Media and Information Literacy among Macau University Students: An Initial Study

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Abstract: Recent research has emphasized the importance of media and information literacy among university undergraduate and graduate students with respect to the high demand on these critical thinking skills. The current study extended three scales for measuring these two literacies, including the Media Literacy Self-assessment Scale, the Competence Information Literacy Questionnaire, and the UNESCO Information Literacy Lifecycle, into Chinese culture with a Macau sample. The aims were to investigate the self-perception of these literacies of students from University of Macau, and the factors that may influence these self-perceptions. Result revealed that: first, gender has no effect on the level of media and information literacy; second, participants who own digital devices tended to have higher self-perceived score on media literacy; and third, participants at Master's Year 2 level showed significantly higher self-perceived scores on the UNESCO information literacy lifecycle. Findings from this study help educators and school policy makers to gain insights on the way to enhance students' media and information literacy in the 21st century and therefore, in the future.

Keywords: media literacy, information literacy, Macau students

1. Introduction

Information and communication technology (ICT) has made great amount of changes on the ways people obtain, perceive, analyze and evaluate information and knowledge since the last few decades. Rafique (2014) suggested a continuous power of ICT in influencing future learning processes. These processes can be either explicit or implicit, for example, students may actively and spontaneously search through searching engine; or they passively and unconsciously gain through social media, advertisement, and others. Information and media technologies have their advantages in integrating knowledge as well as crafting knowledge platform. Problems arise, however, when these technologies were not adopted appropriately, which would cause disadvantages (Chang, Liu, Lee, Chen, Hu, & Lin, 2011). As a result, academics and practitioners emphasized the ability to have relevant literacies (i.e. information literacy), simultaneously when students are searching for information they need (Aharony & Bronstein, 2014; Chang et al., 2011; Sidekli, 2013). Through these processes of searching for information, students are able to relate newly obtained knowledge with their existing knowledge, and

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further use it to achieve desired consequences. Students utilize information properly as they understand and appreciate it, such that they would avoid plagiarism and violating copyrights (Aharony & Bronstein, 2014). Moreover, students with information literacy are capable of judging the reliability of the sources of knowledge and the information in itself (Rafique, 2014). In short, information literacy is essential to be alongside with the process of seeking information and knowledge through information technology and media technology. In this vein, researchers have identified the ability to inspect, judge, and comprehend information and content (Covington, 2004).

Information literacy was identified as students' ability to distinguish, locate, assess, arrange, generate, utilize, and transfer information efficiently so as to resolve the identified problems or concerns (Aharony & Bronstein, 2014). Information literacy is essential as individual takes part effectively in the information rich society today, and it forms the bases for lifelong learning process (United Nations Educational, Scientific and Cultural Organization, UNESCO, 2005, as cite in Rafique, 2014). Media literacy is a branch subordinate to information literacy, and is defined as the ability to uncover, to choose, interpret, determine, and convey through different types of media (Kuiper, Volman, & Terwel, 2009).

The importance of information literacy and media literacy has been identified and stressed by educational researchers in many different countries. Among these researches, a great amount of them were from Western and developed society (Dorner & Gorman, 2006). Consequently, the condition in Eastern and developing society worth to gain more attention, so as to uncover the present stage of development for Eastern students' information literacy and media literacy, their self-perception, and the like. Hence, the current study aimed to examine these issues based on the condition in Macau, with Eastern and Western cultural elements merged together. In addition, Macau is currently placing a lot of emphases on research development, so as to integrate into the global communities. Data and evidence are highly treasurable as it helps to reveal, recognize, and evaluate the strengths and weaknesses of the current education system. Noticing these issues, University of Macau is the major higher educational institution that intents to groom future researchers and educators. Regarding this, the perceptions of students in the University of Macau in terms of information literacy and media literacy are significant and important. Besides, stepping into the new century that technology has been embedded into every life in education, media literacy, and thus information literacy as its superordinate component, has been recognized by Partnership for 21st century skills as one of the indispensable skills required for gaining and transmitting knowledge in the 21st century (Jenkins, 2009).

There are several purposes for the current study: first, to validate the three scales using sample from the University of Macau, and extend it to the Macau University student population; second, to assess the level of self-perception of students in University of Macau toward media and information literacy; third, to examine the effect of different demographic data of students on media and information literacy; and forth, to examine the extent to which the differences on media and information literacy self-perception scores between graduate students and undergraduate students.

2. Literature Review

In the past few years, a number of research has been conducted with respect to the gender difference of information, communication, media literacies, and the like. Notwithstanding that some of these research concluded significant gender differences in terms of the computer self-efficacy and other ICT related attitudes, some more recent research suggested that the gender effect does not exist.

Usluel (2007) and Volman (1997) have conducted research and suggested the gender differences in terms of information and computer literacy. Usluel (2007) examined student teacher's grade level and length of using ICT, and how these variables account for information literacy self-efficacy. Self-efficacy, as a construct that measures self-perceived competence, was defined as the extent to which individuals evaluate their own capacities necessary for arranging and implementing actions for the purpose of accomplishing a desired behavior as a goal (Bandura, 1977). Self-efficacy has been

studied and associated to students' academic achievement, motivation, and many other important outcomes (Anderson, Greene, & Loewen, 1988; Ross, 1992; Woolfolk & Hoy, 1990). In her study, Usluel (2007) found significant gender difference regarding males' and females' ICT attitudes and competence. Female participants have indicated higher level of technical skills with ICTs, such as analyzing and evaluating, crediting sources, and obtaining information; while male indicated higher competence in building necessary techniques to reach and obtain those information. Similarly, Volman (1997) has found that male participants showed higher level of enjoyment, relevance, and competence with regard to computer and information literacies; whereas female participants have indicated higher level of anxiety.

Previously, researchers who found the significant difference between male and female in terms of their ICT literacies self-perceived proficiencies tend to attribute it to the differences in terms of the purposes among male and female. Male, in the old days, insert more effort to expert ICT, such that they explore computer use, write codes, and so on. Female, on the other hand, tend to use ICT when they have to; most of them in the old days perceived it was just a tool (Volman, 1997). Yet, things have changed ever since. Male and female tended to choose occupation with different natures in the old days; but for now, they have almost equal chances to obtain ICT literacies, so as to enter the same kinds of occupations. These moves result in changes in terms of self-perceived competence of male and female in information, computer, and media literacies. Male and female now tends to show no difference with respect to their ICT literacies and relative literacies, such as information and media literacy.

More recent research, however, suggested non-significant gender difference in terms of computer attitudes and ICT literacies. Shapka and Ferrari (2003) investigated the relationship between pre-service teachers' computer related attitudes and literacies and tasks performance. Computer related attitudes can be referred to teachers' self-beliefs and self-efficacy. Tasks performance, on the other hand, referred to teachers' search behaviors and actions. They found the results showing non-significant gender difference. In the same vein, Teo (2006; 2008a; 2008b) has found no gender differences in terms of these attitudes. Teo has conducted study to investigate Asian students' and pre-service teachers' computer related attitudes, such as perceived control, perceived usefulness, computer enjoyment, computer anxiety, and so on. All results from these three studies revealed that there were no significant differences between male and female in terms of these variables (Teo, 2006; 2008a; 2008b). As media and information literacy can be regarded as the subordinate elements of computer attitudes, it was hypothesized in the current study that gender will have no effect on self-perceived media and information literacy.

H1: Students with different gender will show no statistical differences in terms of their self-perceived score on media and information literacy.

Other than gender differences, pervious research suggested that student participants with advanced ICT usage, compared to the beginner level, showed higher level of information literacy self-efficacy. In addition, degree of information literacy self-efficacy also rises alongside with the longer duration of ICT use (Usluel, 2007). As students own technological devices, they will have more chances to access to media and ICT. As a result, they may perceive themselves as being more skillful and proficient in media and information literacy. As such, it was hypothesized that students with various kinds of digital devices will, compared to those who do not own, show higher level of self-perceived competence with respect to their media and information literacy.

H2: Students who own difference kinds of technological devices (i.e. desktop and laptop computer, cellphone, and digital device) will have higher self-perceived score on media and information literacy.

Further, as Kurbanoglu (2003) and Usluel (2007) claimed, self-beliefs about information and computer literacy increase as students step into higher study grade. Kurbanoglu (2003) studied undergraduate students in their second, third, and final-year. Result showed that final-year students demonstrated higher perceived score for information literacy self-efficacy. Usluel (2007) has found results in a similar way. She found that students showed significant increases in their self-perception about building

ICT strategies and crediting ICT sources as their study levels rise. It is possible that students tend to have more actual use of ICT as their study level increase. This tendency may be even steeper as students step into the graduate study levels, which provide students with more chances to access literatures and conduct researches. Graduate students tend to have more chances to work on gathering information and academic resources; consequently, they also have more chances to access media and internet, resulting in higher self-perceived score. Thus, the third hypothesis in the current study was as following:

H3: Students who are studying in the graduate level will have higher self-perceived scores on media and information literacy.

3. Method

3.1 Sample

The current study was conducted by surveying students from the University of Macau, about their perceptions of information and media literacy. A total number of 250 students, including undergraduate and Master students who were studying in the University of Macau during the academic year 2014/2015, were involved in the data collection process. Students were from Bachelor degree program and Master program in 26 different majors: Psychology, Education, Engineering, and etc. Among the participants, 185 (74.6%) were female while 63 (25.4%) were male. These students, except those who refused to declare (N = 3), have age ranged from 17 to 39. All undergraduate students and part of the Master students were born as the Digital Natives, which means they were born after the year of 1985, and were born and grown up with the exposure of technology in their everyday life (Selwyn, 2009). As a result, participants in the current study were expected to frequently access information through internet, media, and other sources as well. They were expected to have well developed ICT skills. Besides, as students graduated and enroll into graduate programme (i.e. Master and PhD programme), they would have more chances to search and gather information from various sources compared to undergraduate students. As such, graduate students tend to have more skilful and proficient media and information literacy when compared to undergraduate students. Among all participants, 5 within the 250 cases were excluded concerning the outlier detection problem.

3.2 Procedure

Paper-based and web-based surveys were adopted for the data collection process of this study. Respondents were students enrolled in 12 different Educational courses given by the Faculty of Education. The students were invited to voluntarily participate in the study by finishing a 10 minutes survey under the administration of the research assistant. All of these processes were conducted during the end of the classes. Students who reserved to fill in the survey in front of the research assistant were invited to finish the web-based version of the survey. For both paper-based and web-based survey, research assistant has provided clear instructions, including the nature and purposes of the study, the estimated responses time, the confidentiality of the data collected, the voluntary nature of the participation, respondents' right of refusing to answer reluctant questions, and their right to withdrawn from the study at any moment. Respondents were also informed about the fact that the current study was totally separated from the courses they were taking, so that their refusing to participant would not result in any deduction of their course grade.

3.3 Measures

Survey research method was employed for the data collection in the current study. The first section was demographic data. Respondents were asked to self-report their gender, age, study level, major, and whether they have ever owned typical types kinds of ICT devices. For the second, third, and forth section, instruments from previous studies were modified and translated to be reasonable for respondents in the current study so as to ensure the instruments were appropriate for the current research setting. All survey questions were translated into traditional Chinese, while presented parallel in

English. Expert in technological educational research were employed to check the appropriateness and accuracy of the translated items. Finally, suggestions and improvements were made, and the questionnaires were revised and refined before starting the survey process.

Three instruments were adopted, including the Media Literacy Self-assessment Scale (MLSS) from Chang et al. (2011) for measuring students' self-perceived media literacy; the Competence Information Literacy Questionnaire (CILQ) from Aharony and Bronstein (2014), and the scale that was used in Rafique's (2014) study which was designed in a way to capture the eleven stages of the UNESCO Information Literacy Lifecycle (UNESCO-ILL) for measuring students' self-perceived information literacy. Among the three instruments, some items were modified so as to present participants with definite questions or items. All questions were presented in both Chinese and English.

The MLSS were developed by Chang et al. (2011) with 13 items. Example items include "I can understand how to operate media". The alpha value reported by Chang et al. (2011) was 0.9, and all the factor loadings in each factor were from 0.5 and above.

The CILQ was developed by Aharony and Bronstein (2014) with 10 items in total. An example items is "Recognize their information needs". Cronbach's alpha value reported by Aharony and Bronstein (2014) was 0.85. In order to present subjects in the current study with clearer concept and understanding, the item "understand the issues of plagiarism and copyrights" was separated into two individual items.

The third scale was developed by Rafique (2014), in which the aim is to capture the eleven stages of the UNESCO-ILL. There are totally 13 items in the scale, including "I am able to organize, analyze, interpret and evaluate information". For this scale, neither specific factor loadings nor alpha value was reported by Rafique (2014). In order to ensure that the participants in the present study understand the questions well, two items, namely, "I am able to organize, analyze, interpret and evaluate information", and "I am able to preserve, store, reuse, record and archive information" were separated into 8 individual items.

All three scales in the current study were measured in a 7-point likert scale, from 1 "strongly disagree" to 7 "strongly agree".

4. Result

The descriptive statistics for each of the three scales were shown in Table 1. The means for all three scales were moderate to high, which has shown that participants perceived themselves as having fair to good media literacy and information literacy. In addition, SDs for all three scales were low, which indicated that the spread of the participants' responses in the current study were not scatted. The three scales were highly correlated, in which the MLSS was highly correlated with the CILQ, $r = 0.70$, and was highly correlated with the UNESCO- ILL, $r = 0.72$; the CILQ, on the other hand, was also highly correlated with the UNESCO-ILL, $r = 0.80$. Internal consistency for the three scales were assessed using Cronbach's alpha coefficient reliability analysis, and the results have shown that all these three scales were highly reliable, with α equal to 0.91, 0.90, and 0.95 for MLSS, CILQ, and UNESCO-ILL, respectively. Overall skewness and kurtosis indexes for the three scales and individual items were also in the acceptable ranges, meaning that it ranged from -0.33 to -0.09 for skewness, and from -0.37 to -0.16 for kurtosis. Items within each scale also result in acceptable skewness and kurtosis indexes. For MLSS, skewness indexes for all items fall within the range of -0.78 to -0.31; kurtosis indexes fall within -0.54 to 0.43. For CILQ, skewness indexes for all items fall within the range of -0.66 to -0.14; kurtosis indexes fall within -0.49 to 0.89. For UNESCO-ILL, skewness indexes for all items fall within the range of -0.58 to 0.08; kurtosis indexes fall within -0.53 to 0.38. All SDs of skewness and kurtosis are low, ranged from 0.16 to 0.31. These values indicated that data of the current study can be regarded as distributing in an acceptable distribution; as skewness and kurtosis indices should fall within $|3|$ and $|10|$ in order to ensure that the data are distributing normally for further analyses (Kline, 2005).

4.1 Factor Analysis

Exploratory factor analysis (EFA) was conducted using principal axis factoring and promax rotation with the sample in the current study (N = 246). In order to run an EFA, a sample of 200 or more cases was suggested (Hair, Black, Babin, Anderson, & Tatham, 2006). Therefore, the sample size for the present study was acceptable for conducting an EFA. The Kaiser-Meyer-Olkin (KMO) value ranged from 0.91 to 0.93, revealing an adequate level of common variance within each of the three scales. For MLSS, two factors had eigenvalues greater than 1, and they accounted for 47.64% and 6.11% of the total variance. All factor loadings for the items were higher than 0.51 except item 6 "I can discuss with others the content that media display. Different from findings of Chang and colleagues' (2011) study, the present study found a different two-factor structure. One of the items (i.e. item 3) that was previously suggested to load on the factor "media communication and ethics", was loading on another factor according to the present result. Accordingly, the first factor was named as "understanding and learning with media", and the second factor was "media communication and ethics" (See Table 2).

The factor structures of CILQ and UNESCO-ILL have not been examined by previous studies conducted by Aharony and Bronstein (2014) and Rafique (2014). For CILQ, two factors had eigenvalues greater than 1, and they have accounted for 47.47% and 6.49% of the total variance. Accordingly, the first factor was named as "learning and interpreting information" and the second factor was named as "respecting information ethics". All factor loadings for the items were higher than or equal to 0.50 except item 4, "form specific queries concerning my information needs", with factor loading of 0.41 (See Table 3). For UNESCO-ILL, four factors had eigenvalues greater than 1, accounted for 51.10%, 6.50%, 4.98%, and 3.57% of the total variance. The four factors were identified as "accessing and utilizing information", "storing information", "handling information", and "disposing information". All items have factor loadings higher than or equal to 0.50, except 3 items, "I am able to determine the existence of needed information or not", "I am able to evaluate reliability of information and its resources", and "I am able to realize that a need or problem exists that requires information", with factor loading of 0.44, 0.41, and 0.43, respectively (See Table 4).

4.2 Participants' Ownership of Technological Devices

Among 246 valid cases, 190 participants have even own desktop computers, 223 of them have even own laptop computers, all of them own cellphones, and 182 of them own digital devices, such as iPad or Galaxy Tab. Result of the Pearson Chi-Square test revealed that gender differences have no effect on the technological devices ownership except for laptop ownership, $\chi 2(1) = 7.46$, $p = .006$ (See Table 5).

4.3 Gender and Devices Ownership in Relation to Media and Information Literacy

Independent sample T-tests were conducted and results showed that among all the categorical variables, namely gender, desktop, laptop, handphone, and digital device ownership, only digital device owndership has significant association with the mean score of MLSS, but not CILQ and UNESCO-ILL. The first hypothesis was, therefore, supported. For the third hypothesis, participants who owned a digital device ($M = 5.15$, $SE = 0.06$) showed significantly higher self-perceived media literacy score than those who did not ($M = 4.88$, $SE = 0.11$), $t (243) = 2.34$, $p = .01$ (one-tailed). The third hypothesis was partly supported, in the way that students who own digital devices showed significant higher media literacy self-perception score compared to those who do not.

4.4 Study Level in Relation to Media and Information Literacy

One-way ANOVA were conducted and the result showed that study level was associated with the mean score of UNESCO-ILL. Result showed a significant effect of study level on the score of UNESCO-ILL of participants, $F (5, 238) = 2.42$, $p = 0.04$. Follow-up planned contrast comparisons were conducted to compare between the scores from Master students and students of other levels. Result revealed that information literacy self-perceived scores were significantly higher for the Master's Year 2 students ($M6 = 5.49$, $SE6 = 0.20$) than for any other groups ($M1 = 4.80$, $SE1 = 0.16$; $M2 = 5.23$, $SE2 = 0.17$; M3

=4.98, SE3 =0.08; M4 =4.90, SE4 = 0.11; M5 =5.16, SE5 = 0.10), t (238) = 2.37, p = .009 (one-tailed). Furthermore, Master's Year 2 students also have significantly higher self-perceived information literacy scores (M6 = 5.49, SE6 = 0.20) than for Undergraduate Year 1 students (M1 =4.80, SE1 =0.16), t (238) = 2.71, p = .004 (one-tailed). In addition to this, Furthermore, Master's Year 2 students also have significantly higher self-perceived information literacy scores (M6 = 5.49, SE6 = 0.20) than for Undergraduate Year 4 students (M4 =4.90, SE4 =0.11), t (238) = 2.58, p = .006 (one-tailed). Thus, the second hypothesis was also supported.

5. Discussion and Conclusion

Three major findings were concluded from the current study. First, gender created no difference in terms of participants' self-perceived media and information literacy; second, ownership of digital devices has a strong association with the self-perceived media literacy of participants; and third, Master's Year 2 students perceived significantly higher information literacy compared to those at the undergraduate level.

Despite the fact that some researchers claimed the differences of ICT attitude in relation to gender (Houtz & Gupta, 2001; Markauskaite, 2006), pervious literatures have provided evidence to show that there is no gender difference in these computer attitudes (Teo, 2006; 2008a; 2008b). The results of the current study arrived in the same conclusion. Among three scales that measured media and information literacy, no gender differences was found in terms of the mean scores. This can be due to the condition that male and female students have equal degree of chances to access and utilize ICT, information, and media, so as to obtain any kinds of information they are interested in. Given these equal chances, it was expected that there would be no gender difference.

In addition to this finding, this research has also provided evidences to prove that ownership of digital devices, such as iPad and Galaxy Tab, may result in higher self-perceived media literacy. Reasons can be due to fact that digital devices are special mediator to collect information from media sources, such as YouTube; or that digital devices per se can already been perceived as a kind of multi-media devices. Last but not least, another important finding of the present study is that Master's Year 2 students perceived themselves as more proficient in terms of the eleven stages of information literacy proposed by UNESCO. Most of the Master students are preparing and conducting their Master's Thesis starting from the second year, leading to the condition that Master's Year 2 students will have far more chances to gather and collect information from ICT sources. Besides, they will also be more familiar with the way to analyze, organize, and to interpret information, as they tend to be more aware of these issues alongside with their work on the Master's Thesis. However, these also revealed that schools and Universities may need to put more emphases on cultivating students at the other levels, such as students from the undergraduate level, with these abilities.

6. Limitations and Future Directions

One limitation of the present study is that the results and conclusions were largely based on self-report information and media literacy. This limitation, however, is common and inevitable in almost every research which involves investigation of self-beliefs and self-perceived proficiencies. As Chan (2009) suggested, self-beliefs as latent constructs may not convert into indicators that are observable. Asking participants for their perceived proficiencies, on the other hand, is one of the aims of the current study. Although judgments based on self-report could be sometimes unreliable, Ciarrochi, Deane, and Anderson (2002) claimed that people evaluate their own abilities during the process of filling in self-report surveys. This would, in turn, require participants to consciously recall the cognitive process through which they experienced. Self-perceived proficiencies were thus revealed through the evaluation of these cognitive processes of information and media literacy. Future research may consider developing instruments that can objectively assess individuals' level of information and media literacy, such that these instruments may require participants to performance some kind of actions or behaviors.

Another potential limitation is that the participants may practically reflect various levels of features that digital datives may have. As was mentioned at the beginning of the article, digital natives are expected to have higher level of readiness in terms of ICT skills. However, it should not be taken for granted that every person who born after 1985 was "born digital" (Teo, 2013). People would have different levels of exposure towards technology or even ICT, which might also have an effect of people's self-perceived proficiencies of information and media literacy. This warrants future research.

Information and media literacy are significant and important skills that all university students and academics are required to have for their academic works, such that they are able to search for various resources, design and conduct researches, invent and explore new knowledge. Educational and technological researchers have identified the disadvantages of internet and media, in a way that students may have obtained false information from different channels and types of sources, therefore critical thinking skills involving in these processes are necessary (Chang et al., 2011). With the findings from the current study, educational, technological researchers, and policy makers can gain better insights with respect to students' self-perceived proficiencies and other factors that may influence these self-perceived proficiencies. In sum, the ways of transforming knowledge have made huge progresses compared to decades ago. These progresses will continuously grow and improve in the next few years. Education, technology, and informational communication will squarely play a role that cannot be neglect in the 21st century. The demand of technology in education will complement with the traditional teaching methods, and the utilization of educational technology will be more widespread as one generation pass and then the next.

Appendix

Table 1. Descriptive statistics of the three scales
MLSS, media literacy self-assessment scale; CILQ, competence information literacy questionnaire; UNESCO-ILL, UNESCO-information literacy lifecycle.

Instrument	No. of items	Mean	Standard deviation	Skewness	Kurtosis
MLSS	13	5.08	0.82	-0.33	-0.16
CILQ	11	5.07	0.78	-0.20	-0.37
UNESCI-ILL	20	5.05	0.77	-0.09	-0.25

Table 2. Factor Loadings for the MLSS

No.	Item	Understanding and Learning with Technology	Media Communication and Ethics
1	I can understand different types of media (e.g. visual media, audio media) and their principles.	0.77	
2	I can understand how to operate media.	0.99	
3	I can understand the content that media convey.	0.67	
4	I can be familiar with the operational functions of media equipment to broadcast the learning content.	0.81	
5	I can use different media technologies to store/backup the content.	0.59	
6	I can discuss with others the content that media display.	0.47	
7	I can select appropriate media to edit the messages that I want to convey.	0.55	
8	I can use media to carry out daily learning.		0.64
9	I can use media appropriately to convey ideas (e.g. use a camera to record events).		0.87
10	I discuss the displayed contents of media with others.		0.68
11	I possess the accurate understanding of media use.		0.61
12	I can cherish and conserve media equipment.		0.56
13	I can comply with the intellectual property rights of media use.		0.58
		Eigenvalue	Cumulative %
Factor 1		6.61	50.85
Factor 2		1.32	60.98

Table 3. Factor Loadings for the CILQ

No.	Item	Learning and Interpreting Info.	Respecting Info. Ethics
1	Recognize my information needs.	0.54	
5	Develop and improve my written and oral communication skills.	0.45	
6	Recognize a variety of information resources.	0.71	
7	Apply high ordinary skills in my workplace and in my private life.	0.80.	
8	Compare different sources of information such as textbooks, databases, Internet . . .	0.76	
9	Relate between new information and existing knowledge.	0.69	
10	Judge information based on internal and external criteria.	0.65	
11	Choose the best strategies and techniques for my information needs.	0.75	
2	Understand the issues of copyrights.		0.91
3	Understand the issues of plagiarism.		0.82
4	Form specific queries concerning my information needs.		0.44
		Eigenvalue	Cumulative %
Factor 1		5.68	51.61
Factor 2		1.06	61.24

Table 4. Factor Loadings for the UNESCO-ILL

No.	Item	Accessing and Utilizing Info.	Storing Info.	Handling Info.	Disposing Info.
5	I am able to determine the existence of needed information or not.	0.44			
6	I am able to fully understand found information.	0.67			
7	I am able to accurately identify and define the information.	0.71			
8	I am able to find the needed information.	0.88			
9	I am able to communicate and present the information.	0.78			
10	I am able to evaluate reliability of information and its resources.	0.41			
11	I am able to utilize the information to resolve the problem.	0.67			
12	I am able to go for help to understand needed information.	0.57			
19	I am able to realize that a need or problem exists that requires information.	0.43			
20	I am able to create or cause to be created unavailable information that I need.	0.45			
15	I am able to preserve information.		0.87		
16	I am able to store information.		0.99		
17	I am able to reuse information.		0.72		
18	I am able to record and archive information.		0.68		
1	I am able to organize information.			0.69	
2	I am able to analyze information.			0.95	
3	I am able to interpret information.			0.83	
4	I am able to evaluate information.			0.85	
13	I am able to dispose of information no longer needed.				0.74
14	I am able to safeguard information no longer needed.				0.91

	Eigenvalue	Cumulative %
Factor 1	10.55	52.73
Factor 2	1.56	60.53
Factor 3	1.30	67.03
Factor 4	1.02	72.14

Table 5. Ownership of Different Kinds of ICT Devices by Female and Male

	Female				Male			
	Yes		No		Yes		No	
Different Kinds of ICT Devices	N	%	N	%	N	%	N	%
Desktop	139	76.4	43	23.6	51	81	12	19
Laptop[a]	171	94	11	6	52	82.5	11	17.5
Cellphone	182	100	0	0	63	100	0	0
Digital Devices	136	74.7	46	25.3	46	73	17	27

[a] Significant difference between female and male on ownership of laptop ($\chi^2 = 7.46$, df = 1, p = .006).

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