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METHODOLOGY FOR DEVELOPING DIGITAL LITERACY AND CYBERSECURITY SKILLS AMONG STUDENTS

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Abstract: The rapid development of digital technologies has significantly transformed the educational environment and created new requirements for students' knowledge and skills. Digital literacy is no longer limited to the ability to operate computers and use online services. It includes the ability to search, evaluate, process, create and communicate information effectively, critically and responsibly in digital environments.

Keywords: digital literacy, cybersecurity, students, digital competence, cyber hygiene, digital citizenship, information security, teaching methodology.

INTRODUCTION

Digital technologies have become an essential component of contemporary education. Students increasingly use computers, smartphones, cloud services, social networks, electronic learning platforms and artificial intelligence-based tools for educational and everyday activities. Consequently, schools and other educational institutions face the task of preparing students not only to use digital technologies but also to use them safely, critically and responsibly.

UNESCO defines digital literacy broadly as the ability to use digital technologies, communication tools and networks to locate, evaluate, use and create information. Thus, digital literacy encompasses considerably more than basic technical computer skills. UNESCO also emphasizes that digital competencies are important for participation in society, lifelong learning and employment.

The digital environment, however, creates both educational opportunities and potential risks. Children and adolescents may encounter privacy violations, cyberbullying, inappropriate content, identity theft, fraudulent messages and other forms of online harm. UNESCO therefore highlights the importance of developing digital literacy, safe ICT use and a culture of cyber hygiene among the school community.

The purpose of this article is to analyze effective methodological approaches to developing students' digital literacy and cybersecurity skills and to propose a practical educational model that can be integrated into school subjects, particularly Informatics and Information Technologies.

MATERIALS AND METHODS

The methodological basis of the study is formed by competency-based, activity-based, problem-based and learner-centered approaches to education. These approaches consider students as active participants in the learning process rather than passive recipients of information.

The competency-based approach is particularly relevant because digital competence consists of several interconnected areas. UNESCO materials identify information and data literacy, communication and collaboration, digital content creation, safety and problem solving as important components of digital competence. Therefore, cybersecurity should not be taught as an isolated technical topic; it should be connected with information literacy, communication, digital ethics and critical thinking.

The proposed methodology consists of five interconnected stages:

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1. Diagnostic stage. Students' existing knowledge and skills are identified through questionnaires, short tests and practical tasks.
2. Knowledge formation stage. Students are introduced to fundamental concepts such as passwords, personal data, privacy, phishing, malware, social engineering, cyberbullying, digital footprints and secure online communication.
3. Practical activity stage. Students perform practical exercises and simulations that reproduce common digital situations. For example, they can analyze fictional emails and determine which characteristics indicate a phishing attempt.
4. Problem-solving stage. Students work individually or in groups to solve cybersecurity-related cases and develop appropriate solutions.
5. Assessment and reflection stage. Students evaluate their own learning, discuss mistakes and demonstrate their ability to apply cybersecurity rules in practical situations.

This methodology corresponds to modern approaches in digital competency education, where learning outcomes should be demonstrated through practical performance rather than memorization alone. UNESCO's digital competence frameworks emphasize clearly defined competencies and observable learning outcomes.

RESULTS AND DISCUSSION

1. Formation of information and digital literacy

The first component of the proposed methodology is the development of students' ability to work effectively with digital information. Students should learn how to search for information, compare different sources, identify unreliable information and distinguish facts from opinions.

For example, teachers can provide students with several Internet sources addressing the same topic and ask them to evaluate each source according to criteria such as author, publication date, purpose, evidence and reliability. This type of activity develops critical thinking and information literacy simultaneously.

Students should also understand that information found online is not automatically reliable. Consequently, the teacher's role is to create situations in which learners must analyze, compare and justify their conclusions.

2. Development of cybersecurity awareness

Cybersecurity education should begin with simple and understandable concepts that are relevant to students' everyday digital experiences.

Important topics include:

- creating and managing strong passwords;
- using multi-factor authentication;
- protecting personal and financial information;
- recognizing phishing messages;
- avoiding suspicious links and attachments;
- updating software and operating systems;
- understanding malware and its potential consequences;
- maintaining privacy on social networks;
- recognizing cyberbullying;
- protecting digital accounts;
- understanding digital footprints.

The teacher should avoid presenting cybersecurity exclusively through theoretical lectures. Instead, students should work with realistic but safe scenarios.

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For example, a teacher can present a fictional message stating that a student has won a prize and must immediately follow a link and enter personal information. Students are asked to identify suspicious elements of the message and explain what they would do. Such an exercise transforms theoretical knowledge into practical decision-making skills.

3. Interactive and simulation-based learning

Interactive methods can significantly increase students' involvement in cybersecurity education. Role-playing and simulation activities allow students to experience different digital situations without being exposed to real threats.

One effective activity is a "Cybersecurity Detective" exercise. Students receive several fictional online messages and classify them as safe, suspicious or dangerous. They then explain the indicators that influenced their decision.

Another useful method is group problem solving. Students can be divided into small groups and given a scenario such as:

"A student receives a message from an unknown account requesting a password and personal information. What should the student do?"

Each group develops a response strategy and presents its reasoning to the class.

Such activities contribute not only to cybersecurity knowledge but also to communication, collaboration and critical-thinking skills. These competencies correspond to internationally recognized digital competence frameworks.

4. Project-based learning

Project-based learning can be used to integrate digital literacy and cybersecurity into students' independent activities. Students can develop posters, presentations, short videos, infographics or digital guides on topics such as "How to Create a Secure Password," "How to Recognize Phishing," "Rules of Safe Social Media Use" or "How to Protect Personal Data."

The project method has several advantages. First, students independently search for and analyze information. Second, they transform information into a digital product. Third, they develop communication and collaboration skills. Finally, the resulting products can be shared with other students and used as educational materials.

5. The role of teachers

The effectiveness of cybersecurity education depends considerably on teachers' digital competence. Teachers should be able to demonstrate safe digital practices and integrate cybersecurity principles into everyday instruction.

UNESCO has emphasized the importance of teacher training in the effective use of technology for teaching and learning. The 2023 UNESCO Global Education Monitoring Report also identified teacher preparedness and cybersecurity as important issues in technology-supported education.

Therefore, professional development programs for teachers should include practical cybersecurity training. Teachers need to understand common digital threats, privacy principles, secure communication, data protection and appropriate responses to cyber incidents.

6. Assessment of students' digital and cybersecurity competencies

Assessment should include both theoretical knowledge and practical performance. A student may know the definition of phishing but still click on a suspicious link in a realistic situation. Therefore, assessment instruments should measure students' ability to apply knowledge.

A possible assessment model can include four components:

Competency	**Assessment method**
Information literacy	Source evaluation task

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Digital skills	Practical computer task
Cybersecurity awareness	Scenario-based test
Safe digital behavior	Simulation and observation

Formative assessment can be conducted throughout the learning process. Teachers can use quizzes, practical tasks, peer assessment, self-assessment and reflective discussions.

A useful indicator of successful learning is not simply whether students can define cybersecurity terms, but whether they can make safe and justified decisions when faced with realistic digital situations.

Proposed Pedagogical Model

Based on the discussed approaches, the following model can be proposed:

Knowledge → Practice → Problem Solving → Reflection → Safe Digital Behavior

At the first stage, students acquire basic concepts. At the second stage, they apply these concepts through practical activities. At the third stage, they solve realistic cybersecurity problems. At the fourth stage, they analyze their decisions and mistakes. Finally, the acquired competencies should be reflected in students' everyday digital behavior.

CONCLUSION

The formation of digital literacy and cybersecurity skills among students is an important component of contemporary education. Digital competence should not be reduced to the technical ability to operate computers or use online services. It should include information literacy, critical thinking, communication, digital content creation, privacy protection, cybersecurity awareness and responsible digital citizenship.

The methodology proposed in this article combines competency-based, activity-based, problem-based and interactive learning approaches. Practical simulations, case studies, project work, discussions and formative assessment can help students transfer theoretical knowledge into real-life digital behavior.

The systematic integration of cybersecurity topics into Informatics and other school subjects can contribute to the development of students' ability to recognize digital threats, protect personal information, evaluate online information critically and use digital technologies responsibly. At the same time, continuous professional development of teachers is necessary to ensure effective implementation of these approaches.

References

1. UNESCO. *Digital Literacy in Education*. UNESCO Institute for Information Technologies in Education, 2011.
2. UNESCO. *Digital Competencies and Skills*. UNESCO.
3. UNESCO Institute for Statistics. *Digital Literacy Global Framework*. UNESCO UIS.
4. UNESCO-UNEVOC. *Digital Competence Frameworks*. UNESCO-UNEVOC.
5. UNESCO IITE. *Children and Adolescents in the Digital World: Joining Efforts towards Securing the Rising Generation*. UNESCO Institute for Information Technologies in Education.
6. UNESCO. *Global Education Monitoring Report 2023: Technology in Education*. UNESCO, 2023.