

The Importance of Information Literacy to Face the Challenges of the Industrial Revolution 4.0: Study of Indonesian, Malaysian, and Thai Students

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Abstract: This study examines and discusses information literacy skills (IL) among students in dealing with the Industrial Revolution (IR) 4.0 in three countries; Indonesia, Malaysia, and Thailand. More specifically, the researcher discusses information search and management strategies undertaken by students in various learning environments and cultures. The respondents consisted of 331 Indonesian students, 320 Malaysian students, and 198 Thailand students. The characteristic of IL skills of the Indonesian and Malaysian students is more on the ability to evaluate products and processes, while the Thai students tend to assess and comprehend the information $F(2, 847) = 21.146, p < .01$. IL ability levels are categorized as basic, intermediate, and advanced with the successive data of Indonesian students was 28.4%, 48.3%, and 23.3%; Malaysian students 61.6%, 10.6%, and 27.8%; while Thai students 57.1%, 12.6%, and 30.3%. From a total of 849 respondents, the basic level reached 47.6%, intermediate level 25.8%, and advanced level 26.6%. Overall, the ability of students is at the basic level, namely the ability to critically evaluate information and process selected information into new knowledge or ideas; the ability needs to be improved to face the challenges of IR 4.0.

Keywords: information literacy, evaluation ability, industrial revolution

Introduction

The fourth industrial revolution (IR 4.0) is a combination of physical, digital, and biological domain elements. It has become the forerunner to disruption in all fields which has an impact on changes in human characteristics and behaviors (Butler-Adam, 2018; Gleason, 2018; Umachandran, Jurcic, Ferdinand-James, Said, & Rashid, 2018). The routine work is replaced by the sophistication of the internet technology of things and artificial intelligence.

Learning faces the challenges of digitizing systems, big data, and the swift flow of information that demands to be skilled in information technology and ready to be competent in the world of work later (Wilson, Lennox, Hughes, & Brown, 2017). This change encourages higher education to continue to be able to adapt, as well as students need to have the skills to manage information qualified. IR 4.0 must be faced with a cultural revolution, a human revolution in various aspects of life, not just a technological revolution, yet a revolution that brings new values and norms in daily life for the benefit of humanity (Kemenristekdikti, 2018; Xu, David, & Kim, 2018). Higher education is demanded to graduate students with an adaptive ability to change more frequently. These abilities include the ability to solve complex problems, think critically and creatively, be able to be a good manager, and have good coordination skills.

Students face conditions where he must survive in carrying out their studies and future challenges. The

abundance of information certainly brings not only positive knowledge but also negative effects. A person's ability to process knowledge into wisdom in his social environment will determine the level of resilience in the information age. Thus, the act of sharing and resharing information has been based on ethical values so that it will not create an escalation of public noise (Blas, 2014). The ability to search, process, and use information wisely become an important skill to be possessed by students (Funamori, 2017; Gleason, 2018; Selamat, Alias, Hikmi, Puteh, & Tapsir, 2017).

Information technology can bring information to a higher level if it becomes the basis of world education. This phenomenon is supported by an unlimited database if used continuously. Information literacy is necessary because people have to master information to ensure the comfort of life. Individuals dealing with the information need to know to differentiate and evaluate the validity of information because information is always multiple. In addition, information can also create job opportunities with the organization of information generated (Leticia, Ottonicar, Valentim, & Mosconi, 2018; Mahmood & Hussin, 2018).

Internet of things (IoT) is part of IR 4.0 and revolutionizes information sources within the organization; thus, the adaptation of the organization and the professionals working in it becomes inevitable. Therefore, if digital interference does not function well and is confronted with all the possibilities, it can bring considerable damage to the organization. Hence,

professionals need to know how to deal with what is already in analog and to pay attention to the transition to digital. The current study is intended to investigate how information literacy competencies contribute to digital disruption in the context of IR 4.0 (Ottonicar, Mosconi, & Nascimento, 2018).

Method

The study uses a quantitative approach to examine the ability of information literacy among students from Indonesia, Malaysia, and Thailand who are currently facing the challenges of the industrial revolution 4.0. Participants involved in this study consisted of 331 Indonesian students, 320 Malaysian students, and 198 Thai students ($SD = 0.768$). The instrument used was ILSES 28-item scale with Cronbach's alpha 0.91 which explored student literacy skills from 7 aspects of competency and three levels of ability (Kurbanoglu, Akkoyunlu, & Umay, 2006) and analyzed using ANOVA.

Results

In general, the students from the three countries had diverse information literacy (IL) abilities ($M = 108.80$, $SD = 13.655$). At the basic level, the IL skill of Indonesian students was at 28.4%, Malaysia 61.6%, and Thailand 57.1% ($F(2, 847) = 5.145$, $p = .006$). The ability at this basic level indicated that students were still oriented towards the process of finding information in general and using a variety of strategies to obtain the information. An intermediate level can be defined as the students' ability to define and obtain information and then interpret it. Furthermore, at this level, students began to communicate the information into new info or even to new ideas/knowledge. At this level, there were 48.3% Indonesian students, 10.6% Malaysian students, and 12.6% Thai students ($F(2, 847) = 70.601$, $p < .01$).

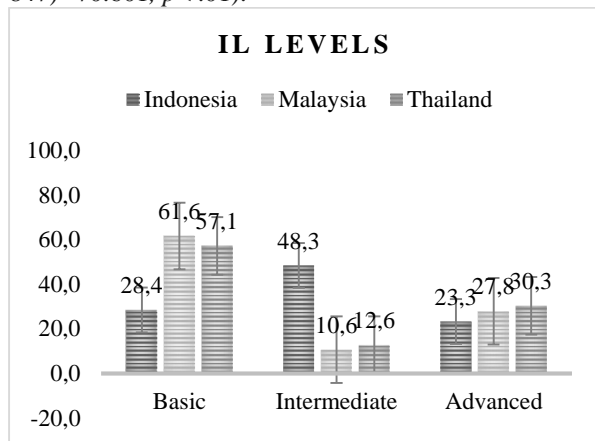


Figure 1. Level of information literacy

The highest level of IL skill was categorized as advanced, namely the students' ability to synthesize and evaluate various information problems and their products. The highest level was owned by Indonesian students with 23.3%, Malaysian students with 27.8%, and Thai students with 30.3%. The difference in IL

ability levels in these three state students was tested to be significant of $F(2, 847) = 17.588$, $p < .01$.

Each student in the three countries had different IL competence characteristics $F(2, 847) = 21.146$, $p < .01$. IL skills in Indonesian students were more prominent in the ability to evaluate the product and process (G; 5.32), while the ability with the lowest score was the skill of finding and accessing resources (C; 3.77). For Malaysian students, the dominant skill was (G; 3.92), while the lowest score was on information communication skills (F; 3.75). Thai students had strong skills in assessing and understanding information (D; 3.91), while the lowest score was on the ability to interpret, synthesize, and use information (E; 3.66).

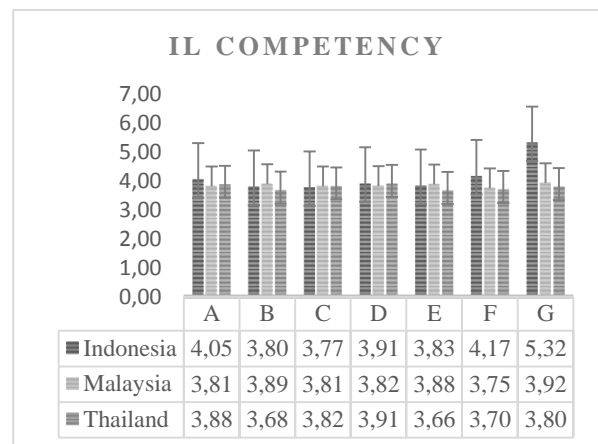


Figure 2. Competency of information literacy

Discussion

The diversity of IL competence characteristics of each country needs to be a concern in higher education. Students need to have strong IL skills, and IL learning becomes a compulsory curriculum to train to students. In Indonesia, IL is placed as an important skill in dealing with globalization, but a few years ago, it was more focused on a skill that must be possessed by librarians (Abidin, 2015; Wicaksono, 2016). At this time, IL has been studied more deeply as a skill that needs to be learned by and taught to students, especially to improve some competency standards that are still low (Pattah, 2014; Prasetyo, Rosyidi, Rohmadi, Auliyani, & Handayani, 2018; Sinurat, Christy, Zulharman, & Amtarina, 2017).

Information literacy is presented in the Malaysian education system but in a different form. Several studies have shown that the concept of information literacy is well understood by various stakeholders in Malaysia. At Malaysian universities, the responsibility for providing information literacy competencies is the librarians. The emergence of studies on the challenges of IR 4.0 brought new interest in information literacy among librarians and library science educators. Stakeholders are now trying to make information literacy on the agenda in the Malaysian education system (Edzan, 2008; Maria, Shahbodin, & Pee, 2018; Selamat et al., 2017). An educational curriculum that

teaches IL makes a significant contribution to higher-order thinking skills (HOTS) as well as wider information literacy skills. Students develop better information seekers, readers, users, researchers and writers (Yu, Adil, Izhar, Rafedziawati, & Rafedzi, 2018).

Whereas in Thailand, information literacy education is perceived as a holistic approach, integrated through cross-curriculum courses through formal and informal education. Discussion-based and task-based learning are identified as the best method for developing students' information literacy. Teaching and learning information literacy is considered the responsibility of academic lecturers, while librarians are not involved in information literacy education (Dokphrom, 2013; Tuamsuk, 2013). The concept of information literacy skills has been integrated into the curriculum. IL is taught in various ways, integration in the material taught by subject teachers or with librarians as partners, especially in the teaching and learning process to promote students' information literacy skills (Kingsawat, Kwiecien, & Tuamsuk, 2015; Saschanand, 2015).

Conclusion

As a competency that must be mastered by students in the IR 4.0 era, IL needs to be integrated systematically as part of the curriculum and trained by teachers and librarians. The increase of IL competency level makes students as reliable information seekers, processors, and producers with high-level thinking skills.

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