



There is evidence that promoting talk about learning can improve children's self-regulated learning, executive function and wider learning. We define 'promoting talk about learning' as educators using talk as a way to help children plan, monitor and reflect on their thinking and learning. This is also known as metacognition.¹ They support children to explain how they plan to do something and to reflect on how their learning is going 'in the moment'. Educators encourage children to share their thoughts about adapting a strategy or goal as the learning context develops. Educators facilitate reflective, reciprocal discussions to evaluate children's activities and learning and use their responses to extend children's contributions.

Evidence for this approach comes mostly from primary studies which evaluate a diverse range of interventions involving adults promoting talk about learning. These interventions involved thinking aloud, using stories and providing feedback. Promoting talk about learning also features in some broader curricular programmes as one of several components; for curricular programmes, we draw on systematic reviews.

Most of the evidence we found for this approach involves the educator and/or the children thinking aloud, or verbalising their thought processes, for example while solving a problem. Educators might model their thinking or their reflection on a task or provide scaffolded support to children by suggesting a strategy or prompting them to recall one.² Children might be encouraged to think aloud by explaining an answer they give. Although children's explanations are usually directed towards an adult, in one study children were asked to explain their answers to a stuffed animal (Sande et al., 2016). Several studies found positive effects of these interventions on a range of outcomes, including fluid intelligence,³ attention, self-regulated learning,⁴ pre-literacy skills, working memory⁵ and inhibitory control⁶ (Pino-Pasternak et al., 2014; Pozuelos et al., 2019; Sande et al., 2-16); two studies found a mix of positive and null effects (Di Lieto et al., 2020; Samaras, 1990). One study found a positive effect of the intervention on executive function skills for children from lower-income families, but not for their peers (Kellens et al., 2023). Another study found that

asking children to explain their thinking while solving problems led to improved problem-solving, but that these positive effects did not transfer to measures of executive function (Miller, 2014).

Two studies used stories to try to improve children's self-regulation and metacognition (Grüneisen et al., 2023; Peskin and Wilde Astington, 2004). Peskin and Wilde Astington (2004) compared the effects of using stories with and without explicit metacognitive terms such as 'figure out', 'know' and 'guess'. They found that children who listened to stories with these terms used them more when telling their own story but did not demonstrate a better understanding of the terms (Peskin and Wilde Astington, 2004). Grüneisen et al. (2023) evaluated an intervention that used a story to introduce children to self-regulated learning strategies. The children listened to a story where the main character encounters various situations requiring self-regulated action to introduce them to strategies such as planning, self-monitoring and self-reflection. Children were also encouraged to evaluate several possible courses of action in different hypothetical situations. They then practised the strategies themselves through playful activities, for example using coloured pens to make marks next to the pictures of the items that the character would need in a particular situation. Teachers were also given training to promote the self-regulated learning strategies in their daily routines. The study found that the training improved children's self-regulated learning, but this did not transfer to improved self-regulation.

Providing children with feedback is one way of promoting talk about learning. For example, children might receive feedback on their approach to a task or on their self-regulation. While many of the studies we found had an element of feedback in the intervention, two studies looked specifically at the effect of feedback (Geurten and Meulemans, 2017; Muñoz and Cruz, 2016). Geurten and Meulemans (2017) looked at the effect of feedback on how accurately children could predict their performance in a future task. When a child was asked to predict their performance on a task for the second time, the adult would remind them of the accuracy of their prediction the first time around. The researchers found that although children

¹ Often described as 'thinking about thinking', metacognition refers to the ways learners monitor and purposefully direct their learning.

² Scaffolding techniques include learning-oriented support, discussions and interactions between an educator and a learner.

³ Fluid intelligence refers to our ability to solve problems that require more than our prior knowledge.

⁴ Self-regulated learning means using self-regulation and metacognition to move towards learning goals.

⁵ 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.

⁶ Inhibitory control is an executive function and describes our ability to control our urges and to think before we react.



did use educators' feedback to adapt their predictions, the accuracy of their predictions did not necessarily improve as a result. Muñoz and Cruz (2016) compared the effects of different kinds of feedback, including self-regulation feedback that facilitates reflection before, during or after a task to help children monitor themselves, and performance feedback, for example relating to how well children carry out a task. The study found that children receiving self-regulation feedback engaged in more 'metacognitive events' (i.e., more planning, monitoring and evaluation of themselves or others while learning), but the sample size was very small, so caution is needed when interpreting this finding.

Some broad curricular programmes involve adults promoting talk about learning as one of several components. The Second Step curriculum involves self-talk,⁷ planning and reflecting on learning, alongside other components such as emotion management and friendship skills that are beyond the scope of the approach of promoting talk. One primary study found that this curriculum had a positive impact on children's executive function (Upshur et al., 2017), but it is not possible to know the extent to which the promoting talk component contributed to this impact.

Another curricular programme, Tools of the Mind (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). In TotM, educators encourage children to use self-regulatory private speech and provide children with individualised scaffolding, increasing or decreasing support depending on a child's performance of a specific skill (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 Stefan et al., 2022).⁸ Baron et al. (2017) found 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 (Stefan 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 limited, and more research is needed to confidently demonstrate the intervention's effectiveness. It is also not possible to know the extent to which the promoting talk element of the curriculum contributes to this effect.

Common educator practices that feature in our evidence base include thinking aloud, encouraging children to plan, monitor and evaluate their learning and performance and providing feedback to help children to learn from mistakes and their previous performance. The role of the educator was not always clearly described, however. Although one study finds thinking aloud effective for children from lower-income families but not their peers, the evidence base as a whole does not tell us whether promoting talk about learning is more effective, less effective or just as effective for children from lower-income families than their peers.

Most of the research we identified for this approach involved research with four-, five- and six-year-olds. A smaller number of studies involved research with children aged three. Studies were only included if the majority of children were aged six or under. Most of the studies took place in North America and Europe, with other evidence coming from a variety of countries.

To find out more about evidence for supporting children language development more broadly, please look at the [Communication and Language](#) section of the Evidence Store.

⁷ Speech which is not directed at other people.

⁸ As the other relevant reviews do not include any additional evidence not already covered by Baron et al. (2017) and Stefan et al. (2022), we emphasise those two reviews in this summary. The former synthesises the findings of six studies, and the latter the findings of five, with three studies in common between the two reviews.



Included evidence reviews:

Baron, A., Evangelou, M., Malmberg, L., and Melendez-Torres, G. J. (2017) 'The Tools of the Mind curriculum for improving self-regulation in early childhood: a systematic review', *Campbell Systematic Review*, 13 (1), pp. 1–77. <https://doi.org/10.4073/csr.2017.10>

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>

Jacob, R. and Parkinson, J. (2015) 'The potential for school-based interventions that target executive function to improve academic achievement: A review', *Review of Educational Research*, 85 (4), pp. 512–552. <https://doi.org/10.3102/0034654314561338>

Muir, R. A., Howard, S. J. and Kervin, L. (2023) 'Interventions and Approaches Targeting Early Self-Regulation or Executive Functioning in Preschools: A Systematic Review', *Educational Psychology Review*, 35 (27). <https://doi.org/10.1007/s10648-023-09740-6>

Sefan, C. A., D'Silva, 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, pp. 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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Di Lieto M. C., Pecini, C., Castro, E., Inguaggiato, E., Cecchi, F., Dario, P., Cioni, G., and Sgandurra, G. (2020) 'Empowering Executive Functions in 5-and 6-Year-Old Typically Developing Children Through Educational Robotics: An RCT Study', *Frontiers in Psychology*, 10, pp.

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Grüneisen, L., Dorrenbacher-Ulrich, L. and Perels, F. (2023) 'Differential Development and Trainability of Self-Regulatory Abilities Among Preschoolers', *Acta Psychologica*, 232, pp. 1–15. <https://doi.org/10.1016/j.actpsy.2022.103802>

Kellens, S., Dieusaert, F., De Wilde, J., Spilt, J. L. and Baeyens, D. (2023) 'The Impact of an Interaction-Based Classroom Program on Executive Function Development in Low-SES Preschoolers: First Support for Effectiveness', *Frontiers in Education*, 8, pp. 1–15. <https://doi.org/10.3389/feduc.2023.1149977>

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Muñoz, L. and Cruz, J. S. (2016) 'The Preschool Classroom as a Context for Cognitive Development: Type of Teacher Feedback and Children's Metacognitive Control', *Electronic Journal of Research in Educational Psychology*, 14 (1), pp. 23–44. <https://doi.org/10.14204/ejrep.38.15033>

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Pozuelos, J. P., Combata, L. M., Abundis, A., Paz-Alonso, P. M., Conejero, Á., Guerra, S. and Rosario Rueda, M. (2019) 'Metacognitive Scaffolding Boosts Cognitive and Neural Benefits Following Executive Attention Training in Children', *Developmental Science*, 22 (2), pp. 1–15. <https://doi.org/10.1111/desc.12756>



Samaras, A. P. (1990) 'Beyond "Scaffolding": The Role of Mediation in Preschoolers' Self-Regulation of Model-Consultation with Microcomputer Puzzles', Technical paper presented at the Annual Meeting of the American Educational Research Association, 1990.

Sande, E., Segers, E. and Verhoeven, L. (2016) 'Supporting Executive Functions During Children's Preliteracy Learning with the Computer', *Journal of Computer Assisted Learning*, 32 (5), pp. 468–480. <https://doi.org/10.1111/jcal.12147>

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