Analyzing Students' Needs for Better Information Literacy In The 21st Century

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Abstract

Mastery of information literacy skills has been proven to be important in the era of globalization. Hence the information literacy training is an activity that should be followed by every student. Information literacy skills are also a provision of lifelong learning. The researcher demonstrates the requirements of information literacy in the 21st century. This purpose is to analyze the information literacy in 21st century that the English students should have. This research used a qualitative approach. In addition, this research used a critical literature review as a method for undertaking the data. The researcher presents the information literacy needs in the 21st century. Several criteria were generated to help the researcher to find out the relevant literature and research of information literacy. After conducting the critical literature review of generating the requirements of information literacy in the 21st century, the findings of the research are there are two dimensions (skills and competencies) that should be considered.

Keywords*: Information literacy, Skills, Competencies*

A. Introduction

Information literacy is very useful in the world of higher education to support education and in implementing competency-based curricula that require students to find information for themselves and make use of various sources of information. Regarding technological advances, there are at least three literacy skills needed in the 21st century, namely information literacy, media literacy, and technology literacy (Sulistiyarini & Sabirin, 2018). Information literacy is the ability to recognize information needs to solve problems, develop ideas, ask important questions, use various information-gathering strategies, determine the information that is suitable, relevant, and authentic (Nurohman, 2014).

Furthermore, related to information literacy, adjoining literacy is media literacy. If information literacy is related to how information is obtained and used, media literacy is related to conveying information (Sulistiyarini & Sabirin, 2018). additionally, digital literacy has a connection with information literacy, and every public service librarian knows intuitively that there is a close relationship between information literacy and digital literacy (Cordell, 2013). There is the interplay between information literacy (which data to search, which terms to use, which limiters to employ, how to evaluate the articles in the results, how to use the information found effectively and ethically, etc.) and digital literacy (how to navigate the articles the library website, how to get to a search page or find the advanced

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search page, or find the help files, how to save or export the citations and full text, how to set up an account in a social media site, how to upload files to that site, how to comment on others' postings, etc.) (Cordell, 2013).

Media literacy is defined as the ability to choose, to understand, to question, to evaluate, to create, and to respond thoughtfully to the media we consume in the context of content, form or style, effect industry, and production, it is deliberate viewing, analytical judgment (Silverblatt, et all, 2014, p. 2). And digital literacy is the knowledge and skills to use digital media, communication tools, or networks to locate, evaluate, use, create information, and use it in a healthy, wise, intelligent, precise, accurate, and law-abiding in order to foster communication and interaction in daily life (Nasrullah, et al, 2017).

Fundamental ideas of the researcher in conducting this research refer to previous research. In previous studies, researchers did not find the characteristics of information literacy. The concept of information literacy has been a concern for decades as a response to the rapid development of information technology and information society (Wijaya, 2016, p. 74). Meanwhile, the researcher chose information literacy as the focus of this research and university as the place as well as the subject of this research. Thus, this research is underpinned by those issues.

21st Century and 21st Century Learning

The 21st-century skills movement seems to think that schooling should be rooted in skills-driven learning and hands-on experiences, as cited by Ledward and Hirata (2011). Thus the rapid technological development is characterized by the 21st century. As new devices are becoming prevalent in our lives, our habits and ways of communicating with people have changed considerably. The 21st century, defined by Castells (2010) as a time of extreme change, is an unprecedented age as business practices have become so globalized that awareness, mobility, and collaboration are more emphasized by core business competencies (Dunning, 2000).

In the 21st century, we are challenged to be able to create an educational system that can produce thinker resources capable of building a knowledge-conscious social and economic order as befits the world's citizens in the 21st century. One of the prominent characteristics of the 21st century is the increasingly interconnected world of science and technology so that the synergy between them becomes faster. Related to the use of information and communication technology/ ICT in the world of education, has resulted in the fusion of the "space and time" dimension which has been a determining factor for the speed and success of human mastery of science and technology (Mukminan, 2014, p. 2).

The twenty-first century is marked by the development of innovation, unlike the time before human history; this century has a distinctive feature in terms of technological development. P21 described the four abilities that are frequently used as learning and creativity abilities of the 21st century, and these abilities are "increasingly recognized as the abilities that separate students in the 21st century who are prepared for increasingly complex life and work environments and those who are not" (P21 as cited in Bedir 2019, p. 232). Chu (2017) stated that twenty-first century skills "are not new, only newly significant", in general terms. For over decades, such skills, such as language skills and critical thinking, have been the subject of attention for educational institutions around the world, while some other skills, including digital literacy, have recently emerged.

Three key areas of knowledge are composed of 21st-century skills: (1) creative thinking; (2) information, media, and ICT (information, communication, and technology) skills (collectively referred to as digital literacy); and (3) life and job skills competencies (p.

8). It consists of eleven competencies which are classified into three gist elements including (1) learning and innovation skills, (2) information, media, and technology skills, and (3) life and career skills (P21 as cited in Chu 2017, p. 3). Chu (2017) explained the first skill for learning and innovation which include communication and capacity for thinking. The second shared set of skills stresses the importance of mastering information technology (IT) skills, which include both standard IT skills, such as keyboarding, web browsing, word processing, and information literacy (IL) skills, including some more sophisticated usage of information, such as properly and ethically scanning, reviewing and citing information contained on the web. The third ability focuses on the ethical side of citizenship, requiring individuals to take responsibility for the environment, both personally, nationally, and internationally. All of the three tested systems were found to accept similar sets of skills and competencies at some length (p. 20-21).

Literacy in 21st Century

Literacy generally refers to reading and writing effectively in a variety of contexts. Literacy in 21st century is more than just reading and writing. In the 21st century, the definition of literacy has increasingly reflected the ability to use technology for gathering and communicating information. The International Reading Association (IRA) stated that the literacies used by today's students are much different from those of their parents or even those of students from just a decade ago (IRA, 2009; Pilgrim, & Martinez, 2013, p. 60). Students need to understand how concepts operate to identify and categorize knowledge, and how concepts can be organized into conceptual structures that link facts into broader areas of knowledge (Barber, 2012). Students must be able to grasp concepts as instruments that can be used to solve problems in the real world (Fish, 2011, p. 15, 29).

Most significantly, students need to understand the concepts of thresholds that enable the world to be seen and known in new ways (Land, Meyer, & Smith, 2008). Literacy of the 21st century is a set of several talents of the higher-order. To develop knowledge using scientific methods, students need to be able to objectively assess the reliability of different sources of knowledge. In order to justify and prove the facts, it often includes publicly debating with different groups of people. But we cannot forget that these abilities of the 21st century are built based on traditional literacy: reading, writing, and fundamental mathematics.

However, literacy concepts have not only been changing, they have been overlapping, as information literacy, multiple literacies, new literacy, digital literacy, and web literacy are all used to describe similar skills necessary for 21st-century learning (Pilgrim, & Martinez, 2013, p. 60). Meanwhile, the meaning of literacy in the current decade largely develops terms and understanding. In today's era, literacy is the ability to read, interpret, and produce valued texts in a community (Kaeophanuek & Songkhla, 2019, p. 22). Meanwhile, on the other hand, Coiro et al., (2008), new literacies are associated with many terms. Basic literacy, Early literacy, Social literacy, Digital literacy, literacies of the 21st century, internet literacy, financial literacy, health literacy, legal literacy, media literacy, information literacy, literacies of ICT, and computer literacy refer to terms that have evolved to describe literacies associated with ways of collecting and communicating information using the internet and new technologies (as cited from Pilgrim, & Martinez, 2013, p. 63).

Information Literacy 21st Century

Information literacy has been historically used to reference the literacy skills needed for information access and problem-solving (Pilgrim, & Martinez, 2013, p. 60). The capacity of knowledge literacy in the 21st century is one that learners must master in order to be able

to seek, access, and apply facts from all sources to guide them in learning and decision-making. Regarding technological advances, there are at least three literacy skills needed in the 21st century, namely information literacy, media literacy, and technology literacy (Sulistiyarini & Sabirin, 2018). Information literacy is an important skill that every individual must-have. By having information literacy, everyone can find out and use the information they need in a relevant way. Information literacy is the ability to recognize information needs to solve problems, develop ideas, ask important questions, use various information-gathering strategies, determine the information that is suitable, relevant, and authentic (Nurohman, 2014).

Since the original meanings of information literacy, sources of information have evolved and as technologies have progressed, how study and learning transpire have become associated with information literacy (Pilgrim, & Martinez, 2013, p. 60). The American Association of School Librarians (AASL) has established standards to guide practitioners. The four standards state that learners will use skills, resources, and tools to 1) inquire, think critically, and gain knowledge; 2) conclude, make informed decisions, apply knowledge to new situations, and create knowledge; 3) share knowledge and participate ethically and productively as members of our democratic society; and 4) pursue personal and aesthetic growth (AASL, 2007).

B. Methods

This is a qualitative analysis employing a literature review as data collection technique. While the data analysis steps is as follows (adapted from Jesson, Matheson, and Lacey as cited in Nashruddin & Mustaqimah (2020). Those steps are:

1) Formulate draft research question;
2) Search, scan, for information, using keywords;
3) Skim, scan, read, reflect and search some more, defining concepts of key;
4) Obtain articles and read some more;
5) Reassess your question; and
6) Formulate the final research question for analysis.

C. Findings and Discussion

Each article was scrutinized to adapt the requirements of better information literacy in the 21st century. More than thirty requirements were collected from six different references (Catts, & Lau, 2008; Bhatt, 2016; Prado, & Marzal, 2013; Dubicki, 2013; Anunobi, &Kingsley, 2014; Weiner, 2014), related to the requirements of information literacy.

Table 1. The Requirements of information literacy in the 21st Century

NO.	DIMENSION	REQUIREMENT	REFERENCES
		Problem solving and innovative skills	*Bhatt, V. (2016)*
1.	**SKILL**	Learning skills (critical thinking, collaboration, and communication)	*Bhatt, V. (2016); Catts, R., & Lau, J. (2008)*

2.	**COMPETENCY**	Connectivism skills	Bhatt, V. (2016)
		Digital citizenship	*Bhatt, V. (2016)*
		Recognize source data value, types and formats	*Catts, R., & Lau, J. (2008)*
		Record and store collected information (authenticity, accuracy, and up-to-date)	Anunobi, C. V., & Udem, O. K. (2014); Weiner, S. A. (2014)
		Search digital library, research databases and the internet effectively	Anunobi, C. V., & Udem, O. K. (2014)
		Determine the nature and extent of information needed	Weiner, S. A. (2014)
		Manage, apply and analyze the information needed	Prado, J. C., & Marzal, M. Á. (2013); Anunobi, C. V., & Udem, O. K. (2014)
		Synthesize information and use it to create new knowledge and understanding	Anunobi, C. V., & Udem, O. K. (2014); Weiner, S. A. (2014); Dubicki, E. (2013).

Those requirements in table 2.1 were categorized and synthesized by the researcher. From the table above, the requirement of information literacy in the 21st century are generally seen from two different dimensions; skill and competency. Skill dimension comprises the learning process that looks like through information literacy in which arises how students should explore and how the content is obtained and used. Skill is a component of competency which includes other components (knowledge and attitude) (Anunobi, & Kingsley, 2014).Whereas, competency dimension comprises for students to have the ability to use information and communication technology and its applications to access and create information, these dimension can be identified as a foundation of making information literacy in 21st century. Competency can be defined as a combination of knowledge, skills and attitudes appropriate to the context (European Communities, 2007). The table above is final result of the requirement of information literacy in the 21st century.

To offers comprehensive findings that have been mentioned above, the researcher critically discuss those requirements of information literacy in the 21 st century within the skill dimension and competency dimension. The skill of information literacy in the 21st century ideally covers some aspect. Problem solving and innovative skills, since the start of the 21st century, technology in education has become prevalent. Computer-based tools are widely used in creative problem solving in finding information, especially in the field of information literacy. A problem is often defined as an unusual situation that does not have apparent solution (Harlim, & Belski, 2013). Therefore, good problem solvers are expected to possess well-developed abilities to identify and analyze a problem, select and organize relevant information, represent the problem, translate relevant information towards finding a solution, identify one or more

solution strategies as well as to apply and evaluate these strategies (Harlim, & Belski, 2013).Thus, the current curriculum in the teaching of science and technology should be developed to educate science literate students who are able to ask questions and solve the problems they face(Balım, 2009). In the conclusion from the various theories above, problem solving skill is a mental and intellectual process in finding problem, analyze a problem, select relevant information and solving based on accurate data and information, so that conclusions can be drawn accurately and carefully.

The example of students who can apply problem solving skill: when the student has a difficulty understanding information, the material becomes unintelligible. When the information becomes unintelligible, the student searches for the information by flicking through keywords and looking for other sources with easier to understand reading. In addition, the definition of innovative is someone that comes up with new ideas, concepts or methods (YourDictionary). Therefore, Collins dictionary interprets an innovative person who introduces changes and new ideas (Collins). Numerous ways to develop students innovations are possible; develop, adapt, evaluate the information to enhance and optimize creative efforts, effectively create, and communicate new information to others, be open and receptive to new and diverse information, integrate group information and suggestions into the work and see failure as an opportunity to learn (Trilling, & Fadel, 2009, p. 57). In the conclusion from the various theories above, innovative skill can be interpreted as a process of developing knowledge, information and skills to create or improve something new or introduce changes. The example of students who can apply innovative skill: getting new information, then students use that information to be used as a reference for developing self-ability.

Secondly, learning skills (critical thinking, collaboration, and communication), Education in the 21st century should be able to form competent students to be able to meet the demands of the development of science and technology and the industrial world. Learning skill argues that 21st century learning should democratic classroom where students are involved in decision-making and meaningful learning viewing themselves as individuals with particular interest and need (Handayani (p. 59). Teaching students with the notion of collaborating, critical thinking, questioning, communicating, and problem solving skills is one of the main principles of science and technology teaching (Balım, 2009).Therefore, Abilities that should be mastered by students include 4C abilities (communication, collaboration, critical thinking, and creativity) (Kembara, Rozak, & Hadian, 2019). Critical thinking refers to the use of cognitive skills or strategies that increase the probability of a desirable outcome.

Critical thinking is a learned skill that must be developed, practiced, and continually integrated into the curriculum to engage students in active learning (Snyder, & Snyder, 2008).Critical thinking is purposeful, reasoned, and goal-directed, it is the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions (Halpern, 1999). Furthermore, critical thinking is required for a student to think clearly, rationally, logically, and independently. Besides that, critical thinking involves accessing, analyzing and synthesizing information, and is considered fundamental to 21st century teaching (Scott, 2015). Critical thinking skills are the capabilities to think reflectively and judge skillfully, so as to decide what information is reliable and what actions should be taken during reasoning and problem solving (Kong, 2014). Students in the twenty-first century, therefore, need to master information literacy and critical thinking skills for their success in learning advancement. The knowledge and digital era demands people with higher

order thinking skills; such as the ability to think logically and solve ill- defined problems by defining and explaining the problem, critically analyzing the information available, framing and testing different theories, formulating innovative ideas, and taking action (C21 Canada, 2012, p. 10).

In the conclusion from the various theories above, critical thinking is the ability to think clearly and rationally about what to do or what to believe and critical thinking involves accessing, analyzing and synthesizing information, and is considered fundamental to 21st century teaching. The example of students who can apply critical thinking skill: students can give reasons that the information they get or what they convey is true, that is not hoax. Collaboration in the 21st century is the ability to work in groups, learn from and contribute to other's learning, use social networking skills, and show empathy in working with diverse others (Fullan, 2013, p. 9). Collaboration is essential and also notes its difficulties, identifying the areas where collaboration often fails (Cooney, & Hiris, 2003).

Further, Hakkinen, et al (2016, p. 8) described that 21st century learning skills particularly from collaborative learning research (three sides of collaborative learning are: (1) collaborating to learn (collaborative learning environments to trigger productive learning mechanisms); (2) learning to collaborate (collaboration skills as such); and (3) learning to teach by applying collaborative learning approaches). Collaboration also requires students to develop collective intelligence and becoming learning developer (Trilling, &Fadel, 2009, p. 49). It supports the need for information literacy instruction for students at university, and describes the use of a collaborative framework for integrating information literacy into English learning (Coone, & Hiris, (2003).

In the conclusion from the various theories above, collaboration skill is the ability to work together in groups, learn from and contribute to other's learning, use social networking skills, and show empathy in working with diverse others. The example of students who can apply collaboration skill: students who are able to work together in teams. Communication can be defined as a process conveying information from someone to others and the information or massages can be received well by the receiver of the message (Syafaruddin, 2015). Thus, communication is multifaceted and incorporates various elements, such as oral, written, listening, visual, intercultural, interdisciplinary, etc (Riemer, 2007). In information literacy students should be actively engaged in framing a significant question or set of questions, the research or creative exploration to find answers and the communication skills to convey the information (Feldmann, & Feldmann, 2000). Students use information literacy in conjunction with communication skills as part of an integrated set of skills which adults need to be effective in all aspects of their lives (Catts, & Lau, 2008). In the conclusion from the various theories above, communication skill is as a process conveying information from someone to others and communication can be oral or written of the message. The example of students who can apply communication skill: students are able to convey information to their friends with their own understanding, either in the form of oral or written.

Thirdly, Connectivism provides a perspective for librarians to construct meaningful information literacy instruction because it connects student learning with the digital age and the always changing nature of information (Brooks, 2015). Connectivism itself is a new learning theory that proposes that information is made up of networked relationships, and that learning is the capacity to navigate these networks successfully (Transue, 2013). Connectivism theory should be of particular interest to librarians because concepts like, credibility, critical thinking,

relevance, information seeking, validity, and access to information, all of the concepts that are crucial to the objectives of libraries are present in the Connectivism principles (Guder, 2010, p. 37). In the conclusion from the various theories above, connectivism gives a perspective for librarians to build relevant information literacy training because it combines student learning with the digital age and the ever-changing nature of information. The example of students who can apply connectivism: students can sort out what important information must be conveyed and giving an illustration or example so that interlocutors can understand it.

Fourthly, Digital citizenship, more important thing in nowadays is being digital citizen. As a result, there are several critical aspects in education that can help students become digital citizens in order to achieve the goals of digital citizenship in the 21 st century. Student learning and academic performance, student environment and student behavior, student life outside the school environment are these key factors of behavior for making up digital citizenship (Ribble & Bailey 2007). Explained digital citizens as ―the characteristic of a genuine digital city‖, digital citizen is generally identified as ―those who use the Internet regularly and effectively‖ (Mossberger, Tolbert & McNeal, 2011).Digital citizenship is typically explained through people's actions, rather than by their formal status of belonging to a nation-state and the rights and responsibilities that come with it Hintz, Dencik, & Wahl- Jorgensen, (2017).

In the conclusion from the various theories above, digital citizenship is a person who has the knowledge and skills to effectively use digital technology to connect with others, engage in society, and create and consume digital material is referred to as a digital citizen. The example of students who can apply digital citizenship: students who use smartphones and use social media as a means to interact with others. This very frequent use of the internet is called digital citizenship.

Similar to the skill dimension, competency of information literacy in the 21st century covers numerous aspects. Firstly, recognize source data value, types and formats, information is currently available in a variety of formats, with varying degrees of quality, there is need for students to develop the intellectual, transferable skills to be able to work efficiently. Recognized information needs is the awareness that information is required to solve problems in education field, to understand student needs, and to provide for the well understanding being of learners is the first component of information literacy (Catts, & Lau, 2008).

A data source may be the initial location where data is born or where physical information is first digitized, however even the most refined data may serve as a source, as long as another process accesses and utilizes it. In the conclusion from the various theories above, recognizing source data value, types and formats is The first component of information literacy is the recognition that information is required to solve challenges in the field of education, to understand student needs, and to provide for the well-being of learners. The example of students who can apply recognize source data value, types and formats: by looking for information about the material being studied through applications, websites, etc. In this case, of course, literacy skills play more of a role, so that skills can be trained to the maximum if the ability to read and analyze is good.

Secondly, record and store collected information (authenticity, accuracy, and up-to-date), the internet provides an easily accessible forum to disseminate both accurate and inaccurate the information, so it has the potential to facilitate but also to jeopardize certainty. People have always appreciated the importance of storage of information and its retrieval for

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later use and the capacity to store and retrieve information is therefore an indicator of information literacy (Catts, & Lau, 2008). The source of the evidence posted on a website may be used to judge its credibility that is, the power of inspiring belief, if these criteria were accepted, the contents of the website would be expected to be accurate (Kunst, Groot, Latthe, Latthe, & Khan, 2002).

Accuracy means the extent to that an information's representation is consistent with available evidence and it is concerned with information validity and whether specific aspects of an information fiction can be respected factual (Saxton, 2020). On the other hand, authenticity relates to a reader's sense of accuracy and the amount to which they believe a representation accurately depicts the past and appraisals of authenticity are subjective and are impacted by preceding representations of the past that the reader has experienced (Saxton, 2020).

Authenticity in this case is closely related to demonstrating the integrity of information that is, ensuring that they are complete and unaltered from the time of creation (Park, 2001). Conducting and providing up-to-date research is critical to academic work, keeping up to date is critical for the expansion of engaging in debates, research projects, writing articles, and even hiring the right researcher (Jamali & Nicholas, 2008). Meanwhile, keeping up-to-date is getting more challenging: Researchers have to find useful material in a corpus of literature that is developing at a rate of millions of new pieces each year (Björk, Roos, & Lauri, 2009; Khabsa &Giles, 2014). This information explosion has changed information deportment and exposed new problems (Pontis, Blandford, Greifeneder, Attalla, & Neal, 2017). Although information is more accessible than 20 years ago, it is more difficult to get to the ―appropriate information as needed at a given time‖ (Saracevic, 2009, p. 2571). To keep up to date, researchers use various information resources, many of which have become available online through search engines and web alerts (Pontis, Blandford, Greifeneder, Attalla, & Neal, 2017). Many scientific and, recently books and more technical publications, can be relatively easily accessed online (Martin&Quan-Haase, 2013).

In the conclusion from the various theories above, recording and storing collected information (authenticity, accuracy, and up-to-date) is collected the information from recently books and more technical publications and related to demonstrating the integrity of information. The example of students who can apply storing collected information (authenticity, accuracy, and up-to-date): when student get an information, they listen and take notes on the important points of a topic and combine them with other references.

Thirdly, search digital library, research databases and the internet effectively, the global network internet has put forth new dimension to libraries of modern digital world. In order to keep pace with the cyberspace librarians are to be provided libraries with latest version of sophisticated technology. The digital library is not merely equivalent to a digitized collection with information management tools, it is also a series of activities that brings together collections, services and people in support of the full life cycle of creation, use and presentation of date, dissemination, knowledge and information (Sun, & Yuan, 2012). Definition of digital library involves three key components, which constitute the theoretical framework underlying digital libraries, namely: (1) people (2) information resources (3) technology (Sun, & Yuan, 2012). The basic principle underlying the organization of any library is to describe the documents it contains so that they may be located. The need for information arises in many intangible forms. Library and information centers are providing numerous types of information

resources and services. Traditionally, libraries have used catalogs to display their holdings pertaining to print collections, such as books, magazines, and newspapers (Suseela, (2014).

One of the most basic tools for organizing information is the database. A database is a set of records, each representing a specific entity, all constructed in the same way with common attributes and connected by relationships (Onwuchekwa, 2012). The books and journals, as well as adopting sophisticated indexing or abstracting technologies is to aid academics in their hunt for scholarly knowledge. Due to the inconceivable expansion of information and documents in digital form, the collection and transmission of knowledge in print form, which was limited to libraries only until two decades ago, has now expanded beyond the jurisdiction of traditional libraries and information centers (Suseela, (2014). In the conclusion from the various theories above, searching digital library, research databases and the internet effectively is much like searching the internet, but the hits returned will be published scholarly articles and other documents depending on the subject. The example of students can apply searching digital library, research databases and the internet effectively: students are able select the right keywords and the important things they want to know. So that with clear keywords information can be obtained easily and appropriately.

Fourthly, determine the nature and extent of information needed, when thinking of information that able to help solve a problem in a development setting, students unavoidably consider information as being a resource. Information is not always the most effective tool for resolving a given issue. As a result, it is only logical that learners will compare data with other resources required for a development of learning. So far, the nature of information (and especially its qualities) has not been questioned as a possible explanation why information is not treated equally to other development resources (Meyer, 2005). On other hand, empirical data related to the content and extent of information that learners require for their decision making are needed. The extent of information disclosure has been the subject of debates (Dranseika, Piasecki, Waligora, 2017). The objective of this competency was to determine the perspectives of learners about the information they need for their decision making when they face problems in obtaining information. Generally, (Karbwang, Koonrungsesomboon, Torres, Jimenez, Kaur, Mathur, & Yadav, 2018). In the conclusion from the various theories above, determining the nature and extent of information needed is to determine the perspectives of learners about the information they need for their decision making when they face problems in obtaining formal or informal information. The example of students can apply determining the nature and extent of information needed: students can specify what they want to understand, no need to search for anything in general.

Fifthly, manage, apply and analyze the information needed, the term information need is often understood as an individual or group's desire to locate and obtain information to satisfy a conscious or unconscious need. Managing knowledge and information will assist organizations in providing students with comprehensive understanding. Information initiatives include organizational adaptations to exploit knowledge, as well as resources and professionals such as teachers and educators (Jamaludin, & Mohd Yunus, 2005).This will assist educational institutions in intentionally teaching pupils as a means of preparing students to become members of a knowledge society and workers. In the conclusion from the various theories above, applying and analyzing the information needed is the way students make sense of the evidence they collect will depend on the kind of information they have collected (facts, answers, feelings, experiences and so on). For example, student will need to use a different

approach for analysing the number and types of information than making sense of the feedback from a series of one-to-one discussions.

Sixthly, synthesize information and use it to create new knowledge and understanding, students can synthesize information by taking information from a variety of sources and combining it. When various sources are merged, they form a unified concept. In most classes, this is how students learn new concepts, theories, and knowledge. Synthesizing differs from summarizing in that it draws on a variety of sources to develop a single subject. The learner is simply rehashing the material they read in the text when summarizing. During the synthesizing process, the learner will come across competing concepts as well as relevant information. Summarizing and synthesizing differ not only in regard to their degree of complexity, but also the extent to which students are familiar with such tasks (Mateos, Martín, Villalón, & Luna, 2008). Furthermore, from synthesizing the information, students are expected to be able to use information to create new knowledge. The researcher tries to examine more deeply what it means for students to create new knowledge. This is an important issue not only for childhood education but for education up to adulthood, for it is only at advanced graduate levels that students are normally expected to make a ―contribution to knowledge‖ (Bereiter, & Scardamalia, 2010). Students have been heralded by some as an ideal technology for knowledge building (Cress & Kimmerle, 2008). In the conclusion from the various theories above, synthesizing information and use it to create new knowledge and understanding is the way that students can take information from multiple sources and bring the information together. The example of student who can apply synthesizing information and use it to create new knowledge and understanding: who can draw the core of a topic so that the information they are looking for can be combined properly and accordingly. The more information they get, they have to sort out the important and necessary one.

D. Conclusion

From the discussion that has been done in previous explanation above there is a conclusion that can be drawn from this research, they are: The requirements of information literacy in the 21st century composed ten they are: problem solving and innovative skills,

learning skills (critical thinking, collaborative, and communication), connectives skills, and digital citizenship. The competency covers some aspects they are: a) recognize source data value, types and formats, b) record and store collected information (authenticity, accuracy, and up-to-date), c) search digital library, research data bases and the internet effectively, d) determine the nature and extent of information needed, e) manage, apply and analyze the information needed, f) synthesize information and use it to create new knowledge and understanding.

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