Information Literacy of Teachers – Why Does It Matter?

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Abstract

We live in the information age. Today, we no longer face challenges in acquiring information; rather, we are confronted with so much information that we struggle to navigate it effectively. Critical evaluation, verification, and creation of information are among the key competencies of the 21st century. A fundamental prerequisite for the development of a learning society is an individual's ability to continually educate themselves. The rapid increase in information, particularly in the online (digital) space, the growing number of sources, and the expansion of information and communication technologies place higher demands on individuals' competencies in educational processes, professional performance, and personal lives. This article examines the information literacy of teachers at various levels of the education system.

Keywords: Information Literacy, Digital Literacy, Critical Thinking, Competencies, Education

1 Introduction

We live in the information age. Nowadays, accessing information is no longer a challenge; rather, we face an abundance of information, making it difficult to navigate and assess. Critical

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evaluation, verification, and creation of information have become essential competencies of the 21st century. A key prerequisite for the development of a learning society is an individual's ability to continuously educate themselves. The quantities of information, particularly in the digital space, the increasing number of sources, and the expansion of information and communication technologies demand higher competencies in educational processes, professional performance as well as private life (Benyak, 2015; Pankevič, 2023).

The term *information literacy* first emerged in 1974 when Paul G. Zurkowski, then-president of the American Information Industry Association, used the term 'information literates' to describe people capable of effectively utilizing information resources in their work. Thus, information literates are individuals capable of solving problems by working with a wide range of informational techniques and sources (Webber & Johnston, 2017; Hrdináková & Fázik, 2021; Pankevič, 2023). There are numerous other definitions of information literacy. Authors most often define it as a set of human competencies necessary for effectively searching for, evaluating, and using information and information sources to fulfil an informational need or solve a specific problem. The ethical use of information in society is always emphasized in this context.

Defining information literacy is not an easy task. The challenge of defining it reflects the fact that the concept of information literacy is extensive, with partial research and theoretical approaches often addressing only specific contextual factors. Moreover, it is challenging to establish a precise definition because the term (as well as the phenomenon itself) is dynamic and constantly evolving (Hrdináková & Fázik, 2021). Information literacy also has clear intersections with other competency areas, such as reading literacy, technological and digital literacy, computer literacy, internet literacy, cultural literacy, data literacy, critical thinking, and others. For this reason, some authors (e.g., Shapiro & Hughes, 1996) consider it an art.

When defining information literacy, the concept is often based on functional literacy, understood as the ability to actively participate in the world of information (Pankevič, 2023). Functional literacy includes the following areas:

- Literary and reading literacy – the ability to understand perused text and extract needed information from it.
- Document literacy – the ability to utilize specific information sources, differentiate between them, and evaluate their informational value.
- Computer and technological literacy – the ability to use current information and communication technologies to access information.
- Global literacy – the ability to understand various cultures, their interconnectedness, cooperation, and changes in the (informational) world.
- Media literacy – the ability to distinguish and use various information sources to acquire needed information; it also represents an individual's growing capacity to produce and distribute content in various forms. It includes the ability

to communicate effectively with print and electronic media to comprehend, analyse, and evaluate transmitted messages (Levine-Clark & Carter, 2013).

- Internet and digital literacy – the ability to use the internet and online platforms for searching, organizing, evaluating, and communicating information in different digital formats; it includes the ability to understand and use information from various digital sources presented via information and communication technologies (Hrdináková & Fázik, 2021).

Digital literacy is considered to be a subset of information literacy applied to the digital environment. Nowadays, digital literacy is becoming an essential competency for everyone who participates in societal life in any form. The digital space serves as the primary environment where individuals encounter hoaxes, unsubstantiated claims, and tools often exploited in hybrid warfare. With the rise of artificial intelligence and deep-fake constructs, digital literacy can be seen as a critical tool for survival in the modern world.

2 Information Literacy and Critical Thinking

Information literacy, in all its forms and manifestations, is inextricably linked to critical thinking. According to Guilford (1967, 1986), critical thinking is essential for effective information processing, as it encompasses the abilities of evaluation, analysis, and decision-making. Critical thinking is also vital for differentiating the quality of information. Nowadays, the ability to think critically is one of the most sought-after skills in the labour market. Despite being globally recognized as an essential competency, its development is significantly underestimated in the Slovak education system, despite long-standing calls for its prioritization (Kosturková & Ferencová, 2018). Yet, the development of critical thinking can also be supported through the enhancement of reading literacy. Reading teaches individuals to focus on one subject for aa longer time period and actively engage with a text at their own pace (Markoš, 2019).

There are many definitions of critical thinking (Kosturková, 2016). According to several authors, it is a complex phenomenon that encompasses several abilities and skills. For example, Paul (1992) offers a model of 35 components of critical thinking, which he also translated into teaching strategies (9 affective, 16 cognitive macro-skills, and 9 cognitive micro-skills). According to Ruisel (2008), critical thinking is synonymous with high-quality or comprehensible thinking, involving motivation for difficulty, knowledge about the skills of critical thinking, training of structures to facilitate transfer between contexts, and metacognitive monitoring.

Critical thinking is closely related to unfounded beliefs. The belief in unsupported information has been present among people much longer and more frequently than one might think. In the past, unfounded beliefs were primarily related to natural phenomena, extraterrestrial civilizations, parapsychological events, and magic. People often lacked sufficient knowledge, so they naturally feared everything new and unknown. However, the present and recent past,

when we have easy access to many scientific explanations, clearly show that belief in unsupported information and the inability to verify information is a very dangerous phenomenon. We encounter unfounded information daily not only in the online space but also on television, in movies, TV shows, advertisements, and books (Ballová Mikušková, 2019). With the popularity of social media, the popularity of influencers with varying levels of character and education also rises, which further complicates the situation, not to mention the existence of troll farms and other tools of hybrid warfare.

Research on belief in unfounded information is extensive and interesting. It is mostly studied in the context of intelligence or education. However, clear conclusions are still lacking. Some studies (e.g., Otis & Alcock, 1982; Aarnio & Linderman, 2005; Bensley, Lilienfeld & Powell, 2014; Ballová Mikušková, 2018) suggest that higher education reduces pseudoscientific beliefs. University students with a higher degree of analytical thinking were less likely to trust unsupported information compared to students from vocational high schools (Aarnio & Linderman, 2005). Similarly, psychology students were better at distinguishing between scientific and pseudoscientific information (Bensley, Lilienfeld & Powell, 2014) compared to the general population. Otis and Alcock concluded in the 1980s that university professors are more sceptical compared to the general population, and they subsequently spread their scepticism among students. On the other hand, many studies suggest that even highly educated individuals, despite their education and higher level of analytical thinking, still believe in many unsupported beliefs (e.g., Kowalski & Taylor, 2009; Swami et al., 2011; Ballová Mikušková, 2018).

Current research offers several explanations for why people believe unfounded information, with the most common being (Kollár Rybanská, Krpálková Krelová & Tkáč, 2024):

- Confirmation bias – people tend to seek information that supports their existing beliefs while ignoring information that contradicts them. This phenomenon was intensely studied, especially in the 1990s (e.g., Kunda, 1990; Nickerson, 1998).
- Lack of critical thinking or underdeveloped critical thinking – some people may have an insufficient ability to think critically, or due to certain circumstances, have not had the opportunity to develop their critical thinking, making them unable to assess the credibility of the information they encounter (Yaqub et al., 2014; Wineburg & McGrew, 2019).
- Emotional appeals – some disinformation and hoaxes may include emotional appeals (e.g., images of wounded people, attacks on dignity, negative emotions like anger, fear, sadness, crying, etc.) that influence a person's emotional experience (Ghanem, Rosso & Rangel, 2018).
- Trust in authorities – research in the 1980s showed that people are more likely to believe information presented by an authority. This phenomenon is also known as the 'halo effect'.

- Insufficient information literacy or lack of information – There are many examples of hoaxes and false information that persist in societies and communities where access to accurate information is limited (e.g., in authoritarian regimes) (Marcellino et al., 2021), or where recipients do not have sufficiently developed information literacy for various reasons.

Naturally, current research also attempts to verify other hypotheses and examines people's susceptibility to believing unsupported information, for example, in relation to their education, life satisfaction, upbringing, and others. Another significant influence comes from various cognitive biases.

From the above mentioned, we can assume that information literacy and critical thinking must now be part of the 'essential equipment' of every person. If a person today cannot orientate in information and information sources, they can easily become a victim of sophisticated scams, but they may also be disadvantaged in the job market and in social life. Therefore, it is essential to assess and develop these skills at all levels of formal education, as well as throughout one's entire life. Developed critical thinking allows us to navigate the information chaos and is a prerequisite for information and digital literacy.

3 Evaluation of Information Literacy

Unfortunately, it is not uncommon for teachers at Slovak high schools and universities to have insufficient information literacy, which can lead to a range of problems, from the spread of hoaxes to young people leaving the country. Evaluation of information literacy is very important because it helps determine the level of information literacy of individuals or entire groups of people, according to specific requirements. Information literacy assessment can provide valuable information about personal abilities to work with information, various information sources, with a current emphasis on working in the digital environment (Hrdináková & Fázik, 2021). Based on the findings, we can further adjust the development processes of teachers within the educational process and prepare them better for their further careers or participation in social life.

There is a large number of models of information literacy and approaches to information literacy, which have been elaborated in detail by authors such as Hrdináková and Fázik (2021). Likewise, there are various ways we can assess or measure information literacy. The most common methods of assessment include standardized and non-standardized tests, essays, questionnaires, structured interviews, scenarios and simulations, portfolios, observations, self-assessments, or different combinations of these. Each of the mentioned methods has its strengths and weaknesses. The choice of tools is usually based on the educational goals or other activities, or on specific requirements. We believe that many of the existing tests for assessing information literacy do not yet respond to the rapid development and changes in the digital space. Although non-standardized tests undoubtedly have many disadvantages, there is currently a need for new tools, especially for high school teachers and university

teachers, that consider changes, particularly after the COVID-19 pandemic and the shift in communication to the virtual space.

In our paper we work with one of the most widely used and clear models, 'The Big Six Skills' (Big 6). It is a process-oriented model that was developed in the 1980s. Initially, it represented a framework for information competencies, but later it was developed as a tool for problem-oriented and information- and technology-supported teaching of various subjects (Eisenberg & Berkowitz, 1990). In 2016, a new version of the Big 6 model was published, which serves as a tool for the development of information, communication, and technological literacy competencies (Eisenberg, Murray & Bartow, 2016). Since we believe that information literacy is inherently linked to critical thinking, we consider the Big Six Skills model to be an ideal model for establishing procedures for assessing information literacy. The Big 6 model can also be interpreted as a strategy for solving information problems, which is applicable to many areas of life. The application of critical thinking in the process of solving information problems, according to its authors, brought a fundamental breakthrough in the concept of information education (Eisenberg & Berkowitz, 1988). The Big 6 model sets six steps of problem solving: definition of the problem, choice of strategy of the information research, localization of information sources, analysis of information, synthesis, and evaluation of effectiveness.

3.1 Use of the Big 6 Model for Evaluating Information Literacy – An Example

The individual phases of the Big 6 model will be used to describe a task that could be used to assess information and digital literacy, as well as critical thinking for high school teachers or university teachers. We primarily focus on information obtained from the digital space and on working with disinformation and hoaxes. We believe that modern tools for assessing information literacy should include questions/tasks/items that touch on several overlapping areas of information literacy (mainly literary and reading literacy, internet literacy, ICT, and digital literacy), should be interesting for teachers so they are willing to participate in the assessment, and should be engaging and align with the current situation. We consider it crucial for teachers to be able to orientate in life on social networks, which have become an inseparable part of young people's lives. Majority of them are users of ‘classic' social networks (Facebook, Instagram), new ones that are emerging (Telegram, Discord, TikTok, Threads, X, Snapchat, and others) are for now not very popular between them. Social networks are currently a main source of misinformation and disinformation, which often leads to confusion and belief in unsupported convictions.

We also believe that information literacy can be tested relatively easily, and along with the result, we can gather additional relevant information about teachers' lives, personalities, and thinking so that we can adjust the educational process in their favour.

As an example, we present the following task: "Imagine that you have had the following symptoms for three days: headache, cough, and a temperature of 37.5°C. Your general practitioner is on holiday. You have access to the internet (or any social network). How would you proceed in the next six steps?"

1. Defining the problem: What needs to be done? What information is needed?
2. Choosing a research strategy: Where can I find the needed information? What are the best sources of information?
3. Localization of information sources: Where are these sources located? How can I access them?
4. Analysing information: What information is relevant? How can I use this information effectively?
5. Synthesizing information: How can I combine this information? How can I present it effectively?
6. Evaluating effectiveness and efficiency: Did I accomplish the task effectively? What did I learn? What can I improve?

To the task, we can also add a brief text describing several illnesses that include the mentioned symptoms. This way, we can easily test reading literacy as well. We chose a health-related topic because we are aware that many people search for health information in the digital space. In this simple task, we can test the aforementioned literacies simultaneously and also learn about the thinking process of a particular teacher. In step 6, we will also discover their ability to engage in self-reflection.

Tasks can be much more complex and may focus only on individual steps. Such evaluations of information literacy have their challenges, and it's important to use them with a specific goal and with sensitivity. With this brief example, we mainly wanted to highlight the need to transfer the evaluation of information literacy into the digital space.

3.2 Points for Reflection

In connection with the topic being addressed, we suggest several points for reflection for teaching young generation and how to teach them:

1. The need to talk about freedom of speech – where are the boundaries? Why can't we spread unverified information? Why is an opinion not a fact? How are arguments formed? What is and what is not an argument?
2. What does the anonymity in the online space mean? How should we approach information from anonymous sources (e.g., Wikipedia)? How to engage in discussions with anonymous (anonymized) participants on social media?
3. What does consent mean in the digital information space?
4. What should and shouldn’t we post on social media?
5. How to feel safe in the online environment?
6. How does artificial intelligence work? (Gemini, ChatGPT, chatbots, and others)

7. What are the most common scams we may encounter in the digital space? How to recognize hoaxes?

4 Conclusion

This paper aims to summarise the importance of information literacy and its individual components, and their connection with the need for developed critical thinking. Currently, particularly young people (students) often engage in the online space, making it essential for their teachers to be familiar with this environment as well. As early as 2019, the issue of face-to-face communication problems was frequently discussed, largely due to the shift of communication to digital platforms. During and after the pandemic, we are still assessing the damage caused; however, one thing is certain: we are unlikely to be able to escape the online virtual environment. Therefore, it is crucial to evaluate and develop information literacy using new, modern methods that reflect the altered conditions and the shift of communication and information into the digital space. The conditions of the information and knowledge society placed on the individual further emphasise the significance of this concept, which is why efforts are being made to integrate it into all levels of the formal education system, from pre-primary to lifelong learning.

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