# Phonics Based Reading Interventions for Students with Intellectual Disability: A Systematic Literature Review

eTale 2022

In this review, studies that focused on the implementation of phonics based reading interventions for students with intellectual disability (ID) were examined to determine certain factors, such as what type of settings are typically used and what type of interventions are being implemented. Results indicate that students with ID continue to respond to phonics based reading interventions and there is an increase in published studies involving phonics based reading interventions for students with ID.

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For students with ID, teachers require interventions that are simple and efficient and can be implemented in the classroom. In this review, studies that focused on the implementation of

phonics based reading interventions for students with ID were examined to determine the salient factors, such as what types of settings are typically used and what types of intervention are being implemented. Results indicate that students with ID continue to respond to phonics based reading interventions and there has been an increase in published studies involving phonics based reading interventions for students with ID.

- The emphasis and methods of reading instruction for students with ID have changed over the past several years.
- The initial focus was on teaching functional sight words to enhance daily living skills for students with ID.
- The mode of instruction primarily involved drill and practice exercises that only targeted word identification and other isolated reading skills.
- While students have learned to identify words, they have experienced great difficulty in reading connected text.
- Research focusing on phonics based reading interventions for students with ID is increasing. Moreover, the findings from two reviews are encouraging and provide support for the use of phonics based instruction for students with ID.
- Conners (1992) concluded that children with moderate ID respond to various forms of phonics instruction.
- Joseph and Seery (2004) concluded that some students with ID are capable of generalising acquired phonetic analysis skills.

**Different forms of phonics instruction:**

- Stimulus-connected prompt fading technique
- Phonetic analysis with error correction
- Comprehensive literacy programme using embedded phonics instruction
- Computer-assisted instructional approaches

The purpose of this review was to update prior reviews and examine studies that have implemented phonics based reading interventions to students with ID to answer the following questions:

1. With whom and in what types of educational settings has phonics instruction been evaluated?
2. Which approaches to phonics instruction have been examined since the last review?
3. How effective are explored phonics interventions for students with ID?
4. Is there evidence for an increased focus on phonics instruction for students with ID since the previous reviews?

In total, 11 articles met the inclusion criteria and were reviewed. In the included articles, Ns varied from 3 to 93 and the subjects ranged from kindergarten age to 15-year-olds.

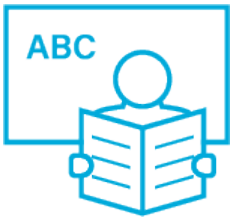
**Findings**

- A total of 240 participants with ID and an age range of 6–15 years participated in the 11 studies.
- Five studies evaluated interventions within participant classrooms, while two provided interventions for participants outside their special education classroom.
- Interventions were classified into two groupings: a) researcher-designed approaches that incorporated various

aspects of systematic, explicit instruction, and the use of published reading curricula (such as corrective reading); and b) interventions consisting of evidence based response-prompting procedures (such as simultaneous prompting).
- Studies with the longest durations tended to report higher reading improvements, with effect sizes ranging from d = 0.30 to 0.88.

**Interventions used:**

- One intervention targeted concepts of print, phonological and phonemic awareness, oral language, letter knowledge, word recognition, vocabulary, fluency, and comprehension.
- An Early Literacy Skills Builder (ELSB) intervention targeted vocabulary, comprehension, phonemic awareness and early phonics skills.
- Corrective Reading Program Decoding A is an established, systematic, explicit reading programme with a focus on decoding skills.
- The synthetic phonics intervention consisted of participants learning individual letter sounds and how to blend them to make words.
- The analogy phonics intervention consisted of participants learning sounds of common consonants and common ‘rimes’ and combining them to read words. Participants were asked to practice reading the words and saying the letter sounds before attempting to match pictures with the sounds/words.
- Simultaneous prompting involves the simultaneous delivery of the controlling prompt and the instructional cue.




**Implications**

- Reported results from the 11 studies reviewed indicated varying degrees of reading improvements as a result of their respective reading interventions. Further, they provided more evidence supporting the efficacy of phonics based interventions for students with ID.
- All studies used a systematic and explicit approach to instruction.
- Interventions were implemented either one-to-one or in a small groups, with each session lasting an average of 32.5 minutes.
- Further examination of the effects of letter-sound correspondence, letter groups, and syllables on reading instruction with students with ID are encouraged.

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# Improving Students' Learning with Effective Learning Techniques: Promising Directions From Cognitive and Educational Psychology

eTale 2022

In this monograph, 10 learning techniques are discussed in detail and recommendations about their relative utility are offered. The techniques are as follows: elaborative interrogation, self-explanation, summarisation, highlighting (or underlining), keyword mnemonics, imagery use for text learning, rereading, practice testing, distributed practice, and interleaved practice.

**Authors: John Dunlosky, Katherine A. Rawson, Elizabeth J. Marsh, Mitchell J. Nathan, & Daniel T. Willingham**

Source: Dunlosky, J., Rawson, K.A., Marsh, E.J., Nathan, M.J., & Willingham, D.T. (2013). Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. *Psychological Science in the Public Interest, 14*(1), 4-58, DOI: 10.1177/1529100612453266

Many students are being left behind by an educational system that some people believe is in crisis. In this monograph, 10 learning techniques are discussed in detail and recommendations about their relative utility are offered. The techniques are elaborative interrogation, self-explanation, summarisation, highlighting (or underlining), keyword mnemonics, imagery use for text learning, rereading, practice testing, distributed practice, and interleaved practice. To offer recommendations about the relative utility of these techniques, it was evaluated whether their benefits generalise across four categories of variables: learning conditions, student characteristics, materials, and criterion tasks.

- Simple techniques are available that teachers and

students can use to improve student learning and achievement. Hence, it is surprising that teachers have not been told about these techniques and many students are not using them.

- Some effective techniques are underutilised because teachers do not learn about them (hence students do not use them). This is despite evidence suggesting that the techniques could benefit student achievement with little added effort.
- Some learning techniques that are popular and often used by students are relatively ineffective.
- Some techniques (such as self-testing and distributed practice) have been chosen for this study because an initial survey of the literature indicated they could improve student success across a wide range of conditions.
- Some techniques (such as rereading and highlighting) were included in the study because students report using them frequently.
- The choices were limited to techniques that could be implemented by students without assistance.
- The review of each learning technique describes how it can be used, its effectiveness for producing long-term retention and comprehension, and its breadth of efficacy across the categories of listed variables (materials, learning conditions, student characteristics, and criterion tasks).

**Learning techniques:**

1. Elaborative interrogation

    - Generating an explanation for why an explicitly stated fact or concept is true

2. Self-explanation

    - Explaining how new information is related to known

information or explaining steps taken during problem solving

3. Summarisation
    - Writing summaries (of various lengths) of to-be-learned texts
4. Highlighting/underlining
    - Marking potentially important portions of to-be-learned materials while reading
5. Keyword mnemonics
    - Using keywords and mental imagery to associate verbal materials
6. Imagery for text
    - Attempting to form mental images of text materials while reading or listening
7. Rereading
    - Restudying text material after an initial reading
8. Practice testing
    - Self-testing or taking practice tests on to-be-learned material
9. Distributed practice
    - Implementing a schedule of practice that spreads study activities over time
10. Interleaved practice
    - Implementing a schedule of practice that mixes different kinds of problems, or a schedule of study that mixes different kinds of material within in a single study session

**Evaluation of the learning techniques**

- Each technique is assessed in terms of its relative utility: low, moderate, or high
- Although a technique could be designated low utility because its effects are limited to a small subset of materials that students need to learn, it could be useful in some cases and adopted in appropriate contexts. However, relative to the other techniques, it would be considered low in utility because of its limited generalisability.
- A technique could receive a low or moderate utility rating if it showed promise but lacked sufficient evidence to support confidence in assigning a higher utility assessment.

**Elaborative interrogation**

What it is and why it should work?

- Prompting students to answer 'Why?' questions can facilitate learning.
- Average effect sizes range from 0.85 to 2.57.
- The key to elaborative interrogation involves prompting learners to generate an explanation for an explicitly stated fact.
- Elaborative interrogation enhances learning by supporting the integration of new information with prior knowledge.
- Processing of similarities and differences among to-be-learned facts also accounts for findings that elaborative-interrogation effects are often larger when elaborations are precise rather than imprecise, when prior knowledge is higher rather than lower, and when elaborations are self-generated rather than provided.

How general are the effects?

- Elaborative-interrogation effects have been consistently

demonstrated using either incidental or intentional learning instructions.
- Although most studies have involved individual learning, elaborative-interrogation effects have also been exhibited among students working in dyads or small groups.
- Elaborative-interrogation effects appear to be relatively robust across different kinds of learners, although the extent to which elaborative interrogation benefits younger learners is less clear.
- Prior knowledge is an important moderator of elaborative-interrogation effects, with effects generally increasing as prior knowledge increases.
- Elaborative-interrogation effects are relatively robust across factual material of different types and with different content.

Issues for implementation

- The apparent requirement of minimal training is a possible merit of elaborative interrogation.
- Elaborative interrogation appears to be relatively reasonable with respect to time demands.
- A limitation of elaborative interrogation concerns its potentially narrow applicability to discrete factual statements.
- Elaborative interrogation is rated as having moderate utility.

**Self-explanation**

What it is and why it should work?

- The core component of self-explanation involves students explaining an aspect of their processing during learning, such as by asking themselves ‘What does the statement mean?’ or ‘Is there anything I still don’t understand?’.

- Self-explanation can enhance learning by supporting the integration of new information with prior knowledge.

How general are the effects?

- Self-explanation has been found effective when accompanied by either direct instruction or discovery learning.
- Self-explanation effects have been exhibited by with both younger and older learners.
- One of the strengths of self-explanation literature is that effects have been shown across different materials within a task domain and across several different task domains.
- Self-explanation has been shown to support many kinds of logic puzzles and mathematics problems, has helped younger learners to overcome various kinds of misconceptions, and has improved their understanding of false belief, number conservation, and principles of balance.
- Self-explanation appears to be broadly applicable.
- Studies involving text learning have also shown the effects of self-explanation on measures of comprehension.
- Studies have shown self-explanation effects on near-transfer tests, in which students are asked to solve problems that have the same (but not identical) structure as practice problems.
- Self-explanation effects on far-transfer tests have been demonstrated for the solving of mathematics problems and pattern learning.

Issues for implementation

- A particular strength of the self-explanation strategy is its broad applicability across a range of tasks and content domains.
- Most students can profit from self-explanation with

minimal training.
- Some students may require more instruction to implement self-explanation successfully. Thus, the benefit of self-explanation might be enhanced by teaching students how to implement the self-explanation technique effectively.
- Self-explanation was rated as having moderate utility.

**Summarisation**

What it is and why it should work?

- Successful summaries identify the main points of a text and capture its essence while excluding unimportant or repetitive material.
- More than just facilitating the extraction of meaning, summarisation should also boost organisational processing. This is because extracting the gist of a text requires learners to connect disparate pieces of the text instead of simply evaluating its individual components.
- Writing about the important points in one's own words produces a benefit over and above that of selecting important information.
- Summarisation appears to benefit students.
- Higher-quality summaries that contain more information and are linked to prior knowledge are associated with better performance.

How general are the effects?

- Younger students struggle to identify main ideas and tend to write lower-quality summaries that retain more of the original wording and structure of the text. However, younger students (such as middle school students) can benefit from summarisation following extensive training.
- When summarisation increases performance, its effects

are relatively robust over days or weeks.
- While benefits can be observed in classroom settings, the real constraint is whether students have the skill to successfully summarise—not whether summarisation occurs in the lab or classroom.

Issues for implementation

- Summarisation would be feasible for undergraduates or other learners who already know how to summarise. For these students, summarisation would constitute an easy-to-implement technique that would be quick to complete or understand.
- Implementing the strategy with students who are not skilled summarisers would be a difficult issue.
- Instructors might want students to summarise material because summarisation itself is a goal, not because they plan to use summarisation as a study technique. Moreover, this goal may merit the efforts of training.
- Summarisation is rated as low utility.
- While summarisation can be an effective learning strategy for learners who are already skilled at summarising, many learners (including children, high school students, and even some undergraduates) will require extensive training. This renders the strategy less feasible.

**Highlighting and underlining**

What it is and why it should work?

- Highlighting and underlining typically appeal to students because they are simple to use, do not entail training, and do not require students to invest much time beyond that already required for reading the material.
- Reading marked text promotes subsequent memory of the marked material.

- Actively selecting information should benefit memory more than simply reading marked text.
- While marked text draws reader attention, additional processing should be required if the reader has to decide which material is most important. Such decisions require the reader to think about the meaning of the text and how its different pieces relate to each other.
- The quality of the highlighting is probably crucial to whether it helps students to learn.

How general are the effects?

- Prior knowledge might moderate the effectiveness of highlighting.
- Mainly in the studies reviewed, it was determined that highlighting did not improve learning.

Issues for implementation

- Given students' enthusiasm for highlighting and underlining, discovering fail-proof ways of ensuring this technique is used effectively might be easier than convincing students to abandon it entirely in favour of other techniques.
- Highlighting and underlining is rated to have low utility.
- It can help when students have the knowledge needed to highlight more effectively or when texts are difficult. However, highlighting can actually hurt performance on higher-level tasks that require inference making.

**Keyword mnemonics**

What it is and why it should work?

- Keyword mnemonics is a technique based on interactive imagery developed by Atkinson and Raugh (1975).
- As an example, Keyword mnemonics can be used for learning foreign vocabulary.

- Interactive imagery involves elaboration that integrates the words meaningfully. Moreover, the images themselves should help to distinguish the sought-after translation from other candidates.

How general are the effects?

- The benefits of keyword mnemonics can be generalised to many different kinds of material: a) foreign-language vocabulary, b) the definitions of obscure vocabulary terms and science terms, c) state-capital associations, d) medical terminology, e) people's names and accomplishments or occupations, and f) minerals and their attributes.
- Keyword mnemonics have also been shown to benefit learners of different ages (from Grade 2 to college level) and students with learning disabilities.
- The outcomes of implementing keyword mnemonics in classroom settings have been mixed.

Issues for implementation

- The majority of research on keyword mnemonics has involved at least some training, which has predominantly been aimed at helping students develop interactive images and use them for subsequently retrieving targets.
- Beyond training, implementation also requires the development of keywords, whether by students, teachers, or textbook designers.
- Keyword mnemonics is rated as low utility.
- While keyword mnemonics show promise for keyword-friendly materials, it is not highly efficient and may not produce durable learning.

**Imagery use for text learning**

What it is and why it should work?

- When students read text, they imagine the content of each paragraph using simple and clear mental images.
- Developing images can enhance one’s mental organisation or integration of information in the text. Moreover, idiosyncratic images of particular referents in the text could also enhance learning.
- Using prior knowledge to generate a coherent representation of a narrative may enhance a student’s general understanding of the text.
- The literature review suggests that the effects of using mental imagery to learn from text may be rather limited and not robust.

How general are the effects?

- Imagery has more benefits among students who have listened to texts compared to students who have read them.
- In some studies, students’ spontaneous use of imagery in control conditions was deemed partly responsible for the failure of imagery to benefit performance in some cases. However, this has not been quantified.
- Despite the promise of imagery, the patchwork of inconsistent effects for Grade 4 students has been replicated with students of other ages.
- While Grade 3 students have been shown to benefit from using imagery, younger students do not appear to benefit from attempting to generate mental images when listening to a story.
- Although imagery instructions can boost performance, sometimes they have no effect.
- In general, imagery instructions do not tend to enhance students’ understanding or application of the content of a text.

Issues for implementation

- The majority of studies have examined the influence of

imagery by using relatively brief instructions that encouraged students to generate images of text content while studying.
- Imagery can improve students' learning of text materials and imagery production and is more broadly applicable than keyword mnemonics.
- The benefits of imagery are largely constrained to imagery-friendly materials and memory tests.
- The use of imagery for learning text is rated as low utility.

**Rereading**

What it is and why it should work?

- Rereading is one of the techniques that students most frequently report using during self-regulated study.
- According to the quantitative hypothesis, rereading simply increases the total amount of information encoded, regardless of the kind or level of information within the text.
- The qualitative hypothesis assumes that rereading affects the processing of higher- and lower-level information within a text differently, with particular emphasis placed on the conceptual organisation and processing of main ideas during rereading.
- Evidence appears to favour the qualitative hypothesis.

How general are the effects?

- The effects of rereading are fairly robust across other variations of learning conditions.
- The lag between initial reading and rereading is an aspect of the learning conditions that significantly moderates the effects of rereading.
- Although the advantages of rereading have been demonstrated with massed and spaced rereading (in which some amount of time passes or intervening material is

presented between initial study and restudy), spaced rereading usually outperforms massed rereading.
- Spaced rereading appears to be effective across moderate lags, with studies reporting significant effects after lags of several minutes, 15-30 minutes, 2 days, and 1 week.
- Most of the benefits of rereading over a single reading appear to accrue from the second reading. Moreover, the majority of studies involving two levels of rereading have indicated diminishing returns from additional rereading trials.
- Most studies on rereading effects have involved undergraduate students.
- Rereading effects are robust across variations in the length and content of text material.

Issues for implementation

- One advantage of rereading is that students require no training, other than perhaps being instructed that it is generally most effective when completed after a moderate delay rather than immediately after an initial reading.
- Relative to some other learning techniques, rereading is relatively economical with respect to time demands.
- Direct comparisons of rereading to other techniques (such as elaborative interrogation, self-explanation, and practice testing) have consistently shown rereading to be an inferior technique for promoting learning.
- Rereading is rated as having low utility.

**Practice testing**

What it is and why it should work?

- Testing is viewed by many students as an undesirable necessity of education. This is unfortunate because it overshadows the fact that testing also improves learning.

- The century of research on practice testing demonstrates the broad generalisability of the benefits of practice testing.
- Testing can enhance retention by triggering elaborative retrieval processes. Attempting to retrieve target information involves a search of long-term memory that activates related information. Further, this activated information may then be encoded along with the retrieved target, forming an elaborated trace that affords multiple pathways to facilitate subsequent access to that information.
- Practice testing may enhance how well students mentally organise information and how well they process idiosyncratic aspects of individual items. Together, these can support better retention and test performance.

How general are the effects?

- Practice tests can benefit learning even when their format does not match the format of the criterion test.
- Practice tests that require more generative responses (such as recall or short answer) are more effective than practice tests that require less generative responses (such as filling in the blank or recognition).
- Concerning dosage, more is better.
- Concerning time intervals, longer is better.
- Repeated practice testing produces greater benefits when lags between trials within a session are longer rather than shorter, when trials are completed in different practice sessions rather than all in the same session, and when intervals between practice sessions are longer rather than shorter.
- The testing effects have been demonstrated across participants with a wide variety of ages.
- Some form of testing effect has been demonstrated with preschool and kindergarten children, elementary school students, middle school students, high school students,

more advanced students, middle-aged learners, and older adults.

Issues for implementation

- Practice testing appears to be relatively reasonable with respect to time demands.
- Practice testing can be implemented with minimal training.
- The advantage of practice testing with feedback over restudy is it is extremely robust.
- The implementation of feedback with practice testing protects against perseveration errors when students respond incorrectly.
- Several studies have reported positive outcomes from administering summative assessments that are shorter and more frequent rather than longer and less frequent. This is true for both learning outcomes and student ratings of factors (such as course satisfaction and preference for more frequent testing).
- Practice testing is rated as having high utility.

**Distributed practice**

What it is and why it should work?

- The term distributed practice effect refers to the finding that distributing learning over time (either within a single study session or across sessions) typically benefits long-term retention more than amassing learning opportunities back-to-back or in relatively close succession.
- One theory invokes the idea of deficient processing, arguing that processing material during a second learning opportunity suffers when it is temporally close to the original learning episode. Students do not have to work very hard to reread notes or retrieve something from memory when they have just completed this same

activity. Furthermore, they may be misled by the ease of this second task and think they know the material better than actuality.
- Another theory involves reminding. Here, the second presentation of to-be-learned material serves as a reminder to the learner of the first learning opportunity, leading it to be retrieved. This process is known to enhance memory.
- Some researchers draw on consolidation in their explanations, positing that the second learning episode benefits from any consolidation of the first trace that has already happened.

How general are the effects?

- The distributed-practice effect refers to improved learning when learning episodes are spread out temporally rather than when they occur in close succession.
- In general, distributed practice testing is superior to distributed study.
- While the majority of distributed-practice experiments have tested undergraduates, effects have also been demonstrated in other populations.
- In general, children of all ages benefit from distributed study.
- Even children aged two years show benefits of distributed practice, such that it increases their subsequent ability to produce studied words. These benefits of spacing for language learning also occur for children with specific language impairments.
- Distributed-practice effects have been observed with many types of to-be-learned materials.
- A number of classroom studies have examined the benefits of distributed practice tests.

Issues for implementation

- One issue students face is that study materials may not be set up in a way that encourages distributed practice.
- Students naturally study in a procrastination scallop way, meaning that time spent studying increases as exams approach.
- Less frequent testing may result in massed study immediately before a test, whereas daily testing effectively leads to study that is distributed over time.
- Students may need some training and convincing that distributed practice is a good way to learn and retain information.
- While simply experiencing the distributed-practice effect may not always be sufficient, a demonstration paired with instruction about the effect may be more convincing to students.
- Distributed practice is rated as having high utility.

**Interleaved practice**

What it is and why it should work?

- In interleaved practice, students alternate their practice of different types of items or problems. In contrast, blocking practice requires that all content from one subtopic is studied (or all problems of one type are practiced) before the student progresses to the next set of material.
- During practice, performance was better with blocked practice compared to interleaved practice. However, this advantage dramatically reversed on the criterion test.
- One explanation for the impressive effect of interleaved practice is that interleaving gives students practice at identifying which solution method should be used for a given item or problem.
- Interleaved practice helps students to discriminate between the different kinds of problems, meaning they

will be more likely to use the correct solution method for each one.

How general are the effects?

- Interleaved practice may further enhance a student's ability to develop accurate concepts when exemplars of different concepts are presented simultaneously.
- Interleaved practice may only be most beneficial after a certain level of competency has been achieved using blocked practice with an individual concept or problem type.
- The majority of studies on interleaved practice have included college-aged students. Sometimes performance was improved and sometimes there was no effect.
- It seems plausible that motivated students could easily use interleaving without help.

Issues for implementation

- After a given type of problem (or topic) has been introduced, practice should first focus on that particular problem. After the next type of problem is introduced (such as during another lecture or study session), that problem should first be practiced. However, this should be followed by extra practice involving interleaving the current type of problem with others introduced during previous sessions.
- Interleaved practice may take more time to implement compared to blocked practice, because solution times often lengthen during interleaved practice. However, slowing down probably indicates the recruitment of other processes that boost performance.
- Interleaved practice is rated as having moderate utility.
- Interleaved practice has been shown to have a relatively dramatic effect on student learning and the retention of mathematical skills.

- Interleaving helps with other cognitive skills.

**Relative utility of the learning techniques**

- Although easy-to-use assessments of each learning technique are provided, it is encouraged that interested teachers and students carefully read each review to make informed decisions about which techniques will best meet their instructional and learning goals.

High utility techniques

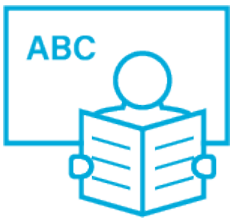
- Practice testing
- Distributed practice

Moderate utility techniques

- Elaborative interrogation
- Self-explanation
- Interleaved practice

Low utility techniques

- Summarisation
- Highlighting
- Keyword mnemonics
- Imagery use for text learning
- Rereading




**Implications**

- Beyond training students to use these techniques, teachers could also incorporate some of them into their lesson plans.

        - When beginning a new section of a unit, a teacher could begin with a practice test (with feedback) on the most important ideas from the previous section.
        - When students are practicing problems from a unit on mathematics, recently studied problems could be interleaved with related problems from previous units.
        - Teachers could also harness distributed practice by re-presenting the most important concepts and activities over the course of several classes.
        - When introducing key concepts or facts in class, teachers could engage students in explanatory questioning by prompting them to consider how the information is new to them, how it relates to what they already know, or why it might be true.
        - Even homework assignments could be designed to take advantage of many of these techniques.
    - Teachers should be encouraged to train students to use learning techniques more consistently (and explicitly) when they are engaged in pursuing various instructional and learning goals.

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# Understanding and Promoting Autonomous Self-Regulation: A Self-Determination Theory

# Perspective

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Self-regulation is a process whereby people organise and manage their capacities in the service of attaining some desired future state. These capacities comprise their thoughts (such as competency beliefs), emotions (such as interest), behaviour (such as engagement with learning activities), and social-contextual surroundings (such as selecting a quiet, comfortable place to study).

**Authors: Johnmarshall Reeve, Richard Ryan, Edward L. Deci, & Hyungshim Jang**

Source: Reeve, J., Ryan, R., Deci, E.L., & Jang, H. (2008). Understanding and promoting autonomous self-regulation: A self-determination theory perspective. Chapter 9 in the book *Motivation and self-regulated learning. Theory, research, and applications* edited by Dale E. Schunk & Barry J. Zimmerman (Routledge, Taylor, & Francis Group).

Self-regulation is a process in which people organise and manage their capacities in the service of attaining some desired future state. These capacities are their thoughts (such as competency beliefs), emotions (such as interest), behaviour (such as engagement with learning activities), and social-contextual surroundings (such as selecting a quiet, comfortable place to study). Theories of self-regulation vary considerably in their specific foci: some focus on the ‘why’ of self-regulation, some on the ‘what’, and some on the ‘how’.

When autonomous in their self-regulation, students are self-initiating and persistent because the tasks they undertake are perceived as interesting or personally important to them.

- Self-determination theory (SDT) begins with the assumption that people are active by nature with an evolved tendency to engage with the environment, assimilate new knowledge and skills, and integrate them into a coherent psychological structure.
- There are minitheories within SDT, including cognitive evaluation theory, organismic integration theory, and basic psychological needs theory.
- Cognitive evaluation theory explains how aspects of the social environment affect intrinsic motivation.
- To be intrinsically motivated is to engage in an activity because one finds the activity itself interesting and enjoyable.
- A general tendency for rewards undermines intrinsic motivation, although positive feedback tends to enhance intrinsic motivation. Moreover, tangible rewards can potentially enhance intrinsic motivation when they are used to communicate competence or improvement.
- External factors tend to undermine intrinsic motivation when they convey incompetence or pressure and control people’s behaviour.
- Organismic integration theory investigates the phenomena of internalisation and integration.
- Internalisation refers to the process through which an individual transforms an externally prescribed regulation or value into one that is internally endorsed.
- Integration refers to the experience in which an internalised regulation has been fully and coherently assimilated with one’s sense of self.
- Basic psychological needs theory focuses on the psychological needs for autonomy, competence, and relatedness as the basis of students’ autonomous self-

regulation.

**Student-classroom dialectical framework**

- According to the SDT framework, all students possess inner motivational resources that can potentially allow them to engage constructively and proactively in learning activities. This is regardless of their starting point, background, or ability.
- Students' inner resources are psychological needs (such as autonomy, competence, and relatedness, integrated values, interests, and intrinsic goals).
- The classroom learning environment includes the teacher's motivating style (such as autonomy supportive vs. controlling) and external events. These events can include interesting things to do, opportunities for action, rules and limits, reward and incentives, goals, feedback, rationales, optimal challenges, and evaluations and assessments.
- The student proactively engages in learning opportunities as an expression of the self and out of a desire to interact in the classroom effectively.
- The classroom environment sometimes nurtures and enriches the student's inner resources, maintaining intrinsic motivation and facilitating internalisation. However, sometimes it can disrupt and thwart these natural processes.

**Autonomy-supportive instructional behaviour**

- Listening: the time a teacher spends listening to student voices during instruction
- Asking what students want or need: frequency with which teacher asks what the students want or need
- Creating independent work time: time teacher allows students to work independently and in their own way
- Encouraging student voice: time students spend talking about the lesson during instruction

- Seating arrangements: the provision of seating arrangements in which the students (rather than the teacher) are positioned near the learning materials
- Providing rationales: frequency with which teacher provides rationales to explain why a particular course of action, way of thinking, or way of feeling might be useful
- Praise as informational feedback: frequency of statements to communicate positive and effective feedback about the students' improvement or mastery
- Offering encouragement: frequency of statements to boost or sustain student engagement (such as 'You can do it')
- Offering hints: frequency of suggestions about how to make progress when students appear stuck
- Being responsive: being responsive to student-generated questions, comments, recommendations, and suggestions
- Perspective-taking statements: frequency of empathic statements to acknowledge the student perspectives or experiences

**Controlling instructional behaviours**

- Uttering directives/commands: voicing commands, such as do this, move that, place it here, turn the page.
- Uttering should, got to, ought to: voicing statements that students should, must, have, got to, or ought to think, feel, or do something that they are not currently thinking, feeling, or doing
- Telling 'the right way': verbalising (or announcing) a particular way of behaving before students have the opportunity to discover an effective way of behaving for themselves
- Showing 'the right way': explicitly displaying (or exhibiting) a particular way of behaving before students have the opportunity to discover an effective way of behaving for themselves
- Monopolising learning materials: the teacher physically

holds, possesses, and monopolises the learning materials
- Controlling questions: communicating directives posed as a question and voiced with the intonation of a question

**Classroom research on self-determination theory**

- Autonomy-supportive classroom contexts tend to promote autonomous self-regulation by helping students to achieve the following: set their own goals; direct their own behaviour; seek out optimal challenges; pursue their own interests and values; choose their own way of solving a problem; think more flexibly and more actively; persist rather than give up; perform better and more creatively; employ more mature coping strategies; and experience more positive feelings about themselves and their learning.
- When learning tasks were introduced in autonomy-supportive (as opposed to controlling) ways, students achieved more positive learning outcomes.
- Supporting intrinsic motivation means being attuned to students' autonomy, competence, and intrinsic motivation, and finding ways to enrich learning opportunities to render them more interesting and relevant to students' lives.

**Supporting internalisation, identified regulation, and integrated regulation**

- Teachers can provide rationales that explain why their recommended way of thinking or behaving might be personally useful for the students.
- Teachers can use informational rather than pressuring language.
- Teachers can acknowledge students' negative feelings about undertaking uninteresting or nonvalued endeavours.
- Teachers can display high relatedness to students; hence, they know with confidence that their teacher truly cares about and is looking out for their personal

welfare.

- Teachers can suggest ‘interest-enhancing strategies’ to support student engagement during relatively uninteresting lessons. For example, goals can be added, repetitive tasks can be conducted in different ways, and students can work in the company of friends.

**How to support self-regulated learning?**

- Encourage autonomy by offering choices
- Build competence by providing challenge
- Encourage group work and peer support
- Build-in student self-evaluation
- Use feedback that is nonthreatening and mastery oriented

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# The Motivational Role of Adaptive Help Seeking in Self-Regulated Learning

eTale 2022

When students work independently, monitor task performance, and recognise difficulties they cannot overcome on their own, requesting assistance from a more knowledgeable individual can

be an adaptive learning strategy. In this chapter, the academic help-seeking literature is briefly reviewed then contrasted with several types of nonadaptive actions in which students often engage when they encounter academic difficulty. Further, practical concerns of teachers are addressed, particularly on how to support student efforts at adaptive help seeking.

**Author: Richard S. Newman**

Source: Newman, R.S. (2008). The motivational role of adaptive help seeking in self-regulated learning. Chapter 13 in the book *Motivation and self-regulated learning. Theory, research, and applications* edited by Dale E. Schunk & Barry J. Zimmerman (Routledge, Taylor, & Francis Group).

An important aspect of the learning process is asking questions about material one does not understand. When students work independently, monitor task performance, and recognise difficulties they cannot overcome on their own, requesting assistance from a more knowledgeable individual can be considered an adaptive learning strategy. In this chapter, academic help-seeking literature is briefly reviewed then contrasted with several types of nonadaptive actions in which students often engage when they encounter academic difficulty. Any practical concerns of teachers, particularly how to support students' efforts at adaptive help seeking, are also addressed.

- Adaptive help seeking is a strategy of self-regulated learning.
- Adaptive help seeking is a goal-directed and intentional action that mediates the relationship between academic difficulty and successful task completion.
- Adaptive help seeking is social—it involves other people.
- According to Vygotsky (1978), a child's cognitive development is necessarily linked to social influences.

The young child is an active participant in social interactions with adults, who provide needed assistance and gradually wean the child off unneeded assistance. In time, the child adopts the adult's regulating role.

- This developmental process has been described as a transition from other-regulation to self-regulation.
- Faced with difficult tasks, learners may require assistance from someone more knowledgeable than themselves.
- An important aspect of self-regulation is knowing when it is necessary to fall back to other-regulation.
- Individuals can alternate between depending on others, gradually developing independence, pushing oneself toward self-sufficiency, asking an expert for further assistance, and pushing oneself to new limits when necessary.
- Willingness to depend on others over a lifespan is a marker of cognitive, social, and emotional maturity.

**Adaptive help seekers carefully consider three sets of questions:**

1. Necessity of the request, for example
    - What exactly don't I understand?
    - What do I understand?
    - Have I tried to do the assignment on my own?
2. Content of the request, for example
    - What exactly should I ask for?
    - Should I raise my hand?
3. Target of the request, for example
    - Whom should I ask?
    - Who is most likely to know the answer?
    - Who is least likely to make me feel "dumb"?

**Adaptive help seekers possess the following intrapersonal, affective-motivational, and self-system resources:**

1. Goals (such as desire to learn)

2. Self-beliefs (such as self-efficacy and perceived competence)

3. Emotions (such as self-esteem that allows one to admit to others his or her limitations)

**Operationalising adaptive help seeking**

- Adaptive help seeking is restricted to occasions when assistance is actually required.
- With age and knowledge, students become increasingly aware of when their knowledge is lacking, comprehension is incomplete, or they are confused.
- Help seeking following initial failure can be interpreted as appropriate (or necessary), whereas help seeking following an initial solution that is correct is inappropriate (or unnecessary).
- Some studies about Grade 3 and 5 students found that Grade 3 students tended to make more unnecessary requests for help than Grade 5 students. Further, Grade 5 students with relatively poor vocabulary asked significantly more unnecessary questions compared to classmates with good vocabulary.
- Asking for a hint is indicative or ‘instrumental’ help seeking (indicating a desire to clarify or refine current knowledge), whereas asking for a direct answer is indicative of ‘executive’ help seeking (indicating either a lack of knowledge or desire for expedient task completion).
- Among more experienced learners, there is evidence of adaptiveness being operationalised according to matching specific types of request to perceived needs.
- Older children take more time before requesting help

compared to younger children, suggesting more perseverance in the face of difficulty.
- Students with learning goals are more interested in obtaining feedback about the correctness of their work. In contrast, students with performance goals are more likely to seek help in seemingly nonadaptive ways, such as by immediately asking for help when it may not be necessary or failing to ask help when it is necessary.

**What can teachers do?**

*Teacher-student involvement*

- In classrooms where teachers are nurturing and share their time and energy, students tend to be attentive, effortful, self-expressive, and interested in learning.
- Teachers perceived as caring are able to adopt the child's perspective, understand their thinking, and guide their learning appropriately.
- Caring teachers tend to listen, ask questions, enquire if students need help, make sure students understand difficult material, and provide help in a nonthreatening way.

*Support for autonomy*

- An important way in which teachers can support autonomy and facilitate adaptive help seeking involves the achievement goals teachers establish in their classroom.
- When they emphasise the importance of long-term mastery, autonomy, and the intrinsic value of learning, teachers foster classroom learning goals.
- Teachers can show students the benefits of carefully monitoring their performance and requesting information and feedback that focus on their exact needs.

*Support for competence*

- It is important that students respect (rather than

criticise) peers who ask for assistance.

- Explicitly encouraging students to use the help that is given to them strategically (such as returning to an incorrect solution and trying to solve the problem again) may help children monitor their understanding continually, determine if they need further assistance, and iteratively request help in increasingly explicit, precise, and direct ways.
- When teachers demonstrate that dilemmas and uncertainty can be tolerated (perhaps even shared and transformed into intellectual challenges), students may realise it is normal not to be able to solve all problems independently.
- Teachers can support adaptive help seeking by helping students assess specific learning situations to determine the particular person who is most likely to meet their particular needs.

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# Work Habits and Self-Regulated Learning: Helping Students to Find a "Will" from a "Way"

eTale 2022

This chapter focuses on motivation as a consequence of learning to self-regulate, arguing that a facility for learning is a motivator in itself. By engaging in academic pursuits productively, an individual can enjoy being a student and develop confidence about schoolwork. Further, students with good work habits are recognised and given status as full participants in their school community.

**Author: Lyn Corno**

Source: Corno, L. (2008). Work habits and self-regulated learning: Helping students to find a 'will' from a 'way'. Chapter 8 in a book *Motivation and self-regulated learning. Theory, research, and applications* edited by Dale E. Schunk & Barry J. Zimmerman (Routledge, Taylor, & Francis Group).

This chapter focuses on motivation as a consequence of learning to self-regulate, arguing that a facility for learning is, in itself, a motivator. Individuals who engage in academic pursuits productively can enjoy being a student and develop confidence about schoolwork. Moreover, students with good work habits are recognised and are considered full participants in their school community. Students tend to carry this sort of recognition throughout their school years.

- Consciously using self-regulation as a tool for undertaking learning tasks increases control and results in other favourable consequences.
- Ongoing use of self-regulation in academic settings increases the likelihood that these processes will be tapped 'automatically' as conditions dictate.
- When routinely applying self-regulation to control

action on school-related tasks, students begin to develop academic work habits.

- Students can improve in school if they learn to process information more effectively when they confront academic work and develop a strategic approach to learning as second nature.
- Internalising what it means to ‘learn how to learn’ might be used to promote effective academic work habits.
- According to Bandura (1977), strong beliefs in personal capabilities influence motivated behaviour, which includes effort and engagement in school.
- Students who can develop into confident and consistent self-regulated learners should be able to tackle almost any task using that adaptive mindset, even if their personal capabilities are average relative to their peer group.
- Multiple strands of research show that low achievers can learn the strategies of self-regulation and apply them under the demands of school tasks.
- Although motivational processes set the stage for goal pursuits, completing a performance often requires persistent striving and navigation of obstacles that define volition.

**What is self-regulated learning?**

- An intentional effort to deepen and manipulate the associative network in a particular area and to monitor and improve that deepening process.
- An associative network refers to semantic material as content, such as in connected text or lessons and mathematics problems.
- The self-regulated learner has a ‘way’ of accomplishing a range of academic tasks of which they are well aware.

**What is volition?**

- Volition reflects an intention to implement or carry out action.
- Volition includes the post-decisional self-regulation activities of setting and prioritising an action plan and activities concerned with implementation (such as bypassing barriers, checking work, managing resources, and budgeting time).
- If work habits and work styles (such as those reflected in self-discipline) are volition based, then it makes sense for students to hone their volitional competency.
- One way for students to strengthen volitional competency is through repeated experience with monitoring volitional states.

**A framework for thinking about work habits**

- Good working habits comprise the strategies and tactics for completing academic tasks that become honed through experience.
- Good work habits are cultivated tendencies that contribute to readiness and success in school.
- Students with good work habits receive positive feedback throughout the age ranges.
- Teachers provide ‘hard workers’ with a variety of opportunities to develop and display leadership.
- It is also recommended that self-disciplined students should qualify for other honours available in the school.
- Teachers confer power and status on students, establishing an upward performance trajectory that extends beyond any particular classroom.
- Improved time management allows opportunities for personal pursuits during free time.
- Students who adopt either the teacher or student role in group assignments provide models of work habits to be perceived and emulated by other members of the group.
- Students who find utility in the positive consequences

of good group habits (and set goals accordingly) should increase their likelihood of school success in the long term.

- Work habits develop over the two scales of time and experience.
- Accumulated experiences organise and stabilise, reshaping a student's repertoire of propensities (some of which are work habits).
- Beyond the classroom, academic work habits develop through homework, peer helping, and in other socio-cultural experiences that share properties with school (events that collectively educate and individual's attention).

**What are good work habits?**

Planning

- Goal setting, outcome expected, scheduling

Organisational skills

- Outline, diagram, review, summarise, mark important points

Managing homework

- Arranging the environment, managing time, monitoring and controlling motivation

Study techniques

- Paraphrase, teachback, underline, copy notes, form images

Experimenting with learning

- Observation, analyse data, interpret, evidence, reinvent practices

Using feedback

- Compare current/baseline performance, use errors as cues, take pride in success

Seeking help

- Asking for assistance when confused, conferencing with teacher

Volunteering

- To read or solve problems, for leadership roles, for community service

Class participation

- Asking questions, answering when called upon, focusing on lessons

**How to plan to work?**

- Prepare to learn
- Set contingency plans
- Make a schedule
- Consider ways to proceed
- Apply related knowledge
- Set manageable goals

**What are good study techniques?**

- Rehearse
- Repeat
- Copy, underline
- Group, order
- Outline, diagram
- Teachback
- Form image, create mnemonic
- Ask, answer questions
- Paraphrase, summarise, review, exemplify, analogise
- Compare, criticise, predict, infer
- Consider other perspectives

**Two ‘bags of tricks’ for doing well in school**

In the case of making ideas orderly, the tricks include the following:

- Goal setting
- Marking important points
- Summarising
- Reviewing

In the case of sharing your ideas, the tricks include the following:

- Asking questions
- Talking to learn
- Answering when called on
- Volunteering

The idea is that teacher responds favourably when students offer help in class without being asked. For example

- Offering to help the teacher with a class project
- Asking to be a group leader
- Raising one’s hand to answer questions
- Volunteering to read aloud or offering to work on a problem publicly

In the curriculum, teachers are asked to work together with students and their parents to design targeted home-based learning skills exercises.

Both quantitative and qualitative evidence from a series of studies supported the value of introducing children to class participation and memory support skills.

Students who completed all the exercises in the programme achieved significantly higher reading and vocabulary scores.

The treatment effect exceeded 0.75 standard deviations of adjusted class means.

**Collaborating with teachers to study work habits**

- When we define a term such as self-regulated learning and provide attendant examples from the research literature, we ask teachers to illustrate the same concept using instances from their own teaching experience.
- We provide assistance to teachers who wish to use our curriculum or adapt it for their purposes.
- We communicate with teachers about how to personalise the curriculum and the quest-related strategies it offers for students to polish their work.
- The experiences teachers devise for their particular students have a common goal: to teach self-regulation strategies and encourage students to apply them naturally when planning for their own challenging quests or events.
- The teachers understand that work habits can develop into a productive work style, meaning a way of doing things that contributes to success across the curriculum.
- We address helping students to find the motivation (or will) to perform in school.
- Teachers indicate that a student’s sense of efficacy can be fragile. Moreover, even confident learners can falter when faced with a disappointing performance.
- We share new theories with teachers about the concept of aptitude, which is no longer perceived as innate and unchanging.
- Aptitude is now understood to be a ‘fit’ between demands and preparation.
- The cultivation of aptitude for schooling can be perceived as the cultivation of attention to contextual cues.
- The processes of motivation and volition rise and fall away in a context of increasing demands and decreasing support.

- Although it is the putative role of the teacher to promote student learning in educational situations, students mediate all the instruction they receive.
- Mediation (including self-regulation) is powerful; it builds self-confidence, leading to other attainments.

**Getting students to develop good work habits**

- Student assignments should require self-regulation.
- In the classroom, the limits on work time in the presence of other students mean that individual learners should ignore intrusions, prioritise work goals, and manage under pressure.
- To require volitional control, assignments should be just beyond the students' current capabilities and are likely to be perceived by them as difficult.
- The teacher can reveal student work habits by asking them questions such as how they do their work at home, how they study, and how they cope with distractions.
- Teachers can use this knowledge of students as an indication of who needs help in which aspects of self-regulation and where they should focus their efforts during the year.

**Example curriculum to exercise and develop budding work habits**

- Students maintain records of time spent preparing for tests or quizzes outside school, numbers of assignments tackled for extra credit, and any ways they sought assistance when completing homework assignments and projects (such as self-management charts).
- Students share with each other and the teacher information on the following: how they manage their work, descriptions of their work space at home, habitual work tactics, any strategies used for action control, and work styles.
- Students write about the ways they plan and prepare for

tests and what they do to stay on task both in and outside the class (such as making lists, colour-coding notes, drawing up tables, or self-monitoring).

- Using good examples from materials they provide, stronger students are asked to share their strategies as peer helpers.
- Students are asked to reflect on their work habits as course activities progress.
- Teachers can present students with problems to solve and other scenarios that prompt evidence of more- and less-productive ways of tackling tasks and investing effort.
- Teachers can take notes on work habits they observe to be developing in individual students throughout the year, which can be shared with students and parents to increase productivity.
- It can be profitable if parents take notes about any salient points.
- In an experiment following an assignment, a partner asks the student to envision a game plan for completing the task, with the aim of the student thinking through when and where they could work. This request was sufficient to induce an action plan for completing the task in the majority of student participants.

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# How Effective Are Early Grade Reading Interventions? A Review of the Evidence

eTale 2022

Herein, evidence from 15 Early Grade Reading (EGR) interventions are summarised. It was found that EGR interventions are not a guaranteed means of improving reading and rarely lead to fluency in the short term. However, they are a predominantly reliable method of making substantial improvements in reading skills over a short period of time across a variety of contexts. The average effects equate to approximately three years of schooling.

**Authors: Jimmy Graham & Sean Kelly**

Source: Graham, J. & Kelly, S. (2019). How effective are early grade reading interventions? A review of the evidence. *Education Research Review, 27*, 155-175, https://doi.org/10.1016/j.edurev.2019.03.006

Early Grade Reading interventions are programmes that aim to strengthen core reading skills in Grades 1–4. This is achieved by training teachers to teach reading using simplified instruction and evidence-based curricula and by employing a combination of complementary approaches. Herein, evidence from 15 EGR interventions are summarised. It was found that EGR interventions are not a guaranteed means to improve reading and they rarely lead to fluency in the short term. However, they are a mainly reliable means of making substantial improvements in reading skills over a short period of time across a variety of contexts, with average effects equating to approximately three years of schooling.

- Despite increasing enrolment rates, early grade illiteracy is widespread in the developing world.
- UNESCO estimates that 250 million primary school-aged

children (out of a total of 650 million) are failing to acquire basic reading skills.
- Illiteracy has wide-ranging costs.
- Illiteracy prevents millions of children from taking advantage of the extensive benefits of education.
- Societal shortcomings in literacy may constrain economic growth and lead to higher societal costs in terms of employment, education, crime, and health.
- Early Grade Reading interventions are a specific type of programme intended to strengthen core reading skills in Grades 1–4 and are emerging as a potential solution to address the crisis of illiteracy.

**What are Early Grade Reading interventions?**

- They are geared towards improving core reading skills.
- They target students in early primary school.
- They train teachers to teach reading with simplified instruction and evidence-based curricula.
- They employ a mix of complementary components. These include providing instructional guidelines, following up on in-service trainings with coaching and monitoring, supplying supplementary instructional materials, and furnishing tools and training for student assessment.

**Teacher training**

- Training must move beyond large, conference-style, one-off, professional development workshops to personal extensive training focused on practical skills.
- Training should focus specifically on reading.
- Training should have a basis in reading curricula that follows evidence from education and cognitive research, be appropriate to student ability levels, and cater to the local language and level of resources available.

**In-service training**

- In-service training should emphasise and explain to participants the five main reading skills central to EGR interventions: phonemic awareness, letter-sound knowledge, vocabulary, reading fluency, and comprehension.
- Initial in-service training at the start of the EGR intervention lasts from five to ten days. This is followed by refresher training of three to five days taken during school breaks in the middle of project implementation.
- In-service training should use cascade models that train master trainers or coaches who then deliver the training to teachers.
- Teachers should learn how to use instructional guidelines and how to integrate new reading materials into their lessons. They should also learn and practice instructional techniques and activities that develop reading skills (such as the 'I Do, We Do, You Do' approach).
- Guidelines enable teachers to develop simple reading instruction routines. Ideally, they should provide step-by-step instructions without too many words or complex procedures.
- The length of lessons in instructional guidelines should range between 30 and 90 min.
- Evidence suggests that scripting lessons tends to enhance the effectiveness of reading instruction in low- and middle-income countries.
- Coaching and continual feedback have been found to be beneficial.
- During visits, coaches observe teachers as they deliver reading lessons to their students. After the lesson, the coach provides individualised feedback with the aim of reinforcing concepts from in-service teacher training, improving lesson content, or helping the teacher apply instructional techniques more effectively.
- Reading materials appropriate for the local context are

fundamental for instruction (once teachers have been trained how to use them).

- The supplementary instructional materials of EGR interventions permit students to practice letter sounds, hear teachers or other students read aloud, learn new vocabulary, and read stories.
- Assessments are a critical part of effective reading instruction. Accordingly, effective EGR interventions often include the furnishing tools and training for student assessment as another component.
- Assessments evaluate student reading skills such as letter sounds, familiar words, listening comprehension, or passages of connected text with reading comprehension questions.
- Student assessments can indicate to teachers those students who need additional instruction in specific reading skills.

**The study**

This paper adds to the literature by presenting a clear definition of EGR interventions and a rationale for why they should enhance reading skills. Further, evidence from 15 impact evaluations occurring across a large variety of contexts are summarised.

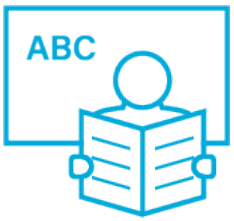
**The data**

Data consisted of 15 evaluations of EGR interventions. When examining these evaluations, the focus was on their effect on reading fluency, letter-sound knowledge, and comprehension.

**Findings**

- For oral reading fluency (ORF), the majority of programme-language groups had effect sizes equating to at least 2 equivalent years of schooling (EYOS), with the average being over 3 EYOS.
- With regard to difference-in-differences (DiD) between treatment and control for the average score for fluency, and considering the range of fluency tends to fall within 45–60 correct words per minute, many of the results tend to appear somewhat substantial (though modest compared to the effect sizes). Only 30% (approximately) of the programme-language groups had average DiDs above 5 correct words per minute.
- Of the 15 interventions, 12 were at least moderately effective in terms of either effect sizes or DiDs.
- Notably, only two averages fell within the range of 45–60 correct words per minute. In other words, the average student in most programs was not reading fluently by the end of the intervention and less likely to read with full comprehension of the text.
- The trends for impacts in terms of letter sound recognition/letter name recognition (LSR/LNR) are similar to those of ORF, with slightly larger impacts on average. The average programme mean effect size was nearly 4 EYOS. Moreover, only 3 out of 11 with data had effect sizes equating to less than 2 EYOS.
- The majority of programmes had at least one programme-language mean above 10 correct letter sounds per minute, which is a substantial improvement given the subtask has 100 items.
- For LSR/LNR, the mother-tongue programmes had

substantially larger effect sizes on average.
- The results for reading comprehension (RC) are consistent with the other findings.
- The average effect size in terms of EYOS (2.86) is slightly smaller than ORF and LSR/LNR.
- The average endline RC scores were low-to-moderate: only one programme had average scores above 50% and most had scores below 20%, implying a high number of zero scores.




**Implications**

- EGR interventions have emerged as a possible solution to the widespread problem of illiteracy among early primary school students in developing countries.
- The findings reveal that EGR interventions are mostly consistent in improving outcomes for letter-sound knowledge, fluency, and comprehension (as measured by LNR/LSR, ORF, and RC).
- While practical gains represented substantial improvements over the status quo, they were rarely large enough to bring students close to fluency.
- Generally, the interventions were slightly more effective at improving outcomes in practical terms for LSR/LNR compared to ORF/RC, although several interventions had very large gains in practical terms for all three subtasks.
- Overall, grade level, intervention length, programme size, and language of assessment did not appear to influence the outcomes substantially.
- EGR interventions are a mostly reliable method

(regardless of context) of making substantial improvements in reading skills and accelerating learning in many contexts.

- Rigorously training teachers to teach reading using evidence-based simplified curricula is probably a powerful element for making progress in reading skills.

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# The Relative Importance of Intelligence and Motivation as Predictors of School Achievement: A Meta-analysis

eTale 2022

This meta-analysis summarises 74 studies (N = 80,145) that simultaneously examined the predictive power of intelligence and motivation for school achievement. In a path model, 24% of variance in school achievement was explained overall, 66.6% was uniquely explained by intelligence, and 16.6% uniquely by motivation. Both intelligence and motivation contribute substantial and unique shares to the prediction of school achievement and an additional share of commonly explained variance.

**Authors: Katharina Kriegbaum, Nicolas Becker & Birgit Spinath**

Source: Kriegbaum, K., Becker, N. & Spinath, B. (2018). The relative importance of intelligence and motivation as predictors of school achievement: A meta-analysis. *Educational Research Review, 25*, 120-148, https://doi.org/10.1016/j.edurev.2018.10.001

This meta-analysis summarises 74 studies (N = 80,145) that simultaneously examined the predictive power of intelligence and motivation for school achievement. The average correlations were moderate between intelligence (r = 0.44) and motivation (r = 0.27) with school achievement and between intelligence and motivation (r = 0.17). Correlation between motivation and school achievement was higher for expectancies than for values. In a path model, 24% of variance in school achievement was explained overall, 66.6% was uniquely explained by intelligence, and 16.6% uniquely by motivation. Both intelligence and motivation contribute substantial and unique shares to the prediction of school achievement and an additional share of commonly explained variance.

- School achievement is strongly influenced by individual student prerequisities, such as cognitive and motivational factors.
- The term school achievement summarises performance outcomes in all domains taught at school.
- School achievement functions as a selection criterion for subsequent education and jobs and is typically operationalised via school grades or standardised tests.
- Standardised test achievements are a purer measure of student achievement compared to grades. However, school grades can be perceived as a highly ecologically valid measure of school achievement because they are good predictors of future academic success and are used as allocation and selection criteria for higher education and jobs.
- Verbal and mixed intelligence tests are more strongly

associated with school achievement than nonverbal intelligence.
- Intelligence is more strongly related to standardised test achievements than to school grades.
- Achievement motivation can be divided into expectancies (academic self-concept and self-efficacy), and values (intrinsic/extrinsic motivation, task values, achievement motive, achievement goals and interest).
- Intelligence and motivation have been shown to predict school achievement, with intelligence typically being the stronger predictor.

**What is intelligence?**

- Ability to understand complex ideas
- Ability to adapt effectively to the environment
- Ability to learn from experience
- Ability to engage in various forms of reasoning
- Ability to overcome obstacles through thought

**What is motivation?**

**Expectancies**

- Academic self-concept is an individual's perception of their competence in a specific domain.
- Self-efficacy is individual expectancy about future performance and is typically measured as a conviction about how well one will be able to solve a certain task in the future.

**Values**

- The value attributed to a certain task comprises different components: intrinsic value (enjoyment of task or interest), importance values (importance of doing well on a certain task), utility value (usefulness of a certain task for one's future), and cost.
- Interest can be defined as a personality-specific trait

(such as a relatively stable preference for a specific learning topic) and a situation-specific state related to attraction of a specific learning condition.

- Whereas intrinsic motivation is defined as engaging in something for its own sake and for enjoyment, extrinsic motivation is defined as doing something for its consequences.
- Achievement goals can be divided in four different types: mastery-approach goals focus on the positive development of one's own competence; mastery-avoidance goals tap the fear of losing competence; performance-approach goals focus on demonstrating one's own competence and performing better than others; and performance-avoidance goals focus on hiding supposed incompetence and striving not to perform worse than others.
- Achievement motives include hope for success (a positive attitude towards performance), the belief that one can succeed, positive emotions in achievement situations, and fear of failure (such as a negative, fearful attitude towards performance and negative emotions in corresponding situations).

**The study**

The purpose of the present meta-analysis was to summarise findings from the literature to investigate the relative importance of motivation and intelligence in predicting school achievement. Another purpose was to identify relevant moderator variables, including the type of achievement measure, motivational construct, intelligence measure, subject domain, study design, grade level, school form, gender,

country, and year of publication.

**Data**

Data for the meta-analysis consisted of 74 published or unpublished studies.

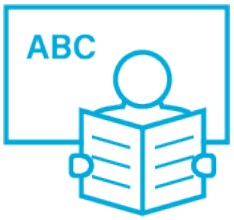
**Findings**

- The correlations for the relationship between intelligence and school achievement were positive and significant in all the 74 primary studies.
- The correlations for the relation between motivation and school achievement and between intelligence and motivation were also significant and positive in all studies except two (one in each).
- The mean correlation in the meta-analysis corrected for sampling error between intelligence and school achievement was M(r) = 0.44, whereas the corrected average correlations between motivation and school achievement and between intelligence and motivation were M(r) = 0.28 and M(r) = 0.17, respectively.
- The correction for error of measurement resulted in a corrected average correlation of M(r) = 0.52 between intelligence and school achievement, M(r) = 0.33 between motivation and school achievement, and M(r) = 0.20 between intelligence and motivation.

**Moderator results**

- The type of achievement measure, grade, gender, country, school form, and year of publication were nonsignificant moderators.

- The average correlation for motivation and school achievement was significantly higher for expectancies (M(r) = 0.40) than for values (M(r) = 0.22); hence, the type of motivational construct was a significant moderator.
- The average correlation between motivation and school achievement was significantly higher for the languages domain (M(r) = 0.39) compared to mathematics (M(r) = 0.22) or science (M(r) = 0.23).
- The average correlation between motivation and school achievement was significantly higher for studies with a cross-sectional design (M(r) = 0.29) compared to longitudinal design having a distance between the measurement occasions from 13 months onward (M(r) = 0.15).
- The average correlation between intelligence and motivation was higher in studies with a cross-sectional design (M(r) = 0.18) compared to studies with a longitudinal design having a distance between the measurement occasions from 13 months onward (M(r) = 0.05).
- In the meta-analytic regression, intelligence strongly predicted (beta = 0.41) and motivation moderately predicted (beta = 0.20) school achievement.
- Overall, 24% of the variance in school achievement was explained by intelligence and motivation.
- Overall, 66.6% of the explained variance in school achievement was uniquely explained by intelligence, whereas motivation uniquely accounted for 16.6%, and 16.6% was explained in common by intelligence and motivation.




**Implications**

- A central finding of the meta-analysis is that intelligence and motivation are only weakly positively associated.
- Results indicate that intelligence is a strong predictor of school achievement.
- The average correlation between motivation and school achievement is moderate and positive.
- Expectancies such as academic self-concept and self-efficacy are more accurate predictors of school achievement compared to values such as intrinsic motivation, interest, achievement motive, and achievement goals.
- Since motivation is easier to influence and foster through instructional characteristics, feedback, learning contexts and situational factors, teachers should be aware of their power to motivate students toward higher achievement.
- Students should develop positive expectancies for success in their future assignments and exams and a realistic (yet positive) self-concept regarding ability.
- Teachers should support their students in developing a realistic academic self-concept. For example, this can be achieved by varying the difficulty of tasks, setting short-term goals, and providing clear, specific, and informative feedback.

# Identifying Student and Classroom Characteristics Related to Primary School Students' Listening Skills: A Systematic Review

eTale 2022

This study presents a systematic review of available empirical research on primary school students' first language listening skills. At the classroom level, students' listening skills and teaching practices (such as listening strategy instruction) in addition to classroom features (such as classroom noise) were related. At the student level, students' listening skills and their cognitive skills (such as working memory) and background characteristics (such as socioeconomic status) were related.

**Authors: Heleen Bourdeaud'hui, Koen Aesaert, Hilde Ven Keer, & Johan van Braak**

Source: Bourdeaud'hui, H; Aesaert, K.; Van Keer, H.; van Braak, J. (2018). Identifying student and classroom characteristics related to primary school students' listening skills: A systematic review. *Educational Research Review, 25*, 86-99, https://doi.org/10.1016/j.edurev.2018.09.005

This study presents a systematic review of available empirical research on primary school students' first language listening

skills. In total, 27 studies were selected and reviewed. First, the outcome variables of listening skills were labelled, with the results indicating that most studies evaluated listening skills as the ability to remember, understand, or interpret an auditory message. Second, important correlates related to primary school students' listening skills were identified. At the classroom level, students' listening skills and teaching practices (such as listening strategy instruction) in addition to classroom features (such as classroom noise) were related. At the student level, students' listening skills and their cognitive skills (such as working memory) and background characteristics (such as socioeconomic status) were related.

- Listening, speaking, reading, and writing are the four language skills.
- In an educational context, research indicates that primary school students spend approximately 50%–75% of each school day listening to teachers, classmates, or audio-supported media.
- Listening skills remain rather challenging for many students, especially for non-native speakers and students with language impairments, learning disabilities, or hyperactivity disorders.
- Classroom noise and poor acoustics could have an effect on listening skills.
- There is a shortage of listening instruction.

**Why are listening skills important?**

- Listening skills and academic success (or knowledge) are closely connected, since listening is an important medium for students to process and acquire information.
- Listening skills play a key role in literacy success and the development of numerous other language skills, such as reading comprehension and writing.
- Students need listening skills to understand practical oral instructions from the teacher, such as homework

assignments.

- Good listening skills are fundamental for the development of social and relational skills in the school context.

**The six components of listening skills (HURIER model):**

- Hearing
- Understanding
- Remembering
- Interpreting
- Evaluating
- Responding

**The study**

The intent of this study is to analyse existing listening literature and provide a systematic overview of the correlates of primary school students' listening skills.

*Research questions:*

1. *How are student listening skills defined and described in different studies according to the HURIER model?*
2. *According to the model of Palardy and Rumberger (2008), which input and process characteristics are related to primary school students' listening skills?*

**The data** consisted of 27 articles reviewed in this study.

**Findings**

- Most studies could be classified on the understanding (18 studies) and/or interpreting level (12 studies) of the HURIER model.

**Results at the class level**

**Teaching practice**

- In 9 out of 11 studies, studying teaching practice in relation to student listening skills resulted in a significant positive effect.
- Teachers taught their students strategies for identifying characters or making inferences about thoughts and feelings of the stories, trained the students in retelling stories, and asked students questions about events such as the main character or the location.
- A significant positive effect was found in three studies that focused on applying visual techniques during listening training. For example, storytelling supported with illustrations increased student listening skills.
- One study compared manipulation strategy (moving manipulatives as directed by the narrative) to viewing pictures of the actors of the story. Those students in the manipulation strategy group outperformed those who only viewed the pictures with the story.
- One study found teaching students to listen for a purpose, clarifying difficult words, imagining the auditory text, predicting what could happen, or summarising the text to be effective listening strategies.

**Classroom features**

- Three studies reported that attention and listening were impaired when classroom acoustics were less beneficial.
- Two studies indicated the potential benefits of sound field amplification technology for student listening skills. This technology improves the sound environment of the class by ensuring an even distribution of sound from the teacher, students, and multimedia.
- Reducing class sizes significantly improves listening scores from kindergarten to third grade.

**Teacher background**

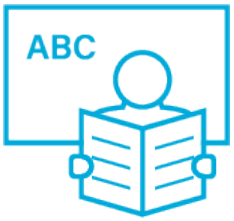
- In one study, significant positive changes in student listening skills were observed after the implementation of a teacher-training package. This included information on the theoretical aspects of the listening material and instruction strategies.

**Results at the student level**

**Student background**

- Four correlational studies found a significant positive relationship between family background (such as parental education, number of books at home, and home language) and student listening skills.
- Seven correlational studies indicated that academic background characteristics (linguistic knowledge (such as vocabulary and language scores) and cognitive skills (such as working memory, theory of mind, and concentration)) were positively related to student listening skills.
- One study demonstrated that high-proficiency listeners had a significantly higher listening motivation and listening interest in performing listening exercises compared to low-proficiency listeners. Further, high-proficiency listeners used significantly more listening

strategies compared to low-proficiency listeners.




**Implications**

- Listening skills are a prerequisite for further educational success.
- The relationship between correlates and listening skills was primarily investigated towards the ‘lower levels’ of listening skills (remembering, understanding, and interpreting).
- Different student level characteristics (such as academic background, demographics, and family background) are correlated to student listening skills.
- Working memory and vocabulary are especially significant predictors of listening skills.
- A student’s socioeconomic status is related to their listening skills.
- Students will remember more facts from auditory texts when they receive instruction in the specific structure of the text type (such as a narrative or expository strategy instruction).
- Student listening skills can be improved through applying visual techniques during listening training, such as telling stories supported by illustration or asking students to paint a picture of the main features in their mind.
- Listening strategy instruction affects listening skills positively. For example, teaching students different listening strategies (such as listening for a purpose or predicting what could happen) will improve their

listening skills.

- Listening skills can be improved through integrating listening activities into the entire curriculum and by combining listening activities with speaking, reading, or writing activities.
- Poor interior acoustics and background noise cause attention loss and exacerbate listening difficulties, while sound system improvements positively influence student listening skills.
- Reducing class sizes and/or investing in sound systems by improving the sound environment in the classroom will positively influence student listening performance.

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# CARE – Curriculum Quality Analysis and Impact Review of European Early Childhood Education and Care (ECEC)

eTale 2022

The evidence on Early Childhood Education and Care (ECEC) in the first three years for disadvantaged children indicates that high-quality ECEC can produce benefits for cognitive,

language, and social development. With regard to provision for subsequent years, disadvantaged children benefit particularly from high-quality preschool provision. Further, children benefit more in socially mixed groups.

**Authors: Edward Melhulsh, Katharina Ereky-Stevens, Konstantinos Petroglannis, Anamaria Ariescu, Efthymia Penderi, Konstantina Rentzou, Alice Tawell, Pauline Slot, Martine Broekhuizen, & Paul Leseman**

Source: Melhulsh, E., Ereky-Stevens, K., Petroglannis, K., Ariescu, A., Penderi, E., Rentzou, K., Tawell, A., Slot, P., Broekhuizen, M. & Leseman, P. (2015). CARE – Curriculum quality analysis and impact review of European Early Childhood Education and Care (ECEC). https://ecec-care.org/fileadmin/careproject/Publications/reports/new_version_CARE_WP4_D4_1_Review_on_the_effects_of_ECEC.pdf

High-quality childcare has been associated with benefits for children's development, with the strongest effects for children from disadvantaged backgrounds. However, negative effects can sometimes occur. Discrepant results may relate to age of starting and differences in the quality of childcare. The evidence on ECEC in the first three years for disadvantaged children indicates that high-quality ECEC can produce benefits for cognitive, language, and social development. With regard to provision for subsequent years, disadvantaged children benefit particularly from high-quality preschool provision. Further, children benefit more in socially mixed groups. This educational success is followed by increased success in employment, social integration, and reduced criminality in adulthood.

- The terms day care, child care, and ECEC have all been used to refer to various forms of non-parental childcare and early education occurring before school.
- ECEC has become a salient developmental context for most children in high-income countries and increasingly so in

low- and middle-income countries.

- Quantity of care issues are concerned with whether child development is related to the following: a) the use of non-parental day care versus parental care (or the use of different types of care); b) the age at which children enter ECEC; and c) the amount of time children spend in ECEC.
- The structural quality of ECEC refers to the organisational and physical features of ECEC, and is generally considered higher when the following conditions are met: child group sizes and child-adult ratios are small, teachers are trained, and curriculum/ programme type, toys and learning materials, and physical space are age-appropriate and adequate.
- The process quality of ECEC refers to the quality of children's daily experiences (including adult–child interactions) that foster children's development.

**Quality characteristics of early years childcare:**

- Adult-child interaction that is responsive, affectionate, and readily available
- Well-trained staff who are committed to their work with children
- A developmentally appropriate curriculum with educational content
- Ratios and group sizes that allow staff to interact appropriately with children
- Supervision that maintains consistency in the quality of care
- Staff development that ensures continuity, stability, and quality improvement
- Facilities that are safe, sanitary, and accessible to parents

**Studies in USA**

**Early Head Start (EHS)**

- EHS is a two-generation intervention programme serving parents and children from birth to age three.
- Centre-based programmes had the strongest effects on child outcomes, whereas home-based programmes had the strongest effects on parenting outcomes. Further, a mixed model combining both centre-based provision with home visiting had the most wide-ranging and strongest positive impact.
- Effect sizes were modest, generally in the range of 10% to 20%.

**The positive effects for children**

- Better cognitive and language development
- Better immunisation records and less hospitalisation
- Lower levels of aggressive behaviour
- More sustained play
- Greater engagement and less negativity with parents

**The positive effects for parents**

- Greater warmth and supportiveness toward children and less detachment
- More time playing with children
- More stimulating home environments
- More language learning and reading support for children
- Less corporal punishment and a wider range of discipline strategies
- A higher likeliness to be employed or in training
- Delayed subsequent child bearing compared to controls

**Infant Health and Development Programme (IHDP)**

- IHDP was an intervention aimed at improving the health and development of premature, low birth weight (LBW) (<2.5 kg) infants through a combination of education and support for parents plus enriched educational day care

and health services for children.
- For children in the range 2.0–2.5 kg, there were large and significant benefits from the enriched educational day care intervention.
- For very LBW (<2 kg) infants, the results were more equivocal.
- There were modest short- and long-term improvements for cognitive outcomes for the heavier LBW participants.
- For non-cognitive outcomes, both short- and long-term effects on heavier LBW children were reported.

**Milwaukee project**

- The Milwaukee Project was an intervention programme designed to facilitate the intellectual development of very young disadvantaged children.
- The intervention technique employed an intensive educational programme for very young high-risk children, starting before the age of six months.
- The very small-scale intervention included a full-time, child-oriented, centre-based programme from infancy to six years of age with increasing educational input as age increased. Vocational training, childcare, and household guidance was also provided for mothers.
- By the age of six years, all the children from the experimental group had higher IQs compared to children from the control group.
- After leaving the programme, IQs started to decline and the scholastic achievement scores of the experimental group were the same as those of the control group.

**Abecedarian Project**

- The Abecedarian Project involved a poor African-American population in North Carolina.
- One group was placed in a programme involving centre-based care and home visits from the age of three months, which continued until the children entered school.

- The control group received family support, social services, low-cost (or free) pediatric care, and child nutritional supplements. However, there was no additional childcare beyond that provided by the parents and local services.
- Overall, there is a consistent positive message on the long-term impact of Abecedarian on cognitive and educational outcomes.
- Long-term effects for non-cognitive outcomes were found, such as reduced depression and delinquency and better employment.

**Project CARE**

- In this project, the effects of a centre-based programme, home visits, and control conditions were compared, with interventions starting shortly after birth. The target group was low-income African-American families.
- The day care plus home visit intervention group scored significantly higher on developmental assessments compared to the control and home visit only groups.
- Children in treatment groups that included childcare were rated as more task-oriented in infancy and tended to exhibit higher and more stable cognitive scores. This started during late infancy and continued through to early childhood.

**Perry Preschool Project (PPP)**

- This half-day, five days a week, centre-based programme started interventions at three years of age and was supplemented by weekly home visits lasting 90 min.
- African-American children with IQs <90 were randomly assigned to the intervention or control groups.
- The intervention involved a high-quality educationally-oriented curriculum with well-trained staff.
- The programme was demonstrated to have long-term

effects.
- The intervention group exhibited higher levels of educational achievement.
- By the age of 27 years, the long-term benefits of the intervention included the following: reduced school drop-out, reduced drug use, reduced teenage pregnancies, enhanced employment, reduced welfare-dependence, and reduced crime.
- The long-term effect sizes were in the range 0.30–0.50 SD.

**Early Training Project (ETP)**

- Three to four year-old children were randomly assigned to treatment (44) and control (21) groups.
- Children were selected if they lived in poor or deteriorating housing or public housing, had a low family income, and had parents with a lower than high school education who were in an unskilled or semi-skilled occupation.
- The intervention consisted of a 10-week summer preschool programme for the 2–3 summers prior to the first grade, plus weekly home visits during the remainder of the year.
- There were positive modest effects, such as on high school completion.

**Head Start**

- Head Start is a broad-based federally funded (but locally administered) early intervention programme with the aim of improving outcomes for children in disadvantaged families.
- Typically, a Head Start programme would include centre-based early childcare and education from three years of age on at least a half-time basis.
- While Head Start had a substantial and immediate effect on participants, the long-term effects were less

evident.

**Child-Parent Centre (CPC)**

- CPCs provide centre-based educational support and family support to disadvantaged children and their parents. This includes education, family, and health services and half-day preschool and school-age services up to the age of nine years.
- Children participated in the preschool intervention for one or two years. They achieved a higher rate of high school completion, more years of completed education, and lower rates of juvenile arrest, violent arrests, and school dropout.
- Children with two years of preschool experience had higher cognitive readiness and higher achievements in reading and mathematics at the age of five years compared to those with only one year of preschool.
- The short-term effects included moderate to high effect sizes, while long-term effects (both cognitive and behavioural) were small to moderate.

**Great Start Readiness Programme**

- This is a state-funded preschool initiative.
- To qualify for the programme, a child must be four years of age and have at least 2 of 25 risk factors (such as living in a low-income or single parent family).
- Children receive a child developmental preschool programme that provides age-appropriate activities to promote their intellectual and social growth and school readiness.
- Children’s families receive parenting support, guidance, and referrals to community services as required.
- Children who attended the programme were more advanced in six areas of child development compared to the control group: initiative, social relations, creative representation, music and movement, language and

literacy, and logic and mathematics.
- In grade four, students who had attended the programme had a significantly higher percentage of satisfactory scores on academic performance.
- Students who participated in the programme demonstrated improved levels of on-time school graduation, lower retention in grade, higher performance in mathematics and in mathematics and language arts combined in high-school.

**Texas Targeted Pre-Kindergarten Programme**

- The purpose of state-sponsored Pre-Kindergarten (pre-K) in Texas is to bolster the academic performance of at-risk children.
- The Texas programme ranks low in quality in terms of class size, staff to pupil ratios, and spending per capita.
- For the 3$^{rd}$ grade reading test there were statistically significant effects for public pre-K attendance.
- Attendance to public pre-K significantly reduced the probability of retention in grade.
- The likelihood of being assigned to special education in the third grade was lower for pre-K children.

**Syracuse Family Development Research Programme**

- This was a comprehensive childcare, education, health and family support programme from pregnancy to the start of school designed to improve child and family functioning through home visitations, parental training, and individualised day care.
- The programme targeted young, African-American, single-parent, low-income families.
- Child Development Trainers visited each family weekly where they focused on increasing family interaction, cohesiveness, and nurturing.
- In the Children's Centre (for day care), infants were

assigned to a caregiver for attention, cognitive and social games, sensorimotor activities, and language stimulation.
- Compared with a control group, the intervention produced better educational attainment and school attendance for girls, but not for boys.
- In adolescence, there were improvements in social adjustment and reduced criminality of the intervention group.

**European studies**

**UK**

- The Hackney Day Care Study proposed to assess the effects of providing day care to children aged six months to three-and-a-half years from socially disadvantaged families.
- While there was an increase in the likelihood of mothers in the intervention group being in paid employment, there was no increase in family income.
- Children in the intervention group were more likely to be infected with ‘glue ear’ (otitis media with effusion)
- No child development effects or positive cost benefits were found.

**Denmark**

- The Action Competencies in Social Pedagogical Work with Socially Endangered Child and Youth (ASP-program) aims to improve the wellbeing and cognitive functioning of all children.
- The intervention appears to have had a positive and growing effect on emotional symptoms, conduct problems, and hyperactivity inattention. However, there was no effect on peer relationships and pro-social behaviour.

**Germany**

- The Socio-economic Panel (SOEP) is a longitudinal survey of private households in a wide-ranging representative study with annual follow-ups.
- Children from advantaged families derived lower returns to childcare attendance than children from a less advantaged family backgrounds.
- Children who would benefit the most—younger children and children from disadvantaged backgrounds—are least likely to be sent to childcare.
- Children who are the least likely to enter childcare gained more from attending childcare in terms of social, language, daily, and motor skills than children who face lower unobserved entry barriers.

**Netherlands**

- Several early education and care programmes were researched in the Dutch Cohort Study of Primary Education (PRIMA).
- The common aim of these programmes was to stimulate socio-emotional and cognitive development.
- Their curriculum is predominantly developmental. Most preschools work with mixed-age groups and most time is spent in free-play activities and work lessons with small groups of children.
- Whole group activities are regularly provided as starter, break, or closing activities during the day and include book reading, play, talking, and singing.
- In the second year of preschool, existing activities are complemented by literacy and mathematics activities (such as exploring letters and words, counting, and measuring)
- Using retrospective analysis, no statistically significant effects of targeted preschool education were found on language and cognitive outcomes and school achievement.
- Using a cohort-sequential augmented latent growth

analysis, a study showed positive effects of teacher-initiated language, literacy, and mathematics activities on children's growth in these skills over time.

**France**

- The French kindergarten (ecole maternelle) is available to all children aged from three to six years and has an explicit educational mission, although this does not necessarily focus on the promotion of pre-academic skills.
- A study reported a stronger effect of an earlier start in ecole maternelle (age two compared to age three) on early school skills and grade retention in primary school, especially for children of low-income and immigrant ethnic minority families.

**Summary of evidence for disadvantaged children**

- The evidence on childcare in the first three years for disadvantaged children indicates that high-quality ECEC can benefit cognitive, language, and social development.
- With regard to provision for three years onwards, disadvantaged children benefit particularly from high-quality preschool provision.
- Children benefit more in socially mixed groups.

## ECEC for children up to three years of age in the general population

### Socio-emotional development

- Two meta-analyses conducted in the 1980s summarised many US studies and concluded that non-maternal care in the first years of life could increase the likelihood of insecure attachment with the mother.
- Daycare may compromise attachment security, but only in instances of poor quality infant care either at home

and/or in daycare.

- A study found that children who started childcare aged 6–12 months and 18–23 months were more prone to frustration and had difficulty reuniting with their mothers. In contrast, children who started when aged 12–17 months displayed lower levels of relational distress.
- Infants and toddlers who are securely attached to their primary caregivers may find experiencing and settling into day care less stressful. Importantly, attachment security to the parent was related to the time spent by children adapting to daycare—if more time was spent, attachment remained or became secure.
- Caregivers showing high levels of sensitive responsiveness were more likely to have children securely attached to them.
- Quantity of group care, particularly where there is an early age of entry and high hourly amounts, have been associated with somewhat elevated levels of externalising behaviour problems.
- High-quality childcare can partially compensate for the negative behavioural effects of high quantity childcare, and the effects on externalising behaviour seem to disappear during elementary school.
- Some studies have reported mixed findings related to externalising behaviours.

**Cognitive, language, and educational development**

- Overall, the studies in this review suggest positive effects of ECEC attendance under the age of three years with regard to children's cognitive and language development and academic achievement.
- The positive effect of ECEC seems particularly true for attendance in centre-based care and for children starting to attend ECEC settings between the ages of two to three years.

- In the Brookline Early Education Project (BEEP), children receiving intervention scored higher and demonstrated fewer difficulties in social development and learning skills compared to children from the same classrooms and similar family backgrounds in the control group (without intervention). This was true for children in both kindergarten and third grade. As young adults, the intervention group reported higher incomes, less depression, better employment, better health, and less risk-taking behaviour compared to the control group.
- In some other studies, longitudinal benefits were not identified.

**ECEC for children aged over three years in the general population**

**Socio-emotional development**

- The effect of ECEC on socio-emotional development has been small.

**Cognitive, language, and educational development**

- Findings on the relationships between attendance or amount of ECEC and children's cognitive, language, and academic outcomes are more conclusive for over-threes in ECEC.
- ECEC participation boosts cognitive development, school readiness skills, and school achievement.
- Findings overall suggest that investing in universally available good quality ECEC can bring benefits to governments, children, families, and communities.

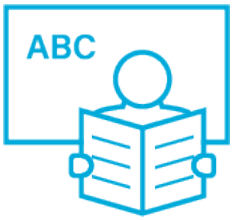
**Summary**

- Home-based care for under-threes may have some benefits for their language development.

- There is some support for the argument that younger children may develop optimally within smaller and more intimate non-parental care settings, where there are fewer peers and greater adult-child ratios than centre-based programmes.
- Centre-based care during the later toddler and preschool years (after aged two or three years) may be more beneficial for children's academic skills development than centre-based care for the youngest children.
- Preschool-aged children, with their growing language, communication, and social skills, and better emotion regulation may benefit from the enhanced variation and stimulation offered in centre-based care and from more opportunities to engage with peer groups.
- Generally, research on the effects of early childcare quality has indicated that high process quality childcare (such as child-teacher relationships and interactions) is prospectively related to more social competence and less behavioural problems in children, with some effects lasting into adolescence.
- In good to excellent childcare, children score higher than peers in mediocre or poor childcare for cognitive and language development.
- Two broad dimensions of programme quality have been identified consistently to describe the most critical facilitators of children's development and learning: a) process quality, which includes the quality of the curriculum and pedagogical practices, and supporting positive relationships and children's emotional development; and b) the quality of structural aspects of childcare (such as adult-child ratios, caregiver qualifications, group size, and characteristics of the physical space).
- Using familiar songs, rhymes, and rhythms with movements can foster children's early language skills. Further, storytelling using familiar story-books and repeating the same story-book offers infants a sense of security

and familiarity while promoting vocabulary development.

- The teacher role is to create conditions for optimal, self-propelled development and to introduce children to cultural domains such as academic language, literacy, numeracy, mathematics, and science.
- The way any changes are carried out should respect developmental and motivational principles, allowing children to take initiatives and partly to determine their own routes through the curriculum. Using construction and symbolic pretend play and collaborative work in small groups can be used as the main vehicles to stimulate development.
- The optimum recommended child-adult ratios for children under two years of age in ECEC settings is relatively consistently stated as 1:3. For those aged two to three years, recommendations on ratios are 1:4 or 1:5, while they are between 1:10 and 1:17 for three to five year-olds
- Ideal group sizes for children aged under two years in ECEC settings are recommended to be six to eight. Further, the recommendation is 10 to 12 for those aged two to three years, 14 to 18 for those aged three years, and 20 to 24 for those aged four to five years.
- Training programmes for work with infants and toddlers should include content that is relevant to the age group and reflect what is known about infant learning and development.
- The content of undergraduate programmes of early childhood teacher education should include foci on critical reflection, self-evaluation, and awareness of diversity.




**Implications**

- While the research on preschool education (over three years) is fairly consistent, research evidence on the effects of childcare (zero to three years) upon development has been equivocal, with some studies finding negative effects, some no effects, and some positive effects.
- Discrepant results may relate to the age of starting and possibly to differences in the quality of childcare received by children.
- Research indicates that high-quality ECEC can produce benefits for cognitive, language, and social development for disadvantaged children.
- Research indicates that the following quality characteristics of Early Years provision are important for enhancing children's development:
    - Adult-child interaction that is responsive, affectionate, and readily available
    - Well-trained staff who are committed to their work with children
    - A developmentally appropriate curriculum with educational content
    - Ratios and group sizes that allow staff to interact appropriately with children
    - Supervision that maintains consistency in the quality of care
    - Staff development that ensures continuity, stability, and improving quality
    - Facilities that are safe, sanitary, and accessible to parents

# Conclusions About Interventions, Programs, And Approaches for Improving Executive Functions That Appear Justified And Those That, Despite Much Hype, Do Not

eTale 2022

The Executive Functions (EFs) of inhibitory control, working memory, and cognitive flexibility enable us to think before we act, resist temptations or impulsive reactions, remain focused, reason, problem-solve, flexibly adjust to changed demands or priorities, and see things from new and different perspectives. Further, it is now clear that they can be improved at any age through training and practice. We predict that in addition to training EFs directly, the most successful approaches for improving EFs will also address emotional, social, and physical needs.

**Authors: Adele Diamond & Daphne S. Ling**

Source: Diamond, A. & Ling, D.S. (2016). Conclusions about interventions, programs, and approaches for improving executive functions that appear justified and those that, despite much hype, do not. *Developmental Cognitive Neuroscience, 18*, 34-48, http://dx.doi.org/10.1016/j.dcn.2015.11.005

The Executive Functions (EFs) of inhibitory control, working memory, and cognitive flexibility enable us to think before we act, resist temptations or impulsive reactions, remain focused, reason, problem-solve, flexibly adjust to changed demands or priorities, and see things from new and different perspectives. Moreover, it is now clear that they can be improved at any age through training and practice. However, despite claims to the contrary, wide transfer does not seem to occur and 'mindless' aerobic exercise does little to improve Efs. Since stress, sadness, loneliness, or poor health impair Efs (and the reverse enhances EFs), we predict in addition to training EFs directly, the most successful approaches for improving EFs will also address emotional, social, and physical needs.

- There has been great interest in improving EFs, accelerating their development, stopping or slowing their decline, and/or remediating deficits.
- Many different methods have been tried to improve EFs, including diverse types of computerised cognitive training, diverse physical activities as well as other things such as certain school curricula.
- EFs are predictive of achievement, health, wealth, and quality of life throughout life, often more so than IQ or socioeconomic status.

**What are Executive functions (EFs)?**

- Three, interrelated core skills: inhibitory control, working memory, and cognitive flexibility. From these, higher-order EFs are built such as reasoning, problem-

solving, and planning.

- Inhibitory control involves acting more wisely instead of responding with an initial impulse or ‘strong pull’ to do a certain thing.
- Inhibitory control makes it possible for us to choose how we react and to change how we behave rather than being ‘unthinking’ creatures of habit or impulse.
- Working memory (WM) involves holding information in the mind while performing one or more mental operations.
- WM is critical for reasoning and problem-solving, because they require the storage of copious amounts of information, exploring their interrelations, and then perhaps dis-assembling those combinations and re-combining the elements in new ways.
- Cognitive flexibility is the ability to adjust to changed demands or priorities—look at the same thing in different ways or from different perspectives.

**Interventions, programmes, and approaches for improving EFs**

- 84 studies met the inclusion criteria.
- Many different activities have at least one peer-reviewed published report on their efficacy in improving executive functions. These include computerised training, games, aerobics, resistance training, martial arts, yoga, mindfulness, theatre, and certain school curricula.

**Conclusions that emerge from the various studies on different methods of improving EFs**

1. While EF training appears to transfer, it appears to be narrow.

- For example, computerised WM training improves WM but not self-control, creativity, or flexibility.
- Wide transfer to untrained cognitive skills has not been demonstrated in either cognitive or physical activity training.
- To see widespread benefits, diverse skills must be practiced. Accordingly, real-world activities such as martial arts and certain school curricula have demonstrated more widespread cognitive benefits than targeted computerised training.

2. Whether EF improvements are achieved depends on the amount of time spent practicing.

- Ericsson's (2006, 2009, 2010) conclusion about the critical importance of practice (with difficulty progressively increasing) for becoming really good at anything also appears to apply to improving EF skills, just as with every other skill Ericsson investigated.
- Longer duration of training (such as computerised cognitive training, mindfulness retreats, or physical activity) produced improved EF results.
- With regard to the duration of training, studies have indicated that the dose (length of each session) and frequency (how often the sessions occur) are significant and more time spent practicing is beneficial.

3. Whether EF improvements are achieved depends on the way an

activity is presented and conducted.

- The personal characteristics of programme leaders can have a major effect on programme efficacy.

4. EFs should be continually challenged (not just used) to produce improvements.

- To become an expert requires copious amounts of practice—not simply practicing what is easy, but continually pushing to go beyond one's comfort zone or current level of competence.
- Challenging one's comfort zone is consistent with what Vygotsky (1986) referred to as the 'zone of proximal development'. This is the zone just beyond what one accomplishes on one's own, but where success can be achieved with a little help from someone else.

5. Those with the poorest EFs consistently gain the most from any programme that improves EFs.

- Since those who start further behind on EFs tend to progress more from any EF intervention, EF training might reduce societal disparities.
- With extreme groups, such as children with very low IQs or adults with severe cognitive decline, cognitive training has not been shown to help.

6. Once practice ends, benefits diminish.

- While studies have demonstrated that EF benefits can last for months (or even years), they invariably reduce with time after training.

7. Often, differences between treatment and control groups only appear when participants' EF skills are pushed near to their limit.

- The largest differences between groups are consistently found on the most demanding EF tasks and task

conditions.

8. Aerobic exercise (resistance training) without a cognitive component produces little or no EF benefits.

- Two meta-analyses of randomised control trials in mostly older adults found little or no EF benefits from aerobic activity.
- Studies involving children have not found any EF benefits from aerobic activities.
- It has been consistently found that people who are more physically active and have better aerobic fitness have better EFs compared to those who are more sedentary.
- Exercise that includes cognitive challenges (such as Tae-Kwon-Do martial arts, soccer, or yoga) have exhibited greater improvement in EFs.
- Several school programmes integrate physical activity with the teaching of academic subjects, and studies indicate improved academic outcomes from these programmes compared to when academic subjects are taught traditionally (sitting still).

9. The reason why improvements are found is not always obvious and sometimes it can be counter-intuitive.

**A different perspective based on the neurobiology of EFs and prefrontal cortex**

- EFs depend on the prefrontal cortex and other neural regions with which it is interconnected.
- The prefrontal cortex is the newest and most vulnerable area of the brain.
- Since stress, sadness, loneliness, and poor health impair EFs. Accordingly, we predict the most successful approaches for improving EFs will directly train and challenge EFs while indirectly supporting EFs by working

to reduce things that impair them and enhance things that support them.

- The main reason stress impairs EFs is because even mild stress overwhelms the prefrontal cortex with excess dopamine.
- The adrenal cortex releases cortisol in response to stress, which can disrupt functional connectivity between the prefrontal cortex and other brain regions.
- People exhibit improved cognitive flexibility and creativity when they are happy.
- Our EFs suffer when we are lonely, whereas we exhibit improved EFs when we feel socially supported. Accordingly, feeling excluded or not belonging impairs prefrontal cortex functioning, selective attention, and reasoning.
- Lack of sleep impairs EFs.
- When people are infected, their prefrontal cortex does not function as well and executive functioning is of poorer quality.
- Feeling confident in your ability to succeed, believing that through effort you can improve, treating errors and failed attempts as learning opportunities (or what happens when you push past your comfort zone), and venturing beyond what you already know are important attributes for succeeding at many things. It is predicted this may also apply for improving EFs.