eHealth Literacy of High School Students in the Philippines

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Abstract

The Internet has become a chief health information source. It is posited that people who use the Web for health information must possess requisite eHealth literacy to avoid misuse. eHealth literacy refers to the skills in searching, retrieving, understanding, evaluating, and applying online health information to alter or maintain well-being. This research employed mixed methods of data collection, following a three-phase explanatory sequential design: 1) survey and eHealth literacy test, 2) focus group discussion, and 3) observational study, to describe the state of eHealth literacy of high school students in terms of their online health information seeking behaviors, search, retrieval, and evaluation strategies, actual eHealth literacy levels, and perceived eHealth literacy levels. Furthermore, the research aimed at investigating the relationships among school type, actual eHealth literacy levels, and perceived eHealth literacy levels. Results show that students are adept in searching and retrieving online health information. However, their evaluation strategies are suboptimal as they lack ability to check for content accuracy and source credibility. Findings also reveal a significant relationship between school type and perceived eHealth literacy levels, X^2 (2, N=263) =14.21, p=0.00, α=0.05. Private school students tend to score their perceived eHealth literacy levels higher. There is also a significant difference between actual eHealth literacy levels and perceived eHealth literacy levels, with students rating their perceived eHealth literacy levels (M=32.45, SD=6.10, N=40) higher than their actual eHealth literacy levels (M=29.13, SD=2.92, N=40), t(40)=4.16, p=0.000, α=0.05. It is concluded that while students are adept in computer and traditional literacies, they still need to further develop health and information literacies to effectively evaluate and apply the searched and retrieved online health information.

Keywords: eHealth, eHealth literacy, high school students

According to Internet Live Statistics (2016), about 50% of the world population is connected to the Internet. In the local setting, the Philippines registered an Internet Penetration Rate (IPR) of 43.5%. Furthermore, according to Cruz (as cited in Bristol, Caro, Mangaliman, & Bernarte, 2016), 60% of Filipino Internet users belong to the youth category of 15-19 years old, the largest representation in national figures. In the report of Bayani (2014, para. 8), global information and measurement company, Nielsen, found that a few of the top online activities of Filipinos are logging on to social networking sites, participating in online discussions and chatrooms, and conducting academic research.

"The Internet, with its capacity to provide information that transcends time and space barriers, continues to transform how people find and apply information to their own lives" (Seckin, Yeatts, Hughes, Hudson, & Bell, 2016, p. e161). Hence, the emergence of the Internet has rapidly changed the paradigm of information consumerism, particularly in the health sector. Fox and Duggan (2013) found that 72% of Internet users in the United States searched for online health information. Tracing the early years of the 20th century, one in three adolescents used the Internet as a reference for health information (Lenhart, Madden, & Hitlin, 2005). Fox and Duggan (2013) further found that the majority of Internet users sought information about a specific condition or disease to medically diagnose themselves. Moreover, 28% of these users did not follow up further with a medical professional. According to Atienza, Hesse, Gustafson, and Croyle (as cited in Seckin et al., 2016), they generally consult the Internet first before their physician. These reports imply a strong, apparent influence of the Internet in the way people manage their health and well-being.

Though access to online health information may develop the consumer to become empowered and reflexive, Im (as cited in Seckin et al., 2016) strongly declares that regardless of one's level of reflexivity and empowerment, a person must still possess a requisite high level of health literacy to avoid information misuse. Health literacy has blended in and evolved with the advancement of technology and onset of Internet access. Hence the emerging concept of eHealth literacy is coined and explored.

eHealth literacy is defined as "the ability to read, use computers, search for information, understand health information, and put it into context" (Norman & Skinner, 2006a, p. e27). Simple as it may seem, eHealth literacy is a multi-skill competency. The ability to navigate the computer and access health information requires complex processes. Understanding health knowledge involves critical evaluation of the acquired information. Lastly, putting the information into real-life context entails careful reflection while being faced with various decision-making mediators.

There have been numerous studies that have attempted to provide descriptions of, indicators of, and/or baseline data on eHealth literacy of various populations such as adolescents (Ghaddar, Valerio, Garcia, & Hansen, 2012), adults (Marazienė, Klumbienė, Tomkevičiūtė, & Misevičienė, 2012), and health information and services consumers in general (AlGhamdi & Moussa, 2012). However, these studies were conducted by foreign researchers. Hence, there is a wide gap between the global research development on the emerging concept of eHealth literacy and the findings from within the Philippines.

Apart from the studies previously mentioned, it is imperative to initiate research on this emerging field because the advent of technology has prompted schools to revitalize their curricula in order to respond to the needs of the learners. To contextualize, competencies on digital literacy and consumer health have been incorporated into the Enhanced K-12 Basic Education Curriculum of the Philippines since its implementation in 2012. Though there is no

competency specifically targeting the development of eHealth literacy, its components are taught separately across subjects and grade levels.

The rationale for this research is the need for immediacy to address the absence or lack of contextualized studies on eHealth literacy. This research aimed to consolidate the theoretical underpinnings of the concept in an attempt to quantify the eHealth literacy of the most ideal sample, adolescents, particularly those who are transitioning from secondary to tertiary education, where the level of independence and reflexivity is increased. This study focuses on Filipino high school students and specifically investigated the following research questions:

1. What is the state of eHealth literacy of high school students in the Philippines in terms of online health information-seeking behavior, strategies for search and retrieval of online health information, criteria for evaluating online health information, and perceived and actual eHealth literacy levels?
2. What relationship exists among school type, perceived eHealth literacy level, and actual eHealth literacy level?
3. Is there a significant difference between the perceived and actual eHealth literacy levels of high school students in the Philippines?

Literature Review

Defining eHealth Literacy

eHealth literacy is a combination of different literacies simultaneously applied in eHealth conditions such as facing online health information and availing of Internet health services. Norman and Skinner (2006b) developed the Lily Model (Figure 1) to illustrate the facets of various literacies incorporated in eHealth literacy: traditional literacy and numeracy, and computer, media, science, information, and health literacies. The researchers explain that these are further categorized into two central types or models – *analytic* and *content-specific.* Analytic literacies are a set of skills that are practiced regardless of the content or situation. Content-specific literacies apply to particular situations.

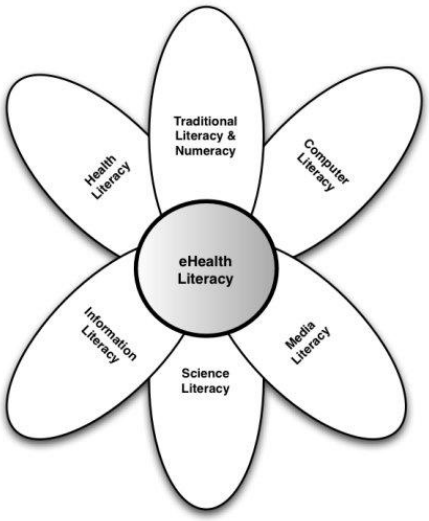

Figure 1: The eHealth Literacy Lily Model (Norman & Skinner, 2006b, eHealth Literacy Model, para. 1)

The lily metaphor used by the researchers seamlessly represents how eHealth literacy operates in the minds of individuals. In its practice, each of the literacy components is applied independently, whether simultaneously or consecutively. However, efficacy in the application of eHealth literacy greatly relies on the interdependence of all its components. The eHealth literacy as the pistil, as used by Norman and Skinner (2006b), encapsulates this interrelationship – the central concept holding its components [petals] which have their respective characteristics.

Online Health Information Search, Retrieval, and Evaluation

Online health information-seeking behaviors, patterns, and skills have become an emerging field in health research over the past two decades. For example, in the study of Eysenbach and Kohler (2002), it was uncovered that people find it "easier to access the quality of information on the [Inter]net than elsewhere because they could verify and cross check the information on different sites" (p. 575). However, it also discovered that their search techniques of the online users are suboptimal. It means that they are not utilizing effective strategies to retrieve accurate, complete, and reliable information. The researchers further reported that this state is due to reasons such as inability to utilize medical portals or sites of medical societies or libraries as a starting point and usually choosing the first results displayed by the search engine without exploring the succeeding pages. The participants were also asked about what they consider in checking the website reliability. They mentioned criteria such as professional layout and writing, indication of official authority, and citation of scientific references.

Measuring eHealth Literacy

Little is known about how to quantitatively measure eHealth literacy. Pleasant (2009) argues that while existing tests are comprehensive, they are merely screening tools. He explains that "the goal of screening is to divide people into healthy and sick categories and it does not tell what is actually wrong with the patient" (p. 18). In the same light, Baker (2006) posits that the measurement of literacy must also involve the individual's reading ability and vocabulary, not only their health status. Considering that literacy operates through interactive relationship among individuals and the healthcare system, he further stressed that measuring the communication capacities of the person is also necessary.

As the instruments evolve to cater to the changing profiles of the population, contexts at which the individuals are assessed adjust as well. According to the Institute of Medicine (as cited in Norman & Skinner, 2006a), there is "a need to look at the different contexts where health information is obtained and used as part of a strategy of addressing health literacy" (Introduction section, para. 4). These contexts include electronic sources. This has been the inspiration of Norman and Skinner (2006a) in developing the eHealth Literacy Scale (eHEALS) which is "a self-report tool that can be administered by a health professional and is based on an individual's perception of her or his own skills and knowledge within each measured domain" (p. e27). It is crafted to measure individual's estimated literacy level, used to make clinical decisions. Contextualizing the aims of this present study, it may be inferred that the instrument most appropriate to use is the eHEALS as it is the only instrument that provides if not actual – at the very least perceived – a quantitative measure to describe the eHealth literacy profile of an individual.

eHealth Literacy and Adolescents

It is ideal to identify the youth as a focus for eHealth literacy studies for many reasons. First, adolescents are about to enter college life, which is "a transitional time for taking charge of their own health and maintaining a healthy lifestyle, which is essential to their academic achievement and their overall adult health outcomes" (Ma & Latham, 2013, p. 793). Second,

they are highly familiar with technology as evidenced by their high IPR (Cruz, as cited in Bristol et al., 2016). This is further supported by Norman and Skinner (2006a) when they sampled youth in their research because of the age group's high level of eHealth use. Third, adolescents are found to experience difficulty "engaging with eHealth and understanding or using health information online" (Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005 in Norman & Skinner, 2006a, Introduction, para. 7). In addition, Ivanitskaya, Boyle and Casey (2006) concluded in their study that adolescents do not possess the ability to "conduct advanced information searches, judge the trustworthiness of health-related websites and articles, and differentiate between various information sources" (Conclusions, para. 1). The authors further stated that even if adolescents reported high confidence in perceived eHealth literacy, their skills are still not an accurate predictor of their health information competencies. It is hypothesized by Norman and Skinner (2006a) that the longer the exposure of an individual to technology, the more likely s/he to use it as a tool to aid in health management.

Therefore, as adolescents grow in technology-rich environments, they will continue to seek health information from these digital sources. With this inference, it is of high importance that continuous research be conducted in order to appropriately and adequately address the adolescents' eHealth literacy needs through intervention provisions.

eHealth Literacy in the Philippine National Curriculum

As of this writing, there is no competency in the Philippine national health education curriculum that deliberately and specifically covers the development of eHealth literacy across elementary and high school. However, the components of eHealth literacy are taken independently. For example, sources of reliable information are initially discussed in Grade 3. It is the terminal lesson in the 3rd Quarter wherein at the end, the students are expected to "[identify] reliable sources of health information" (Department of Education, 2016, p. 36). The following are the sources of health information explicitly mentioned in the document: a) government agencies, b) health professionals, and c) printed materials produced by health professionals or legitimate health institutions. On the other hand, it is in the health curriculum of Grade 10 when evaluation of health information is tackled. The learning competencies required of the students after they study consumer health in the 1st Quarter (p.87) are: differentiates reliable from unreliable health information, products, and services; explains the guidelines and criteria in the selection and evaluation of health information, products, and services; explains the nature and dangers of quackery; and reports fraudulent health services. Although these topics are not "online" in nature, it must be posited that high school students are equipped with skills needed in the practice of eHealth literacy.

Methodology

Research Design and Methods

The study employed a three-phase explanatory sequential mixed methods design (Cresswell & Plano Clark, 2007): survey and eHealth Literacy Test (eHLT), focus group discussion (FGD), and observational study (OS). The first phase aimed at eliciting the respondents' demographic profile and online health information-seeking behavior. It was followed by FGD to gather qualitative data on factors that influence the state of eHealth literacy of the high school students and their retrieval and evaluation strategies. Finally, the last phase elicited observations on the personal search and retrieval processes of the high school students given a specific task.

The research was conducted within the school year when it commenced. Furthermore, the data gathering procedures were carried out consecutively with short intervals. This is due to factors such as time, experience, exposure to technology, and learning of new concept and skills in

regular class that may affect the perceived and actual levels of eHealth literacy of the high school students.

Sample and Sampling Procedures

The research was conducted in Quezon City, Metro Manila to ensure variation in student characteristics. It has also the highest student population in the country. In addition, Metro Manila registered the highest IPR of 19% in the country (Social Weather Stations, 2013; as cited in Labucay, 2014).

Grade 10 students from four private and four public schools were purposively chosen because at the time this study has been conducted, they have completed the core competencies of the national health curriculum, particularly on consumer health.

There were two sampling procedures employed. The first determined the survey and eHLT participants. The eight schools were chosen through criterion sampling. Medium and large schools, as categorized by the Department of Education, were considered to ensure maximum variation. Excluding homogenous classes, the section in each school was selected through random sampling. The number of respondents in each school varied as intact class sampling was employed. Tables 1 and 2 describe the demographic information of the participants.

Table 1: Population of schools

School	School Population*	Grade 10 Population	Sample Surveyed	Invalidated Surveys**	Actual Sample Size	Actual Sample Size by School Type
A	368	71	29	3	26	Private = 128
B	975	168	43	4	39	
C	297	92	39	3	36	
D	***	224	29	2	27	
E	2748	622	39	7	32	Public = 146
F	3314	607	40	4	36	
G	3126	658	36	4	32	
H	1978	510	48	2	46	
Total			303	29	274	274

*both Junior and Senior High Schools
**incomplete and incorrectly answered
***did not disclose

Table 2: Demographic information of survey and eHLT respondents

	School								Total
	A	B	C	D	E	F	G	H	
Sex:									
Male	16	14	22	14	14	13	14	21	128
Female	10	25	14	13	18	23	18	25	146
Age:									
15	13	11	14	9	15	8	4	17	91
16	11	26	16	14	13	20	16	20	136
17	2	1	5	3	2	6	9	7	35
18	-	1	1	1	1	1	-	2	7
19	-	-	-	-	-	1	3	-	4
20	-	-	-	-	1	-	-	-	1

The second sampling procedure was carried out to identify the FGD and OS participants. Through purposive sampling, four schools (a pair from each school type) with the highest and lowest means of perceived eHealth literacy level were considered. Table 3 shows the results of the eHLT. Ten students from Schools A, B, E, and H participated in the FGD and OS. These students were composed of the five respondents who scored the lowest and five who scored the highest perceived eHealth literacy levels. Table 4 details their demographic information.

Table 3: eHLT results

Type	School	Mean
Private	A	31.77
	B	35.21
	C	33.00
	D	32.67
Public	E	28.44
	F	29.31
	G	30.06
	H	32.47

Table 4: Demographic information of FGD and OS participants

	School				Total
	A	B	E	H	
Sex:					
Male	6	2	6	5	19
Female	4	8	4	5	21
Age:					
15	5	1	4	5	15
16	4	8	4	2	18
17	1	-	1	3	5
18	-	1	1	-	2

Research Instruments

The research instruments utilized in the study are the survey, eHLT, and eHealth Literacy Rubric (eHLR), which are supplemented with guides for the conduct of the FGD and OS.

a. Survey

The survey is based on the instrument developed by TNS Political & Social (2014) as published in their research on digital health literacy of European citizens. The first of two parts collected demographic information. The second part is composed of open- and close-ended questions that elicited information on the students' online health information-seeking behaviors.

b. eHLT

Administered simultaneously with the survey, the eHLT was utilized to investigate the respondents' perceived eHealth literacy level. It was developed by the researcher as a derivation of Norman and Skinner's eHEALS (2006a). It measured the respondents' perceived level of effectiveness in the completion of tasks related to the application of eHealth literacy. The respondents assigned a perceived level of effectiveness in accomplishing each task. The ratings and their corresponding descriptions are listed in Table 5.

Table 5: eHLT rating of task effectiveness

Rating	Description
4	I can do the task alone confidently and effectively.
3	I can do the task effectively but with minimal assistance from another person.
2	I can do the task when fully assisted by another person.
1	I cannot do the task alone or even with assistance from another person.

In the context of online health information search and retrieval to address a health concern or problem, Table 6 presents the tasks in the sequence of accomplishment and the literacies being practiced.

Table 6: eHLT tasks

Task	Literacy/ies
1. Understand the information needed to search for when asked to address a health concern or problem	Traditional literacy and numeracy
2. Tell whether the technological tool is connected to the Internet or not	Computer
3. Identify appropriate software applications to use to search for online health information	Computer
4. Navigate the software application used to search for online health information	Computer
5. Identify websites that are credible sources of health information	Health and information
6. Check if an unfamiliar website is a credible source of health information	Health and information

7. Understand the language used in the information presented	Traditional literacy and numeracy
8. Identify helpful information from a text presented	Health, information, media, and science literacies
9. Tell whether the online health information is accurate or not	Health, information, and science
10. Explain the answer to a health concern after searching and retrieving online health information	Traditional literacy and numeracy

c. eHLR
The eHLR is a researcher-developed rubric used to score the respondents' actual performance of eHLT tasks during the simulation activity in the OS.

Prior to data gathering, an expert validation and a pilot study were administered to ensure the validity and reliability of the research instruments. Four content professionals and one language expert participated in the expert validation. The pilot study was conducted in two secondary schools: one public and one private.

Having an expert validation rating of *Exceeds expectation* (Survey: *M*=3.75/4.00; eHLT: *M*=3.91/4.00; eHLR: *M*=3.81/4.00), *Good* Cronbach's alpha (α) of 0.82 from the pilot study, and no major recommendations for language revision, the results of the instrument validation and pilot study indicated that the research tools are valid and reliable.

Data Analysis
The resulting data from the various methods of collection were rendered and analyzed through different means. The data analysis procedure is subdivided into three phases.

Phase one. Descriptive statistics were employed to organize survey data which include the demographic profile and the prevalence and patterns of online health information-seeking behaviors.

The eHLT was scored accordingly, with minimum score of 10 and maximum of 40. This determined the perceived eHealth literacy level. As the score adds, the level increases. Table 7 indicates the range of scores and corresponding proficiency levels. This is based on the study of Cutilli and Benett (2009, Results of the NAAL section), where adult health literacy in the United States was evaluated through a series of tasks. Proficient eHealth literacy refers to the ability to perform complex tasks such as knowing how to properly use online health information and evaluate content validity and source credibility. Intermediate eHealth literacy refers to skills that allow the person to perform moderately complex tasks such as knowing where to find helpful health information on the Internet. Basic eHealth literacy refers to the ability to perform simple tasks such as accessing the Internet. Below basic eHealth literacy describes the skill level below simple and concrete tasks, which include the inability to use technology to access online health information.

Table 7: eHLT proficiency levels

Score	Level
29 – 40	Proficient
24 – 28	Intermediate
19 – 23	Basic
10 – 18	Below Basic

Phase two. The results of the FGD were rendered through thematic analysis. On the other hand, each respondent's effectiveness in the performance of eHealth literacy-related tasks during the OS was scored accordingly using the eHLR. The same scoring and assignment of literacy levels used in the eHLT evaluation were utilized. The results from the eHLR yielded each participant's actual eHealth literacy level.

Phase three. Using IBM SPSS Statistics version 20 for Windows, inferential statistics were employed to answer Research Questions 2 and 3. A chi-square test was administered to describe the relationship that exists among school type, perceived eHealth literacy level, and actual eHealth literacy level. In addition, a paired samples *t*-test was administered to determine if there is a significant difference between the means of perceived and actual eHealth literacy levels of the high school students.

Ethical Considerations

Several ethical guidelines were upheld in the conduct of the study. The well-being of the respondents was protected at all times, with their identities kept confidential. Necessary permits were also secured from appropriate channels prior to administration of any data gathering procedure. Informed consent, verbal assent, and written consent were also secured wherever imperative to do so. No individual was forced to participate in the study and all were given freedom to leave the study any time they feel the need to do so.

Results and Discussion

Access to the Internet and Online Health Information

It is not surprising that 100% of the respondents in this study reported access to the Internet, with personal gadgets used most frequently (at 92.0%). The age group of the respondents makes up the biggest populace of Filipino Internet users. According to On Device Research (2014), 53% of Filipino Internet users are under the age of 24. In terms of frequency of use, 89.8% of the respondents reported daily access to the Internet. This percentage even surpasses the finding of Labucay (2014) that three-fifths of Filipino Internet users are "frequent to moderate users" (p. 39), accessing the Web a few times or at least once daily.

Of those who access the Internet, 96% reported searching for online health information, with personal gadgets remaining to be the top choice for use (at 89.4%). Of this percentage, 47.5% conveyed that they do so weekly, while 41.4% reported monthly access. The high percentage of reported access to online health information even exceeds the range of 40%-73.4% described in existing literature on adolescents (Jimenez-Pernett, de Labry-Lima, Bermudez-Tamayo, Garcia-Gutierrez, & Salcedo-Sanchez, 2010). These also support the findings of Labucay (2014) as she reported that health, dieting, and fitness information-seeking and -learning are one of the major online activities of Internet users.

Type of Health Information Searched Online

The types of health information searched for by the respondents vary. In general, most of the information gathered by the students is about personal health (60.8%), nutrition (58.2%), and injury prevention, safety, and first aid (52.5%). This finding supported the study of Fernando-Callo (2009) on high school students' expressed health interests. She reported that the top three health interest topics are about mental health, nutrition, and safety education and first aid.

These concerns are linked to health risk behaviors reported by Peltzer and Pengpid (2015) in their cross-sectional study on the results of the 2003, 2007, and 2011 Global School-based Health Survey to investigate the trends in the health risk behaviors of adolescents aged 10-19. These behaviors include improper dieting, lack of physical activity, increased sedentary habits, injury and violence involvement, and practices that contribute to poor mental health. According to Miguel-Baquilod (as cited in Peltzer & Pengpid, 2015, p. 1), risk behaviors relative to the aforementioned list are correlated with the leading causes of death among the youth in the Philippines.

Peltzer and Pengpid (2015) reported that there were significant improvements in malnutrition and mental health over the nine-year coverage of the study. However, it has been found that there is an increase of health risk behaviors that pertain to bullying, injury, and loneliness. This particular finding of their research is indicative of this study's results on the specific health concerns being searched for online by the respondents.

The high percentage of information search about mental health also supports the results of the 2015 National Youth Assessment Study reported by Cendeña (2017). Cendeña mentioned that 20% of the 2,762 respondents "have experienced extreme emotional distress" (p. 20), while about a third "thought at least once that life was not worth living" (p.20). This may be an underlying reason why this study's participants reported the highest frequency of online information search for mental health concerns.

Sources and Consumers of Online Health Information

Results show that 63.5% of the respondents use Google Chrome, Mozilla Firefox, Bing, Yahoo, Safari, and Internet Explorer for health information search. These bridge the Internet users to various websites that offer health content. Boyer & Geissbuhler (2006, in Jimenez-Pernett et al., 2010) posit that these mechanisms are most frequently used "because they are very easy, accessible, fast, and contain a great deal of information" (p.5).

At 42.6%, the second most frequently visited source of online health information are social media sites. Official websites of government and non-government health organizations ranked fourth at 14.4%. Online newspapers and magazines are reported to be the least common source of online health information at 12.5%.

Jacobs, Amuta, and Kwon (2017) mentioned that the motivations behind the health information-seeking behavior are the individual's perception of health, health status, and family health history. This is consistent with the results of this study's survey. When asked for whom the health information search is for, 72.6% of all respondents reported that they are the mere consumers of the information. Only 25.1% searches online health information for their family members and a low of 2.3% for their friends.

The survey also prompted the respondents to identify all possible reasons for online health information search. A high percentage of 65% stated that they wanted to gain additional knowledge on the topics searched. It is interesting to note that private and public schools differ

on the second most common reason for searching online health information. Among students from public schools, 13.0% reported that they seek clarification in the Internet regarding the opinion they gathered from a medical check-up. In the private school setting, 8.0% of the students indicated that they search for online health information to guide them in buying a health product or availing of a health service.

Perceived eHealth Literacy

The results of the eHLT revealed that the respondents perceive their eHealth literacy level as proficient at *M*=31.75 (n=263). The mean eHLT scores of students from private and public schools are 33.30 (n=125) and 30.30 (n=138) respectively. These results indicate that generally, the students' eHealth literacy level is proficient. Figure 2 indicates the complete eHLT results.

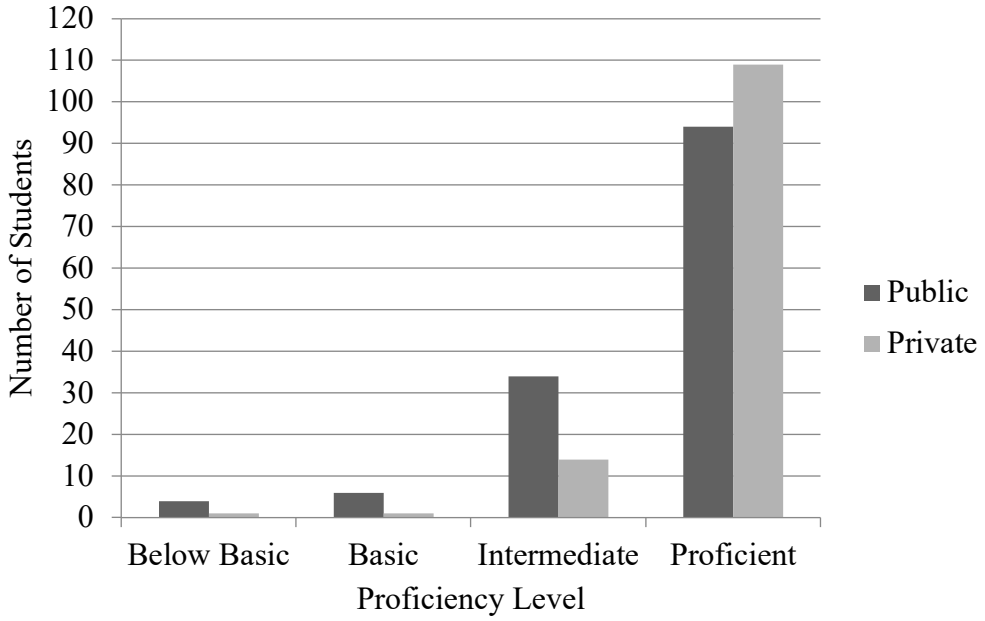

Figure 2: Perceived eHealth literacy levels

The eHLT also indicated that the participants are most confident in efficiently performing tasks that practice their computer and traditional literacies. These include the ability to understand the information needed to retrieve to address the health concern (*M*=3.21), to tell whether the tool is connected to the Internet or not (*M*=3.35), to identify the software application needed to retrieve online health information (*M*=3.22), to navigate the software application (*M*=3.16), and to understand the language used in the presentation of information (*M*=3.30). Different factors may explain this trend. First, it has been established that today's youth are tech-savvy. Second, this is supported by the high basic and functional literacy rates of the country. In the Philippine in Figures 2017 Report of the Philippine Statistics Authority (2017), the basic literacy rate of Filipinos in 2013 is 96.5% while the functional literacy rate is 90.3%.

On the other hand, they scored their lowest efficiency in tasks that apply health and information literacies. The majority of the respondents reported difficulty and need of full assistance from another person in explaining the answer to a health concern after an information search (*M*=3.15), identifying credible websites (*M*=3.10), checking the credibility of an unfamiliar website (*M*=3.01), and proving the accuracy of the online health information (*M*=2.98).

Focus Group Discussion

FGD results revealed that the participants preferred Google Chrome as their starting point in searching and retrieving online health information due to its speed and variety of references. The participants also reported the use of both English and Filipino in accessing online health information. There are more participants from private schools who type keywords on the search engine because for them, it will provide more varied scope. The sentence or question form is more preferred by participants from public schools as they think it provides them exact information they need to address their concern or question. When asked which from the Google results list is first chosen, the majority of the respondents reported that they select the first website because they think it is the most rated and reliable.

Upon analyzing the emerging themes, there are only three main criteria used by the respondents to evaluate the credibility of the online health information: user rating and review, commonality of content across websites, and authority of source. It may be deduced that the criteria are somewhat ineffective. For one, user rating and review may not necessarily guarantee the accuracy of content. The anonymity of the source is already a cause of doubt and worry. Moreover, the commonality of content across websites is neither a reliable criterion because information can easily be disseminated online by anyone. It is only the authority of source that has high reliability in terms of discerning the trustworthiness of the source. In terms of action taken after information retrieval, the majority of the respondents reported that they immediately applied the information to address their concerns through self-medication, which has no guarantee of effectiveness and may pose great harm.

Observational Study

The search and retrieval process was simulated during the OS. The 40 respondents visited a total of 113 webpages from 35 unique websites. The average time in finishing the search and retrieval process is 7 minutes 20 seconds. All participants used Google Chrome as a starting point and Google Search as the engine for information retrieval. With relatively fast duration of search and familiarity with online navigation, it was observed that the students are adept in terms of their computer literacy.

The majority of the health concerns searched were phrased in English. In analyzing the quality of search, it is imperative to validate whether the phrase or sentence searched is accurate to the concern being addressed. Although the majority of the participants scored high in their ability to understand the information needed to search (M=3.55), which is a skill practiced in traditional literacy, there is disparity in terms of phrasing the information. There were instances when the information typed in the search bar included unnecessary details. In addition, none of the participants utilized Boolean operators for a more efficient search.

About 60% of the participants clicked the first website in the results list. 90% of the respondents reported lack of familiarity with the websites they visited. When asked to check for credibility, almost half admitted to having no idea. When probed by the researcher, the students mentioned that they tend to consider the physical layout or attractiveness of the website as the primary basis to determine its credibility.

Identifying helpful information in the article is not considered a challenge for the respondents. With the mean score of 3.40, it may be analyzed that the participants' facility in the English and Filipino languages aided them in the understanding of information that will answer the health concern. However, checking the information's accuracy seems to be a challenge for the participants. A low mean score of 1.43 in the particular task only dictates that the participants cannot verify the information even if assistance and cuing are given. From the abovementioned

observations, it is inferred that the students need further development of their health, information, media, and scientific literacies.

At the end of the OS, the participants were required to explain to the researcher the information gathered to address the health concern. With a mean score of 3.05, it is inferred that they are equipped in terms of comprehension and summarizing skills.

Actual eHealth Literacy

The results of the OS complement the reported perceived inefficiency of the respondents in applying their health and information skills. The general mean score of students in the OS is 29.13 (n=40), which translates to borderline intermediate to proficient eHealth literacy level. Unpacking the results further, students from private schools scored lower in the search and retrieval experiment (M=28.85, intermediate eHealth literacy) than those from public schools (M=29.40, proficient eHealth literacy). Figure 3 indicates the participants' actual eHealth literacy scores.

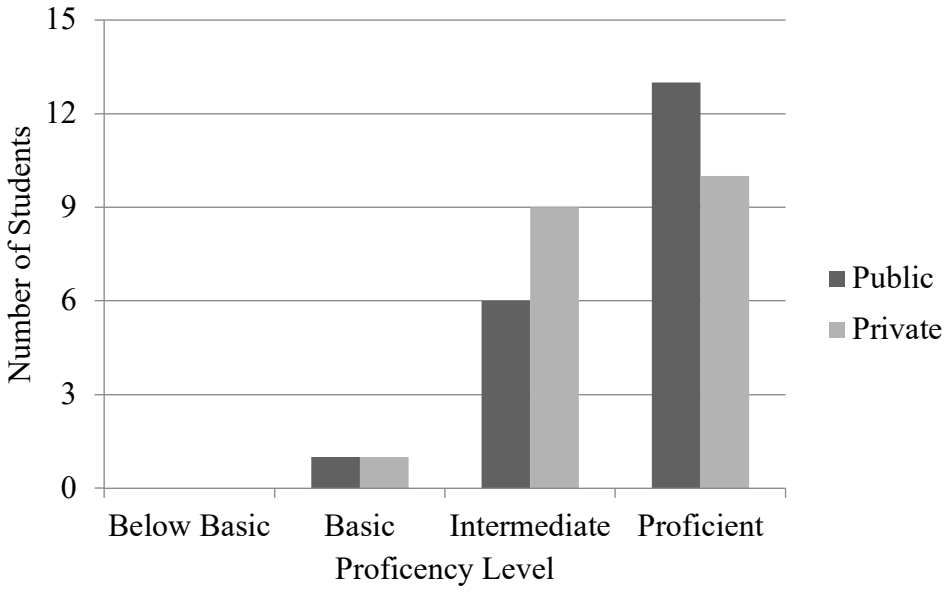

Figure 3: Actual eHealth literacy levels

Relationships among Variables Affecting eHealth Literacy

The chi-square test of independence also indicated that the actual eHealth literacy level does not depend on the school type, $X^2(2, N=40)=0.99$ with p-value of 0.61 at 95% confidence. However the results of the same test indicate that school type affects the perceived eHealth literacy level, $X^2(2, N=263)= 14.21$with p-value of 0.00 at 95% confidence. Students from private schools tend to score their perceived eHealth literacy level higher than their counterparts in public schools.

Lastly, a paired samples t-test was administered to investigate if there is a significant difference between the perceived and actual eHealth literacy levels of the high school students. Results show that there is a significant difference between the two variables. The high school students rated their perceived eHealth literacy (M=32.45, SD=6.10, N=40) higher than their actual eHealth literacy (M=29.13, SD=2.92, N=40), $t(40)=4.16$, p=0.000 at 95% confidence.

Summary and Conclusion

This study aimed at describing the state of eHealth literacy of high school students in terms of their online health information-seeking behavior, strategies for search and retrieval of online health information, and criteria for evaluating online health information. It also intended to provide a quantitative description of the perceived and actual eHealth literacy of the students along with identifying their relationship with school type.

The high school students indicate high frequency of use of personal gadgets to search for online health information to maintain or improve their well-being. They prefer to use search engines as a starting point. They generally search for information about personal health, nutrition, and injury prevention, safety and first aid. Personal consumption was the main motivation for the online search. When asked for the general satisfaction, almost all participants provided an affirmative response.

The high school students' ability to evaluate the credibility of online sources of health information and the accuracy of health information in general is suboptimal. They tend to consider the layout of the website rather than its content. It may be concluded that the respondents have not mastered the curricular competencies covering these skills. It is in the national health curriculum of Grade 10 (p. 87) when evaluation of health information is tackled. It is essential to point that the participants of the study are Grade 10 students and the research was conducted during the 4th Quarter; this means that these competencies should have been learned by the students already.

The high school students perceive their eHealth literacy level higher than their actual ability. This finding implies that they may not have been given enough opportunities to practice their learning competencies on evaluation of health information and health information sources. Knowledge may have been imparted, but its actual application may be missing.

In summary, the high school students, though adept in terms of traditional and computer literacies, still need to further develop their scientific, media, information, and health literacy in order to effectively consume and apply online health information to maintain and/or improve their well-being.

Recommendations

It is recommended to conduct further research to investigate other influencing factors to eHealth literacy. A study on the impact of educators and other stakeholders in the development and enhancement of eHealth literacy is imperative to expounding on the emerging skill. It is also essential to develop and validate eHealth literacy measurement tools in the local language.

Since the findings of the study indicate absence/lack of the skill integration in the curriculum, reviews by program and curriculum planners must be initiated to incorporate the emerging concept especially in consumer health learning competencies. It is also necessary to reinforce consumer health instruction in schools through the educational policy-makers, administrators, and educators in order to strengthen the foundational skills of the students in terms of evaluating source credibility and content accuracy of health information gathered whether online or through other emerging forms of media. In terms of classroom assessment, review and enhancement of methods to evaluate consumer health skills must be proposed so that actual practice of such among students shall be evident and successful. If curricular inclusion may not

be possible, it can be recommended that school administration devises an eHealth literacy development program or module as supplementary instruction in regular classes.

Extending the utilization of the research results to the healthcare setting, medical personnel may use the data to enhance patient-professional relationship as the services are being rendered. Furthermore, the findings may also be key in the improvement of user interface of online sites that provide health information, products, and services.

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