



We found very few studies examining the effectiveness of educators creating a community of collaborative learners on self-regulation or executive function outcomes. In this approach, educators act as facilitators to create a collaborative learning community, including during shared, cooperative activities and creative or imaginative play where children take on a role. Educators use questions and co-ordinate children's responses, enabling them to share ideas and choose what they would like to do and how to do it. Educators make suggestions of strategies to help children to cooperate, recall their ideas, and adapt them as their play develops. Educators sensitively join in with play, where appropriate, to scaffold cooperative learning between peers. The evidence base includes a broad range of outcomes; here, we focus on self-regulation and executive function outcomes and refer to broader outcomes such as literacy where relevant. The studies we found present a mixed picture of effectiveness for this approach, with some evidence of promise.

One review looked at approaches involving small group creative play activities, such as block play and fantasy or pretend play, where children work together and regulate their actions towards a goal (Muir et al., 2023). Adults did not engage as a 'co-player' in the activity but scaffolded the play by encouraging children to be self-directed and plan, problem-solve, and negotiate with each other. The review found evidence of impact on working memory,¹ some evidence of impact on cognitive flexibility,² and no evidence of impact on inhibitory control³ or global executive function. The authors concluded that the evidence in favour of this type of play and the adult's role within it is currently limited but that it may have promise for supporting children's working memory.

One small-scale study from the United States examined the effectiveness of a summer programme that supports four-year-old children from lower-income families in the transition to school (Pears et al., 2014). The programme focused on literacy skills, social skills, and self-regulation skills and involved a parent training component. The programme targeted children's prosocial skills, such as cooperating, sharing, and joining in with games and activities together, and their self-regulatory skills,

such as handling feelings, problem-solving, and being a good sport. These skills were taught through direct instruction, role play, and instruction embedded in children's daily activities and routines; adults also provided children with feedback and guided practice of the different skills. The study found positive effects on children's literacy and self-regulation outcomes and on some, but not all, measures of their social skills.

Some programmes involved adults facilitating collaborative learning as one of several components of the programme. The Tools of the Mind curriculum (TotM) centres on make-believe play to improve children's self-regulation, supports them to plan and reflect on their play and learning, and incorporates a focus on mathematics and literacy (Barnett et al., 2008; Blair and Raver, 2014). We focus on the most recent and most comprehensive reviews for the following discussion (Baron et al., 2017 and Ștefan et al., 2022).⁴ Baron et al. (2017) find a small, positive impact for TotM on children's maths skills. The same review also reports a positive effect on self-regulation and literacy skills but advises caution with this finding due to the small size and limited quality of the evidence base (Baron et al., 2017). In contrast, the most recent review (Ștefan et al., 2022) found a positive impact for TotM on executive function, self-regulation, emotional and behavioural problems, and social competence. A further review (Gagne and Nwadinobi, 2018) finds some evidence that TotM can improve outcomes for children from lower-income families. Most of the studies testing the impact of TotM have been carried out in North America. Overall, there is some evidence that TotM may have a positive effect on executive function, self-regulation, and attainment outcomes but the evidence base remains small and more research is needed to confidently demonstrate the intervention's effectiveness. It is also not possible to know the extent to which the collaborative learning element of the curriculum contributes to this effect.

The evidence in this summary comes mostly from the United States and includes children aged between three and six. Studies were only included if the majority of children were aged six or under.

¹ Working memory is an executive function that describes our ability to temporarily hold and manipulate information in our mind. It acts like a mental notepad that helps us complete tasks and solve problems.

² Cognitive flexibility is an executive function that characterises our capacity to switch between different tasks and cognitive processes. It involves the ability to shift attention and modify thinking in response to changing situational demands.

³ Inhibitory control is an executive function and describes our ability to control our urges and to think before we react.

⁴ As the other relevant reviews do not include any additional evidence not already covered by Baron et al. (2017) and Ștefan et al. (2022), we emphasise those two reviews in our synthesis. The former synthesises the findings of six studies and the latter the findings of five, with three studies in common between the two reviews.



References

Included evidence reviews

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- Gagne, J. R. and Nwadinobi, O. K. (2018) 'Self-Control Interventions that Benefit Executive Functioning and Academic Outcomes in Early and Middle Childhood', *Early Education and Development*, 29 (7), pp. 971–987. <https://doi.org/10.1080/10409289.2018.1496721>
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- Ștefan, C. A., Dănilă, I. and Cristescu, D. (2022) 'Classroom-Wide School Interventions for Preschoolers' Social-Emotional Learning: A Systematic Review of Evidence-Based Programs', *Educational Psychology Review*, 34, 2971–3010. <https://doi.org/10.1007/s10648-022-09680-7>

Included primary studies

- Barnett, W. S., Jung, K., Yarosz, D. J., Thomas, J., Hornbeck, A., Stechuk, R. and Burns, S. (2008) 'Educational Effects of the Tools of the Mind Curriculums: A Randomized Trial', *Early Childhood Research Quarterly*, 23 (3), pp. 299–313. <https://doi.org/10.1016/j.ecresq.2008.03.001>
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- Pears, K. C., Healey, C. V., Fisher, P. A., Braun, D., Gill, C., Conte, H. M., Newman, J. and Ticer, S. (2014) 'Immediate Effects of a Program to Promote School Readiness in Low-Income Children: Results of a Pilot Study', *Education and Treatment of Children*, 37 (3), pp. 431–460. <https://doi.org/10.1353/etc.2014.0021>