Exploring Digital Competency of Rural Students in Malaysia

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Abstract. The Internet technologies have become the fundamental backbone for the economy, education, health and well-being, and human lifestyles. The application of digital technology or information and communication technology (ICT) towards social, economics and politics has become an increasingly important function and the power of the Internet has immense potential to reach out to anyone in the world that has online access. With the growing number of the Internet penetration rate, being competent to survive in the digital world is a necessity. The basis of the competencies is skills, knowledge and literacy. However, how the competencies are conceptualized vary from one aspect to another. Therefore, in this study, we explore the state of digital competencies among students in a rural area. Using a qualitative approach, the findings offer the rural students digital competencies are information processing, communication and collaboration and basic ethics and security competencies. However, there seem to be lacking in the ability to create digital content and ability to solve digital problems. The findings will help to improve on the competencies and roadmap development to be used as digital competence framework for the information society. Finally, as the study served as an exploratory attempted at understanding the rural students digital competencies and conducted at one school, we suggest future research to expand the research landscape for thorough understanding of the issues and implications.

Keywords: digital competencies, digital world, information society, rural students

I. Introduction

Digital technologies are increasingly being used in society and the economy, and this is transforming ways of working, studying, communicating, accessing information, or spending leisure time, among others. Internet and especially social technologies are used for various purposes by different groups of citizens and are also being appropriated for new social activities. Through online spaces, citizens can access resources, follow, interact, and create and share with other people globally. People from all age groups are participating in different types of onlinenetworked activities, which have become parts of work, learning and citizenship (Ala-Mutka, 2008).

While many people especially the gen Z, are growing with Internet technologies, concerns on digital competencies are on the rise. This is due to the emergence of internet-related crimes such as rape, theft and piracy. As a result, young adults have become the target and they have become the vulnerable demographic. In Malaysia, for example, fraud cases detected in cyberspace jumped 20% last year compared to 2015. Besides fraud, the top cybercrime were intrusion, spam and malicious code. Statistics shown a total of 2,428 cybercrime incidences reported between January and April in the year of 2017 (MCMC, 2017).

In Malaysia, the number of active internet users in the country has now exceeded 20 million, with 16.8 million being active on social media (MCMC, 2017). The adoption rate amongst Internet users was decreasing as the range of age ascends. In terms of Internet experience, 31.9% of Internet users were connected as early as five years old. Nearly 80% of the 19- 49 age group were among internet users, while 20% of the 55-74 age groups had hardly used it. This highlights the need to ensure that everybody has the opportunity from early on in their education to see the value of digital tools and

media and acquire the skills to use them. Another lesson from the statistics is the necessity to develop learning opportunities for those who have already finished with formal education, but who need digital competence to participate in society and for their work and personal lives. Furthermore, parents need an understanding of digital competence in order to protect, support and educate their young children in digital usage. For example, recent data shows that currently 77% of 13-16 years old and 38% of 9-12 years old in Europe use social networking sites, and not all of them are aware of the privacy settings. A study conducted in Malaysia found that female students are more aware and have affirmative insights than male, students in the age group of 18-23 years have lower perception and awareness than those aged 24 years and above and those with higher academic qualifications are more aware at cybercrime and perceived the issue of risk differently (Hasan, Rahman, Abdillah, & Omar (2015).

Therefore, it is in the interest of the researchers to explore the level of digital competencies among rural students. The empirical research will be conducted mainly via the qualitative surveys that include the teenagers in rural area. Studying digital competence is crucial for understanding the well-balance of people's well-being.

II. Literature Review

A. Digital Competence

B. Technological advancement has made people utilize technology in their daily life where the digital competencies is defined as one of the central competences needed in the future, and the ability to use digital tools was defined as a basic skill (Ilomäki et al., 2016). The key competencies of lifelong learning in a knowledge society is digital competence where besides the ICT skills, other aspects are equally important, such as critical thinking in the use of new technologies and media, safe and responsible use, risk awareness and ethical and legal considerations.

Digital competence is also described as being able to connect based on social connections and interaction (Ilomäki et al., 2016). For the young adult employees to be able to practice the use of ICT skills in their work may influence their work performance as well as how a digital competence can perform in their work and life. The development of ICT has changed knowledge work significantly in recent decades. In order to understand digital technology practices among them and to accommodate their needs, a holistic approach encompassing a close examination of their online practices and information seeking behavior is advocated (Alam and Imran, 2015)

C. Digital competence measurement

Competencies are always measured from the basis of skills, knowledge and attitudes (AlaMutka, 2011). The European policies have taken several approaches to digital competence that emphasize on different perspectives and specific concepts. The examples include digital society, ICT for innovation capability, lifelong learning and employment. Based on sequential research work, Ferrari (2013) reported one of the issues being highlighted globally is no longer on the access to and use of technologies, but the capability to benefit from them in a meaningful way. Hence, a conceptual model for digital competence is offered that evaluates on the communication and collaboration, information management, learning and problem solving and meaningful participation. Interestingly, a digital competence framework for citizens that captures the essence of information and literacy, communication and collaboration, digital content creation, safety and problem solving has been developed by Vuorikari et al., (2016).

D. Digital learning

The world is digitizing, and higher education is not immune to this transition. The trend is well underway and seems to be accelerating as top universities create departments and senior leadership

positions to explore processes of digital learning innovation within the academy (Siemens, Gašević, & Dawson, 2015). It was further added a society or academic organization is required to facilitate the advancement and adoption of digital learning research. In exploring for digital learning competencies, Vaitsis et al., (2016) developed the Online Learning Activities for Medical Education (OLAmeD) concept, which builds on unified competency frameworks and generic technical standards for education. The results show the tools promote learning and set a base for a community of medical educational contents across different education context. Thus, it signifies for the important attribute of digital competency.

E. Digital technology as a lifestyle

The computers, networking, the Internet and ubiquitous applications have revolutionized how human think, act, interact and lead the lives. Changes and transformation occur to the economics, education, education, politics and governance (Deutsche Bank Research, 2012). Not a single thing is left unaffected by the Internet. The physically connected society is beginning to blur and the digitally connected society is emerging. In some countries, digital and k-economy, digital society and digital governance are becoming more common. With social media and social networking, they become the catalyst to the digital society emergence.

The Internet and social media promote for more transparency, open interaction, open culture and open innovation. They are transforming the social hierarchy and structure, and eventually the social norms. How the society adapts to the new technology vary. While some are diligently reacting in accordance to the acceptable Internet behaviour, some others act and think differently (Haviland, Pincus and Dial; 2003, Wang and Kiryu, 2003).

F. Malaysian Digital Technology Landscape

The globalized online learning is one of the agendas in the Malaysian education transformation. Utilizing the massive open online course (MOOC), the Malaysian Higher Education Ministry has set for 70% blended-learning activities by 2025 (Tapsir, 2016). It was further added the aim of the learning experience is to change the learning mode and the learning environment. With a total of 79,016 academics and 1.29 million students in public and private higher learning institutes, promoting for competencies in the digital learning is a challenge (Tapsir, 2016).

In addition, recent statistics from the Malaysian Communications and Multimedia Commission (2016) show there are 21mil Internet users in Malaysia, which is equivalent to 68.5% of the total population. Comparing between the age cohorts, the population age between 18 and 44 contributes to 72% of the total Internet usage. On average, Malaysians spend 5.1 hours a day on the Internet and 2.8 hours a day on social networks. The internet usage is the main aspects of technology that sets as the digital lifestyle.

III. Research Method

A. Research Design

Since the aim of the research is to gain insights and capture the richness of the key issues and challenges, a case study via sets of interviews was conducted. The method is believed to provide empirical inquiries that investigate the contemporary phenomenon. Furthermore, the purpose and focus of the method is to describe the meaning, provide deep understanding, and interpretation of the textual information derived from the interviews. In order to gain a holistic comprehension and reflection, the interviews were conducted young adults aged 15-17 years old. Participants were selected based on purposive sampling strategy. Unique purposeful sampling method was applied in this study. The research was interested to understand the main issues of digital competency and internet wellness behavior among teenagers, therefore, purposeful sampling was appropriate

assuming that researcher wants to discover, understand and gain insight about the topic; thus selecting sample from which can be learned is crucial.

Unstructured interviews were conducted that allows for probing the answers for more input. In addition, by using the interview technique, the respondents had the freedom to discuss the issues on a broader topic. Therefore, even though the aim of the study was to get insights of the key issues of digital competency and internet wellness behavior, the researcher started by asking about the internet and online media usage in general. Once the respondents provided their feedback, the researchers probe further questions by asking "why", "how" and "what".

B. Respondents Background

The participants were selected based on purposive sampling, that referred to selection of sampling based on their unique and atypical attributes, whom the researcher believes were able to provide honest answers that will relevantly answering the research questions and assisting in achieving research objectives. The researcher had set two suitability criterions that should be owned by a prospect informants: 1) Students and 2) Age: all informants are of age 15 to17 years old. Through a personal contact, eight participants had been approached and interviewed. They were chosen as the participants due to their profile that met the criterions set by the researchers. The recommended sampling was until a point of saturation or until redundancy is reached (Merriam, 2009). Therefore, the sampling for this study ceased at eight informants due to the redundancy of information that was reached.

IV. Results and Discussion

The data was analyzed by following the constant comparison method. This was highlighted by Boeije (2002) that the aim of the constant comparison method is to discover the concepts. There were four phases involved namely, exploration, specification, reduction and integration. Following Corbin and Strauss (2014) three coding processes of open, axial and selective were adhered to in the exploration phase. The validation of the findings was achieved by getting the participants' approval on the narrative summary. The findings suggest for the following issues: information and data literacy, communication and collaboration, ethics and security. The summary of the findings is presented in the figure below.

Information processing	• Know and use of relevant software/equipment • Browsing and information searching (personal/educational purpose) • Managing data, information and digital content
Communication and collaboration	• Interacting through digital technologies (social media, email, whatsapp, weechat) • Sharing through digital technologies (email, social media) • Colloborating through digital technologies (game, online shopping, social media)
Ethics and security	• Etiquete/ethical issues (know but did not practice) • Protecting devices (password, finger print) • Protecting personal data and privacy (Private social media-some of them)

Fig. 1. Summary of key findings Detail
discussions of the key findings are presented here.

A. Information Processing

All respondents indicated that they know and able to use relevant software or equipment when browsing the Internet or using computers or smartphones. Majority agreed that the main reason they browsed and searched information for personal and educational purpose. However, they lack skill in managing the data, information and digital content due to lack of practices and knowledge in the specified area. It is very important that at this young age, they know how to manage data, information and digital content efficiently because it will save them a lot of time and avoid gather unnecessary or wrong contents. In summary, their information digital competencies are considered very basic and these include:

1. able to look for information online using search engine
2. understand not all online information is reliable
3. able to save or store files and retrieve them
4. classify the information
5. save the information in different format

On the other hand, there seem to be lacking in the following information digital competencies:
1. not able to use advanced search engines to find information
2. not able to assess the validity and credibility of information using a range of criteria
3. not able to use cloud information storage services
4. do not back up information that they have stored

B. Communication and Collaboration

Most respondents admit that they prefer interacting through digital technologies especially social medias i.e. Facebook, Instagram, email, WhatsApp, and WeChat. They mentioned that the main activities they used it is to share information, news, gossips through emails and social media. Students admit that they collaborate with their friends through digital technologies by playing online games, buying things online, and using social media. Their responses on the communication and collaboration competencies could be summarised as below:

1. able to actively communicate with other using chat-basic features
2. actively use a wide range of communication tools
3. able to share files and contents using simple tools
4. able to use collaboration tools
5. ability to use online services, where appropriate
6. minimum knowledge on advanced communication tools

C. Ethics and Security

Ethics and security are the most important competency that these rural teenagers must possess. However due to their negligence and limited knowledge they did not apply safety precautions when using digital technologies. All of them agreed that they used basic security measures such as passwords and fingers print on their devices. However, many of them did set their information on social media such as on Facebook and Instagram as private. Hence, it appears to be dangerous where it can be very vulnerable for them at this very young age. It is very crucial to look further on the reason why they lack such skill and knowledge. In a nutshell, their ethics and security competencies could be summarised as:

1. basic protection for some online services
2. use password to access equipment
3. aware that information could be stolen
4. understand excessive Internet and phone usage would affect health
5. understand that health risks are associated with use of digital technologies

However, there seem to be poor in the following ethics and security procedure:
1. do not installed security programs on the device that is used to access the Internet
2. do not check for security configuration
3. do not have the adequate ability to configure the firewall and security settings
4. do not have adequate understanding on the impacts of technology to lifestyle and everyday life

Based on the findings and analysis, it could be concluded rural students possess three components of digital competencies which are information processing, communication and collaboration and basic ethics and security competencies. However, there seem to be lacking in the ability to create digital content and ability to solve digital problems. Having adequate level of digital competencies is very important because it is one of the central competences needed in the future, and the ability to use digital tools was defined as a basic skill (Ilomäki et al., 2016). In addition, the level of digital competencies could be assessed as very basic, and many other areas require adequate level of knowledge and skills.

V. Conclusion and Research Implications

The findings of the study provide the evidences for the key digital competency among youth in rural area. They serve as the foundations of understanding how the next process of finding the digital competency among school children in Malaysia should be conducted. The findings suggest for the following key competency possessed by the teenagers; information and data literacy, communication and collaboration, ethics and security. However, there seem to be lacking in the competencies of digital content and ability to solve digital problems. Therefore, in encouraging the digital competencies among rural natives, strategies should be placed for ensuring disintegration between groups or digital divide could be reduced. Nevertheless, the findings will help to improve on the competencies and roadmap development to be used as digital competence framework for the information society. Finally, as the study served as an exploratory attempted at understanding the rural students' digital competencies and conducted at one school, we suggest future research to expand the research landscape for thorough understanding of the issues and implications. This is to be done not only for the rural, but to consider a wider horizon for the digital natives.

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