

To use or not to use: role of digital resources in adolescents' collaborative problem solving - a literature review

Ksenija Krstić^a, Marina Videnović^a, Jovan Ivanović^a

^aUniversity of Belgrade, Faculty of Philosophy, Department of Psychology, Belgrade, Serbia

Digital tools are an inevitable part of adolescents' everyday life. Consequently, increasing attention is dedicated to its role as a resource for knowledge and learning. The need for teamwork and collaborative problem solving (CPS) in modern, progressive society demands from adolescents critical thinking in selecting, validating, and integrating data and knowledge available online. Studies have found that although adolescents spend much of their time using digital tools, they do not necessarily have the skills to use such tools for productive learning and problem-solving.

The findings presented in this paper are the result of a broader systematic literature review aimed at exploring characteristics of productive peer interaction in problem-solving. A special focus of this study is on adolescent use of digital resources for supporting collaborative learning and problem-solving. This literature review was performed following the PRISMA guidelines, in search of features of (un)productive peer dialogue, and the way adolescents use digital resources during CPS. After the process of abstract and full-text screening, 160 papers were selected for data extraction. There were 56 papers (35% out of 160) relevant to our research question – use of digital resources in adolescents CPS.

Thematic analysis revealed two major roles of digital resources in productive CPS. The first referred to the use of digital resources for supporting processes of knowledge acquisition or problem-solving, identified in half of the selected papers (N = 28). More focused analysis suggested that digital resources were significant for students' knowledge integration and learning and better conceptual understanding. Further, in the context of CPS, digital tools helped students evaluate different internet data sources. They stimulated further investigation, drawing conclusions, and a deeper understanding of the problem at hand. The second role is related to the use of digital resources as tools for scaffolding collaboration, which emerged in about a third of papers (N = 18). These resources could enhance the production of creative ideas during collaboration. Also, they could shape adolescent collaboration supporting students to rise

questions, discuss different meanings, and engage in exploratory talk within the group. Finally, some of the reviewed studies showed that digital resources were relevant for socio-emotional group processes. The use of different digital tools can help in shaping group identity and interpersonal relations in the classroom and developing and regulating social relations during teamwork. While systematic and thorough internet searching behavior is characteristic of productive peer groups, few studies showed that students don't always take advantage of digital resources during CPS. Also, the use of digital resources did not always improve all aspects of teamwork. Our findings indicate that students need additional support and guidance in using digital tools for collaborative learning and problem-solving in groups, as well as that additional research is needed on the factors of effective use of these resources in different areas of adolescents' life and work.

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