

Formation of Internet Resources Critical Evaluation Skills of Future Primary School Teachers

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Abstract

In the era of the Internet when information is placed, processed and stored in the Internet in the form of Internet resources the ability to estimate consumed Internet resources before using them for personal needs or educational aims becomes of great importance. The article analyses competences required for critical evaluation of Internet resources. The research was conducted where 54 future primary school teachers - Master's Degree students of specialty "Primary education" at Borys Grinchenko Kyiv University - took part. In the process of the research the following data was determined: the level of future primary school teachers' awareness of cybersecurity events arranged at country level; the most effective means of information distribution on cybersecurity provision; primary school subjects which can be used to form pupils skills of Internet resources evaluation; utilization of methods and technologies for developing skills of Internet resources critical evaluation. Education programs and educational activity styles aimed at formation of Internet resources critical evaluation skills were analyzed. The case study on creating a lesson or a project using learning styles by D. Laurillard was designed. The model of formation of Internet resources critical evaluation skills system for future primary school teachers was designed,

Keywords

Internet resources, critical thinking, Internet resources evaluation. competencies, primary school, future primary school teachers

1. Introduction

Introduction of new global network technologies and new formats of presenting data in the Internet resulted in wide access of age-diverse users to various information data and its exchange with the help of network technologies. Most information and data seekers rely on open Internet sources for implementation of search strategies. According to Internet World Stats (IWS) data the number of Internet users exceeds 4 billion people; in Ukraine more than 40 million people are Internet users which makes up 94,1% of the population [1]. A person spends many hours a day on the Internet receiving information during all this time. However, the reliability of this information, its interpretation and ability to make conclusions about received data are questionable. According to McCrindle Research children aged 8-12 years spend 4 hours and 44 minutes in front of the screen every day for entertainment [2] (we need to clarify that this statistics describes American children, but the tendency spreads all over the world). At the same time, we have to note that most of them do not have the skills of cybersecurity, critical evaluation of resources, and this includes both children and adults.

With the growth of the number of Internet resources, it becomes essential to develop and master skills to critically evaluate them and use received information safely. Therefore, for the sake of future generations and the future of the planet, it is imperative to provide educational systems across the EU with powerful tools that could help students to develop their critical thinking ability to distinguish fact

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from fiction and science from pseudo-science. Media literacy is included in the digital competence, which is described in the Council Recommendation on Key Competences [3] as well as in the more detailed LifeComp: The European Framework for Personal, Social and Learning to Learn Key Competence” [4].

The necessity of formation of educators’ digital competence is mentioned in the European Framework for the Digital Competence of Educators: DigCompEdu [5], as well as in The Digital Education Action Plan (2021-2027) [6]. Moreover, one of the key competences required in the modern world and labor market is critical thinking [7]. That is why the importance of the competence development is underlined in various Ukrainian regulatory documents [8] and at the international level, for example, in World Economic Forum (New Vision for Education: Fostering Social and Emotional Learning through Technology, 2016) [9] and UNESCO (Education for Sustainable Development Goals: Learning Objectives, 2017) [10].

In 2020 in Ukraine Professional standard of primary school teacher [11] was approved, where the requirements to information and digital competence of a teacher are defined including “the ability to navigate in the information space, search for and critically evaluate information, operate with it in professional activity”.

Taking into account that the age of the Internet users becomes younger annually, formation of digital competence becomes an important request of the society, namely critical evaluation of information by children starting from primary school age. In the framework of the performed research “Media culture under the pandemic conditions” L. A. Naidionova notes that according to the data of 2018 when there was no pandemic almost every fifth teenager faced bullying, trolling, threats, slander; every sixth one faced altercations, persecution, impersonation, phishing, fraud, isolation, and happy slapping. None of these types of cyberbullying covered the third of teenagers. Under present-day conditions almost a third of teenagers face bullying, trolling, threats, altercations, isolation. And every fifth pupil deals with the rest of the above-mentioned cyber dangers. Such significant growth has drastically changed the character of traditional cyber risks [12].

Solution of the problem is possible if future primary school teachers' training considers challenges caused by using the Internet from early childhood and is designed according to the requirements of the Professional standard of primary school teacher.

2. Research Analysis on Teaching Children to Critically Evaluate Internet Resources

Australian sociologist and demographer Mark McCrindle introduced a new notion - generation alpha[13]. It refers to children born after 2010 (till 2025) and represents children who perceive a phone and Internet as their body extension. Generation Alpha (0-9 years old) were born in the world where algorithms make them constantly press buttons, scroll, and swipe at a frantic speed. Starting from primary school pupils face a huge information flow from different sources, but mainly from Internet resources. The statistics show that 30% of Ukrainians dealt with online frauds, 30% - with cruelty scenes online, 25% - with offensive actions, 23% - with unpleasant or repulsive news online[14]. World statistics demonstrate that 18 minutes are enough to get from a child their naked photo. One third of the materials classified as child pornography is made by children themselves. Every second 50-70 thousand Internet users try to make a contact with a child with the aim of sexual abuse. 50% of children suffer from serious cyberbullying. Children are not protected when they chat with strangers, and the pandemic has even made the situation worse as children spend more time on the Internet [15].

In the research by Quayyum at al. [16,17] parents of children aged 10-15 years old were interviewed in Norway. The results were used to determine the list of problems that should be solved by parents to ensure cyber security of their children at home, and a list of educational resources was offered to learn how to avoid the determined problems.

Primary school pupils’ lack of life experience increases the risk to face online threats: online violence, fraud, pornography, personal information gaining for criminal purposes, aggression and physical violence propaganda that can lead to the corresponding models of behaviour of modern generation in real life such as cruelty towards animals, humiliation of weaker ones, beating peers. That is why the question of development of primary school pupils’ skills to critically evaluate Internet

resources is of great importance. O. Pometun thinks that critical thinking is a “special type of thinking which is characterised by activity, purposefulness, independence, discipline and reflectivity, and provides for development of person’s skills in the learning process: to define problems, to analyse, synthesize, evaluate information from any sources, to come up with alternatives and estimate them, to choose a solution of the problem or own position on it and substantiate own opinion, to make a conscious choice and to take actions” [18, p.94].

I. Kurlishchuk determines a leading role of electronic media resources in the educational process of primary school, especially under the conditions of distance learning, and denotes the importance of primary school pupils’ having technical knowledge and skills on media technics, correct perception of media culture publications, their analysis, independent comprehension and interpretation, that is media literacy skills [19].

O. Baryshpolets defines media literacy criteria for effective functioning of a person in a media environment: media activity - conscious media products consumption; analytical skills - ability to evaluate media products; selectivity - conscious choice of information required for social roles performance [20].

“Understanding how to navigate, select and critically evaluate information are skills that all online users should possess in order to manage the risks associated with issues such as disinformation, online scams, hate speech and managing online relationships” - is emphasized in the manual for teachers developed by European Commission [21].

In the State educational standard of primary education the following skills are common for all key competences: reading and understanding, ability to express own opinion orally and in writing, critical and systematic thinking, ability to logically substantiate own attitude, ability to manage emotions constructively, estimate risks, make decisions, solve problems, collaborate with other people [22]. Formation of critical thinking is covered in general results of primary education in many educational branches and presented in Table 1.

Table 1

Description of learning outcomes in educational branches that have to form pupils’ critical thinking on information evaluation, including the one from the Internet

Educational branch	General learning outcomes of the students
linguistic and literary	perceives information critically for achieving different goals; clarifies information according to the situation separates necessary information from different sources, including media texts, for making up own statement with a specific purpose
computer science	expresses opinion about simple media texts differentiates truthful and untrustworthy statements received from different sources expresses assumptions about reliability of information received from digital sources, differentiates facts and statements collaborates and communicates in protected network communities for exchanging opinions, performing collective tasks, information search and study follows work safety rules; protects own informational environment; tells adults about problems visits only useful and safe web-sites; follows the intellectual property rules
health-preserving	tries to evaluate critically information about goods and services accepts criticism about themselves and reacts to it properly

civil and historical separates doubtful facts; finds information which confirms or refutes doubts; explains possible consequences of spreading false information

Nationwide project on media literacy presented by Ministry of culture and information policy provides for raising awareness of all age groups on the problem of desinformation in the following directions:

- strengthening communication by the state;
- media education development;
- stimulation of a responsible and safe media environment.

In particular, in the framework of the national project on media literacy “Filter” initiatives dedicated to the International week of media and information literacy in Ukraine were held on October, 25-31, 2021 [23].

Solution of the question of pupils’ safety in the Internet in other countries, where Internet is widely used in educational and research activities, is characterized by complex approach, and the safety problem is closely related to the question of formation of pupils’ responsibility for their action or inaction in the network to avoid and/or lower risks. For example, in the USA, Germany, Canada, Finland and other countries pupils together with parents and school representatives sign up special agreements on safe and responsible Internet use. In such agreements responsibilities of safe and responsible social networks usage by all educational process participants are agreed and prescribed. In Finland media education is a part of the national education program, and by joining sectoral and interdisciplinary approaches it is included into different life activities (school teachers, museum workers, scientific and academic center representatives, librarians, etc.) [24].

Among the key competencies offered by Organisation for Economic Co-operation and Development (OECD) together with the need to master computer technologies by modern pupils “ability of critical attitude to the information and advertisement broadcasted through mass media and the Internet” is mentioned. In the research “Digital competence in practice: frame analysis”, which was published by European Commission, it is mentioned that in the framework of European recommendations of EU digital competence is recognized one of the key competences in the context of lifelong learning and it is determined as “ability to use information and communication technologies confidently, critically and creatively to achieve goals which belong to the spheres of work, employment, education, leisure, inclusion and participation in social life”[25].

Many scientists think that it is preferable to educate in media literacy from primary school through introduction of media education elements into the educational process [26]. To form pupils’ sustainable skills of critical thinking and critical evaluation of Internet and media resources it is primary important for teachers to learn to evaluate Internet resources critically, know the criteria and indicators of reliable web-sites and reliability of received information, main techniques of propaganda etc. Moreover, it is essential to familiarize teachers with methods and instruments of critical thinking formation for information evaluation, in particular on the Internet. The next step should be the choice of instruments and methods, pedagogical technologies for evaluation of pupils’ level of formation such skills.

3. Analysis of Future Teachers Preparation to form Children’s Skills of Critical Evaluation of Internet Resources

In the prospect of increasing the level of Internet resources evaluation by primary school pupils, we conducted research on the preparation of future primary school teachers and their readiness to form the corresponding children’s skills. The analysis of the education program “Primary education” of the first (Bachelor’s) level at Borys Grinchenko Kyiv University demonstrates that special (professional) competency CK-2 (ability to orient in informational environment, use open resources, information and communication, and digital technologies, operate them in professional activities) and program results PR-3 (critically evaluate truthfulness and reliability of information sources, comply with legal and ethical requirements on information and communication, and digital technologies utilization during pedagogical activities in primary school), which help to gain the skill of critical information evaluation,

are formed while learning the following disciplines: Ukrainian and university studies, Mathematical and pedagogical education, Information and technology education [27]. Education program of the specialty “Primary education” for the second education level (Master’s) provides formation of competencies of critical evaluation of information in the disciplines: Educational institution IT infrastructure management, Internetics and applied Internet technologies in education, Innovative methods, technologies and quality monitoring of electronic learning, Pedagogy and psychology of higher education institution [28].

In the framework of the research future primary school teachers were surveyed on awareness of Internet resources critical evaluation. 54 students took part in the survey. 78% of them noted that they faced different types of fraud on the Internet. At the same time, all students are aware of many cybersecurity measures carried out at the national level (Fig. 1).

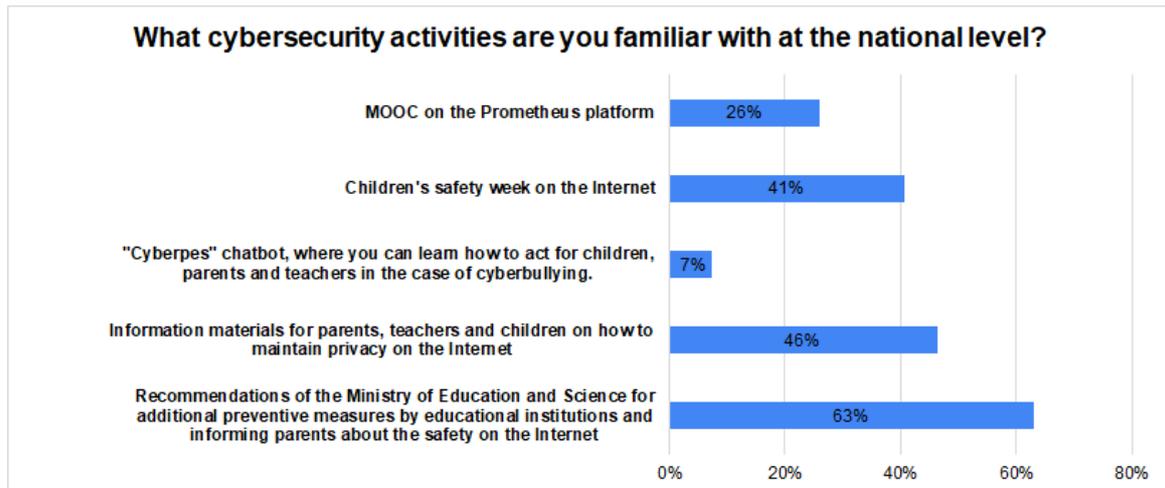


Figure 1: Results of the survey on future primary school teachers awareness of cybersecurity measures carried out at the national level

The respondents defined the most effective ways of informing about cybersecurity measures: introduction of the subject “Cybersecurity” into school course - 78%, inclusion of cybersecurity issues into teacher training program - 65%, into the standard of primary education - 61%, using information web-sites, portals, blogs - 44% (Fig. 2).

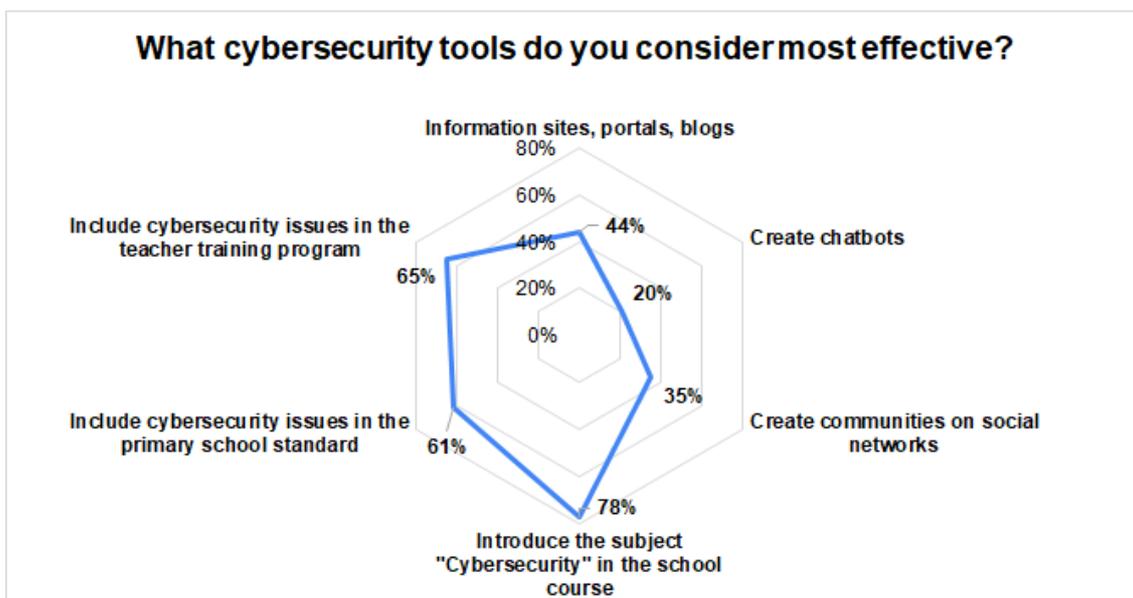


Figure 2: Results of the future primary school teachers survey on the most effective ways of informing about cybersecurity measures

Also future primary school teachers indicate the need to form critical thinking skills in all school subjects, in particularly, foremost in computer science (informatics) - 87%, I explore the world - 57% and a separate subject “Critical thinking” - 52%; other subjects were voted for by 28% or less of the respondents (Fig.3).

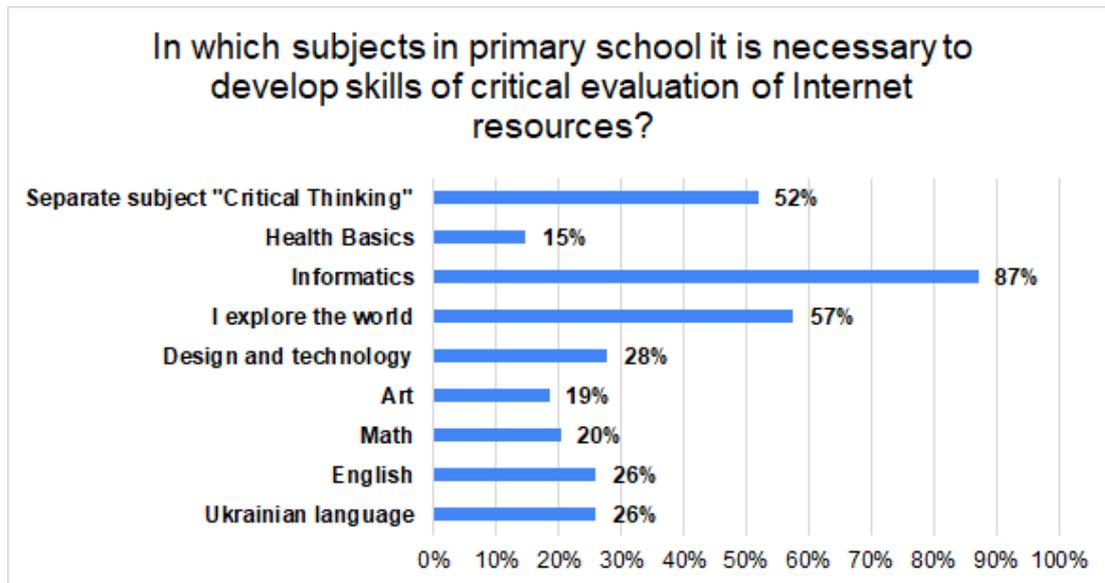


Figure 3: Results of the future primary school teachers survey on subjects where pupils’ skills to evaluate Internet resources should be formed

Formation of own skills to critically evaluate information students see in utilization of various methods and techniques in the educational process (Fig.4). Technologies of learning projects, collaboration in pairs and groups, effective usage of digital instruments take special place in this process.

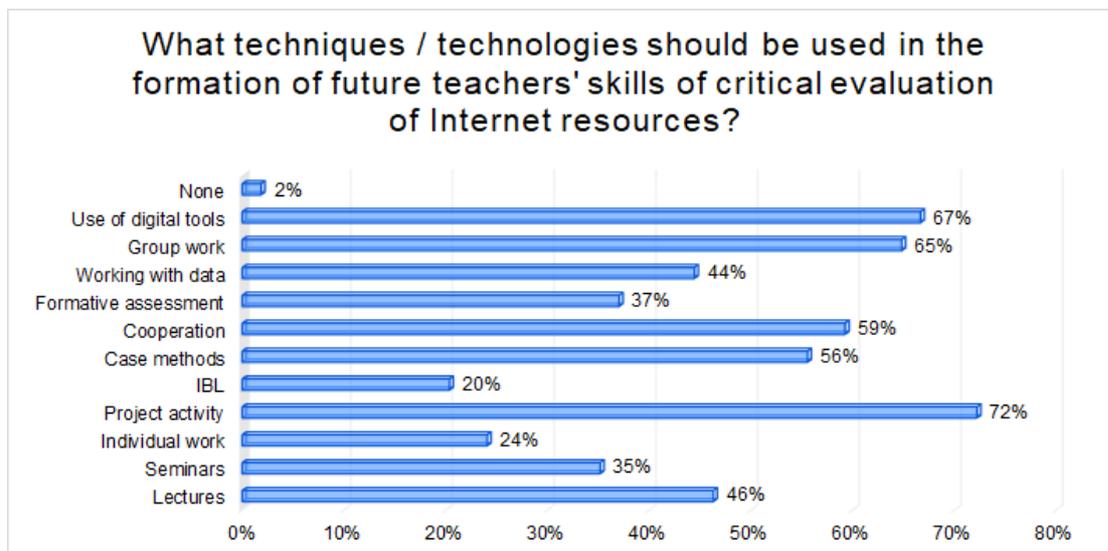


Figure 4: Results of the future primary school teachers survey on utilization of methods and technologies in the process of formation of critical Internet resources evaluation skills

Specific types of activities and assignments for formation of students’ skills to teach children to critically evaluate information on the Internet are: designing a set of criteria of web-sites reliability and data truthfulness there; site verification according to these criteria and determination whether a site is suitable for learning purposes; creating accounts in social networks and their adaptation to definite

educational needs; acquaintance and recognition of propaganda techniques; recognition of unreliable information; search requests formation; determination of web-site URL reliability etc.

The analysis of education programs and educational activity styles provided for formation of skills to critically evaluate information from the Internet allowed designing a study case of a lesson of a project using learning styles by D. Laurillard [29] (Fig. 5).

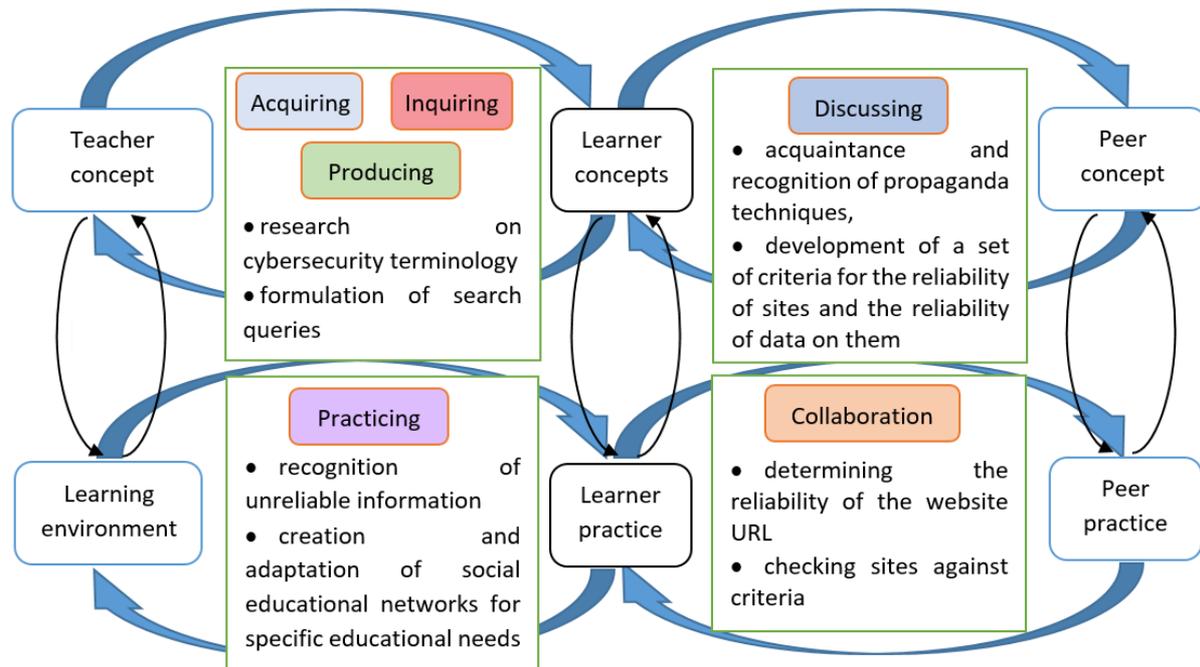


Figure 5: Case study on designing a lesson using learning styles for formation of skills to critically evaluate information from the Internet

Listed educational activity styles are offered to students during laboratory and practical sessions. Also, in the framework of the discipline “Innovative methods, technologies and monitoring of electronic learning quality”, that is included into selective part of the education program in specialization “Electronic learning management”, students are given for self-study materials of massive open online courses (MOOC) “Basics of information security”, “Media literacy for educators”, “Critical thinking for educators” on the platform Prometheus.org.

Besides, self-study of materials, that are open source and aimed at formation of children’s skills to evaluate information critically, will increase students’ professional competence in the problem. Let us give short description of nationwide projects which can be used to help to form students’ and pupils’ skills of critical Internet resources evaluation.

- Education game «Mediarnaiko», which is aimed at school children and gives possibility to learn about information (media) field and become media expert <https://www.aup.com.ua/Game/index.html>
- Game «Media literacy mission» by IREX, which gives adults possibility to check their knowledge and skills of media literacy and critical thinking http://irex.mocotms.com/ml_game/story_html5.html
- Distance course «How to understand social networks» <https://vumonline.ua/course/how-to-understand-social-networks/>
- Distance course «Verification on the Internet» <https://vumonline.ua/course/verification-in-the-Internet/>
- Online course «News literacy» by Detector Media <https://video.detector.media/special-projects/novynna-gramotnist-i22>

4. Model of the System of Formation of Internet Resources Critical Evaluation Skills of Future Primary School Teachers

Experience shows that for the formation of future teachers' sustainable skills of critical evaluation of information on the Internet it is essential to rely on a systematic approach. As a background for such a system a pedagogical model (Fig.6) can be used that includes determination of the level of critical Internet resources evaluation skills at the beginning of the learning process. Afterwards, content on formation of web-sites evaluation skills, data analysis and interpretation, and decision making about further use of information is chosen considering the outer needs. To increase the effectiveness of learning, utilization of innovative pedagogical methods is introduced including PBL, IBL, case-study, collaboration and group work, formative assessment, working with data and use of digital tools. To check the effectiveness of learning at the final stage of learning re-examination of the level of critical Internet resources evaluation is carried out.

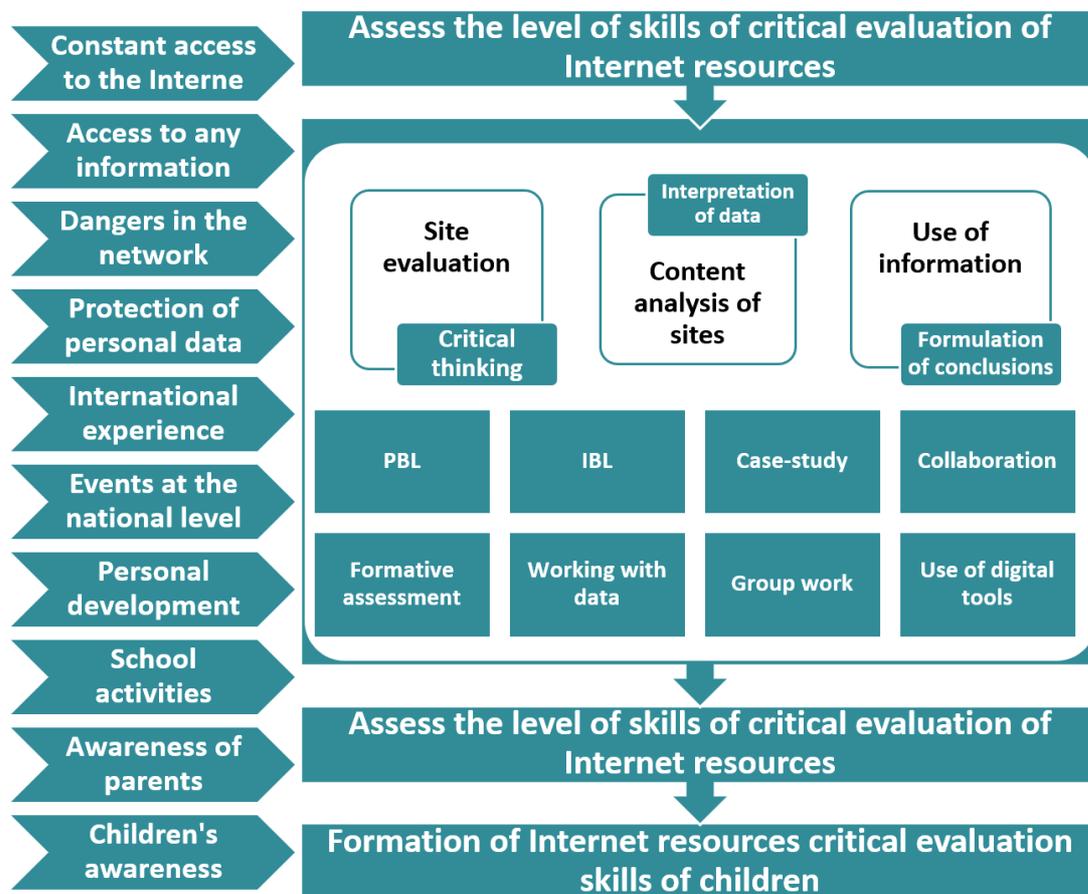


Figure 6: Model of the system of formation of Internet resources critical evaluation skills of future primary school teachers

5. Conclusions

Our dependence on the Internet increased. Our dependence on all forms of media for news and information also increased, as did the surge in false information circulated in all media channels. Every teacher should know about Media Literacy and digital safety – how we consume and understand information, how we interact with others online, what content we develop and how we publish it safely, how we safely use our devices, share data and use the resources in a way that is not a burden to the environment, as well as how we solve problems. They must teach students not to take everything at face value, to check sources, motivations and language.

To lower the risks of primary school children facing online dangers complex measures should be taken. One of important factors is the formation of Internet resources critical evaluation skills of future primary school teachers as children spend a lot of time, and teachers who have corresponding skills are able to develop them in their pupils.

In the process of teaching future primary school teachers different types of activities and technologies can be used for formation of Internet resources critical evaluation skills including those that are presented in the article in the form of the model and the generalized case study.

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