Fostering Health Literacy and Social Media in a Higher Education Setting

Sandra Vamos, EdD & Paul Yeung, PhD

ABSTRACT

As a result of technological advancements, many people access and assess health-related information via techno-logical devices. Yet, not all health-related information available is accurate. This study adopted Flanagan's Critical Incident Technique (CIT) to explore the kinds of incidents (i.e., learning and/or teaching-related examples) that allow Physical and Health Education Teacher Education (PHETE) candidates to engage in the promotion of health literacy (HL) through digital media during a course-based experiential learning opportunity in higher education. The study utilized a focus group interview (n=6) to explore what helps or hinders participants' experiential learning and their perception of health education and health promotion efforts through the lens of HL and digital literacy. Altogether 100 critical incidents were recorded. The results showed that the top three "helps" are: "writing health blogs" (13.46%), "communicating health topics to others" (11.54%), and "raising others' health awareness" (11.54%). Participants' collaboration from inside and outside the course to plan and implement the PHETE Ambassador pizza party was the most commonly described as a helpful critical incident. Participants also reported the top two "hinders": "starting from zero" (23.53%) and "administrative errors in list serve" (17.65%). In terms of "specific hinders", participants noted: "starting from zero" (20.00%), "unable to attend pre-established meetings" (20.00%), and "under time cons-traints"(20.00%). Through participants' sharing, not only do they see the importance of social media and technology, but they also concur that HL forms an important bridge between the education and health fields.

Key words: critical incident technique, experiential learning; health education; health literacy; social media

Introduction

Due to the technological advancements, many people have come to access and assess health-rela-ted information via technological and digital devi-ces [1-2]. For example, the Pew Research Center's Internet & American Life Project has been conduc-ting surveys about the social impact of the Internet, including its effect on health and health care since 2009 [3]. This social life of health information sur-vey reported that "80% of internet users look online for health information" in the U.S. [4, para. 2]. Ac-cording to the results of the Canadian Internet Use Survey, 70% of Canadians go online to search for health-related or medial information [5]. Recent re-search has also found a similar respondent rate, albeit at a much smaller scale survey. Wong and Cheung reported that 87.44% (1016/1162) of patients sought health-related information online in Hong Kong [6]. This increases significant health risks for people who lack knowledge and skills to comprehend health-re-lated messages, carry out health-related instructions, and make healthy decisions [7-8].

In the context of health education, health promoti-on, and health prevention, it is important for people to access the information, education, and care they need in a way that they can understand and make informed decisions. This connects to the notion of health litera-cy (HL), which is defined as one's "ability to access, comprehend, evaluate and communicate information as a way to promote, maintain and improve health in a variety of settings across the life-course" [9, p.11].

The Europe Union has added a new layer to the construct of health literacy and put forward that im-proving digital health literacy is a top priority [10]. This is evident in the draft 2019 WHO European roadmap for implementation of health literacy initia-tives through the life course. It provides five strate-gic directions to support health literacy development including increasing capacity building on health li-teracy, advancing development and implementation of health literacy initiatives, and improving digital health literacy [11]. Digital media is an umbrella, all-encompassing term covering anything that is digital or online. It is everywhere and conveys content using digital signals [12]. Social media is a subset of the

larger term digital media – and includes the channels where people socialize (e.g., Facebook, Twitter, Instagram, Blogs, etc.) [13]. It thrives on user-generated content, sharing and consuming (i.e., 2-way street). This research relied upon Levin-Zamir and Bertschi's definition of Media Health Literacy (MHL), which builds on the synthesis of health literacy and media literacy. MHL includes the following skills: 1) ability to identify health-related contents in various types of media; 2) recognize its influence on health behaviors; 3) critically analyze the content; and 4) express intentions through personal health behavior or advocacy [14]. As stated in the eHealth Action Plan 2012-2020 report, building digital/media health literacy capacity among citizens and allied health professionals is vital in the European Union and beyond [10]. This research was designed to explore important inter-related concepts and associated skill sets (i.e., HL, digital media, MHL, and social media) and their relationships for empowering students to actively engage in their own health and educating others to do so as future teachers in today's global and digitalized world.

Health Literacy and the Social Life of Health Information

Unfortunately, research has consistently shown that not only low HL level is a global public health issue faced by many countries [15-18], but it is also a problem in the U.S. [19]. For example, according to the US National Action Plan to Improving Health Literacy (NAP) milestone report, nine out of 10 American adults have difficulty accessing, comprehending, communicating and using health-related information [20]. Research has shown the top three factors determining levels of health literacy (ages 16-65) are literacy practices at home (reading), educational attainment, and family background [18].

To further illustrate, 30% of the U.S youth have not graduated from high school. This number has not changed much in 30 years [21]. What has changed is the shifting landscape and increasing health information demands that people are being exposed to every day. Information is everywhere, especially on the internet. With mobile access and daily use of social technologies related to health on the rise, coupled with large numbers of people having low levels of HL [22], social media and HL is everyone's concern. Health promotion is ultimately a social responsibility shared by all walks of life, including people who create and disseminate health contents via social media [23]. As mentioned in the Ottawa Charter, 'enable' is one of the three basic pre-requisites and strategies for health promotion, which focuses on "achieving equity in health". It is time for stakeholders (such as allied health professionals) to address obstacles that are experienced by citizens when accessing to health-related services.

Education for Health Literacy

Unfortunately, there is still a lack of awareness and understanding by many allied health professionals about the concept and importance of HL. There are common factors and rationales for not providing HL training to health profession students in higher education, including but not limited to an existing overloaded curricula, lack of time, and a lack of guidance and research based to help inform content, structure and effective teaching approaches [24-25].

The United States' National Action Plan to Improve Health Literacy consists of seven national goals to improve health in an interdisciplinary effort, including goal three – Incorporating standards-based early childhood through university education [26]. While this requires higher education institutions to reshape teacher education training programs [27], higher education institutions tend to be lacking behind for not adequately developing the necessary expertise among health-related professionals to address student, patient, and/or family literacy [28-29]. Teacher HL is just as important as student HL.

HL is an essential component for curricula revitalization and redevelopment. As noted in the recent 2018 systematic review, the HL training that does take place in health professions tends to occur in health disciplines such as nursing, medical, pharmacy education [30]. The potential for teacher training programs to lead improvements in HL has been under-emphasized in academic programs and research.

This research was a timely and relevant inquiry. In the U.S, the Michigan Department of Education announced a newly combined Physical and Health Education Teacher Education (PHETE) to form a K-12 dual major program, which has been in effect since the Fall of 2018 [31]. The eight-week Health Education course, called a Teaching Assistantship (TA) in Health Education is mandatory for each PHETE major, which was added and formalized to the PHETE program at a Michigan university. The health education experiential learning course was developed by the first author to meet the new program requirement. One of the student learning outcomes of this course was to help learners acquire the knowledge and skills to become a health-literate educator. To meet this outcome, learners were asked to utilize social media and technology to enrich their experiential learning journey. A snapshot is provided of the TA in health education experiential learning course in the methodology section.

In order to provide a bridge to guide future curriculum development and research in this area, Flanagan's Critical Incident Technique (CIT) was employed to help address the research questions concerning what helps and hinders students' health education, health promotion, and health prevention efforts through the lens of HL [32]. Specifically, two main research questions for this study were:

1) "What kinds of incidents (i.e., learning and/or teaching-related examples) help Physical and Health Education Teacher Education (PHETE) candidates in their promotion of HL through social media and technology during a course-based experiential learning opportunity in higher education?"

2) "What kinds of incidents (i.e., learning and/or teaching-related examples) hinder PHETE candidates in their promotion of HL through social media and technology during a course-based experiential learning opportunity in higher education?"

Methodology

Participants

Participant recruitment took place during the course orientation session at the start of Fall 2018 semester, following Institutional Review Board (IRB) approval from the participating academic institution. All participants were enrolled and required to complete the new required 8-week experiential course, entitled Teaching Assistantship in Health Education as part of their dual major in PHETE degree program.

Six pre-service physical and health education teachers were being recruited for the study (n=6). Demographic variables included: two females and four males; age ranged from 23 to 35; and ethnicity consisted of five Caucasian and one Black/African American. In order to reduce participants' self-inducing responses (i.e., responding to the way that they thought the course instructor would like to hear), our research team employed a faculty member who was not the course instructor to make an announcement following the recruitment script upon the completion of the orientation session.

The faculty member also distributed the informed consent form for each student. The consent form emphasized that students' participation is voluntary, and no consequence if students choose not to participate (e.g., no grade penalty). In other words, while it was part of the course requirement that all students participated in an exit interview in the form of semi-structured focus group, the faculty member made it clear to all students that they had opportunities to allow (or not to allow) the use of their individual data to be analyzed for research at any time. All enrolled students in the course provided consent, however.

Overview of the Course

TA in health education course-based experience

There were six key expectations or tasks for each student: 1) orientation; 2) PHETE ambassador web-form; 3) PHETE student spotlight interviews; 4) health education blogs; 5) evaluation, and 6) exit interview. Many learning tasks were related to soci-

al media platforms to support shared program goals and to enhance the profession via HL practice efforts. It was the responsibility of each student to use this opportunity to demonstrate ownership, commitment and innovation to successfully complete tasks via collegiality, professionalism, and leadership. 'Education for health literacy' was the crux of the curriculum design. It was intended to help students build important skills using their own campus community for learning and teaching efforts, and in turn, help prepare them for real-word K-12 educator school-community experience. The following guidelines were viewed as the minimal expectations for each student completing the Health Education course.

Orientation

A two-hour orientation session was held before the start of the semester to review the course expectations (e.g., collaboratively determine and set dates for bi-weekly check-in sessions), course learning outcomes, course learning activities and tasks (see Figure 1), and complete the consent form for the focus groups at the end of the experience. Presentations were provided by invited guest speakers from the College of Education and Human Development's College Director of Marketing and Communications and Web Content Specialist regarding social media policies and procedures in the College. The new PHETE College blog platform site was revealed along with steps to access it to create and post their blogs. We concluded with a student photoshoot and providing each student with a new PHETE Ambassador t-shirt. These six students were to be profiled and spotlighted by the College as inaugural PHETE Ambassadors for the College and university.

Individual PHETE ambassadors web form

Each candidate was asked to complete the web form prior to the orientation session. As "PHETE Ambassadors", the information was to be designed and used as the first students in the state to highlight diverse profiles, aspirations and goals in a dual-teacher certification program for health and physical education. The Student Spotlights were intended to help raise awareness of students' passions related to the dual program to meet their goals to fellow students, the community, and beyond.

PHETE student spotlight interviews (with new 2018 PHETE Cohort)

The PHETE Ambassadors were asked work together as a collaborative team to coordinate and gather information from every student in our new 2018 PHETE cohort. As the interviewee, they reached out via Facebook, email and other means to contact and conduct student interviews to gather the following information: 1) Q&As; 2) obtain one quote; 3) and one

Week	Expectations
Getting Started	• Orientation – Mon Aug. 27th (1:00-3:00pm) • DUE: PHETE Student Information web form (TAs) BEFORE Orientation (by Fri Aug 24th)
Week 1 (Sept 3)	• TA activities
Week 2 (Sept 10)	• TA activities • Group check-in with Instructor to discuss progress (meetings every 2 weeks); TA-led • DUE: 2 Draft Blogs for instructor review/peer-review during check-in
Week 3 (Sept 17)	• TA activities
Week 4 (Sept 24)	• TA activities • Group check-in with Instructor to discuss progress (meetings every 2 weeks); TA-led • DUE: 2 Draft Blogs for instructor review/peer-review during check-in
Week 5 (Oct 1)	• TA activities
Week 6 (Oct 8)	• TA activities • Group check-in with Instructor to discuss progress (meetings every 2 weeks); TA-led • DUE: 2 Draft Blogs for instructor review/peer-review during check-in
Week 7 (Oct 15)	• TA activities • DUE: Final Blogs for final instructor review • 1st PHETE Blog Launch
Week 8 (Oct 22)	• Individual candidate check-in and experience summary with Instructor to discuss individual performance/competencies/evaluation (DUE: TA Time Sheet & Evaluation Form) • DUE: PHETE Student Information word doc forms DUE (i.e., PHETE student interviews) • Scheduled TA Exit Interview (TA Focus Group) for TA in Health Education (date/time TBD)
* TA outline may be subject to instructor modification. Instructor will announce any modifications throughout the TA learning experience. Please check announcements regularly (e.g., email, eLearning, required check-ins).	

Figure 1. Weekly Expectations (Tentative Schedule)

photo from each PHETE student. This data was to be translated and populated into a user-friendly spotlights "I Want to Be a Physical & Health Educator Because..." for the new department webpage.

Health education blogs

In order to embed the concept of MHL in the course, each PHETE ambassador was invited to write and post a minimum of six diverse health education blogs. Translating health education via blogging is an important service learning tool and educational tool that helps students learn while educating others throughout their campus community [33]. Their blogs focused on why health education and health literacy matters. Great blog posts are "interesting, relevant, and informative." Students were reminded to think about the big picture related to health and wellness, which includes the eight dimensions of health/wellness (i.e., social/cultural, emotional, spiritual, environmental, occupational, intellectual, physical,

financial) [34]. The instructor of the course (first author) provided blog writing sessions, instructor feedback, and in-class peer-review checklists as part of this re-iterative process. However, each blog includes a disclaimer statement indicating that it is written from a student's perspective and the content in the post does not represent the views of the College and/or university.

Evaluation

Each student was required to submit a completed Log Time Sheet and Health Education Teaching Assistantship (TA) Self-Evaluation Form to the online assignment Dropbox on the university course learning management system (D2L) at the end of the 8-week learning experience. They were also asked to bring a hard copy of both forms with them to their last instructor check-in to individually discuss their learning and performance. The criteria for the TA Self-Evaluation Form was created and based on

Health Education Teacher Preparation Standards [35-36] and the roles and responsibilities for health education specialists, reflecting effective practice for health educators [37]. The form also includes a separate section for professional dispositions. Students are instructed to included comments and a concrete example(s) from their TA experience to describe performance and explain scale selections. Comments may address individual items or the standard as a whole. They reviewed their completed form with the Instructor. An example standard is provided below in Figure 2. The evaluation was designed to formulate final grade for each student and was not part of the data collection.

Exit interview

This TA 8-week journey culminated with a required exit interview (i.e.,

focus group) as the final expectation. The exit interview was approximately two hours. The PHE-TE ambassadors were asked about their involvement in the learning activities and the promotion of health literacy through social media and technology efforts (including, but not limited to those initiated and executed on their own). For example, they were asked to reflect upon:

- Examples that enhanced your health literacy
- Examples that enhanced the health literacy of others
- What helped your health education and health literacy efforts
- What hindered your health education and health literacy efforts
- Insights as a result of your TA in HE experience

Research Design

The CIT is a qualitative method with an established history and has been applied in many fields and relevant in the health sciences [32, 38-43]. Specifically, Flanagan developed the CIT to collect a series of descriptions of observed instances from participants and placed them into constructed categories, so that these instances could be tallied, followed by participants' narratives in order to help researchers comprehend about a specific outcome [32, 42].

Flanagan defined an incident as "any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act" [32, p. 327]. More specifically, a critical incident is defined as "one

Standard VIII — Communication and Advocacy	Proficient	Emerging	Undeveloped
Candidates communicate, promote and advocate for health education.	☐	☐	☐
A) Analyzes and responds to current and emerging factors and trends that impact current and future needs of individuals and societies	☐	☐	☐
B) Demonstrates professionalism when engaging stakeholders, partners, and peers	☐	☐	☐
C) Leads advocacy initiatives related to health	☐	☐	☐
D) Identifies additional current and emerging health issues requiring advocacy	☐	☐	☐
E) Promotes the health education profession by serving as a mentor to others beginning in the profession	☐	☐	☐
F) Uses effective verbal and non-verbal communication	☐	☐	☐
G) Uses effective written communication	☐	☐	☐
Comments			

*For each of the items, students used the following definitions to guide their ratings.

Proficient: The candidate has the knowledge and ability to perform this task with limited or no guidance.
Emerging: The candidate has basic knowledge of this concept, and would need guidance to complete the task.
Undeveloped: The candidate lacks basic knowledge of this concept and would need significant guidance to perform this task.

Figure 2. Excerpt from teaching assistantship in health education self-evaluation form

which must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects" [32, p. 327].

The first task was to determine the aim of the chosen activity to be studied. Our research interest was about HL, which is one's ability to "access, understand, evaluate and communicate information [which serves] as a way to promote, maintain and improve health in a variety of settings across the life-course" [9, p. 11]. The research aim should be simple and clearly stated, so we initially asked participants to describe incidents that they would come across during their experiential learning journey (i.e., "what would significantly help or hinder their efforts to promote HL through social media and technology?"). The respective definitions of "help" and/or "hinder" are: making a positive contribution in their learning process (i.e., it helps them adapt their health education, health promotion, and health prevention roles) and/ or making a negative contribution to their learning process (i.e., interactions/situations that will make adapting to their new roles more difficult).

The second task was to make concrete and specific plans for how the data should be collected. In this study, it was the learners who made the observations about their experiential learning journey. Specifically, the learners reported critical incidents that helped or hindered their experiential learning (such as learning challenges with respect to health education, health promotion, and health prevention).

Data Collection

In terms of data collection, Flanagan's approach centers on getting participants to describe the real-world critical incidents (i.e., examples and descriptions) and what helped or hindered leading to the result (i.e., outcome or consequence). A semi-structured focus group was adopted to tap into the aforementioned research questions, which took place at the end of the course. A semi-structured focus group interview was employed because paper-pencil inventories and questionnaires do not capture the rich contextual nuances of participants' experiences. It was also important to give these participants maximum freedom to articulate their thoughts, feelings, and behaviors, which was intended to further advance our understanding of the promotion of health literacy through social media and technology.

Analysis

It is important to acknowledge that because the CIT is descriptive and exploratory, sampling requirements are different than for quantitative research [32, 38-43]. The major purpose of a critical incident study is to provide the most complete coverage of the content domain derived from the participants. As the name Critical Incident Technique suggests, the focus is not so much on having a large sample size, than on having a sufficient number of critical incidents. There is no rule regarding the minimum number of critical incidents that researchers must have: it depends upon how complex the research aim is.

A general rule of thumb is to collect incidents until redundancy appears. One way of checking redundancy is to keep a running count of approximately every 100 incidents [32]. As far as "significance" or detectable differences are concerned, Flanagan argued that it depends on the nature of the study. As mentioned earlier, participants were asked to provide as many incidents as possible for each "helps" or "hinders" category of their experiential learning journey. This enabled exploration of these participants' underlying learning factors with respect to HL.

There are a number of ways to conceptualize and analyze the data. For example, Flanagan created categories [32, 42], whereas Neely and Iburg used the components of their chosen theory to pre-establish categories [43]. The research team members (n=2) independently reviewed the focus group transcripts and organized and coded all transcribed data into themes. In this study, initial themes were identified separately by each researcher and discussed at scheduled meetings. We then tallied thematic content of the transcripts through inductive reasoning. Thematic categories were generated and then were re-written and refined to enhance the meaningful presentation of the data. Before finalizing emerging categories, any disagreements were discussed and consensus was reached.

Results

We presented a comprehensive extract of participants' narratives. In total, six participants generated 52 critical incidents of specific help for their promotion of HL through social media and technology during a 8-week course-based experiential learning opportunity. The 52 critical incidents were summarized into 18 thematic categories (see Table 1).

Based on the participants' narratives, the topic three overall "helps" were: "writing health blogs" (13.46%), "communicating health topics to others" (11.54%) , and "raising others' health awareness" (11.54%). To illustrate the number one "help", one of the participants hoped to use blogs to share accurate information with others: "I wrote about how good deeds improve mental health. It's my favorite blog because I didn't realize that there was actual, backed by research, that one's mental health does improve by doing good for others. And I think that it is going to inspire the people who read it and choose to do some good in their community."

We then asked participants to identify specific critical incidents that were significantly helpful for them in their promotion of HL. The participants generated

Table 1. Incidents of "Helps" Reported by Respondents

	Frequent	Percentage
Writing health blogs	7	13.46%
Communicating health topics to others	6	11.54%
Raising others' health awareness	6	11.54%
Helpful faculty and staff	5	9.62%
Evolving identity: More than just TAs	4	7.69%
PHETE Ambassador pizza party initiative	4	7.69%
Learning organizational skill	3	5.77%
Course material	2	3.85%
Classmates' support	2	3.85%
Obtaining funding for initiatives	2	3.85%
Attending pre-planning and planning meetings	2	3.85%
Using different communication tools	2	3.85%
Being part of a community engagement team	2	3.85%
CDC Simply Put guide	1	1.92%
Eight (8) dimensions of health/wellness	1	1.92%
Learning managerial skills	1	1.92%
Peer review others' HL work	1	1.92%
Role model for others	1	1.92%
Total	52	100.00%

Note. Respondents were invited to come up with as many incidents as possible that would help illustrate their experience learning journey. Hence, the total would be greater than the sample size (n=6).

16 critical incidents which were summarized into 10 thematic categories, and "the PHETE Ambassador pizza party initiative" (18.75%) was the highlight of "specific helps" that respondents had identified (see Table 2). As one participant said, "I expected a health TA to be...like an assistant to a professor in a classroom. But I'm glad that we got this experience [referring to the PHETE Ambassador pizza party] because it gave me a better understanding of the whole school, whole child, whole community (WSCC) approach. Because we're not just teachers in the classroom, we're people that are trying to inspire health literacy in the whole community, not just in the classroom."

In addition to inviting participants to generate critical incidents of specific help, we also asked participants for critical incidents pertaining to factors that hindered them in their promotion of HL through

social media and technology. The six participants generated 17 critical incidents, which were summarized into nine themes, and the top two "hinders" were: "starting from zero" (23.53%), "administrative errors in list serve" (17.65%) (see Table 3).

We then asked participants to identify specific critical incidents that significantly hindered them in their promotion of HL through social media and technology during a course-based experiential learning opportunity. The 15 critical incidents were summarized into six thematic categories, and "starting from zero" (20.00%), "unable to attend pre-established meetings" (20.00%), and "under time constraints" (20.00%) were the highlight of "specific hinders" that participants had identified (see Table 4). To illustrate critical incidents that significantly hindered participants in their promotion of HL, one participant summed it up nicely: "Since we were the first group

Table 2. Incidents of "Specific Helps" Reported by Respondents

	Frequent	**Percentage**
PHETE Ambassador pizza party initiative	3	18.75%
Communicating health topics to others	2	12.50%
Flipping one's education: being the active agent	2	12.50%
Helpful faculty and staff	2	12.50%
Raising others' health awareness	2	12.50%
Cooperation	1	6.25%
Learning organizational skills	1	6.25%
New learning opportunities	1	6.25%
Working under time pressure	1	6.25%
Writing health blogs	1	6.25%
Total	16	100.00%

Note. Respondents were invited to come up with as many significant incidents as possible. Hence, the total would be greater than the sample size (n=6).

Table 3. Incidents of "Hinders" Reported by Respondents

	Frequent	**Percentage**
Starting from zero	4	23.53%
Administrative errors in list serve	3	17.65%
Low attendance	2	11.76%
Students unaware of the new program	2	11.76%
Under time constraints	2	11.76%
Finding right groups of students	1	5.88%
PHETE Ambassador pizza party initiative didn't go smoothly	1	5.88%
Not having information booth	1	5.88%
Uncertain about how things being unfolded	1	5.88%
Total	17	100.00%

Note. Respondents were invited to come up with as many significant incidents of "Hinders" as possible. Hence, the total would be greater than the sample size (n=6).

Table 4. Incidents of "Specific Hinders" Reported by Respondents

	Frequent	Percentage
Starting from zero	3	20.00%
Unable to attend pre-established meetings at times	3	20.00%
Under time constraints	3	20.00%
Class visits	2	13.33%
More presentation time is needed	2	13.33%
Better preparation and planning is needed	2	13.33%
Total	15	100.00%

Note. Respondents were invited to come up with as many significant incidents of "Hinders" as possible. Hence, the total would be greater than the sample size (n=6).

of ambassadors, we didn't necessarily know a whole lot. The next year's ambassadors will have a lot more information than we did. They will have a better understanding of what is expected in terms of implementing health literacy than we did."

Discussion

Social Media and Technology

The adoption of social media and technology was embedded as instructional strategies in the dual K-12 major (PHETE) program. As reported in the result section, the number one "help" derived from the participants was "writing health blogs" (13.46%). Participants recognized that inaccurate information is everywhere, especially on the Internet. In this course, we encouraged participants to put efforts in correcting the wrong. To achieve this, we embedded MHL in our curriculum design. For example, students were asked to identify health-related contents in various types of media (ranging from traditional news outlets through Facebook to YouTube) in order to find and write something that they were passionate. This connects to one component of MHL — "expressing intentions through personal health behavior or advocacy" [14]. The type of blogs that participants had come to create ranged from social wellness to environmental health. Our thinking behind this is supported by the literature on engagement which has been shown to be "a highly desirable goal with positive outcomes for all parties [involved]" [44, p. 354] Redmond, Abawi, Brown, Henderson, and Heffernan furthered supported that "student engagement is...an important benchmark and indicator of the quality of the student experience for higher education" [45, p. 183].

More specifically, "writing health blogs" assisted participants in integrating health literacy into their upcoming health-related roles as K-12 teachers. "Writing health blogs" provides participants with the opportunity to explore health literacy domains (i.e., access, comprehend, evaluate, communication) and apply learned skills in the Health Education course and promising practices into health promotion work in a K-12 setting. The process of "writing health blogs" has allowed participants to better understand how social media and technology can be an asset in their future work to address obstacles that are experienced by students when accessing to health-related information and services.

Participants further acknowledged that they have learned that health education, health promotion, and health literacy matter. Specifically, health literacy is the use of a wide range of skills that improve the ability of people to act on information in order to live healthier lives. This connects to an aspect of MHL which recognizes its influence on health behaviors [14]. One participant punctuated this point: "I remember when we went over J's blog about intermittent fasting, I had no idea about any of that. So that's one example that just comes to mind. Reading people's blogs about health topics that are in plain language while they have some sort of backing from research really helps." For optimal health, it is important for all of people to get the information that they need in a way in which they can understand and can use [9, 15].

The results of our study suggest that there are benefits of embedding social media and technology in curricula for our pre-service teachers. As one participant eloquently summarized the goal of the curriculum and this research: "I just feel like as future physical and health educators we're going to be leaders in our community and in our school districts. And we're going to be looked up to. And I feel like this whole program, including health literacy, really helped with that, just gaining the confidence to be a leader." Participants recognized that HL skills are important now

more than ever.

We have also found support from WHO. The need and benefits of including health literacy in schools have been highlighted in a recent 2016 WHO policy brief on investing in school health literacy [46]. This WHO policy brief highlights what we know about the several co-benefits of the delivery of health literacy practices and interventions to children, youth, families, and staff via schools. This includes 'education for health literacy', which includes a range of actions and activities, where are critical to help build knowledge and skills around issues of health and wellness in schools on any campus [46]. In the end, teaching HL to students in grades K-12 and beyond can improve the health literacy of future generations.

Health Literacy and Events

Another important finding garnered from our thematic analysis is that the participants most commonly regarded the "PHETE Ambassador pizza party" initiative as the highlight of "specific help". The pizza party was intended to be a space where participants raised students' awareness of health education, health promotion, and health literacy on campus. They intended to expand the awareness and reach to students about health and wellness resources on campus and in the local community (e.g., mental health supports, counselling services, writing center, health services, disability services, etc.). One participant used the pizza party as a stepping stone to anticipate how to plan events in the future which might not always go smoothly: "I think this whole experience, like the whole pizza party, and everything, is just like a glimpse of what's going to happen when we start working in a school district. It just shows that not everything goes as planned as a teacher." Participants recognized that the "PHETE Ambassador pizza party" provided an opportunity to apply learned skills and strategies to develop and deliver a health activity or initiative. This allowed participants to identify challenges in their efforts to promote health literacy while identifying potential health-related collaborators and supports.

All students were appreciative of the faculty's and staff's support for the pre-planning process and the actual implementation of the pizza party. For example, participants noted that the planning for the pizza party initiative included the need of working out logistics (e.g., sought funding, room booking, etc.) as well as working as a team to identity objectives and action outcomes for the initiative. Not only did this first-hand on experience help increase participants' commitment to the promotion of HL, but it also shaped their identity as an active agent to be a health literacy ambassador. Being an active agent in the promotion of HL goes beyond the classroom.

This is an important finding because, from an instructional standpoint, the planning process is meant to help participants to learn that there are key components of a planning process, which will typically include organizing a health initiative around content or theme; identifying prescribed and desired national standards; generating specific learning and action outcomes; coordinating with community resources and efforts, school services and environments; developing best practice and evidence based learning activities to meet the desired outcomes; finding ways to challenge students; and evaluating outcomes appropriately.

Senge explained that "systems thinking is a discipline for seeing wholes. It is a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static 'snapshots'" [47, p. 53]. In order to help participants see the whole as opposed to individual parts of health education, health promotion, and healthy literacy, the "PHETE Ambassador pizza party" helped convey the importance of instructional design and action outcomes, which go beyond the classroom learning environment.

Limitations

This study recognized the small sample size. In order to enhance the analysis, the CIT was used to help generate valuable qualitative data. Furthermore, the CIT allows for very specific information to be collected while still allowing for free-flowing dialogue. As we embarked on this research study, we wanted to solicit details and meaning at a deep individual learner level for which the quantitative approach is not designed. Another limitation may be whether the critical incidents were in fact critical. In this case the honesty of respondents' narratives were relied upon. We wholehearted believed that becoming reflective health-literate educators and practitioners is an important part in this research.

Conclusion

Through participants' sharing, not only do they see the importance of social media and technology in the eight-week Health Education course, but they also concur that HL forms an important bridge between the education and health fields. As we have seen, changes have been made to state curricula in K-12 schools over the years and as a result, state teacher preparation standards have also been revised. Regardless the of K-12 curricular changes, one thing for certain is that the education system plays an integral part for enhancing students' health literacy. Specifically, the role of schools is critical for developing students' health literacy starting at a young age. We strongly believe that higher education can play a key role in strengthening K-12 teachers' knowledge of HL through social media and technology.

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Sandra Vamos, EdD (Lead and Corresponding Author), Associate Professor, School of Interdisciplinary Health Programs, College of Health and Human Services, Western Michigan University, sandra.vamos@wmich.edu.

Paul Yeung, PhD, Adjunct Professor, Faculty of Education, Simon Fraser University, pauly@sfu.ca.