W I S D O M

1(21), 2022

SOCIAL PHILOSOPHY, PHILOSOPHY OF EDUCATION

Nattapon MEEKAEW

PRE-SERVICE TEACHER'S INTELLECTUAL VIRTUES AND ONLINE INFORMATION LITERACY

Abstract

Intellectual virtues and online information literacy are critical issues in education. This has a significant impact on the development of pre-service teachers' learning skills, as they will play an important role in transferring knowledge to students in the future. This article investigates the relationship between intellectual virtues and information literacy among pre-service teachers on an online platform. To collect qualitative data, in-depth interviews and focus group discussions were used. Thirty pre-service teachers from three universities in northeastern Thailand served as key informants. The philosophical analysis was used to analyze the data, along with phenomenological analysis. The results looked into the intellectual virtues that pre-service teachers needed to improve their learning skills. Curiosity played a role in encouraging pre-service teachers to improve their critical thinking skills when dealing with online information. Furthermore, intellectual thoroughness and intellectual attentiveness were helpful for pre-service teachers to improve information literacy skills. Improving pre-service teachers' information literacy through various instructional approaches was beneficial in allowing them to make rational choices when accessing online information. The article suggests higher education institutes providing more instructional practices to pre-service teachers to boost their critical thinking skills and information literacy on an online platform.

Keywords: critical thinking, information literacy, intellectual virtues, online, pre-service teachers.

Introduction

Information literacy was a relatively new concept in the field of library science (Borko, 1986; Froehlich, 1989). The concept was further developed to meet the interdisciplinary research that has taken more prominence in modern academics so that it can be viewed and applied alongside other academic disciplines such as sociology, philosophy, and education (Swanson, 2006; Budd, 1995; Fallis, 2000, 2002, 2008; Tollefsen, 2009; Floridi, 2002). Many interdisciplinary studies have used information literacy to address current social phenomena, particularly topics relating to individuals' access to information sources. As a result, it is necessary to clarify information literacy to understand and be aware of information access from various sources.

Online information is increasingly becoming a part of people's daily lives. It is possible to say that the majority of daily activities rely on online information. For example, searching for a travel route, daily news, or even communicating with friends via e-mail or social networks. All of these factors contribute to the acquisition or transmission of information from us to recipients via the Internet (Fuchs, 2007). The Internet is a tool that allows people to obtain information from a variety of sources, such as the Google search engine, Wikipedia, and a variety of other websites. However, there is a wealth of information on the internet that contains both true and false information. Individuals should have some means of validating and evaluating the trustworthiness of online information from websites (Sample, 2020). These abilities are regarded as informa-

tion literacy, which individuals should possess at this time.

Individuals should be literate in online information. Online information literacy has three fundamental components: 1) online information literacy is the acquisition of skills in the "age of information," 2) online information literacy is the cultivation of a good habit, and 3) online information literacy is a component of information-rich social practices. These three aspects bring a clear consistency between online information literacy and the formal and informal contexts in which people use and develop their own information knowledge (Addison & Meyers, 2013).

Human behaviour has been dramatically altered by technological advances in the twenty-first century. Human activities are influenced by the internet and information technology. The existence of the internet and information technology is known to the majority of the world's countries. Thailand, for example, has included a digital information technology development guideline in its National Strategic Plan (Wongkitrungruang, 2018) to capitalize on digital technology. Digital technology has been used to help the country's socioeconomic development, including education. In education, digital technology is used to provide equal access to all educational stakeholders, such as students, teachers, and other educational supporters. To carry out educational activities effectively, all educational stakeholders must improve their knowledge and skills in digital technology, as well as understand the effects of technology usage on education. Pre-service teachers are among those educational stakeholders who require strong information literacy skills.

This study focuses on pre-service teachers, who are senior college students who will be full-time teachers after graduation. Students who have received information literacy training are better able to deal with the rapid changes in educational technology. It is yet another way for them to develop digital citizenship skills so that they can effectively provide learning materials

and learning outcomes to students. Some studies, such as Heersmink (2018), highlighted the importance of information literacy instruction and curricula for students in schools and universities. Learners at all levels should be literate in information by incorporating "intellectual virtues" as a tool in the learning process (Heersmink, 2018)

The virtue of responsibility is an important point raised in the article. This method stems from an individual's desire to learn something specific. This manner is not innate, but it is trainable and can lead to cognitive knowledge about information literacy skills (Heersmink, 2016, 2018). The virtue of responsibility is analogized to the eagerness or desire to continue studying regardless of whether the information received is correct or not. The purpose of this article is to answer the research question, "How do intellectual virtues improve online information literacy among pre-service teachers?" The study's implications include good instructional practices that improve online information literacy skills among pre-service teachers in higher education.

Identifying Issues with Online Information Literacy

Online information literacy is a valuable skill that enables students to actively search, interpret, comprehend, and evaluate information sources. However, improving students' online information literacy is a challenge for educators since there are limitations that obstruct improvement. Several studies have revealed limitations in improving online information literacy, particularly higher education students. It is critical for students to understand and be aware of how the internet links to the information patterns they receive (Lynch, 2016; Harkins, Rodrigues, & Orlov, 2011). The absence of critical thinking about online information resources is part of the problem with online information literacy (Allen, 2008). Many students make extensive use of online search engines, but many of them prefer to focus on the information that appears at the

top of the screen and opt to utilize it without questioning the source's legitimacy (Westerwick, 2013). Additionally, a lack of abilities in judging the reliability of online information is attributed in part to limits in teaching online information literacy, as well as a lack of knowledge of information's trustworthiness (Fernandez-Ramos, 2019).

Furthermore, diverse variables, such as instructions, and supportive learning resources like libraries, should be used to improve students' information literacy abilities (Varlejs & Stec, 2014). Several studies have highlighted the value of supportive learning resources that help learners acquire their online information literacy abilities (Williams & Evans, 2008; Johnston & Webber, 2003). However, some studies urge that the supporting learning resources have limits in terms of improving students' information literacy. In offering information literacy abilities to students, certain learning resources exhibit fewer linkages with teachers (Varlejs & Stec, 2014). For example, increasing the usage of online information on websites makes it simpler for students to obtain information, and they are more likely to trust the information without questioning it. Students look for information on Wikipedia, but the difficulty is that they are unable to assess the trustworthiness of online content on Wikipedia (Brailas, 2021).

There have been studies on online information literacy for Thai higher education students. Many students are unaware of the significance of information literacy in the digital age. Previously, the development of students' information literacy tended to focus on technical rather than cognitive knowledge, such as procedures for selecting information sources, accessing information, searching, and producing academic reports (Tuamsuk, 2013). Despite the fact that these strategies improve students' information literacy, they are nonetheless unaware of the information they are accessing. Furthermore, according to other surveys, many Thai universities make information literacy a priority for stu-

dents. However, some universities still do not require it, resulting in students with lower information literacy skills at those institutions (Tuamsuk & Subramaniam, 2017). However, there are now attempts in educational management to improve information literacy skills, but numerous supportive mechanisms are still needed to improve students' awareness. Therefore, the focus of this research paper is on the study of online information literacy based on intellectual virtues, with the goal of developing a guideline for enhancing students' information literacy.

The Connection Between Intellectual Virtue and Information Literacy

The concepts of Intellectual Virtue (Baehr, 2015; Fallis, 2002) and information literacy (Welsh & Wright, 2010) are widely recognized in the modern academic realm. In Baehr's "Cultivating Good Minds" (2015), intellectual virtues are divided into three categories, each with three components.

Intellectual virtues for basic learning

Individual curiosity contributes to expanding the boundaries of knowledge. The key feature of curiosity is that people have an internal motivation to learn new things. As a result, people who possess this virtue are constantly inquisitive about everything around them. Curiosity, it can be said, is the true source of inspiration that exists within individuals (Watson, 2018a).

Intellectual autonomy can be defined as the freedom, willpower, or ability to think for oneself. Individuals with intellectual autonomy would be able to think for themselves. They have the ability to think and learn on their own. When confronted with an argument between existing beliefs and newly acquired beliefs, they would not immediately switch to a new belief. They would take their time to carefully consider their options before making a decision. It does not imply that they are obstinate, but rather that they have appropriate cognitive skills and accept reality (Baehr, 2015).

Intellectual humility is the recognition and acceptance of one's cognitive limitations, weaknesses, and errors. The individual is always aware of the need to improve and supplement what he lacks. They can effectively improve themselves if they are aware of their own limitations and the areas in which they need to grow. As a result, intellectual humility is another factor that allows people to gain proper knowledge (Snow, 2018).

Intellectual virtues for a proper learning process

Intellectual attentiveness: those who are attentive and committed to what they are doing will understand what they are doing, whether speaking, writing, or reading. Curiosity will be encouraged and implemented in any circumstance if they have enough attention (Baehr, 2015).

Intellectual carefulness is a critical virtue for individuals. It assists people in avoiding mistakes, misunderstandings, false beliefs, and ignorance. Individuals require this virtue when acquiring knowledge. Individuals would be able to consider the information before passing judgment if they were cautious. This is to avoid accepting false beliefs (Baehr, 2015).

Intellectual thoroughness: individuals with intellectual thoroughness are always eager to delve deeply into a variety of topics. As a result, they are often dissatisfied with issues that are neither profound nor ambiguous. This creates a strong determination to think deeply about a specific idea or issue until it can be grasped or understood seriously (Baehr, 2015).

Intellectual virtues for overcoming learning limitations

Open-mindedness is critical to being open-minded. For example, we have a set of traditional beliefs, but new explanations for those beliefs appear to be more accurate or well-grounded. This virtue will enable us to think about and accept new explanations. This is extremely beneficial to individuals because it will serve as a guideline for developing a new set of knowledge. This is not to say that people should not have strong beliefs, but they should be able to reconsider them with new perspectives. This allows us to see our knowledge's strengths and weaknesses. Therefore, when there is a new or better explanation for an old belief, we will be able to decide whether or not to accept it (Riggs, 2015).

Intellectual courage is required to instil confidence and transfer true knowledge, but this has always been fraught with difficulties. For example, Galileo's presentation of Dialogue Concerning the Two Chief World Systems caused him to resonate with the Christian perspective (Baehr, 2015).

Intellectual tenacity: persistence or perseverance are terms used to describe intellectual tenacity. Individuals with intellectual tenacity will not easily give up if they do not understand something. They will not give up if they do not seek knowledge. They continue to work toward their objectives to clarify knowledge. Normally, if someone is curious about something that has stuck with them, they will search until they have a clear understanding of it (Baehr, 2015).

According to the intellectual virtues mentioned above, it is useful as a starting point for learning about the information on the Internet. We must not only make simple judgments about the information we obtain from the internet, but we must also use these intellectual virtues to allow us to clarify in online information until a decision to believe is made (Watson, 2018b).

Information Literacy

Information literacy is a set of skills that a person uses when seeking information. It is the capacity to effectively locate, assess, and apply information. Information literacy is also a crucial basis for lifelong learning, and it is a skill set that is applicable to people from many disciplines, learning contexts, and educational levels (Welsh & Wright, 2010). Information literacy is concerned with personal characteristics such as being aware of the need for information, understanding that accurate and complete information

is the foundation for making informed decisions, organizing data for practical use, and combining new information with existing knowledge. In other words, information literacy refers to the ability to formulate research questions, evaluate results and abilities, and access various sorts of information to meet an individual's demand for information (Lenox & Walker, 1993; Webber & Johnston, 2000).

When addressing the concept of information literacy, library and information science experts say that the usage of information is a crucial aspect of both informal and formal learning. The basic concept is that people can recognize when they require information. They can recognize, point to, evaluate, and apply information to solve difficulties in their daily lives. Therefore, learners must be able to access a number of tools and resources, as well as extract and carefully pick information from a variety of sources. They require reasonable knowledge to make judgments across several dimensions. Furthermore, the emphasis of information literacy teaching is on raising awareness of the quality, authenticity, and reliability of information (Kulab, 2020).

International organizations such as UNESCO (Moeller, Joseph, Lau, & Carbo, 2011; Catts & Lau, 2008) has recently adopted information literacy indicators. The acquisition of information, information evaluation, information ethics, information innovation, information requirements, information communication, information awareness, information use, and information management are all components of information literacy (Zhu, Wu, Shi, & Yu, 2017).

Zhu, S., Wu, D., Shi, Y. H., and Yu, L. Q. (2017) discuss four main difficulties based on this definition: 1) Awareness and cognition; information-literate persons can perceive the need for information and decide the kind and quantity of essential information. 2) Scientific knowledge, like how knowledge interacts with fundamental information systems. According to Bruce (1995), information literate persons understand the structure of information and how to access formal information networks. 3) Creativity and application, such as the capacity to engage with data. And 4) ethics and legality, such as information-use operational principles.

In summary, definitions of four key issues of information literacy are addressed as follows:

1. awareness and cognition refer to an individual's perception of information, such as correctly understanding and interpreting information;

2. scientific knowledge refers to expertise in information theory, methods, and principles of information technology tools;

3. application and innovation refer to the ability to think critically, interact with information, and use the information to create knowledge; and

4. ethics and law refer to how to access and use information.

This article applies these definitions to formulate a conceptual research framework to find which intellectual virtues pre-service teachers need to cope with online information literacy.

Methodology

This article investigated the intellectual virtues of pre-service teachers by employing philosophical analysis and together with phenomenological analysis. The key informants of the study were pre-service teachers in higher education, 30 pre-service teachers in total. Pre-service teachers were selected by purposive sampling. They were senior students who were on internships at schools.

The qualitative data was gathered from three different sources: 1) documentation reviews, 2) in-depth interviews, and 3) focus group discussions. Data collection began with a study of documentation on intellectual virtues, online information literacy, and pre-service teachers' attitudes on online information literacy. Academic publications, books, and other forms of documentation were used to conduct documentation reviews. Data from documentation reviews were

used to undertake in-depth interviews with pre-service teachers in order to determine which virtues were effective for improving online information literacy among instructors and students in the local education context.

The findings from the in-depth interviews were then shared in a focus group discussion with the selected pre-service teachers in order to corroborate the findings and provide recommendations for improving online information literacy. The acquired data were triangulated and analyzed using philosophical analysis along with phenomenological analysis.

Results

Intellectual virtues and the comprehension of online information

To shape pre-service teachers into ones who are literate in many types of online information, intellectual virtue is required to improve their ability to interpret and understand information. Curiosity is an essential virtue for pre-service teachers to create awareness of online information. Zagzebski (1996), a virtue epistemologist, argues that a curious person is driven to ask questions about what they have seen, heard, or read. What types of questions, on the other hand, will elicit curiosity? Answers should be queries prompted by the questioner's suspicion. The questioner, for example, is unsure if the information obtained is comparable with other facts or evidence. This questioner's attribute is advantageous to them since it allows them to double-check the information they have received (Watson, 2015).

Pre-service teachers frequently struggle with asking questions regarding the information they are received. According to some evidence, pre-service teachers in higher education rarely raise questions about the information they are provided. They have a tendency to assume that information found on websites is reliable. This is a learning behaviour that interferes with their ability to learn in class. However, when they ob-

tained information from the website, they only asked a few questions. It is intriguing to speculate as to why they fail to check or fully comprehend information before opting to use it. Some students, on the other hand, choose to bring online information to debate with their classmates outside the classroom. This demonstrates that collaborative thinking is still useful in the learning process, and it generates more questions than learning from specific information alone.

Questioning is an essential part of interpreting the information. Before interpreting the information, individuals must first question the source of information and then start searching for alternative sources to obtain reliable information. Once more information is sought, the information must be organized for the information to be interpreted and understood. For example, students discuss historical topics in social studies class. Their primary responsibility is to search for the information they have been given. Initially, they prefer to just investigate the information to share it and trust it. Nevertheless, it was later discovered that this information did not lead to any queries. So, they were persuaded to bring that information to discuss rather than just present it. Our students have become more sceptical in information as a result of this instructional style. They will constantly evaluate the information and think about it thoroughly. That knowledge will not make them believe it right away. This method also leads to democratic information exchange.

A crucial strategy to knowledge building and information literacy is to encourage students to ask questions. The deliberation will help assess the reliability of information more efficiently. The deliberation encourages pre-service teachers to have thinking habits, including critical thinking. Students can successfully exchange information with classmates both within and outside the classroom through collaborative dialogues. In addition, considering the information together promotes the acquisition of accurate knowledge of the information rather than considering it

alone (Hanson & Howe, 2011). Deliberation of information will assist pre-service teachers in making the best option when it comes to trusting information since it is a process that involves a variety of processes. It's a process of integrating information and extending arguments (Landemore, 2012; Min & Wong, 2018). Individuals are encouraged to ask questions and scrutinize others as a result of this deliberation. Furthermore, it is obvious that questioning and deliberation serve as tools for information interpretation since information interpretation must begin with questions and doubts.

After pre-service teachers have sparked their curiosity through questioning, they should look for more clear answers after class discussion. Attentiveness and thoroughness are key cognitive traits in finding answers (Baehr, 2015). Both attributes play a crucial role in knowledge retrieval since seeking information based on classroom recommendations requires concentration. Besides attentiveness, pre-service teachers should be intellectually thorough. They must be attentive to identifying the information when searching for it, which takes time to find the truth. One option is to instruct students on how to make comparisons of data. Pre-service teachers who perform extensive study about which they are interested are usually better at online information literacy than those who do minimal study. Pre-service teachers, for example, will use information from the website to supplement their lessons. By reviewing more practised comparing information, they must educate themselves to be more intellectually thorough. It can be shown that thorough attention to obtaining information can assist pre-service teachers in obtaining the correct information rather than the incorrect information. It's also a reaction to knowledge gleaned from reliable sources (Tatum, 2021).

It can be concluded that having the ability to interpret and understand information, pre-service teachers need three virtues which are curiosity, attentiveness, and thoroughness. These elements enable them to investigate information they have obtained on their own. Curiosity is an effective element for pre-service teachers to seek further information to check the trustworthiness of the information, as well as to carefully examine the information. Pre-service teachers employ deliberation to reach a consensus on the credibility of the material. It also encourages pre-service teachers to be receptive to different points of view. It reminds them not to trust anything unless you can prove it. The intellectual virtues enable pre-service teachers to self-examine the information they acquire by challenging it.

Levels of critical thinking and its implication in pre-service teachers' instruction

Critical thinking skills are essential for pre-service teachers and students in various fields. Critical thinking enables students to comprehend, interpret, and be aware of the facts contained in online information. Due to the large amount of online information available on the Internet, students who lack critical thinking abilities find it difficult to determine the reliability of the information. Curiosity and thoroughness are thus crucial components in comprehending and interpreting online information. Critical thinking is investigated via learning behaviour, according to Bloom's Taxonomy (1956). Pre-service teachers are able to perceive a wide range of information online, and they are able to thoroughly classify and comprehend the body of knowledge that is reflected in the perception of various information on social media such as Facebook, Twitter, Wikipedia, and others. They can utilize the knowledge they've gathered to discuss and share their thoughts with others once they've processed it. In universities, this cognition is practised via instruction. Students at the faculty of educational sciences can learn a range of teaching approaches. This enables the process of developing critical thinking to be applied in a number of circumstances. This point is considered an advantage for pre-service teachers over students from other faculties. For example, developing critical thinking through phenomenology-based learning or problem-

based learning. These teaching methods engage pre-service teachers in analyzing, arguing, and solving problems that result in effective learning outcomes. However, the development of higher levels of critical thinking, particularly abilities in information synthesis and evaluation, remains a concern among them. Several challenges, such as diverse curriculum structures at each university, restricted access to learning materials, or teachers' capacity to convey information, impeded the development of these learning practices. As a consequence, higher education institutions should focus on strengthening students' critical thinking skills in order to boost their ability to accurately determine the reliability of online information.

Discussion in topics above exhibits the function of intellectual virtues to deal with online information. Intellectual virtues are used to create pre-service teachers' ability to literate online information, which is critical thinking skills. Therefore, critical thinking should be raised as an essential cognitive attribute for pre-service teachers to examine online information, particularly scientific or other social science data, which is vital for giving teaching to kids in schools (Santos, 2017). The learning process to improve pre-service teachers' online information literacy is implemented in educational institutions in various ways: however, prioritising the way that leads to the same goal – to let students learn, access, explore, and evaluate online information. To complete all the learning phases, these processes need intellectual virtues to motivate pre-service teachers to gather knowledge, which eventually contributes to strong information literacy skills. Improving information literacy skills requires comprehension of the online information obtained. For example, when people acquire information from a free online source like Wikipedia, they should not immediately trust it but rather carefully consider it. This is an important process that leads to people becoming information-literate.

Conclusion and Discussion

Curiosity is a key starting point for developing pre-service teachers' online information literacy skills. Curiosity encourages them to inquire about something. Curiosity is a motivator for them to think that the information they get is incorrect or not. As a result, it may be better to make an attempt to continue searching for more information. Because we cannot immediately trust the knowledge we receive, our curiosity drives us to intellectual humility. These features motivate us to engage in a learning process to develop our information literacy skills.

The main aspect that has to be acknowledged is that online information is not something that should be denied instantly. Carr (2011) and Greenfield (2014) argue that the use of technical tools to obtain information on the Internet, such as searching for news and encyclopedias, has had an impact on people's biological memory. This argument is unfavourable because it implies that the internet user has less knowledge and makes fewer attempts to get information. However, according to this study, internet users are not individuals with limited information. They only require a few tools to collect and organize a large amount of information. One of the skills that requires intellectual virtue is online information literacy. Heersmink (2018) explained that, while using the internet to access information allows us to retain less information in our biological memory, such applications allow us to access a large amount of information in a broad range of locations, providing dependable and efficient access to information. If online information users utilize it wisely and adopt an epistemological approach, it appears to have an advantage over information rather than a negative (Heersmink, 2018).

In conclusion, this article argues that using the Internet to seek for information is not always incorrect. It is activated if the users have strong intellectual virtues and critical thinking skills.

The good virtues contribute to increased critical thinking, which is essential for pre-service teachers who need to practice selecting online information sources. We are all aware that pre-service teachers are those who are prepared to become teachers in schools, despite the fact that there are tons of learning resources available on the internet. Therefore, online information literacy may be a key skill for them in order to select the relevant learning material and utilize it to appropriately train students in the future.

Acknowledgement

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