

What differentiates productive from unproductive adolescent groups engaged in collaborative problem-solving: A Qualitative Systematic Review

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Peer interaction is widely recognized as one of the important factors of cognitive development, especially in constructivist and sociocultural approach. Having in mind that global demands for collaborative problem-solving (CPS) have sparked investigations of peer interaction in the educational context, we have reviewed research findings within that setting. We chose adolescents considering their advancements in cognitive and socio-emotional prerequisites to embrace and consider different views regarding argument exchange, in comparison to younger children, and their higher potential to further develop those competencies compared to the older population. Our main goal was to make a qualitative systematization of studies investigating face-to-face peer interaction within school context in order to extract characteristics which differentiate productive from unproductive groups of adolescents engaged in CPS. The literature inspection using research strings within the three databases (PsycInfo, WoS, ERIC) yielded 5,256 human studies published in English between 2012 and 2022, which are uploaded to Covidence. The systematic narrative literature review was conducted in the form of an inductive- deductive thematic analysis of 160 papers, selected from the mentioned sample aligned with the steps in PRISMA guidelines. Interrater reliability was excellent (Cohen's $\kappa=.92$; agreement percentage = 97%). We extracted six major themes differentiating productive from unproductive adolescent peer groups dialogues during CPS. The first was named Socio-Cognitive Aspects of Collaboration, associated with the quality of idea exchange and its potential to be a solid base for joint construction of meaning/knowledge. The second, Socio-Emotional Aspects of Collaboration is related to social and emotional processes in a peer group during problem-solving. The third theme entitled The Quality of Task/Problem-Solving Strategies is pertained to adequate reasoning and approaching the problem. The fourth and fifth groups describe two types of regulation within a peer group, one oriented towards the problem/task itself (The Regulation of Group Activity Oriented Towards the Task) and the other towards

participants in the process (The Regulation of Group Activity Oriented Towards Group Members). The sixth one, Participant Engagement, reflected on the nature of adolescents' involvement in CPS. The number of identified themes describing peer dialogue during CPS has revealed the enormous complexity of social interaction and numerous factors influencing it. The obtained results are in accordance with similar literature reviews (Howe & Abedin, 2013; Asterhan & Schwarz, 2016; Gillies, 2016) but seem to have a particular focus on the quality of peer interaction and cover a broader spectrum of its features. Besides theoretical, our findings have practical implications and serve as a guidebook for teachers eager to contribute to productive collaboration between students in their classroom, but also for researchers who seek deeper understanding of the nature of peer interaction in order to develop new interventions focusing on productive dialogue features and prevention of unproductive peer interaction.

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