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Assessment of Information Literacy and Fake News Identification of Benguet State University Freshmen: Implications for Library Literacy Program

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Implications for Library Literacy Program

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ABSTRACT

The world is experiencing a rapid and massive spread of misinformation referred to as "infodemic" (WHO, 2020, cited by Salvi, et al., 2021). Despite information literacy had been a long-offered solution to information problems (Horton, 2007) and studies discovered that accurate identification of fake news was significantly associated with information literacy (Jones-Jang, et al., 2021), approaches to IL instruction must be updated and must adapt to the changing information society and environment (SCONUL, 2018; Rutledge and LeMire, 2017).

It aimed to determine the level of information literacy and fake news identification of the students. It also determined if there is a significant difference in the students' competence when grouped according to their gender and academic performance. It also determined the correlation between information literacy, and fake news identification.

The study employed a descriptive correlation approach and used an online questionnaire tool adapted from the TRAILS assessment tool. The questionnaire also included examples of news materials that students will determine which are fake. The respondents consist of 331 freshmen students of Benguet State University enrolled during the school year 2020-2021.

The findings revealed that students are fairly competent in information literacy and fake news identification. It was also found that, when compared according to gender, there is no significant difference in the information literacy of the students but there is a significant difference on the fake news identification. It was concluded that female students are more capable in identifying fake news. When compared according to academic performance, there is a significant difference on students' information literacy and fake news identification. It was concluded that students with higher academic performance tend to have higher competence in information literacy and fake news identification. It was concluded that there is a significant moderate correlation between information literacy and fake news identification.

The results of the study guided the information literacy program launched by the library, #BUILDS or the BSU ULIS Information Literacy Development Solutions. One of the activities under the program is the release of the information literacy video series intended to develop student's information competencies.

Contributions: *In BSU, IL exists only as a part of library instruction service embedded on orientations. This study will be used to formalize an instruction or literacy program that will target the skills of the students that are needed to be improved.*

Introduction

In this technology and media-driven world, there is access to vast information, fast-paced advances in technological tools, and easier establishment of virtual connections and collaborations (Lozanta, 2019). Especially now during the covid-19 pandemic, the whole world was forced to shift into online mode of delivering information. With all of these rapid changes, a lot of information related issues surfaced. One of these is misinformation or the spread of fake news. It goes by many terms, such as post-truth, post-fact, hoax, or alternative facts. But according to Osborne (2018), fake news is associated with yellow journalism and he implied that news can be fabricated or can contain manipulated information. One of the downside of living in the era of vast information access is that we are also living in the era of fake news and it is evident from what is happening every time there are discussions on international news, global events, elections and especially during this pandemic. The World Health Organization (2020), as cited by Salvi, et al. (2021), acknowledges that besides the pandemic, the world is experiencing a rapid and massive spread of misinformation referred to as "infodemic". This global pandemic crisis exposed that majority of information consumers do not know how to critically examine communication and information products before using them. Once they use this warped information from fake news, they could be disinformed or misinformed. According to Wardle (2017), when an intentional spread of false information is made, it is called disinformation, while an unintentional spread of information is called misinformation.

Many studies from literacy, library science, information science, and communication have looked into different angles to find a competency that would equip students for this fake news era. Plenty of literatures have identified competencies or literacies that are considered effective. For example, accurate identification of fake news was significantly associated with information literacy (IL) (Jones-Jang, et al., 2021). Another competency found to be useful against misinformation and disinformation, which was even compared to information literacy due to its similar components, is online reading comprehension (Martin and Steinkuehler, 2011). Online civic reasoning was also identified to be useful to help students who are struggling in evaluating information online (McGrew, et al., 2018). But what this study sought to further discover is the relationship of students' IL with their actual ability to identify fake news.

With the discovery of Jones-Jang, et al., (2021) that accurate identification of fake news was significantly associated with IL, this study looked into the correlation of the different IL components with the students' actual ability in identifying fake news. This will become the basis of library education program implementation. In applying an outcomes-based education to library instruction program, assessment of student progress towards the outcome is deemed necessary (Thomas, et al., 2011). Bostock, et al. (2010) also claims that assessment of IL skills forms a crucial element of the learning experience for all students. According to Thomas, et al. (2011), this can be achieved through educational assessment models to initially diagnose student competency and determine which competencies are to be strengthened.

Conceptual Framework

This study was based from the IL Standards for Higher Education of the American Library Association (2000). It describes IL as the ability to locate, access, evaluate, use and communicate information. Recent studies have used the TRAILS IL Assessment Tool (Canovan, et al., 2010; Kovalik, et al., 2012; Foo, et al., 2017), which consists of the following, (a) identifying information need, (b) employing information retrieval techniques, (c) evaluating information, (d) identifying potential sources, and (e) using information. Adapting the standards and indicators from the IL standards for Higher Education (ALA, 2000), key indicators of IL skills that the students must demonstrate were specified. First, the student must be able to a) define and articulate the information need, b) identify a variety of types and formats for potential information sources, and c) considers the costs and benefits of acquiring needed information. Second, the student must be able to a) select the most appropriate information retrieval strategy, b) construct and apply effectively-designed searches strategies, c) retrieve information online or in print using various methods, d) refine the search strategy if necessary, and e) extract, record, and manage the information and its sources. Third, the students must be able to a) summarize the main ideas to be extracted from the information gathered, b) articulate and apply initial criteria for evaluating both the information and its sources, c) synthesize main ideas to construct new concepts, d) compares new knowledge with prior knowledge to determine the value added, contradictions, or other unique characteristics of the information, e) determine whether the new knowledge has an impact on the individual's value system and takes steps to reconcile differences, f) validate understanding and interpretation of the information through discourse with other individuals, subject-area experts, and /or practitioners, and g) determine whether the initial query should be revised. Fourth, the students must be able to a) apply new and prior information to the planning and creation of a particular product or performance, b) revises the development process for the product or performance, and c) communicate the product or performance effectively to others. Lastly, the students must be able to a) understand many of the ethical, legal, and socio-economic issues surrounding information and information technology, b) follows laws, regulations, institutional policies, and etiquette related to the access and use of information sources, and c) acknowledge the use of information sources in communicating the product or performance. Because assessment is key to monitor the outcomes, the mentioned components and their corresponding indicators were used to devise an assessment tool adapted from the TRAILS, an assessment program used by numerous IL studies.

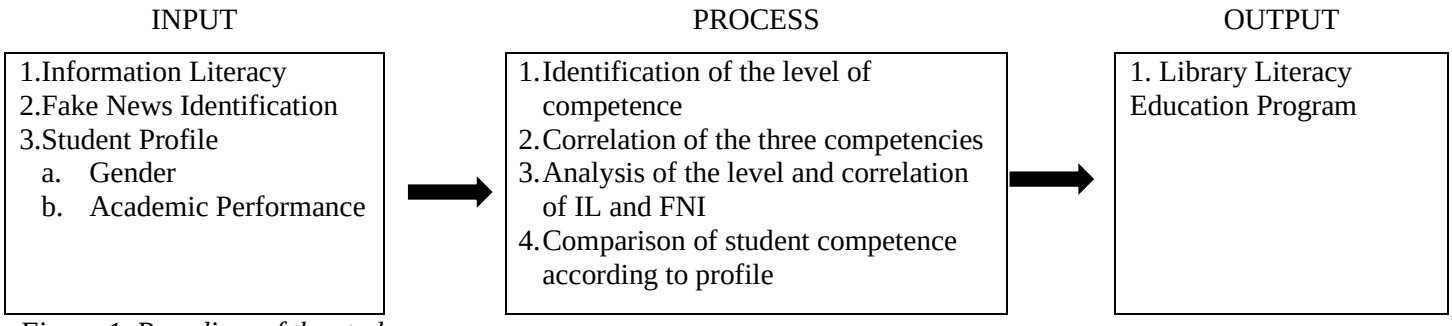

Figure 1. Paradigm of the study

LITERATURE REVIEW

Information Literacy (IL)

From the 1960's to date, IL had been a long-offered solution to information problems (Horton, 2007). Librarians and information professionals have been advocating IL as a 21st century skill necessary to be equipped by citizens. In fact, IL is closely associated with the digital technology which are considerably required in the 21st century (Ongardwanich, et al., 2015). Added by Hughes and Bruce (2012), the increasingly blurred boundaries between physical and online learning spaces demands a new pedagogical construct from information professionals to support the IL learning needs of students; especially now that they are becoming universally mobile and Google focused. They propose a flexible approach that is responsive to the dynamic information-learning environment. They also added that it must support a holistic learning approach where students engage in the process of using information to learn specific content or practice. In short, using context-specific knowledge and practices in teaching IL, learners will develop flexibility and confidence in using information in a constantly evolving information environment. In this study, it will look into how would IL be taught in the context of fake news identification (FNI). It is aimed to design a program that would allow students to become information literate in order to learn how to identify fake news.

In a study conducted by Jones-Jang, et al. (2021), it was examined whether four existing literacy scales (media literacy, IL, news literacy, and digital literacy) are significantly related to the ability to recognize fake news. It was found that IL, which emphasizes users' abilities to navigate and locate verified and reliable information, was positively associated with FNI, but the other types of literacies did not show a significant relationship. Apart from IL, Andretta (2005) emphasizes how critical and analytical skills associated with IL can help consumers of information identify credible sources while refuting fake news. She then argues that it is therefore imperative that all members of society have strong critical and evaluative skills applicable to all formats of information, both offline and online. Further, Archila, et al. (2019) posits that critical thinking about wrong scientific information presented in news articles is an important for of scientific media literacy.

In the new literacy framework introduced by Mackey and Jacobson (2011), IL is reframed to become a metaliteracy. This metaliteracy framework they introduced presents considerations and competencies for managing information in the information age (De Paor and Heravi, 2020). Mackey and Jacobson (2011), believe that IL is still considered of central importance but must reflect the needs of the information society. Putting in mind that information society changes or the environment of information is changing (SCONUL, 2018), approaches to IL instruction must also adapt to the times.

Many studies support that IL initiatives and programs should be updated and enhanced. Rutledge and LeMire (2017), proposes that libraries reimagine their IL instructional programs using a broader conceptualization and implementation of IL that promotes collaborative and personalized learning experiences for students, faculty, and staff. They concluded that librarians must expand their traditional conceptualization and implementation of IL instruction. In BSU, IL exists only as a part of library instruction service embedded on orientations. That is why in this study, the aim is to bring IL instruction from the library, inside the classroom and out into the physical and online world.

As mentioned and explained earlier, education during the pandemic occurs mostly online. This new generations of learners are aided by the Internet to gather, learn and understand information. Columnist Mark Moran (2010), as cited by Thomas, et al. (2011), told that to use the Internet as a library, you need new research skills and librarians can be the experts to teach students how to phrase search queries, protect themselves online, and how to share their work through wikis, videos, and other interactive media. He added that a without a dedicated guide, they would end up as "feral children of the Internet raised by Web 2.0 wolves". This moves the researcher to specialize the IL education for the Information Generation or the iGen. Most especially now that the pandemic caused a surge in the amount of fake news circulation on the Internet (Shirish, et al., 2021).

Fake News Identification (FNI)

Fake news abound in this global era where one can easily publish on the internet. It is an alarming issue given studies show that everybody has problems with identifying fake news (Atodiresei, et al., 2018). In an assessment of civic online reasoning by the Stanford University History Education Group, the results indicated that students struggled to evaluate tweets (Wineburg, et al., 2016). This inability to identify fake news leads to exposure and usage of false and inaccurate information.

Rapp and Salovich (2018) concluded from their study that exposure to inaccurate information can pose problems. In their study, readers exhibited the effects such as, confusion, doubt, and reliance to false information, after reading

inaccurate statements. This is despite readers have prior knowledge to information evaluation and rejection of information inaccuracies. Further, Pennycook, et al. (2018) found that even a single exposure increases the subsequent perceptions of accuracy and explained that "illusory truth effect" occurs on social media users even when stories are labeled as contested by fact checkers. Added by Fazio, et al. (2015), "illusory truth effect" happens even when participants of their experiment knew better. The authors further explained that repeated statements are easier to process, and subsequently perceived to be more truthful, than new statements. That is why it is important for both experts and laypeople to acknowledge that encountering information inaccuracies pose danger and must engage in caution and evaluation when comprehending information (Rapp and Salovich, 2018). This is because, as discussed by Fazio, et al. (2015), people tend to underutilize their knowledge in the face of repetition-based fluency.

There are ample factors why people tend to fall for fake news. Dordevic and Safieddine (2020) explains how human factors affect people's tendency to fall for fake news. These factors include attraction to rumors, information that confirms one's beliefs, likelihood to take any action, and tendency to invest time and effort to verify information. The authors further enumerated factors besides human factors that might explain why people believe in fake news; such as social media interaction factors, online content factors, and platform factors. Dordevic, et al. (2020) also emphasized in another study that several key players that are involved in the process of the spread of fake news similar to the aforementioned factors, namely; users, content and social networks. Apuke and Omar (2020) also looked into several predictors of why social media users share fake news. This includes entertainment, socialization, pass time, altruism, information seeking and information sharing. It was concluded that altruism is the most significant predictor of fake news sharing among their respondents. It means that users tend to share fake news just because of altruistic behavior or they disseminate fake news as way to help people without thinking of any reward. Information sharing also showed significance in their study. It is explained that the eagerness to become urgent in sharing information makes it unlikely for people to verify information before sharing. This is also mentioned by Pennycook and Rand (2021), that poor truth discernment is linked to lack of careful reasoning and relevant knowledge. This contradicts the common narrative that people tend to fall for fake news due to political partisanship or motivated reasoning. It was found in their study that people often fail to discern truth from fiction because they fail to stop and reflect about the accuracy of what they see on social media. Sinderman, et al. (2020) also identified intelligence and personality as possible factors associated with true and fake news evaluation along with other variables (age, gender, and education).

Gender

Often within the technology adoption literature, many studies have suggested that women are less likely to adopt new technology (Allyn, 2003; Li, et al., 2004). Prior researches show that 'boys' have better technology skills than 'girls' because boys tend to spend more time on home computers and have a more positive attitude towards computers (Kuhlemeier and Hemker, 2007). This difference in attitude towards new technology across genders causes the development of the varied level of skills in using technology. In a recent survey made by Statista Research Department in March 2017, it showed what respondents believed to count as fake news arranged by gender. It was found that more male respondents than female respondents believe that news organizations deliver fake news when news organizations (1) deliberately say things that aren't, (2) do not check if their stories are true, (3) twist their reporting to fit their political viewpoint or agenda and (4) if news organizations that are honest but have a clear political viewpoint or agenda. However, there is one aspect that has a lower turn out for males compared to females. There are more female respondents than male respondents who consider organizations publishing funny or satirical material, which is presented so that it looks real but isn't supposed to be real, as fake news (Statista Research Department, 2019).

In an survey made by Watson (2018), 30 % of male respondents consider themselves very confident in distinguishing between real news and fake news while only 14% of females consider themselves very confident. This is similar to the findings of Taylor and Dalal (2017) that males appeared to be more confident in the credibility and accuracy of the results returned by search engines. In another perspective, Chen, et al. (2015) found that women had a higher prevalence of sharing and intention to share misinformation. Contrary to the findings of Taylor and Dalal (2017) that female respondents are more discerning than males in evaluating information sources, therefore concluding that there is gender differentiation in IL skills. But relating IL skills to ICT skills, an earlier study suggests that girls are more proficient with the use of ICT (Ritzhaupt, et al. (2013). However, others have also suggested that gender gaps in computer literacy and usage are closing (Rainer, et al., 2003). In the study of Rampersad and Althiyabi (2020), there is an indirect effect of gender in the respondents' acceptance of fake news which was positive yet a weak effect. This is similar to the findings of Pinto and Fernandez-Pascual (2017) that show no significant difference between female and male students in their levels of

knowledge regarding searching and evaluation. However, there is a significant difference between male and female students in processing and communication. Specifically, female students had higher scores in communicating information while male students had higher scores in processing information.

Academic performance

The cognitive ability or intellectual capacity of the students to analyze information is one of the factors that might affect students' vulnerability to fake news. Shu, et al. (2018) believes that "experienced" users can recognize fake news items as false and "naïve" users are more likely to believe fake news. Leeder (2019) also claimed that higher-performing students demonstrated stronger critical evaluation behaviors and greater use of verification strategies. Also, individuals who over claim or over-assess their level of knowledge judge fake news to be more accurate (Pennycook and Rand, 2019a). In their other study, Pennycook and Rand (2019b), rated their respondents' perceived accuracy of fake and real news headlines. They associated analytic thinking with the ability to discern between fake and real. With no evidence that analytic thinking exacerbates motivated reasoning which means analytic thinking is used to assess the plausibility of headlines, regardless of whether the stories are consistent or inconsistent with one's political ideology. Therefore, susceptibility to fake news is driven more by lazy thinking than it is by partisan bias per se – a finding that opens potential avenues for fighting fake news. In other words, falling for fake news is more a result of a lack of thinking than partisanship or bias.

The claims of Pennycook and Rand in both studies discussed above were even proven by Bronstein (2019). These studies established that delusion-prone individuals, dogmatic individuals, and religious fundamentalists are more likely to believe fake news. They concluded that reductions in analytic thinking and a related concept, actively open-minded thinking, may increase belief in fake news across multiple groups of people. Therefore, they suggest that interventions designed to increase analytic thinking or actively open-minded thinking may help keep delusion-prone and dogmatic individuals, as well as religious fundamentalists, from falling for fake news. In the study of Rampersad and Althiyabi (2020), education is also an important factor that can decrease the dissemination of fake news to a great extent since, by increasing education, an individual will be less likely to follow or spread fake news without any confirmation regarding the source of the news. A similar study conducted by Harrison and Newton (2010) looked into the correlational analysis of IL and academic performance. A strong relationship between IL abilities and academic performance of students were found. However, despite the data results demonstrated that better performance in IL assessment is related to better academic performance, the analysis does not infer a causal relationship.

Another study conducted by De Keersmaecker and Roets (2017), shows that people generally do adjust their attitudes, but the degree to which they correct their assessment depends on their cognitive ability. Specifically, individuals with lower levels of cognitive ability adjusted their attitudes to a lesser extent than individuals with higher levels of cognitive ability. This means that they employ an easier and more convenient evaluation. Even if they are presented with explicitly false information, they still have the same perspective and bias. These results indicate that the initial influence of incorrect information cannot simply be undone by pointing out that this information was incorrect, especially in people with relatively lower cognitive ability. This is similar to the findings of Soysal and Coskun (2019) where there is significant difference in ICT literacies among students with highest and lowest scores. This is related to the higher cognitive competence of students.

Research Objectives

The study aimed to determine the competencies of the students in deterring fake news.

Specifically, the following questions were answered:

1. What is the students' level of competence in information literacy, in terms of the following components?
    a. Identifying Information Need
    b. Retrieving Information
    c. Evaluating Information
    d. Identifying Information Source
    e. Using Information
2. What is the students' level of competence in fake news identification?
3. Is there significant difference in the students' level of competence in information literacy and fake news identification when grouped according to the following?
    a. Gender
    b. Academic performance

4. Is there a significant relationship between fake news identification and the components of information literacy?

Hypotheses

With the review of literature and analysis of several documents, the following hypotheses were deduced.

1. There is a significant difference in the students' level of competence in information literacy and fake news identification when grouped according to the following:
    a. Gender
    b. Academic performance
2. There is a significant relationship between fake news identification and the components of information literacy

METHODOLOGY

The study employed a descriptive correlational approach to measure the level of students' IL, and FNI and to determine the relationship between the variables. Convenient sampling was employed to target respondents that could answer via online forms. The respondents consist of 331 freshmen students of Benguet State University enrolled during the school year 2020-2021 as freshmen. Specifically, the respondents are products of the K-12 curriculum where a separate course on Media and IL is included in their core subjects.

Table 1. *Level of IL grouped according to gender*

Gender	Academic Performance				Total
	Underperforming	Below Average	Average	Above Average	
Female	0	16	189	48	253
Male	0	11	54	13	78
Total	0	27	243	61	331

An online questionnaire tool was adapted from the TRAILS IL Assessment Tool which consists of five (5) parts that correspond to each IL component, namely; (a) identifying information need, (b) employing information retrieval techniques, (c) evaluating information, (d) identifying potential sources, and (e) using information. It was modified to localize the context of the questions. To measure the ability of the respondents to identify fake news, the questionnaire included examples of news stories, social media posts and actual websites that student will determine whether these are credible information sources. In a reliability analysis with 113 respondents, the Cronbach analysis ran through Jamovi statistical software yielded an alpha value of 0.799. Therefore, the modified tool is acceptable in terms of internal validity.

For the analysis of data, mean score was used to describe the students' IL, and identify fake news. The following scales were used to analyze and interpret the scores of the student in each competency.

Table 2. *Score scale for IL and FNI*

RATING EQUIVALENT (RE)	SCORE SCALE		DESCRIPTIVE EQUIVALENT (DE)
	Information Literacy (IL)	Fake News Identification (FNI)	
4	57-75	31-40	Highly Competent (HC)
3	38-56	21-30	Moderately Competent (MC)
2	19-37	11-20	Fairly Competent (FC)
1	0-18	0-10	Poorly Competent (PC)

Chi-Square was used to determine significant differences between the variables. Pearson correlation was specifically used to determine the degree and significance of the relationship between IL, and FNI.

Table 3. *Coefficient of correlation table*

r	Degree/Strength of Relationship	
1.0	Perfect correlation	PC
0.70-0.99	Strong correlation	SC
0.40-0.69	Moderate correlation	MC
0.10-0.39	Weak correlation	WC
0.00-0.09	No correlation	NC

RESULTS AND DISCUSSION

Level of Information Literacy

Table 4 presents the frequency distribution of the students' level of competence in each IL component. The identifying information need component yield the highest mean (2.44). This implies that students are fairly competent in identifying information need. Similarly, Harrison and Newton (2010) also found a relatively good performance on the "recognizing an information need" component which implies the students are still developing their ability in defining their information need. It is also the component that yielded the highest mean score in their study.

Table 4. *Frequency Distribution of Students' Level of Student Competence in IL Components*

Competency	Level of Competence				MEAN	Descriptive equivalent
	1	2	3	4		
Identifying information need	24	151	143	13	2.44	FC
Retrieving information	41	152	121	17	2.34	FC
Evaluating information	59	233	37	2	1.95	FC
Identifying information source	37	184	99	13	2.26	FC
Using information	24	167	132	10	2.38	FC
Information literacy (IL)	**25**	**199**	**101**	**6**	**2.27**	**FC**

The least is evaluating information (1.95) which can be compared with Harrison and Newton's (2010) "comparing and evaluating information". Similarly, this component also showed no significant improvement on the students' competency across the assessment program. This means that they are also still developing their knowledge and skill in information evaluation. Overall, the students are fairly competent in information literacy. Specifically, students are strongest in identifying information need but weakest in terms of information evaluation. This shows that students are yet to develop the basic information literacy skills, such as determining the scope of their need, using Boolean and truncation, employing evaluation criteria, identification of information sources, and writing bibliographic citations. Once these skills are acquired, they can move to develop higher skills such as understanding information costs, narrowing or broadening their search, cross validation of sources, differentiating primary, secondary, and tertiary sources, and repackaging of information. Eventually, students can acquire even complex skills such as acknowledging biases, understanding logarithm and ads mechanics, revising query based on discovered information, maximizing unconventional information sources, and assuming the responsibility to disseminate accurate information and debunk misinformation.

Level of Fake News Identification

Table 5 shows the frequency distribution of the students' level of FNI. Overall, the mean (2.04) shows that the students are fairly competent in identifying fake news. This means that they are able to identify several news whether it is fake or not. However, they cannot ascertain if some news posted are safe to be shared. Similar to the findings of Wineburg, et al. (2016), that students struggle to evaluate online contents.

Table 5. *Frequency Distribution of Students' Level of Student Competence in FNI*

Competency	Level of Competence				Mean	Descriptive equivalent (DE)
	1	2	3	4		
FNI (FI)	89	146	91	5	2.04	Fairly Competent

The fair competency developed by students could be attributed to the vastness and complexity of the online contents that students deal with every time. Students could be overwhelmed with the complexity of the online contents that caused their decision-making skills to lessen. It might also be due to rashness and immediately responding to the presented material.

Students might have assumed the factuality of an online without even criticizing and analyzing small details. Such an alarming behavior for the so-called digital natives.

Level of IL and FNI According to Gender

Table 6 shows that females students have higher IL skills compared to male students. This is contrary to prior researches' claims that males have better information technology skills than females because they tend to spend more time on home computers and have a more positive attitude towards computers (Kuhlemeier and Hemker, 2007). We are always fed with the notion that males are generally tech savvy and are easier to pick up computer related literacies. The results clarify that female students are more information literate than male students. This is somehow similar with the findings of Pinto and Fernandez-Pascual (2017). They specified in their research that female students had higher scores in one component of IL which is using or communicating information. Ritzhaupt, et al. (2013) also found the same results on the use of ICT that girls are more proficient compared to boys. However, the p-value (0.100) is greater than the alpha, therefore the alternative hypothesis is rejected. It means that there is a no significant difference in the IL of the students regardless of their gender. Similar with the findings of Pinto and Fernandez-Pascual (2017), it was also found that there is no significant difference between female and male students in their levels of knowledge regarding searching and evaluation. However, a significant difference was found on other IL components, i.e., processing and communicating information.

Table 6. *Level of IL grouped according to gender*

Gender	Level of IL				Total	Mean	DE
	1	2	3	4			
Female	17	149	83	4	253	2.29	FC
Male	8	50	18	2	78	2.18	FC

$x^2 = 3.42^{ns}$ p-value = 0.331

Table 7 shows that both male and female students are fairly competent in FNI. However, female students also have higher mean in FNI compared to male students. Further, the p-value (0.004) is less than the alpha, therefore the alternative hypothesis is accepted. It means that there is a significant difference in the FNI of the students when grouped according to gender. It means that female students have higher level of competence in identifying fake news compared to male students. Similar to the findings of Taylor and Dalal (2017), female respondents are more discerning than males in evaluating information sources. In addition, Taylor and Dalal (2017) also added that males appeared to be more confident in the credibility and accuracy of the results of their information search process. This is a manifestation of the Dunning-Kruger effect (1999), where people with a low ability tend to overestimate their ability. Male students are overconfident of their capability in identifying fake news but they actually have lower FNI competence.

Table 7. *Level of FNI grouped according to gender*

Gender	Level of FNI				Total	Mean	DE
	1	2	3	4			
Female	57	115	78	3	253	2.12	FC
Male	32	31	13	2	78	1.81	FC

$x^2 = 13.1^*$ p-value = 0.004

Level of IL and FNI According to Academic Performance

Table 8 shows that when grouped according to their academic performance, above average students have the highest mean (2.57), indicating that they are moderately competent in IL. It also shows that average students have a mean of 2.22, which mean they are fairly competent in IL. Despite below average students are also fairly competent in IL, they have the lowest mean (1.96) among the group. It shows that low performing students in their academics, appears to be gullible when it comes to false information. As also explained by Pennycook and Rand (2019b), it might be because of their lack of effort to think or critically deal with information. This only shows that this "lazy thinking" manifests inside the classroom, as well as on how they are dealing with information outside and online.

Table 8. *Level of IL grouped according to academic performance*

Academic Performance	Level of IL				Total	Mean	DE
	1	2	3	4			
Above Average	2	25	31	3	61	2.57	MC
Average	18	156	66	3	243	2.22	FC
Below Average	5	18	4	0	27	1.96	FC
Underperforming	0	0	0	0	0	0.00	-

x^2 = 25.9*** p-value = <.001

Further, the p-value (<.001) is less than the alpha, therefore the alternative hypothesis is accepted. It means that there is a very high significant difference in the IL of the students when grouped according to academic performance. It means that students with higher academic performance have higher IL. Similar to the findings of Harrison and Newton (2010), a strong correlation was found between IL abilities and academic performance. It confirms the findings that better IL constitutes a better academic performance. This is supported by Leeder (2019) that higher-performing students demonstrated stronger critical evaluation behaviors and greater use of verification strategies.

Table 9 shows that both above average and average students are fairly competent in FNI while below average students are poorly competent in FNI. However, it also shows that above average students have the highest mean, followed by average students, then by below average students. This coincides with the claims of Shu, et al. (2018) that "naïve" users are more likely to believe in fake news.

Table 9. *Level of FNI grouped according to academic performance*

Academic Performance	Level of FNI				Total	Mean	DE
	1	2	3	4			
Above Average	4	35	20	2	61	2.33	FC
Average	72	100	68	3	243	2.01	FC
Below Average	13	11	3	0	27	1.63	PC
Underperforming	0	0	0	0	0	0.00	-

x^2 = 22.7*** p-value = <.001

It also shows that the p-value (<.001) is less than the alpha, therefore the alternative hypothesis is accepted. It means that there is a very high significant difference in the FNI of the students when grouped according to academic performance. It means that students with higher academic performance have higher competence in FNI. This is supported by Bronstein (2019) who concluded that reduced analytic thinking and related concepts, may increase belief in a fake news across multiple groups of people. Further, Rampersad and Althiyabi (2020) indicated education status as an important factor that can decrease the dissemination of fake news. In addition, cognitive ability of people determines their attitude to adjust their assessment (De Keersmaecker and Roets, 2017). Students with lower cognitive ability or their academic performance, when presented with fake news or information, their perspective and bias would be impossible to be swayed. As emphasized by Pennycook and Rand (2019b), biases are less likely to be the reason why people tend to believe in fake news.

Correlation Between IL and FNI

The p-value indicates that there is a very high significant correlation between FNI and IL. The Pearson's r value also indicates a moderate correlation between FNI and IL. This moderate relationship strengthens the advocacy of the library professionals that IL instruction can be used as an intervention to the increasing fake news/misinformation pandemic. The results show that IL and FNI are related competencies. This is further proven when the IL components are correlated with FNI.

Table 10. *Degree of Correlation between FNI and IL components*

		Identify information Need	Retrieve Information	Evaluate Information	Identify Information Sources	Use Information	IL
FNI	Pearson's r	0.362***	0.502***	0.339***	0.464***	0.360***	0.540***
	Degree of correlation	WC	MC	WC	MC	WC	MC
	p-value	<.001	<.001	<.001	<.001	<.001	<.001

Note. $p > .05 = {}^{ns}$, $p < .05 = *$, $p < .01 = **$, $p < .001 = ***$

Table 10 shows the degree of correlation between FNI and IL components. The p-values indicate that there is a very high significant correlation between FNI and the different IL components. The highest correlation is found between FNI and information retrieval. The r value (0.502) means that FNI has moderate correlation with information retrieval. This implies that students who are efficient in retrieving information, they are also able to identify fake news. This can be illustrated when students are retrieving news information, they know how to efficiently strategize their search process and retrieve only the needed information. Unlike students who are not able to use information retrieval techniques, are shown with multiple search results. The study of Roetzel (2018) confirms that when information load exceeds the information processing capacity, the decision making performance decreases. In other words, information processing capacity lowers as an individual experiences information overload.

The least correlation is found between FNI and evaluating information. The r value (0.339) indicates a weak correlation. This shows that the ability to evaluate information is not an assurance that students could identify which are fake news. This might be explained why despite students know the concept of evaluation criteria and know how to apply them, they could still fall for fake news. This might be because of motivated cognition or reasoning. According to Thaler (2020), people distort how they process information towards beliefs they find attractive. Among the IL components, information evaluation is the most critical to be affected by one's personal motives or judgments. Despite students try to be objective in applying evaluation criteria, motivated reasoning or in simpler terms "wishful thinking" (Hahn and Harris, 2014) might influence the result of their evaluation. Due to their personal bias, they might process or evaluate information and tend towards deflecting information that are against their beliefs and only accept those that support it.

Overall, the reason why information retrieval and identifying information sources yielded the highest r values that indicated moderate correlation, is because the set of skills applied in information retrieval and information source identification cannot be affected by cognitive biases or motivated reasoning. If the students use the same complex information retrieval techniques, the search results will show the same well filtered results. If the students have the same knowledge on information sources and the nature of questions they answer, they would refer the same sources to answer a specific question.

On the other hand, identifying information need, information evaluation and information use are dependent to several factors. Even if all the students could fully recognize their information need, they might still be drawn to information that coincides with their preexisting beliefs (Maitland and Battersby, 2019). Even if students use the same evaluation criteria, the result of their evaluation might be affected by motivated reasoning (Thaler, 2020; Hahn and Harris, 2014). Even if students are fully aware of the legal, ethical, and socio-economic issues that surround information use, they might still be clouded by their own interpretation and would result different extent of information use. In addition, the prevalence of clickbaits (Naeem, et al., 2020), deepfakes (Botha and Pieterse, 2020), and other seemingly true but fake information, makes it more difficult for students to use information.

This shows the interdependence of the IL components. The better the competence in every component would result into a higher chance to become information literate and proficient in identifying fake news. In order for students to utilize their IL competence and apply in identifying fake news and information, they must be able to know how to learn all of the components.

CONCLUSIONS

The students have the basic IL skills. Most specifically, the students are strongest in identifying information need but weakest in evaluating information. This means students understand their information need and are able to articulate them in search engines or translate their inquiries into practice. However, they need to develop their ability in identifying whether an information source is accurate, reliable, and authoritative. Students must also learn how to do a background check of the information sources by visiting the "about us" pages or the vision/mission statement of the organization disseminating such information.

In terms of fake news identification, they are capable of identifying several news whether it is fake or not. They can manage to process simple debunking and deflecting with news materials that are obviously erroneous but they struggle when it comes to complex fabricated news.

The study also concludes that both genders have the same level of information literacy but female student have higher competence in fake news identification. When it comes to academic performance, students with higher academic performance tend to have higher level of IL and FNI competence.

Another conclusion drawn is that IL is an indicator of the students' ability to identify fake news. Specifically, information retrieval and information source identification is moderately related with FNI while information need identification, information evaluation, and information use is weakly related with FNI. In the design of an IL program geared towards aiding students in identifying fake news, the relationship of their competence in fake news identification with the different information literacy competencies. In introducing the components of information literacy, it is encouraged that there should be an emphasis on the information retrieval and information source identification. Given that a moderate correlation was found, strengthening the skills on information search and retrieval techniques and familiarity with the different sources of information could also strengthen the ability of students to identify fake news. In teaching information retrieval, setting learning objectives should be placed in the context of identifying fake news.

RECOMMENDATIONS

The study recommends formalizing the IL Program of the library that aims to improve the information literacy skills of the students in facing the infodemic. The program will focus on IL components which the students were lacking, such as information evaluation and identification of information sources. The researchers were also able draft learning objectives based from ALA's IL Standards for Higher Education integrating practical applications of IL in identifying fake news. The program will build the information competencies of students and help them apply information literacy concepts in deterring the consumption of misinformation or fake news.

This study was only able to accommodate students that could conveniently respond to the online questionnaire. Hence, the sample size is statistically valid to represent the 2,142 enrolled freshmen students during the school year. Although, only a general conclusion could be drawn out from the study's findings. Therefore, it is recommended that future studies be made to purposively target a larger population to also consider other intervening variables such as degree program, socio-economic status, online behavior or internet activity, and more. This would make the respondents representative of the different variables that might affect the competencies being measured. More specifically, considering the degree program could result in a development of an information literacy that is program-specific; or differentiate the IL competencies of board and non-board programs or technical and non-technical degree program.

Also, the fake news identification part of the questionnaire only determined whether students could identify which news articles or online contents are fake. It is only limited to assessing their ability in identifying fake news and not understanding their motivations, actual practices, and thought processes. It wasn't able to gather provide educators information that would help understand students' attitude, behavior and knowledge around information. Therefore, the study could simply correlate the competencies. It is therefore recommended that a follow-up study shall be conducted to include the affective, behavioral, and cognitive factors why students arrive at a conclusion that a certain news or online content is fake.

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