
Title: The System for Formation of Safe Educational Cyberspace: a Human and Cyber-Physical Systems' Integration Approach

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Abstract

The COVID-19 pandemic and distance learning have caused changes in: methods, content and means of education, the effectiveness and safety of its participants. The security of educational content has been the subject of a cognitive war in recent years. However, the current Ukraine legislation on cybersecurity (CS) does not provide protection of a human as participant of education process (PEP), does not accounting the declining quality of a human component of intellectual capital under the negative impact of cyber threats on mental/physical health, distorted cognitive models of life, creating risks. The following will be developed: a prototype of the PEP CS system, methods for assessing the impact of cyber hazards and their risk-metrics based on indicators of psychophysiological changes under their influence, recommendations for cyber security of the PEP CS, proposals on the structure and scope of training materials for forming a general CS culture. Tasks to be solved: (1) the taxonomic model of hazardous factors in the digital learning environment (DLE). (2) Methodological support for the consideration and mitigation of hazardous factors on participants in the educational process (PEP) in the DLE. (3) Results of the preliminary experimental survey of high school students. 4. The prototype system for PEP cybersecurity. (5) Carry out an experimental study of the effectiveness of the developed methodological support for high school students using the approach "Cybersecurity Red Team Versus Blue Team". (6) The analysis of the informative values of the factors that mitigate the vulnerability of students to cyber threats. (7) Recommendations on cybersecurity for PEP in the DLE.

Key words: cybersecurity, education, human-system integration.

Biography

Oleksandr BUROV is a Leading Researcher, Institute of Information Technology and Learning Tools, National Academy of Pedagogic Science of Ukraine. Educational Background: Dr.Sc., science field "Ergonomics"; Ph.D., science field "Control in biological and medical systems"; Applied Mathematic Department, M.Sc. Area of professional interests: Cognitive work, intelligence, human factors/ergonomics, psychophysiology of mental activity. Professional expertise: Psychophysiological assessment of human performance, functional state and prediction of operators' fitness for duty and performance (power industry, space, aviation). Field of application: space, aviation, power industry, education and talent development, human-system integration approach for cybersecurity.