ICT Literacy of Teachers and Students in the Context of Students' Critical Thinking

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Abstract

In contemporary education, information literacy is a key competence for both students and teachers. Digital skills can be enhanced and mastered through continuous professional development. Teachers' ICT skills also influence the quality of the educational process. They have more opportunities, options, and competencies to implement modern educational approaches, such as applying active learning methods. Active learning methods significantly aid in developing students' critical thinking. By fostering critical thinking, students become socially, economically, and politically capable individuals who can discern and evaluate the information presented by the mass media.

Keywords: Information Literacy, Critical Thinking, Activating Methods, Mass Media

1 ICT Literacy

In Slovakia, the information literacy in schools is primarily addressed by the Ministry of Education, Research, Development and Youth of the Slovak Republic, the National Institute of Education and Youth (NIVAM), various scientific and research institutions, such as colleges and universities.

The digitisation of education is facilitated, among other means, by financial support from European projects. However, it is questionable to what extent the acquired technologies are utilised in practice. The concept of literacy, as one of the basic competencies of a modern person, is closely related to this issue.

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In this context, literacy, as a primary competence, can be understood from different perspectives: on the one hand, the ICT or digital literacy of the population in general; and on the other, the ICT literacy of specific groups, such as students and their parents.
Hrmo et al. (2003) state that the term competence has many definitions which often overlap. Having a certain competence means that in a certain situation we are able to navigate appropriately, react appropriately and thus activate a suitable operation, to adopt a beneficial attitude (Hrmo et al., 2003).
Blaško (2013) perceives teaching strategies in the context of the development of key competences, and characterises them as common methodological procedures, i.e. methods and forms, activities, possibilities, rules in teaching at the school level or at the subject level, but also beyond them. He stated that they are common to all teachers and schools, and that by them the school targets, systematically forms and develops all key competences of students (Blaško, 2013).
According to Brown (2017), digital literacy is now, in an increasingly digitised society and knowledge economy, essential for successful life, education and work (Brown, 2017).

1.1 Teacher's digital literacy

According to Vránová et al. (2016), the teacher's digital competences include professional involvement in work communication with both colleagues and students, professional cooperation, and continuous professional development. One of the key skills of effective educators is the ability to know and work with digital resources, which they use to create and modify digital teaching materials. When using digital resources, it is essential to respect copyright, protection, and sharing protocols. Furthermore, technologies can improve the quality of teaching in various ways. The implementation of technology into teaching is related to the introduction of new procedures and methods. A digitally competent teacher must be able to manage and lead all students, support student collaboration, and foster independent learning. It is important for the teacher to be able to create assessment strategies, analyse learning outcomes, obtain feedback, and plan through digital assessment tools. The benefit of digital technologies is their potential to support students, build access, inclusion, differentiation, individualisation, and activate students to learn (Vránová et al., 2016).
According to Turek (2010, p. 192), a person with abilities, motivation, knowledge, skills, and attitudes to do what is required to be done in the relevant field is usually considered to be a competent person in a certain area (Turek, 2010, p. 192).
Therefore, teachers should actively educate themselves and work on their own self-development in order to motivate students and at the same time, to be able to mediate current information to them, support their critical thinking and creativity in learning, and even outside of school.
Bodoríková et al. (Hattie, 2003; Barber and Mourshed, 2007) state that:

> "Efforts to improve the quality of education is accompanied by the effort to improve the quality of the teachers´ work, which fundamentally influences the quality of education. This is also evidenced by some research which show that the quality of teachers has a greater impact on the educational outcomes of students, such as the quality of the curriculum or the material and technical equipment of schools." (Hattie, 2003; Barber and Mourshed, 2007 In: Bodoríková et al., 2023)

1.2 Student's digital literacy

According to Sak (2007), if we want to maintain competitiveness in Europe and even in the world, it is not enough to educate digitally literate users of digital technologies. It is essential to equip students with knowledge and skills in the field of informatics. The phenomenon of today's time is informational thinking, and this perspective is precisely information and the way in which digital technologies work (Sak, 2007).
Digital literacy is closely linked to the effect of multimedia, or even opinion-forming mass media on the development of the student's personality.
Buckingham (2007, p. 43) states that: "In most regions of the world, the media is an inescapable fact of the contemporary world. In most industrialized countries, children spend more time with media of various kinds than they do at school or with their family or friends" (Buckingham, 2007, p. 43).
The digital literacy of students, media and their influence are currently receiving increased attention. Young generation is often the most endangered group of people, which is most exposed to the threats of media content, hoaxes, misinformation and the like, which threaten their critical thinking.
According to Strenáčiková (2020, p. 350): "Although a lot of money and energy was invested in the digitisation of education, neither teachers nor students were prepared for a situation where the entire education will be implemented only in virtual mode" (Strenáčiková, 2020, p. 350).

2 Activating Methods Influencing Students' Critical Thinking

2.1 Critical thinking

Ruisel (2004) defines critical thinking as a process that minimises the influence of prejudices and biases through the rational evaluation of evidence, produces conclusions that follow from this evidence, considers alternative explanations.

Facione (2011) claims that without critical thinking, an individual in today's democratic society is threatened economically and politically (Facione, 2011).
Today, society feels the most pressing need to pay increased attention to the critical thinking skills development. These days, when people are exposed to the enormous pressure of all kinds of information from the opinion-forming mass media, we feel the need to think critically. Young adolescents are the most vulnerable group that is most exposed to the influence of mass media (TV, radio and especially the Internet), from where they get a lot of different information. These mass media have a significant influence on most young people, trying to influence their judgement. Without critical thinking, the influence is often successful.
Strenáčiková (2015, p. 280) states that:

> "Valuable information must be selected from information noise and waste. Although every individual is constantly exposed to the continuous (and sometimes misleading) influence of the mass media, commercial TV stations and magazines with articles without factual informative value, the young generation is most at risk, since young people are also overwhelmed by the enormous numbers of information from the Internet." (Strenáčiková, 2015, p. 280)

In schools, teachers have the opportunity to discuss and explain to their students what misinformation, hoaxes, and the like are, but many times, it is only in theory. A much more valuable competency that teachers can impart to their students is the ability to learn to think critically. The ability to think critically is practical and useful at any age and in any area of life. Critical thinking can be trained and supported in the educational process in several different ways. These methods have a common label: activating methods. There are several activating methods that have the potential to support students' critical thinking and that can make the learning process special and attract or activate students. The teacher only has to choose which activity suits the students' needs and expectations the best, and which one would capture their attention and lead them to active enthusiastic learning.
Bodoríková et al. (2023, p. 153 – 154) state that:

> "Topics regarding the students' critical thinking still raise a lot of questions in teachers, gradually lead them to a changed view of teaching, enable them to see the teaching process in broader contexts, to understand the essence of educational situations, and to find ways to solve them." (Bodoríková et al, 2023, 153-154)

2.2 Brainstorming

This teaching method was described by Alex Osborne in 1953 as a method of encouraging groups to creative thinking.

The key principle and advantage of brainstorming is to produce a large number of different proposals for solutions to an appropriately formulated problem in a short time. This method is especially suitable for solving specific problems that require original ideas created in a short time. Maňák and Švec (2003) recommend working in smaller groups, with approximately 5-8 group members. The optimal time for brainstorming is 30 to 45 minutes, during which no criticism of any of the proposed solutions is allowed. The actual assessment of ideas falls to the next stage of the process. Furthermore, they also state that supporting the complete freedom of ideas is a matter of course. Every proposal or idea must be registered, and this creates the possibility of inspiration from ideas that have already been exposed (Maňák, Švec, 2003).

Brainstorming requires maximum relaxation. It cannot be expected that the answer to every question will be found with the help of brainstorming, but it certainly helps the development of creativity, creative and critical thinking. The brainstorming has undergone some development. Over time, several other variants developed from this activating method, such as brainwriting, brain sketching, or the 6-3-5 method.

2.3 Mind maps

Mind maps graphically display concepts from a certain area and the relationships between them. Müller (2013) states that mind mapping is a method that allows you to manage waves of information, process them and give them an easily understandable structure. Mind mapping can help us improve our overview, show clear connections, relationships and potential problems. It also allows us to express our thoughts and contributes to their full awareness (Müller, 2013).

Mind maps mainly focus on the linear recording of main thoughts and ideas, and thus imitate the real functioning of the brain, which is divided into two hemispheres responsible for coordinating various activities of the human body.

According to Belák (2022), it is necessary to familiarise students with mind maps first, similarly to other newly used methods. That is why he considers it important to explain to students the benefits of creating and using mind maps in the classes (Belák, 2022).

2.4 Project method

W. H. Kilpatrick is considered to be the author of the project method. He developed the problem-based method created by his teacher J. Dewey into the currently known method of project teaching.

Zormanová (2012) states that in this method, students are led to independent work on certain projects. These projects are usually perceived as complex tasks or problems that are connected to the reality of life. A characteristic feature of project-based teaching is the aim.

The given aim is represented by a certain output, possibly a product, or a practical solution to a problem. Projects are often based on interdisciplinary relationships (Zormanová, 2012). Turek (2010) includes project method among modern concepts of the teaching process (Turek, 2010).

3 Conclusion

Bodoríková et al. (2023, p. 10) state:

> "Today we know that only scientific knowledge is not enough for practical life, therefore effective teaching includes the development of skills associated with critical thinking, such as the processing of ideas based on their meanings, the ability to identify key ideas and assumptions in arguments, recognise important contexts, interpret data correctly, reevaluate different arguments, ability to draw logical conclusions from available information, distinguish facts and assumptions, create hypotheses, evaluate the reliability of evidence, effectively make decisions or solve problem tasks." (Bodoríková et al., 2023, p. 10)

As stated by Grecmanová, Urbanovská, Novotný (2000, p. 13):

> "Critical thinking is primarily active and independent thinking, conditioned by the following abilities: understanding information and its thorough examination, comparing an idea with other opinions and statements, seeing facts in context, using all levels of thinking processes, taking a stand and being responsible for it." (Grecmanová, Urbanovská, Novotný, 2000, p. 13)

The school provides a sufficient environment and space for students to develop their own ideas and thinking processes under the supervision and guidance of their teacher. The teacher's creativity in introducing activating methods significantly contributes to the development of students' critical thinking. Incorporating digital technologies into the planning and implementation of these activities adds value, as it supports and develops the ICT literacy of both teachers and students. Consequently, students can become mature, critically thinking individuals who are not entirely subject to the information flow of the mass media but are able to discern and select information that is real, true, and genuinely useful to them.

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