and studying in the health field require information skills such as literature searching and critical appraisal in order to enable them to make decisions that are based on evidence.

It is vital to remember that patients and their careers, as well as those in the health services, require information skills training to enable them to access accurate, timely and high quality health information and to critically appraise the information that they retrieve. Further, information professionals also require information skills training in order to meet the needs and requirements of their users and provide training to them. The examples of information skill training courses is library induction, library catalogue/intra training, copyright and plagiarism issue, citing bibliographic references, using electronic resources, internet searching, literature searching, bibliographic database searching, critical appraisal and also references management.

Every age level need good information to make decisions. From children at their early age also makes about 3, 000 decisions a day. Various internet sources

estimate that an adult makes about 35, 000 remotely conscious decisions each day. According to researchers at Cornell University, we make 226.7 decisions each day on just food alone [9].

Education Begins in the Womb: Ideal muslimah [10] in their website stated that there are numerous things which the fetus can do in this period such as expressing emotions, happiness, fear, disgust etc. Through facial expressions, it can show anxiety through the sucking of the thumb, assert itself and protest through kicking and it develops memory. One other important development during this stage is the ability to distinguish and recognise sounds. Experiments have been carried out that proved this when words were repeated by the mother to her fetus, after it is born, the baby will prefer,

- a story that has been read twice a day to it, when it was a fetus, to a new one.
- a newborn will recognize and copy its mother's words.
- when a theme music to a program was played, a newborn whose mother watched the show during pregnancy, will calm down.

This is because the brain of the fetus appears to be electrically silent during the first six weeks of life. After this time, slowly activities of low intensity occurs. Although the brain is at least 'moving', it is not 'thinking' in any real sense. The fetus becomes conscious during the second trimester.. There is ultrasound evidence that about 23 weeks (161 days) the fetus dreams. Dreaming is certainly an indication of the presence of the mental capabilities required for thought...(The Thinking Fetus, n.d). Imagine the good input and information feed everyday to the fetus, by the time it is born, it will always prefer good things over others.

Education Continues to Pre School: Mcinerny [11] reports that readiness for preschool starts way back in the cradle. People think the baby is born and everything is kind of ready to go. But really, when babies are born their brains are what we call experience expectant and we have certain things that need to happen in order for the babies brain to completely finish up development. This philosophy of beginning a child's education from the time he is born is something child development research supports. A 2012 study from the Center for Early Literacy Learning looked at two groups of toddlers – those who were read to and those who weren't. The children who

were read to developed their language skills earlier than those who were not. Some of these experiences include activities that develop a child's motor skills and getting them familiar with language through reading. Both which help the child developmentally prepare for school. All these are vital informations for the children and parents also concerns about information of their child development.

Education for the Pensioner: Pensioner also need information and have to make decisions about how to collect their pension, make use of that money, to invest for sustaining their future or to spent it by enjoying through vacations or as far as to make decision where they want to be buried and get 'rest in peace'. What will they do in utilizing their day, involved in social community activity, learn religious knowledge or play with their grandchildren. Good decisions comes from quality and good information. Without good information, it will not guarantee a good outcome. An information skills will surely make every decision valuable and best decisions are just a reflection of their values in action.

CONCLUSION

21st. Century Skills refer to content knowledge, literacies and proficiencies that prepare individuals to meet the challenges and opportunities of today's world. Now more than ever, it is essential for individuals to access, synthesize and communicate information, to work collaboratively across differences to solve complex problems and to create new knowledge through the innovative use of multiple technologies. Educators play a significant role in the cultivation of 21st. Century Skills. By weaving together core-subject mastery and contemporary interdisciplinary themes, teachers can help learners and society to obtain relevant career and life skills. The integration of new technologies with inquiry-, project- and game-based learning may also increase opportunities for learning. Along with quality teacher professional development, a healthy and responsive learning environment is critical to 21st. century success.

ACKNOWLEDGEMENT

This paper was partially funded by:

- Conference Support Fund, Institute of Graduate Studies (IPSiS, UiTM)
- Academic Development Trust Fund (TAPA), Faculty of Information Management, UiTM

- YayasanMinda Fund

REFERENCES

1. Caruso, J.B. and R.B. Kvavik, 2005. Students and information technology: convenience, connection, control and learning. Educause Center for Applied Research.
2. Carroll, T., 2007. "Teaching for the Future," Chapter 4 in Building a 21st. Century U.S. Education System. National Commission on Teaching and America's Future. [http:// www.nctaf.org/resources/research_and_reports/nctaf_research_reports/documents/Chapter4.Carroll.pdf](http://www.nctaf.org/resources/research_and_reports/nctaf_research_reports/documents/Chapter4.Carroll.pdf).
3. The Educational Testing Service (ETS), 2007. Digital Transformation: A Literacy Framework for ICT Literacy.
4. Learn Higher CETL, 2008. 3rd. Annual Self- Evaluation Report, Liverpool: LearnHigher.
5. Andretta, S., 2005. Information literacy: A practitioner's guide. Oxford, UK: Chandos Publishing, Ltd.
6. Bundy, A., 2004. Australian and New Zealand Information Literacy Framework principles, standards and practice, 2nd. ed. Adelaide: Australian and New Zealand Institute Information Literacy.
7. Kibby, M.W., 2000. "What will be the demands of literacy in the workplace in the next millennium?", Reading Research Quarterly, 35(3): 380-1.
8. Foo, S., Shaheen Majid, Intan Azura Mokhtar, X.Y.K. Zhang, and C., Brendan, 2014. Information literacy skills of secondary school students in Singapore, Aslib Journal of Information Management, 66(1): 54-76 <http://dx.doi.org/10.1108/AJIM-08-2012-0066>.
9. Wansink, Brian and Jeffrey Sobal, 2007. "Mindless Eating: The 200 Daily Food Decisions We Overlook," Environment and Behavior, 39(1): 106-123.
10. Ideal Muslimah, 2017. Education Begins In The Womb. Retrieved on August 1, 2017 at: <http://idealmuslimah.com/family/pregnancynew-born/337-education-begins-in-the-womb.html>.
11. Mcinerny, Claire, 2014. Why Education Starts Not In The Classroom, But In The Womb. Retrieved on August 1, 2017 at: <http://indianapublicmedia.org/stateimpact/2014/07/03/prepping-infants-toddlers-school-brain-development/>.