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ENHANCING SKILLS IN RECOGNIZING SYNTHETICALLY REPRODUCED MEDIA CONTENT: RATIONALE FOR DEVELOPING AN EDUCATIONAL METHODOLOGY

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ABSTRACT

The educational methodology of critical thinking and pedagogical support to counteract disinformation and manipulation of artificially reproduced media content encompasses a comprehensive set of thoughtfully designed instructional methods, techniques, forms, principles, and guidelines for their application. It entails a series of methodical and technological steps directed toward the attainment of objectives related to skill formation. The overarching goal is the cultivation of critical thinking skills specifically tailored for discerning synthetically reproduced media content, contributing to the development of innovative personalities within the cultural-educational landscape.

This educational methodology demonstrates a systematic and sequential approach in shaping methodological, theoretical, and practical knowledge. In the process of justifying the development of this methodology, the author draws upon international experiences in competency building and aligns with global standards for the formulation of educational training programs in media literacy. The methodology involves an analytical examination of existing practices and a comparison of obtained data with societal demands. It also incorporates the modeling of benchmark results that are anticipated through the transformation of these practices, all of which are reflected in the comprehensive structure of the developed educational methodology of critical thinking and pedagogical support to counteract disinformation and manipulation of artificially reproduced media content.

Keywords: Deepfake, Artificial Intelligence, Generative Images, Misinformation, Media Literacy, Critical Thinking, Synthetic Media Content, Methodology.

INTRODUCTION

In the modern world, the Fourth Industrial Revolution is underway, resulting in global informatization that brings both positive and negative trends. Among the positive aspects, we can include free access to information of any volume, content, etc. On the negative side, there is a lack of skills to work with this information, leading to superficial or distorted perceptions of various phenomena, belief in myths, and manipulations of individual and mass consciousness, particularly through the use of synthetically altered or generated media content. At the same time, the dynamic nature of the world, external and internal challenges, the rapidity of social, economic, and political processes in the modern world and Ukraine require citizens capable of critically perceiving visual information, which implies possessing critical thinking skills. The ability of the future generation to think critically and identify synthetically reproduced or altered media content is essential.

ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

In recent years, the surge in the prevalence of fake news has become a serious menace to public discourse, societal well-being, education, and democratic processes (Borges et al., 2019, p. 4; Qayyum et al., 2019, p. 16; Chemerys et al., 2021a, b). Fake news refers to fabricated news-style content crafted with the intention of misleading the public (Aldwairi & Alwahedi, 2018; Jang et al.,

2018). This misinformation proliferates through social networks, transcending geographical boundaries and potentially impacting millions of users (Figueira & Oliveira, 2017). The rising popularity of video content emphasizes the need to develop techniques that promote critical thinking among the public to determine the authenticity of media and news, especially considering that new technologies enable highly convincing manipulation of visual information (Anderson, 2018).

We are currently in an era marked by digital disinformation and information warfare, where fake information campaigns are orchestrated to influence public opinion (Anderson, 2018; Qayyum et al., 2019; Zannettou et al., 2019). Recent technological advancements have simplified the production of visual content through the use of "Deepfake" technology, leading to the creation of hyperrealistic visual content via face swaps that leave virtually no discernible traces of manipulation (Chawla, 2019, p. 4-5; Maras & Alexandrou, 2019, p. 256). Deepfake technology has the potential to generate various types of content, such as humor, pornography, or political videos, where individuals appear to say things without their consent, with their images and voices manipulated (Day, 2019, p. 108; Fletcher, 2018, p. 455-456). Significantly, Deepfake technology poses a substantial threat due to its ability to produce counterfeit visual content for purposes including political sabotage, fabricating video evidence for legal proceedings, disseminating terrorist propaganda, enabling blackmail, manipulating financial markets, and propagating fake news (Maras & Alexandrou, 2019).

To bolster the efforts against misinformation, the European Commission will concentrate on revising the Code of Practice on Disinformation within the framework of regulating obligations and accountability for Internet platforms as outlined in the upcoming Digital Services Act. Overall, the European Commission aims to implement tools that enhance the accountability of media entities and recipients of information campaigns in combatting the spread of misinformation. The urgency of this issue is underscored by various normative and legislative documents dedicated to regulating measures for ensuring national information security and the right to access accurate information.

The primary guidelines for the introduction and advancement of information, telecommunications, and media technologies in Ukraine are outlined in the Strategy for the Development of the Information Society in Ukraine (2013). To address hybrid threats and the dissemination of misinformation in Ukraine, the country has ratified and implemented the Cybersecurity Strategy of Ukraine for 2021-2025, titled "Safe Cyberspace – the Key to the Successful Development of the Country." Additionally, the National Security Strategy of Ukraine and the Law of Ukraine "On National Security" (2018) play crucial roles in this regard.

Notably, on July 15, 2021, Ukrainian state authorities and a delegation from foreign states engaged in discussions at the OSCE regarding the battle against misinformation and information security. During these discussions, global best practices for shielding society from the harmful impacts of misinformation and other hybrid tools were deliberated upon. Several foreign regulations, including the Code of European Union Practice Regarding Disinformation (2018), and the European Commission's adoption of a "Joint Framework on Counter-Hybrid Response" as part of the European Union's response (2016), were considered in this context.

CRITERIA AND ASSESSMENT TOOLS FOR THE FORMATION OF SKILLS IN RECOGNIZING SYNTHETICALLY REPRODUCED MEDIA CONTENT

In the process of developing an educational methodology for the formation of skills in recognizing synthetically reproduced media content, it is necessary to update the criteria and assessment tools. The primary task is to define the criteria, indicators, and levels of proficiency in critical thinking and skills in recognizing synthetically reproduced media content.

As components of skills in recognizing synthetically reproduced media content, we have identified orientation towards practical activity, motivation, heuristic activity, reflection, systemic thinking, and the ability to conduct research and exploratory activities.

These components, in their unity and interconnection, form skills in recognizing synthetically reproduced media content. Therefore, we consider it possible to assert that the proficiency of each component indicates the overall proficiency in critical thinking and skills in recognizing synthetically reproduced media content. To assess the level of its formation, it is necessary to define criteria, indicators, and levels for each of the identified components.

Each criterion for assessing the level of proficiency in the components of skills in recognizing synthetically reproduced media content is characterized by its own set of indicators. Indicators are classified as qualitative, indicating the presence or absence of a specific property, and quantitative, determining the degree of expression of the property.

Thus, based on the proposed structure of components of critical thinking and considering the specific skills related to the identification of artificially reproduced media content, we propose the following criteria for the proficiency of critical thinking and their indicators.

Cognitive Criterion - characterizes the degree of engagement in the process of recognizing synthetically reproduced media content - the strength of emotional responses to tasks involving critical analysis skills.

Motivational-Activity Criterion - reflects the motivation to conduct exploratory searches for identifying markers of synthetic media content or its modification, involving critical analysis skills, selecting the most successful behavioral strategy, and various cognitive techniques in solving the task. It also involves an orientation towards results, a desire for self-development, and the ability for continuous self-improvement.

Analytical-Reflective Criterion - reveals the ability for self-analysis, self-reflection, exploration of one's strengths and weaknesses, understanding the world and its transformation, and objective criticism of one's own and others' statements.

The use of a complex of cognitive, motivational-activity, and analytical-reflective criteria ensures, first and foremost, the objectivity of control. This objectivity lies in the scientifically substantiated content of indicators for the development of critical thinking and skills in recognizing synthetically reproduced media content, as well as their application, and in precise, adequately established criteria for assessing the acquired knowledge and skills.

The complex of criteria contributes to the systematic analysis of the effectiveness of implementing the developed methodology, requiring a regular comprehensive approach to diagnostics. This approach involves various forms, methods, and means of control, verification, and evaluation used in close interconnection and unity, all subordinated to a common goal. Additionally, the defined set of criteria allows for transparency, demonstrating openness in conducting assessments using the same criteria.

Taking into account the requirements for the level of critical thinking and media literacy, we have outlined integrated indicators for the criteria of proficiency in the components of skills in recognizing synthetically reproduced media content:

For the *indicators of the cognitive criterion*, we have included: divergent thinking; ease of using associations (associative and expressive speed); temperament features (plasticity, variability, emotional stability, inclination for intense activity, social energy); supra-situational activity (initiative, going beyond the given, interest in solving problem-search tasks).

Indicators for the motivational-activity criterion include: the need for research and educational activities and recognition of its value; a positive attitude towards self-education; cognitive independence; a desire to achieve goals and obtain specific results from one's activities; the ability to optimize behavior (flexible choice of a particular behavioral strategy, abandonment of an ineffective

course of action); the ability to produce unconventional solutions; a tendency towards independence, the absence of fear of expressing one's point of view on an issue.

For the *indicators of the analytical-reflective criterion*, we have included: features of emotional and value attitudes towards oneself (level of self-esteem, its adequacy); a desire for self-education and self-development; the ability to objectively assess one's own and others' judgments.

Skills Level Descriptions in Recognizing Synthetically Reproduced Media Content:

Level 1: Critical (Intuitive). Absence of a coherent picture in applying critical thinking skills, minimal knowledge. Difficulties in exploring new material. Superficial and unacknowledged knowledge. Challenges in applying acquired knowledge in practice. Separation of personal and analytical-important qualities. Lack of a need for self-development. Task execution process involves numerous fundamental errors and inaccuracies. Unsatisfactory quality of judgments and conclusions. Ability to solve tasks only based on the recognition of previously learned information. Lack of independence in task execution. Constant need for assistance from a tutor or other individuals. Indifference towards investigating and exposing manipulative, generated, and modified media content.

Level 2: Acceptable (Reproductive). Insufficient knowledge for practical application. Proficiency in traditional means and technologies for identifying modified media content. Ability to apply knowledge in tasks related to identifying synthetically reproduced media content. Demonstrates readiness for independent execution of tasks with reproductive (algorithmic) content. Involves independent reproduction from memory and application of previously acquired educational information. Knowledge is acquired through repetitive repetition. Mostly conscious knowledge. Task execution process involves errors and inaccuracies, but they are not fundamental. Demonstrates some independence in investigating media content for identifying synthetically reproduced or modified content. Periodic assistance from a tutor or others is still needed. Positive attitude towards identifying synthetically reproduced or modified media content, but with moderate activity in learning.

Level 3: Sufficient (Productive). Recognizes the need for knowledge in identifying synthetically reproduced or modified media content, but lacks a commitment to applying acquired skills in everyday life. Acquires knowledge after initial exposure. Conscious knowledge, not always systematized. Training task execution involves occasional minor errors and inaccuracies. Activity is productive (heuristic). Execution of training tasks is based on a developed algorithm created during the activity, using transformation of known problem-solving methods. Demonstrates independence in identifying and recognizing synthetically reproduced or modified media content. Requires minimal assistance from a tutor. Positive attitude towards identifying synthetically reproduced or modified media content, but with moderate activity in learning.

Level 4: High (Heuristic). Expresses an updated need for knowledge in identifying synthetically reproduced or modified media content. Has a complete understanding of applying acquired skills in daily life. Recognizes the essence and significance of identifying manipulative and disinformation content. Acknowledges the need for personal self-improvement. Analyzes the results of their activities. Acquires, consciously comprehends, and systematizes knowledge after initial exposure. High-quality execution of training tasks without errors or inaccuracies. Activity is heuristic and exploratory. Demonstrates independence in finding solutions to modified and complex tasks. Strongly positive attitude towards identifying synthetically reproduced or modified media content. The developed system of criteria, indicators, and levels will enable, based on an individual approach, the formation of the necessary level of proficiency in recognizing synthetically reproduced media content, allowing for an objective and comprehensive assessment of the level of critical thinking development.

Thus, we have identified the most significant elements for the formation of skills in recognizing synthetically reproduced media content. Based on this, the development of an educational methodology for the formation of skills in recognizing synthetically reproduced media content becomes possible.

COMPONENT CONTENT OF EDUCATIONAL METHODOLOGY

For effective and successful achievement of the research goals, we will describe the component content of the educational methodology that has been developed (Figure 1.).

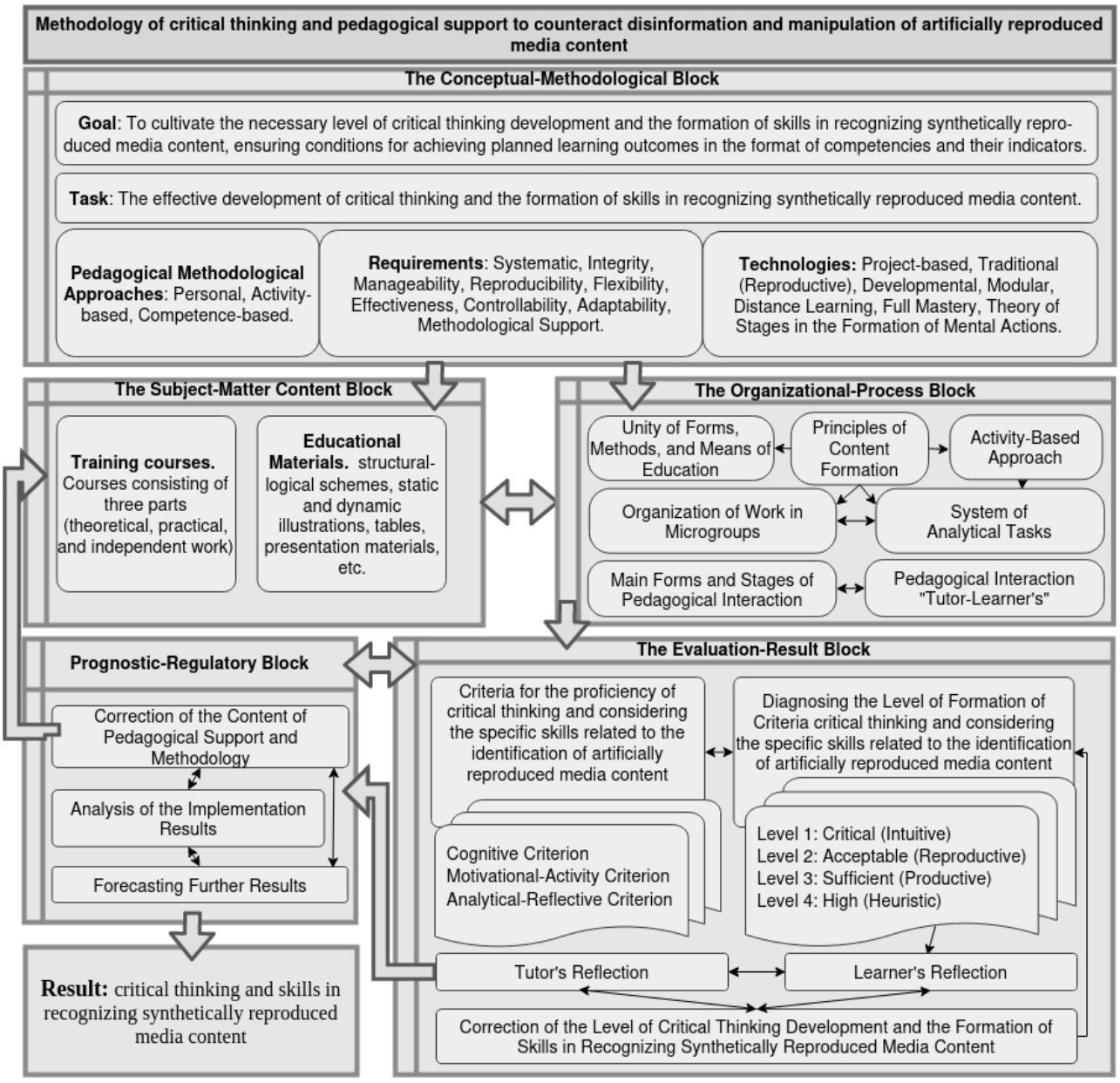

Fig. 1. Structure of the pedagogical methodology for the formation of skills in recognizing synthetically reproduced media content

1) *The Conceptual-Methodological Block* allows for the determination of methodological principles for conducting pedagogical activities. It encompasses the fundamental scientific approaches we relied upon, principles, and information about related pedagogical technologies (modular learning technology, traditional (reproductive) teaching technology; developmental teaching technology (L. Vygotsky, L. Zankov, D. Elkonin, V. Davydov, and others); distance learning technology; the theory of step-by-step formation of mental actions (P. Galperin, D. Elkonin, N. Talizina, and others);

technologies for full assimilation (J. Carroll, B. Bloom). The goals and tasks presented in the model reflect the main directions of pedagogical activities that ensure the formation of critical thinking and the skills in recognizing synthetically reproduced media content.

2) *The Subject-Matter Content Block* for the formation of skills in recognizing synthetically reproduced media content involves identifying the general and specific goals of the methodology and the content of training materials. It comprises educational materials that effectively contribute to the development of critical thinking and skills in recognizing synthetically reproduced media content. This component of the methodology includes structured and classified educational information on one hand and pedagogical support on the other. To ensure clarity and accessibility of the educational material, we utilized structural-logical schemes, static and dynamic illustrations, tables, presentation materials, etc. The methodology's content is embodied in training courses on the identification of synthetically reproduced and modified media content, consisting of three parts (theoretical, practical, and independent work). To deepen and expand knowledge, research-oriented tasks were developed and implemented in the training. The tutor, during the implementation of the training, acts as a guide and mentor, an active subject of the educational process, consultant, coordinator, and, at times, as an expert. The tutor's position should be dynamic, reflective, open to interactions, providing space for autonomy.

3) *The Organizational-Process Block* (Technological Process) includes a description of its application for the formation of necessary qualities. It is developed based on an activity approach and encompasses teaching, learning, and emotional-intellectual interaction models. It is characterized as a continuous process, designed but not initially fully specified, evolving through systematic, pre-designed (algorithmized) sequential actions of the tutor, ensuring the achievement of planned learning outcomes.

4) *The Evaluation-Result Block* includes monitoring and diagnosis, forming the basis for creating a performance database of the designed methodology. Pedagogical diagnosis analyzes the educational process and highlights the results. Diagnosis differs from traditional knowledge and skills testing by not only stating the results but also explaining their origins. It determines the results through the prism of ways and means of their achievement, outlines trends, the dynamics of learning product formation. Diagnosis covers control, checking, evaluation, accumulation of statistical data, their analysis, tracking dynamics, trends, and predicting further development. Overall, the essence of pedagogical diagnosis lies in tracking qualitative changes occurring in the diagnosis subject, analyzing collected information to determine achievements and failures in development, and revealing the meaning of changes happening in the diagnosis subject.

5) *Prognostic-Regulatory Block.* Diagnosing the development of critical thinking serves as a specific practical task, contributing to and enabling the prediction of its further development. The feedback function of pedagogical diagnosis allows for controlling the process of forming skills in recognizing synthetically reproduced media content by tracking the process of skills development in detecting and identifying synthetically reproduced media content. Based on the analysis, the correction of the level of knowledge, skills, and qualities is carried out. This stage is characterized by a set of professional knowledge, skills, and qualities that enable analysis and reflection, evaluation of the level, and effectiveness of preparation. The assessment of readiness is conducted based on reflection mechanisms implemented in activities and includes diagnostic methodologies: self-assessment method, a method for self-evaluation of the effectiveness of various activities, and a test for the level of reflection.

CONCLUSION

It is worth noting that diagnosing the level of skills in recognizing synthetically reproduced media content will provide the ability to track the dynamics of the development of skills in

identifying and detecting synthetically reproduced and modified media content. The analysis of information in the database allows the tutor to make changes to the structural components of the methodology and predict their development. Based on the above components of the methodology, an algorithm of activity is developed. The components are interconnected and interdependent, as a change in one component requires a change in another. Therefore, the implementation of the developed methodology for pedagogical support in fostering critical thinking aims to contribute to the formation of skills in recognizing synthetically reproduced media content. The acquired knowledge, skills, and qualities, continually improving, will ensure the development of skills in recognizing synthetically reproduced media content for active analytical activities and preparedness to identify modified content to prevent misinformation and manipulation.

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