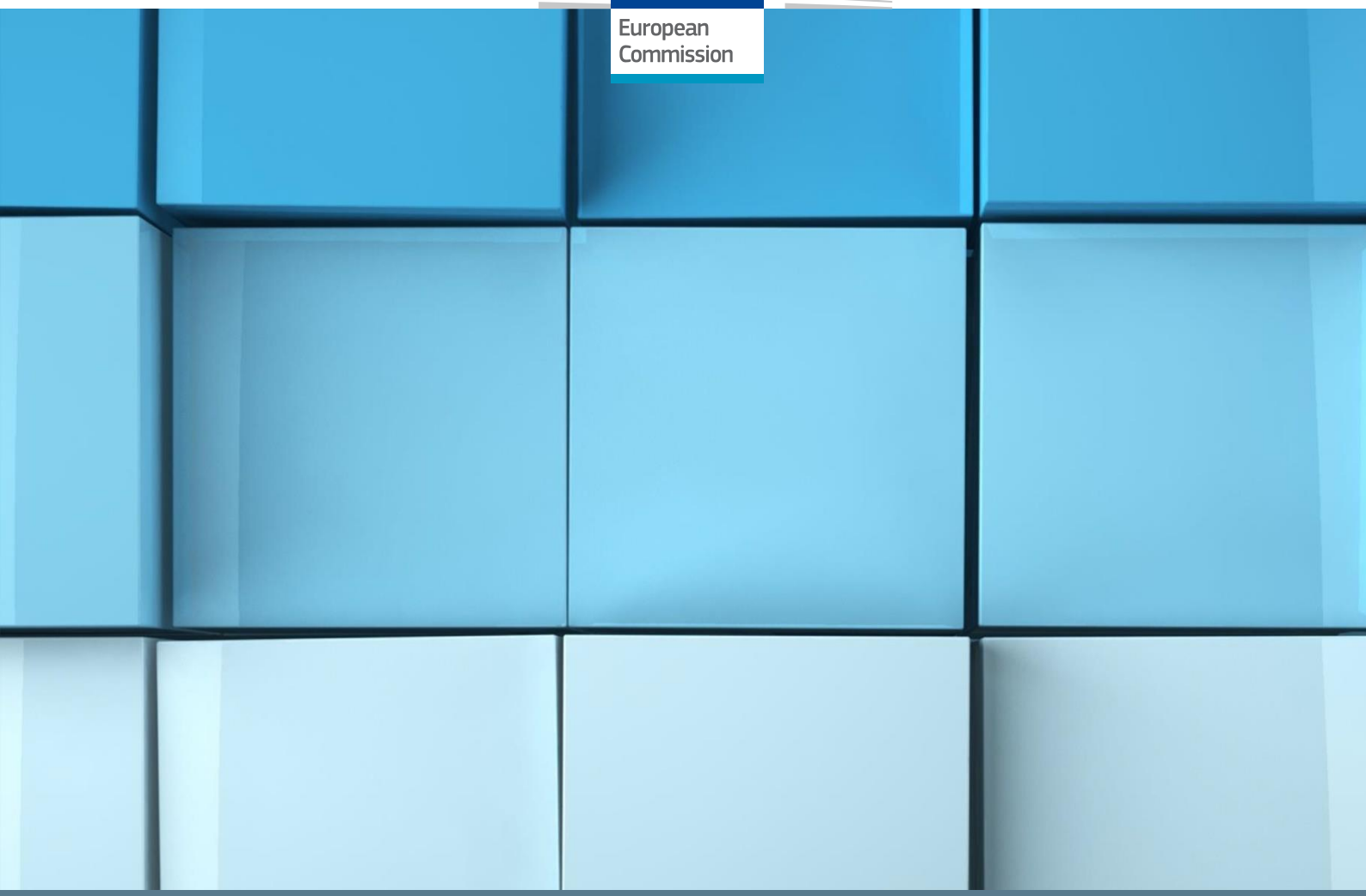

European Commission

Effective practices for literacy teaching

Analytical report

EENEE European Expert Network on Economics of Education

NESET

Education and Training

Please cite this publication as:

Harrison, C., Brooks, G., Pearson, P.D., Sulkunen, S., Valtin, R. (2025). 'Effective practices for literacy teaching' *EENEE-NESET report*, Luxembourg: Publications Office of the European Union. doi: 10.2766/485436.

ABOUT EENEE

EENEE is an advisory network of experts working on economics of education and training. The establishment of the network was initiated by the European Commission's Directorate-General for Education and Culture and is funded by the Erasmus+ Programme. PPMI is responsible for the coordination of the EENEE network. More information on EENEE and its deliverables can be found on the network's website www.eenee.eu. For any inquiries, please contact us at: eenee@ppmi.lt.

ABOUT NESET

NESET is an advisory network of experts working on the social dimension of education and training. The European Commission's Directorate-General for Education and Culture initiated the establishment of the network as the successor to NESSE (2007-2010), NESET (2011-2014) and NESET II (2015-2018). The Public Policy and Management Institute (PPMI) is responsible for the administration of the NESET network. For any inquiries please contact us at: info-neset@ppmi.lt.

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Acknowledgements

This report would not have been possible without the support of NESET and EENEE. We are particularly grateful to colleagues from PPMI, and to the peer reviewers, for their invaluable help during the process of writing and publishing this volume.

EUROPEAN COMMISSION

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Effective practices for literacy teaching

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2025

EN

PDF	ISBN 978-92-68-19553-6	DOI: 10.2766/485436	NC-02-24-811-EN-N
Print	ISBN 978-92-68-19554-3	DOI: 10.2766/842446	NC-02-24-811-EN-C

Luxembourg: Publications Office of the European Union, 2025

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Executive summary

Context

This joint NESET-EENEE analytical report is based on a detailed literature review of the most recent European and international research on effective approaches to the teaching of literacy, highlighting practices that have been properly evaluated and are supported by evidence of impact. Interest in this subject comes in the light of PISA 2022 student results, which showed a decline in performance in basic reading skills across Europe. The authors of the report have drawn upon over 600 studies of effective teaching practices (both pedagogical and content-specific), support programmes and policies that promote literacy for all children across the EU. The report covers different levels of education and considers the perspective of gender as well as the needs of vulnerable and special needs groups. Lastly, the authors of the report identify key challenges that need to be overcome in order for these practices and policies to be implemented successfully.

Target audience for this report

The primary target audience for this report is policymakers: those who decide a nation's priorities in terms of focus, human resources and funding. However, the authors have also aimed to write a scientifically robust report that can be used directly by teachers, parents and all those who make a contribution to the development of children's literacy – and, indeed, by all those who work at any level to support literacy, from birth to higher education and in the workplace. The authors share the view of many economists that improved literacy levels can directly support a nation's economic growth, but they also believe that literacy can open the door to so much more: to the possibility of a fuller, healthier and richer life; a life in which imagination, empathy and creativity also make a contribution to a nation's well-being.

Areas of focus and key findings of the report

When governments express concern over low literacy levels in relation to PISA scores, they are usually referring to the number of students in their country who have failed to achieve a Level 2 in reading, which is defined by PISA as 'basic proficiency' or 'baseline proficiency'. However, as the PISA assessment guidelines indicate, what the authors of the present report term "basic proficiency" in literacy actually involves far more than non-experts might expect. The "basics" of reading were once considered to include recognising letters, reading words and understanding at the level of sentences. In fact, successful reading at Level 2 requires a number of different skills, including identifying main ideas, drawing inferences, bringing together information from different sources, reflecting on the author's purpose, and evaluating evidence. This report therefore includes the teaching of comprehension beyond letters and words, including drawing inferences and judging relevance and trustworthiness. It also includes dispositional characteristics such as motivation, metacognition and world knowledge, since these have a significant effect on reading proficiency. The report also reviews the teaching of digital literacy skills, and the important new skill of critically evaluating online information.

Every education system in Europe has the goal of improving literacy levels. The authors of this report suggest that this is generally for two reasons. First, to enhance human capital

in the country concerned, so that the workforce is better educated with the advantages that this can bring: greater health awareness, better parenting skills, and a better life. Second, so that the workforce will be better able to contribute a more advanced skill set to their employment. This, in turn, will contribute to a higher GDP. If this is the goal, the authors feel that in writing this report, it would be essential to pay some attention to the two areas of vocational education and training (VET) and adult learning, which research has shown also have a significant impact on GDP. The authors have therefore included some important research findings that relate to these areas.

Key findings

Chapter 1: What is the current state of literacy in Europe?

A serious learning loss in literacy has occurred for many students across Europe due to COVID-19. The effects of this have been disproportionally greater for students from poorer homes, even in countries with relatively good internet coverage. However, scores in international reading tests have been declining in Europe for more than a decade. Although girls continue to outperform boys in reading, in 2022 both groups contained a significantly greater proportion of students who failed to achieve "basic proficiency" in reading (PISA Level 2) than in previous rounds of PISA. Poorer student mental health and increased anxiety are also a concern internationally.

Chapter 2: How do children learn to read? The key issues

Literacy development involves many stakeholders: schools and teachers are vital, but parents, social workers and health professionals, as well as local and national governments, all make enormously important contributions. Literacy development starts from birth: children's experience of songs, nursery rhymes, interactive play and stories between age 0 and 3 predict reading performance at age 9. Family literacy programmes that promote home literacy activities are very valuable, especially for migrant and less advantaged communities. Prior to starting school, early childhood education and care (ECEC) is vital to enhance equal opportunities for disadvantaged communities. When school begins, teaching children to decode and recognise words is important, but so is print-related play, reading storybooks and talking about books. As children get older, free reading (including re-reading), in classrooms that have developed a culture of reading, helps to develop fluency and comprehension.

Chapter 3: Why do some children fail to learn to read?

Some children learn to read at home, but most learn at school. As Chapter 2 demonstrates, literacy development is complex and multifaceted. However, it is clear that COVID-19-related school closures of between 8 and 27 weeks in education systems across Europe had a very significant negative effect on the literacy development of many children. One European study reported that the average student in grades 1-4 lost five weeks of reading progress, while students in schools in the poorest areas showed no learning gain at all during the lockdown period. However, many catch-up programmes are now in place that have shown good outcomes in developing vocabulary, word recognition, comprehension, motivation and self-esteem, all of which are important.

Chapter 4: What do education systems in the EU need to do to improve literacy at ECEC and primary levels?

Research into literacy development prioritises good health care from birth, together with support for parents in developing children's language and familiarity with books, paying special attention to the needs of migrant and vulnerable communities. European Commission reports recommend quality ECEC in every EU Member State, with publicly funded provision for all. They also recommend that special attention be given to accessibility, staff training, a coherent curriculum, and careful monitoring and evaluation of ECEC centres. In primary education, the teaching of reading in schools should be personalised, with reading and reading achievement being celebrated. The teaching of decoding needs to be balanced with the enjoyment of stories and writing, and developing comprehension should be linked with developing talk and vocabulary. The development of children's digital skills, including critical digital literacy, also begins in primary school. Support for struggling readers is also vital, and every teacher should have some knowledge of how to deliver this.

Chapter 5: What should education systems in the EU do to improve literacy, including digital literacy, at secondary level and beyond?

At secondary level, knowledge and information are no longer primarily delivered by the teacher. Instead, they come from text, from books, from the internet and from multimedia – and teachers have an important role to play in helping students to access and navigate this world of data. Reading comprehension is one of the brain's most challenging and demanding achievements, and every teacher in secondary education needs to understand how they can help their students to achieve this, while recognising that every subject area has its own vocabulary, text structures and necessary background knowledge. Enquiry-based learning, reciprocal teaching, small-group learning and many other practices can help students (and their teachers) to achieve more engaged and effective learning from text. Supporting underachieving readers at secondary level is also very important. Fortunately, many research-tested classroom strategies and computer programs are now available to help secondary students – many of which can be linked to discipline-specific content.

Chapter 6: The cost-effectiveness of literacy development – what are the issues?

There are two main approaches to determine the cost-effectiveness of literacy programmes. The first is direct: namely, to relate a literacy intervention to some kind of outcome measure such as the gain score in a reading test. For example, the HeadStart pre-school programme in the US was linked to students' short-term and long-term gains in cognition, socio-emotional development and school progress, with an estimated benefit of USD 7-12 per USD 1 invested. The second approach to determining cost-effectiveness is indirect: a large-scale statistical exercise calculating the relationship between factors such as a country's PISA reading scores and its national GDP. Such a calculation could, for example, determine that if every EU country increased its PISA reading score by 25 points, this would add EUR 71 trillion to the EU's GDP. The first approach has a strong claim to demonstrating causality, but is on a smaller scale than the second, which is dramatic and compelling, but is built on a greater number of statistical assumptions. Increasing funding for literacy development in the 0-6 age range is the clearest cost-effective imperative. While remedial reading programmes, delivered at a later stage, produce mixed results, Reading Recovery has been judged to work well, and is regarded as cost effective by some evaluations.

Recommendations

In Chapter 7, the authors of this report make 20 research-informed recommendations. These are intended to address the fact that the education systems of every European country will be dealing with the outcomes of COVID-19 school closures and social lockdowns for the next two decades, because there are children not yet in school whose life chances may have been diminished by these events. Given this context, it is even more vital for governments to recognise that their education systems can make a massive contribution to reducing the negative impacts that will continue to affect their schools, by implementing these recommendations – every one of which comes from the research-informed analyses in Chapters 1-6. A condensed version of the 20 recommendations is provided below:

Policy recommendations at system level

Recommendation 1: **Governments need to be more prepared for change and shock.** Given the challenges to education systems of a volatile, uncertain, complex and ambiguous digital world, governments should stand ready to adapt their policies and practices to sudden and often drastic changes.

Recommendation 2: **Digital resources must be available for all.** Governments should support educational institutions by upgrading their digital systems to better support both schools and their students, in school and at home, paying particular attention to schools and their students in economically and socially disadvantaged areas.

Recommendation 3: **Post-COVID-19 catch-up programmes must be continued for two decades.** Following the COVID-19 pandemic, many schools have implemented laudable policies to compensate for learning loss among disadvantaged students. Such programmes (including summer schools and tutoring programmes) should be continued and extended up to the end of formal schooling, to help reduce inequities that might otherwise impact both higher education opportunities and lifetime human capital.

Recommendation 4: **Personalised learning must be extended.** The personalisation of learning is increasing, and digital technologies support this augmentation of the pedagogical repertoire. Personalisation should be welcomed, planned for, and extended, since it can lead to increased student engagement, more efficient teaching, more rapid feedback for students, and enhanced learning outcomes – not least in the field of literacy development.

Recommendation 5: If the appropriate systems are in place, school closures need not be too damaging. The schools that responded well to the challenges of school closure were those that put in place measures that mitigated many of the negative effects of closure and the unanticipated switch to remote learning. Schools – and school systems – should therefore learn from these understandings and adapt them within their own contexts:

1. It is important for schools and school systems to establish networks for teachers to share good pedagogical practices in online learning; these can bring significant efficiency savings as well as improved teaching

2. Digital learning appears to work better with small rather than large groups
3. All students learn less if they do not receive rapid feedback on their learning, either from the teacher, from one of their peers, or from a computer
4. All teachers require help in setting up remote learning opportunities – in producing and sharing content, encouraging motivation, and enhancing students' self-efficacy

Recommendation 6: Literacy development is a multi-agency concern. To promote literacy in the early years, governments should take account of the following factors when determining policy and funding to support literacy development:

- Good health care
- Children's early language development (in both their mother tongue and the language of instruction)
- The role of families in building a sustainable basis for the lifelong literacy skills of children and adolescents, but also of their parents
- High-quality early childhood education and care (ECEC), especially with regard to children's proficiency in the language of instruction.
- High-quality teaching, within a system that supports teachers and their continuing professional development
- Early identification of literacy difficulties and tailored support for students
- Multi-literacy and digital literacy competences
- Motivation and engagement

Recommendation 7: Education policies for children aged 0-6 are vital for literacy development. Governments should prioritise support for (i) family literacy initiatives that will impact children's language and literacy development during the pre-school years, and (ii) early childhood education and care. As our cost analysis in Chapter 6 demonstrates, these two areas of child development together form an enormously powerful engine not only for enhancing literacy outcomes; they are also an effective tool for reducing social inequality in later years, as the life chances of children in disadvantaged areas can be set on a different trajectory in these crucial years.

Specific recommendations for early years and primary schooling: developing literacy in primary school requires a balanced approach – stories and talk, as well as decoding and skills

Recommendation 8: Stories and talk are vital to pre-school literacy development. To enhance pre-school language development, it is important for both parents and teachers to be aware that sharing stories with children, and talking with the child about those stories, has been found to have significant benefits. While some research now offers guidance for parents on how to manage children's access to digital media, the WHO argues that a child's access to all forms of screen time should be managed carefully (World Health Organisation 2019; and more recently the OECD, 2023):

- For infants below the age of 3: there should be storytelling and reading with a caregiver every day, but no exposure to screen time at all (no television, no phone or tablet, no laptop)

- For children aged 3 or 4: engaging in reading and storytelling with a caregiver every day is encouraged, but screen time should be no more than 60 minutes in one day

Recommendation 9: **Stories, songs and conversation are just as important as phonics.** It is important for every teacher to understand how enormously valuable it is for children who are learning to read to sing songs, to hear stories and poems read aloud, and to participate in conversations about what they have heard. Crucially, stories introduce children to other worlds, to other children, and to other cultures, and stories invite them to find a place for themselves in those worlds. Literature develops the imagination, and as the events in a story unfold, the cognitive side of reading is also being developed.

Recommendation 10: **Word recognition and comprehension should be taught together**. While literacy instruction in the early years focuses more on code-based skills, it is nevertheless important not to delay teaching a wide range of comprehension strategies with all children, from the first day of school. Research has shown that word recognition and comprehension need to be taught together. In fact, it is the weakest readers who benefit most from explicit instruction in reading comprehension.

Recommendation 11: **It is important to develop a culture of reading in a school.** Once initial literacy has been established, teachers and schools can make a significant difference to continuing development by implementing a variety of practices that have been shown in research to impact literacy standards at the level of individuals and schools. Schools should be made aware of these practices, and encouraged to put into practice those that are appropriate to their context, in order to develop a culture of reading in every school. Research has shown that reading books, rather than gaming or talking with friends on the internet, can be more beneficial than online activity in developing both vocabulary and comprehension.

Recommendation 12: **Reading needs to be developed in secondary school as well as in primary school.** Not only is it clear that comprehension should be taught from the outset, but it should be taught and developed in both primary and secondary school. The authors recommend that all teachers be given support, if needed, to extend their repertoire of pedagogies in this important area.

Recommendation 13: **Developing critical digital literacy is vital.** It is important for teachers to develop their students' digital literacy skills. In harmony with this recommendation, the authors argue that there is an urgent need for teachers to help students to develop not just digital literacy, but *critical* digital literacy – an awareness that the internet can be a dangerous place, containing intentionally misleading information.

Specific recommendations for post-primary education: reading development continues during secondary education – and beyond

Recommendation 14: **Secondary schools need support from specialists who can help develop reading across the curriculum.** It is important that content-area teachers have the knowledge and expertise to teach language and literacy practices that relate to their discipline. Specialist, in-service teachers are therefore needed, and disciplinary pedagogy and language should be included in initial teacher education (ITE) and in the continuing professional development of all teachers.

Recommendation 15: **Literacy specialists are needed in vocational education, too.** In VET, it is necessary to develop the literacy skills that are needed in the practical tasks of the work, on the one hand; and to support learners' personal development and active citizenship, on the other. In VET, every teacher is a literacy teacher, but vocational teachers need and deserve training that provides them with an awareness of and the skills to teach vocational language and literacy.

Recommendation 16: **Adult literacy must be a government responsibility, and its benefits for society are significant.** Adult literacy has consequences not only for the lives of adults themselves but also for their families and the larger communities they are part of, as well as for the whole of society and for a nation's GDP. In the constantly changing landscape of literacy, European countries need to:

- identify those adults most in need of updating and developing their literacy skills;
- introduce outreach activities to attract and motivate those adults who most need to develop their skills to attend adult literacy courses and other adult education and training (AET) provisions;
- offer low-skilled adults opportunities to update their literacy skills and acquire a minimum level of literacy;
- offer high-quality literacy provision for adults that meets learners' individual and varied needs and life situations, is provided by well-trained teachers, connects with real-life and everyday experiences, is adequate in length and intensity, and gathers longitudinal evidence on the long-term effectiveness of training; and
- develop the selection and training of adult literacy teachers as part of adult literacy policy.

Recommendation 17: **The continuation of support for struggling readers who are already in secondary education needs to be well funded, and linked to whole-school policies.** Research into the best ways to help struggling readers suggests that it is important for teachers to have rich data on each student's literacy capabilities. This makes it clear which students require help, and enables progress to be monitored and celebrated. Struggling readers need help in developing not just reading, but also engagement, motivation, oral language and writing. Research shows that structured talk and small-group work can have a significant impact on the development of students' reading and comprehension.

Recommendation 18: **Paired reading and peer-tutoring can be very valuable.** It is important for struggling readers to feel supported, and also that they have reading experiences that are enjoyable and which they look forward to. Two ways in which this can happen are through paired reading and peer-tutoring. The authors recommend that schools should consider using one or both of these approaches with struggling readers.

Recommendation 19: **Continuing, system-wide support for multilingual learners is essential, and should begin early.** Research has shown that support to help migrants and multilingual students to become more fluent readers should begin as early as possible in a child's schooling. This is an area of concern in almost every school in Europe. The authors recommend that schools and teachers consider putting measures into place to

enable this to happen. When such support is provided, the whole culture of the school is enriched.

Specific recommendation for teachers' professional development: properly funded teacher development, pre-service and in-service, will be essential to ensure a workforce is in place that really understands what it means for every teacher, from early years to university level, to be a teacher of reading

Recommendation 20: **Research-informed pre-service teacher education and in-service teacher education are both vital for developing literacy.** The authors recommend that policymakers give careful thought to the ways in which teachers, teaching assistants, head teachers and local network administrators will be guided and supported through the changes that will be demanded of them over the coming decade, and that they put in place stable and enduring support networks, both face-to-face and digital, to embed and make permanent the professional development frameworks that will be needed.

The need for a Europe-wide perspective

One great challenge for policymakers is that across Europe, governments face many competing demands – among which literacy is important, but is not necessarily in the foreground. The 2022 Council Recommendation on Pathways to School Success highlights the need to ensure that all learners have the chance to fulfil their potential, irrespective of personal circumstances, family, cultural and socio-economic backgrounds. The Recommendation also calls for the integrated and comprehensive plans necessary to bring about coherent policy developments across the education and social sectors.

While literacy is one among many competing demands, the authors of this report nevertheless hope that where policymakers do choose to foreground literacy development, the research-informed and practical approaches advocated in this report will be found useful, and will make a contribution to enhancing both human development at individual level, and economic growth at national level.

Chapter 1. Post-COVID literacy in Europe: what is the current state of play?

Methodology

To compile this report, the authors drew upon over 600 research reports and meta-analyses, paying particular attention to the following:

- Analytical reports on policy and practice across Europe from NESET (the Network of Experts working on the Social dimension of Education and Training) and EENEE (the European Network of Experts on the Economics of Education)
- Reports from the European Commission, particularly those analysing media literacy and digital literacy, as well as post-COVID impacts on literacy
- Studies in the research literature evaluating pedagogies and interventions whose goal was to improve literacy levels, looking particularly at evidence of both short-term and long-term improvements
- Studies related to literacy development that included evidence of cost-effectiveness, and evidence related to human capital as well as literacy or GDP
- Studies that included attention being paid to digital literacy and online reading, recognising that in the 21st century, reading – and the assessment of reading – are increasingly taking place online

The authors also took account of a number of European literacy development initiatives, including the work of the European Commission's High Level Group of Experts on Literacy, as well as the work of ELINET, the European Literacy Policy Network. The latter was established in 2014 by the European Commission, and brings together experts from 28 European countries to identify and share good practices in literacy teaching across Europe.

One of the innovations in the 2014 report produced by the European Commission's High Level Group of Experts on Literacy was the inclusion of good practice examples. The present report also adopts this approach. Specifically, Chapters 4 and 5 of the report present 20 examples of good practices, making it easier for teachers and policymakers to take a detailed look at some of the pedagogic practices that have been shown by research to be effective. These chapters focus closely on research-supported classroom practice.

1.1. What have international surveys and subsequent follow-up studies revealed about the current state of reading standards and literacy instruction in Europe?

In the Spring of 2020, education across the world was disrupted by COVID-19-related school closures. These confronted students, teachers, schools and parents with a sudden switch from in-person learning to a less effective form of remote learning. Numerous researchers warned that this sudden switch would have negative effects on student achievement in general, and was likely to contribute to increasing inequality in achievement. Detailed studies of the impact of the COVID-19 pandemic across 27 European countries (Schnepf et al., 2024; European Commission, 2024) have confirmed that this is precisely what happened. The OECD's Programme for International Student Assessment (PISA) regularly tests the skill levels of 15-year-olds in mathematics, reading and science.

The results of the PISA 2022 study (OECD, 2023), analysed in this report from an EU perspective, are deeply worrying. Around 30 % of young people in the EU failed to reach what PISA defines as the minimum competence level in mathematics, and around 25 % failed to do so in reading and science. A similar increase in the number of underachieving readers was reported in PIRLS (Progress in International Reading Literacy Study), the international survey of attainment among 10-year-old students, where underachievement rates rose from 19 % in 2006 to 22 % in 2016 and 24 % in 2021 (Reynolds et al., 2024).

Reading is the primary focus of the present report, but it is important to note that reading is only one aspect of literacy. In order to participate actively in a digital society, writing is at least as important as reading–to make their voices heard, readers must also be able to write. Digitisation has changed the nature, frequency and importance of writing. Artificial intelligence software and real-time automated feedback tools have revolutionised composition, and new digital devices have changed the nature of social connectivity. As the European Commission High Level Group stated in 2012: "Writing has, however, received much less attention at international policy level than reading. This is largely a product of the lack of assessment instruments capable of quantifying how well children and young people write in an international comparative perspective. More research is therefore needed." (Brooks et al., 2012, p. 23).

If the countries of Europe wish to improve their PISA "reading proficiency" scores, it is important to clarify exactly what is being tested by PISA, and what the notion of "minimum competence" entails. In PISA 2022, reading proficiency is defined as follows:

> *Reading literacy is understanding, using, evaluating, reflecting on and engaging with texts in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society. PISA conceives of reading skills as a broad set of competencies that allows readers to engage with written information presented in one or more texts for a specific purpose.*
>
> *Readers must understand the text and integrate this with their pre-existing knowledge. They must examine the author's (or authors') point of view and decide whether the text is reliable and truthful, and whether it is relevant to their goals or purpose.*
>
> *Reading in the 21st century involves not only the printed page but also electronic formats (i.e. digital reading). It requires triangulating different sources, navigating through ambiguity, distinguishing between fact and opinion, and constructing knowledge. During the pandemic, remote teaching initiatives heavily relied on the availability of digital education resources*. (OECD, 2023a, p.83)

Achieving all of the above competencies is challenging, and of course this list applies to all readers, from the least to the most able. PISA test scores are standardised, and each individual's score is assigned one of eight levels (from 1c, the lowest, to 6, the highest, with Level 1 being divided into three levels, 1a, 1b and 1c). The term "minimum competence" is one of three phrases applied in PISA reports to a Level 2 reading score. What is important in the context of this report is that Level 2 is also often referred to by

PISA as either "basic proficiency" or "baseline proficiency". However, "baseline proficiency" involves much more than the simple ability to decode individual words or short texts:

> *Readers at Level 2 can identify the main idea in a piece of text of moderate length. They can understand relationships or construe meaning within a limited part of the text when the information is not prominent by producing basic inferences, and/or when the text(s) include some distracting information. They can select and access a page in a set based on explicit though sometimes complex prompts, and locate one or more pieces of information based on multiple, partly implicit criteria. Readers at Level 2 can, when explicitly cued, reflect on the overall purpose, or on the purpose of specific details, in texts of moderate length. They can reflect on simple visual or typographical features. They can compare claims and evaluate the reasons supporting them based on short, explicit statements. Tasks at Level 2 may involve comparisons or contrasts based on a single feature in the text. Typical reflective tasks at this level require readers to make a comparison or several connections between the text and outside knowledge by drawing on personal experience and attitudes*. (OECD, 2023a, p. 100)

The remit for the present report specifies that it should focus on the ways in which basic skills in reading should be taught. It is already clear from the above that "baseline proficiency" goes a good way beyond what we used to think of as the "basics" of reading, namely letter recognition, word reading and understanding at the level of sentences. Successful reading at Level 2 ultimately requires the coordination of an array of different skills and knowledge. This report therefore emphasises the teaching of comprehension that goes beyond letters and words, and includes drawing inferences and judging relevance and trustworthiness. It also includes dispositional characteristics such as motivation, metacognition and world knowledge, since these have a significant effect on reading proficiency. By looking at a more replete and complex array of skills and knowledge, this report focuses on enhancing literacy at different developmental stages, with an emphasis on pedagogical approaches that have been evaluated and shown to be demonstrably effective. Our analysis also pays careful attention to the relationship between technology and reading, and draws upon research into defining and teaching critical digital literacy. It also reviews research on the use of digital applications to support weaker readers, as well as the issue of equity of access to technology.

Digitalisation has also changed the nature of knowledge in our society. In the "post-truth" world of social media, the need for critical digital literacy has never been greater, and this must form a part of "baseline proficiency".

In the 2022 PISA tests, there was an unprecedented fall in the mean scores in all three areas of assessment: in mathematics, this decline was 15 points, and in reading and science the average fall was 10 points. To put this in perspective, as a rough estimate, 30 points approximates to a year's expected learning gain for the average 15-year-old (Woessmann, 2016). Never before had any overall change been greater than 5 points. More recent OECD work based on PISA 2015 and 2018 data for 18 countries and economies (Avvisati & Givord, 2021) suggests that on average, students' PISA scores increase by around 20 points over a school year, with larger gains in high-income countries compared with middle-income countries – although those estimates have large confidence intervals.

In a large majority of education systems in Europe, the mean scores for reading in 2022 were below those for 2018, and across the EU the proportion of students who failed to reach Level 2 was 26.2 %, which was greater than the figure of 21.7 % for 2018, and worryingly short of the 15% target that the EU has set itself for 2030 (European Commission, 2024).

Underachievement in PISA tests was also much more common among socially and economically disadvantaged students than among their advantaged peers. As we seek to consider how best to improve reading standards across Europe, it is important to understand in greater detail the factors that contributed to this underachievement, and the ways in which these may have impacted education during the COVID-19-related school closures. In addition, we shall highlight the ways in which some education systems put in place policies that mitigated these potential learning losses.

1.2. How did the shift to remote schooling lead to learning loss, and how did some education systems mitigate those effects?

School closures during the COVID-19 crisis had a disproportionate impact on socially disadvantaged students, because most schools had to rely on digital technologies in order to continue teaching, and this magnified the effect of existing inequalities. Students in poorer homes generally lacked ready access to digital devices, and had slower internet connections. They also faced competing digital needs from other family members (including siblings attending the same school) and often lacked access to an adequate learning environment in their home (OECD, 2023). A number of studies have estimated students' level of "learning loss" following the school closures. In the Netherlands, for example, nationally standardised data collection happened to coincide with the period immediately before lockdown and very soon after it, so it was possible to compare actual performance with progress that would have been expected if no school closures had occurred.

The EC Joint Research Centre (JRC) analysis of data from five EU states (Carretero et al, 2021) reported that students from disadvantaged homes in the Netherlands had learning losses more than 50 % greater than those of the general student population. Children with a migrant background (in particular, ethnic minorities or refugees) were especially at risk, as were those in rural areas, where internet coverage was poor. Students who were confined to home suffered from being unable to learn from and with their peers. The Netherlands as a whole has excellent internet connectivity, but a lack of fast, stable broadband connections in many homes meant that some students were often unable to participate in synchronous activities even when these were attempted. School networks were simply not powerful enough to support simultaneous networking that involved hundreds of students. Across Europe, students with disabilities faced additional problems: a lack of support from specialist teachers, inaccessible software and the inability to access personalised learning platforms often created a serious barrier to learning, which was frustrating for parents as well as their children.

One of the most important lessons learned by teachers during the enforced switch to digital learning was that remote teaching needs to go beyond simply making learning content digital. As one school leader in Belgium put it, "What can our children continue to learn from home, practice and revise, in other ways than in in–person teaching?" (Carretero et

al., 2021, p. 13). Meanwhile, a school leader in Italy acknowledged the need for a radical rethinking of online pedagogy: "For me, it was fundamental to make teachers understand that remote teaching was very different from in-person lessons and therefore it could not be done in the same way".

A report by the JRC (Carretero et al., 2021) noted that some schools adapted swiftly to the challenges of remote learning. This report produced some insights that will be extremely valuable going forward, as online learning becomes embedded as a component of pedagogy, independent of crises caused by war, civil unrest or epidemics. The following are some of the lessons learned by schools and school systems that responded well to the challenges of school closure:

- Establishing a network for teachers to share good pedagogical practices can be invaluable – in a crisis, it can help teachers to improve their knowledge, develop new skills and feel less alone
- Schools that were able to communicate across a single digital environment or platform were better able to organise, as well as sharing good practices and work across the curriculum
- Face-to-face teaching can work with a large group, but online, digital learning appears to work better with small groups in which the teacher can better monitor attention, participation and student understanding
- Some children may work better with remote learning (for example, many introverts, those who are easily distracted, and even some ADHD students), but nearly all students learn less if they do not receive feedback on their learning, either from the teacher, from one of their peers or from the computer.
- All teachers need help in setting up remote learning opportunities: producing and sharing content, encouraging motivation, enhancing students' self-efficacy, and managing their time and the time of their students.
- The social and emotional aspects of online learning are vitally important, and these work differently online in comparison to the classroom; teachers need support in learning how to manage these.
- The computer can be a very valuable ally in managing student assessment and feedback, but again, teachers need support in learning how to make the best use of the tools available.

1.3. Has there been an irrecoverable learning loss among primary-age children?

Younger students faced additional problems during school closures. Most younger primary-age children were not autonomous enough to access or make use of digital technologies, and this meant that children whose parents were not able to support their digital access fell even further behind in learning. This was an extremely serious problem for primary schools across Europe. The Netherlands underwent a relatively short period of lockdown (eight weeks), and has an equitable rate of school funding and the world's highest rate of broadband access. Even so, national test data on 300,000 primary school children collected just before and soon after the school closures demonstrated an average learning loss equivalent to one-fifth of a school year (the same period that schools had remained closed), with the learning loss being up to 60 % higher among students from less educated homes

(Engzell, Frey & Verhagen, 2021). Thus, despite these favourable conditions in the Netherlands – which we might regard as a "best-case" scenario – it was found that primary school students made little or no progress while learning from home, and that the learning loss was even more pronounced among students from disadvantaged homes.

A similarly bleak picture emerged in the UK (Buchanan, Hargreaves & Quick, 2023). Despite being rated as one of the fairest countries in the OECD in terms of equity – i.e. it had a relatively smaller gap between the performance of students with high and low socio-economic status (SES) students – the UK nevertheless reported that following the school closures (which, for most primary students, totalled around 22 weeks), 7-year-old children from poorer homes were an additional five months behind their more well-off classmates on tests of reading and writing. In other words, they had made no progress at all during lockdown.

In Germany, Förster and her colleagues (2023) noted that for more than 20 years, inter-individual differences in student performance had been much larger than in many other European countries, and that students' academic skills were strongly related to their socio-economic and migration background. Their data suggested that these very problems have been – at least in part – exacerbated by the pandemic. In contrast, the achievement gap between girls and boys, which is found in almost all countries, but which is not exceptionally large in Germany, was unaffected.

A disturbing epidemiological study from the US by nationally recognised public health professionals (Christakis, Van Cleve & Zimmerman, 2020) analysed the potential long-term effects of the damage caused by the learning loss among the 24 million US primary school students who had missed between 10 and 12 weeks of schooling. Earlier studies had demonstrated a clear relationship between academic achievement and life expectancy. If, as the researchers argued, the relationship between these factors is a causal one, and if (as some studies have shown) there was little or no learning gain in many communities, across the lifespan the average number of years of life lost (YLL) attributable to 12 weeks of school closures across the US would be in the region of 0.14 years per student. Using census data, Christakis et al. estimated that across the whole US population, the total YLL was between 5 and 15 million. By contrast, if schools had remained open, the authors estimate that the YLL would have been approximately 4 million. There were clearly many assumptions and extrapolations in this study that could be challenged, but it nevertheless provides a profound perspective on the impact of school closures. The issue of a cost-benefit analysis of school closures is one to which we shall return in Chapter 6.

1.4. In every nation, reading scores for both boys and girls are declining

One of the UNESCO goals for education is to eliminate gender disparities in education (UNESCO, 2016). PISA data helps countries to know to what extent this goal is being achieved. Unfortunately, not only is this goal far from being achieved, but reading scores across the EU have deteriorated steadily since 2012 for both boys and girls. Across the EU, the 31 % of boys failed to reach Level 2 in reading in 2022, an increase of 3 percentage points since 2018. Meanwhile, the percentage of girls failing to reach Level 2 for reading was 22 %, an increase of 4 percentage points since 2018. Based on these figures, the gender gap has narrowed slightly. However, this is hardly good news: using 2021

population figures, out of 8 million close to the statutory school leaving age in Europe, approximately 2.5 million failed to achieve the level of "basic proficiency" in reading.

The reasons for this decline in reading standards are complex, but Chalari and Vryonides (2022) have attempted to find some answers. Their study was based on questionnaire data and focus group interviews from 527 adolescents in Greece and Cyprus, drawing upon a full range of social and economic groups, including migrant communities. These countries were notable in that they imposed the strictest lockdowns and the most protracted periods of school closure in Europe. These lengthy closures therefore gave students the longest period in which to explore alternatives to normal schooling and socialisation. To avoid bias, the researchers' questions did not prioritise reading, but ranged widely across topics relating to how the adolescents spent their time during the first and second lockdown periods. The students' responses showed remarkable homogeneity: there was an initial "honeymoon period", during which many behaved as if they were on holiday, with technology-related mutual support, optimism and bonding within the family. This phase was soon succeeded by boredom, addictive behaviour with phones and tablets, and a loss of both energy and direction. The following focus-group comment was typical of many: "…I had lost my sleep, my sense of time, life had no meaning anymore for me, I didn't do anything I like…I was spending most of my time on my mobile phone, [in front of] the TV and in bed…' (inner-city Athens; girl, aged 14). Reading books was an important activity for hardly any of the adolescents: "…no books, only the necessary [ones]. Generally, I do not like reading books. Chatting, TV, video games, but after some time it was boring…' (inner-city Nicosia; boy, aged 15).

The students whose lives during lockdown were represented in this study spent most of their time online, and both books and schoolwork were a far from central focus. Their questionnaire and focus group responses indicated that their time was mostly spent chatting with friends, reading information online, playing video games, watching films or Netflix shows, listening to podcasts, viewing memes, Instagram, YouTube channels and photo apps, and listening to music. Chalari and Vryonides make the point that much of the students' online activity was in some sense social, whereas reading a book was seen as both a solitary and a demanding activity. Tellingly, one boy reported that he did eventually begin reading, but only because his parents told him to: "…I did not read books, because I did not consider it very important. But then my parents told me that I should read, so I slowly started reading extracurricular books…" (inner-city Athens; boy, aged 15). The implication of this is clear: in households where adolescents are either directly or indirectly encouraged to read by their parents, the child is more likely to become a reader. If there is no modelling of reader behaviour by the parents, and no direct encouragement to read, a child is unlikely to become a reader. In a multivariate analysis of their data, Chalari and Vryonides found that by far the strongest predictor of academic achievement was the "material well-being" of the family – in other words, family income, wealth and housing. "Mother's educational level" was also a strong predictor, as was "reading books". Although this was the least-cited activity out of the nine to which adolescents attributed their time spent during lock-down, "reading books" was the only activity that had a positive predictive relationship with students' academic achievement.

This decrease in reading achievement across Europe is paralleled by a decrease of the number of students reading for enjoyment in the majority of countries worldwide, as

demonstrated in both the PIRLS and PISA results (Vogrinčič Čepič, Mascia & Aerila, 2024). The differences in reading motivation between girls and boys to a large extent explain the subsequent differences in reading competence (McElvany, Kessels, Schwabe & Kasper 2017).

1.5. Are we witnessing the end of reading?

Do these results suggest that reading is no longer an important activity for students in the 21st Century? For Chalari and Vryonides (2022), the answer is definitely not. Adolescents read all the time – although most of this reading is undertaken on their devices. For the coming generations, reading will be digital rather than paper-based and, as Harrison (1981) noted more than 40 years ago, in schools, the textbook has been an endangered species for some time. For many children and adults, reading will be primarily multimedia-based rather than single-mode based, and it will be short-form rather than long-form. As we move forward, assessment methods will need to keep up with these new forms of textual presentation, and new pedagogies will need to be devised to ensure that as adults, learners have the skills they need to be confident and critical readers.

The 2022 PISA tests in nearly every country were delivered by computer. Reading online was therefore a critical component of PISA assessment in reading, but also in mathematics and science. Access to online learning was also a significant factor in the PISA results for 2022. In the small number of OECD countries that maintained or raised their scores between 2018 and 2022, their school systems showed common features including shorter school closures, fewer obstacles to remote learning, and continuing support from teachers and parents.

1.6. Educating the whole child: mental health, anxiety and learning after COVID-19

Mental health and anxiety are not the primary focus of this report, but it must be noted that reading is an activity that stimulates dozens of different areas in the brain, and that it is also a socio-cognitive activity. Reading is associated with many socio-emotional constructs: interpersonal skills, social behaviour, emotional regulation, empathy and developing a theory of mind (Batini et al., 2021). Jerome Bruner (1986/2009) argued that as a child becomes familiar with stories from its earliest years, his or her understanding and awareness of the needs and thoughts of others changes and becomes a crucial part of the child's ability to develop not only empathy, but also creativity, intentionality and a sense of personal identity.

In many ways, therefore, reading – and particularly online reading – became for many young people an invaluable social companion during lockdown, and a source of engagement and interaction that was perhaps on a much deeper level than TikTok, whose 15-second videos were watched by many 12-15-year-old children for "several hours each day" (Ofcom, 2020, p. 13). Ofcom reported that many TikTok users (mostly girls) simultaneously chatted with their friends on Facebook while watching or creating videos. There was often a social aspect to the games such as Fortnite or Minecraft that the boys were playing: while there are elements of violence and danger in both games, collaboration, planning and teamwork were often involved. In the case of Minecraft, many

users learned quite a lot about programming in order to create their own character or personal world.

A report by Milašiūtė et al. (2023) on mental health among 11-17-year-olds in Lithuania during lockdown was typical of many European studies. In it, the most frequent complaint reported by children was anxiety. Girls reported the experience of getting angry more easily, experiencing greater anxiety, stress and tension, together with profound tiredness. They also reported being more worried about family and friends becoming infected. Boys were unable to participate in daily activities, but were less worried about being infected. Children reported severe loneliness, sadness, fatigue, impaired concentration and increased sleeping time more frequently than parents. On the positive side, many children reported improved interpersonal relationships with friends, but impaired relationships with siblings. Two years after the first lockdown, the pandemic continued to have an extensive negative impact on children's mental health, but parents now tended to underestimate these effects. Reading requires both engagement and concentration, so it is hardly surprising that the impact of such mental health issues would have a negative effect on reading and reading development.

On a more positive note, as the PIRLS team have pointed out (Reynolds et al., 2024), teachers can have a very positive influence on their students' mental health. Activity and feedback from teachers impacts the affective dimension of their students' well-being, in positive and negative ways. The affective dimension has, in turn, been shown to influence individuals' cognition, including thought processes, attention and interpretation of information. Positive feelings such as enthusiasm, engagement, attention and joy can increase motivation within the academic context, and these are aspects of emotion that good teachers can bring to learning. As the later chapters of this report will make clear, focusing on the future in a positive manner will be important: the challenges are great, but we now know a great deal about how children learn to read, and how teachers can help them to read more deeply, more widely and more successfully.

Chapter 2. How do children learn to read? Research evidence from Europe and beyond

2.1. Overview: broad agreement in Europe across the scientific and educational communities about how children learn to read

As the European Union High Level Group of Experts on Literacy reported (Brooks et al., 2012), there is broad agreement across Europe that the education system is not the only stakeholder responsible for students learning to read and write. The contribution of schools and their teachers is vital, but fostering the acquisition of literacy involves a whole society and multiple stakeholders, which include parents, educators, social workers, scientists, health professionals, political groups and service providers. Furthermore, literacy learning is not limited to childhood and adolescence; it is a lifelong need and requirement. The work of the EU High Level Group has been continued by ELINET, the European Literacy Policy Network of experts from 28 European countries, which has developed a Framework of Good Practice in Raising Literacy Levels of Children (Garbe, Mallows & Valtin, 2016). This framework highlights the importance of the following factors:

- **Good health care**
- **Children's early language development** (in both their mother tongue and the language of instruction)
- **The role of families** in building a sustainable basis for the lifelong literacy skills of children and adolescents, as well as their parents
- **High-quality early childhood education and care (ECEC)**, especially with regard to proficiency in the language of instruction.
- **High-quality teaching** within a system that supports teachers and their continuing professional development
- **Early identification of literacy difficulties** and tailored support for students
- **Multi-literacy and digital literacy competences**
- **Motivation and engagement**

In the sections that follow, we explain some of the ways in which these factors combine to produce competence in literacy.

2.2. Pre-primary years: the home environment and ECEC

The home learning environment, particularly during a child's first three years, is extremely important for the development of children's literacy (Van Steensel, 2006). We now know that early language development is vital for developing not only vocabulary, but also phonological awareness, which will be vital later for differentiating speech sounds, rhymes, syllables and phonemes, all of which are part of the reading process. We know that this learning begins in the womb. Most children hear and listen to sounds at and even before birth; they learn to talk by imitating the sounds they hear around them, and the syllables and voices of their parents and caregivers (Goswami, 2010). Parents and other caregivers not only determine children's language and communication abilities; they also develop and shape their attitudes to reading by being good reading role models, providing reading materials, and reading to and with the child.

Children's language development does not occur spontaneously. Infants learn language through social communication with others, not simply because of passive exposure to sequences of sounds (Goswami, 2010). In a carefully controlled study, Hoff (2003) recorded speech interactions between college-educated and high-school educated mothers and their infant children (mean age 21 months) over a two-month period. Both sets of children had increased their vocabulary after two months, but the higher-SES children had significantly greater vocabulary gains. Hoff argued that this was because the higher-SES parents spoke in longer utterances and had more interaction with their infants. The somewhat notorious study by Hart and Risley (2003) estimated that there was already a "30-million-word gap" by the age of 3 between the number of words heard by children in high- versus low-SES homes, and that these differences predicted educational attainment at age 10 with startling accuracy. Subsequent studies, while challenging Hart and Risley's methodology, assumptions and extrapolations, have nevertheless produced similar outcomes. Gilkerson et al. (2017) used an automated analysis of nearly 50,000 hours of infant speech collected over four years. These authors reported a high correlation between the social class of a parent and the number of verbal interactions between parent and child, with the number of interactions for high-SES parents being almost double those of poorer parents. Gilkerson estimated that the "word gap" was probably closer to 4 million words by the age of four, but the key variable predicting subsequent vocabulary development was not the number of words spoken by the parent, but the number of parent-child interactions per day.

Between birth and the age of 3, interactions related to play, music and book-related activities are all important predictors of future literacy achievement. PIRLS 2021 (Mullis et al., 2023) asked parents how often they engaged in certain relevant activities with their child prior to the beginning of primary school. These included reading books, telling stories, singing songs, playing with alphabet toys, talking about things they had done, talking about things they had read, playing word games, writing letters or words, and reading signs and labels aloud. The PIRLS Early Literacy Activity Scale data correlated with later reading performance in Grade 4. The international average reading score in Grade 4 of pupils who often engaged in these activities with their parents prior to the beginning of primary school was 517, compared with 494 for pupils whose parents only engaged them in these activities "sometimes", and 418 for those who never or almost never engaged in them.

The home literacy environment is also extremely important for children who are in homes in which the main spoken language is not the language that the children will encounter when they begin school. Dong and Chow (2022) carried out a meta-analysis of studies exploring the relationship between the family's literacy-related activity, and its impact on the children's subsequent development – particularly the acquisition of literacy in their second language. There were highly significant effect sizes not only for the mother's role, but also separately for fathers and for siblings. Dong and Chow reported research that found that home literacy activities such as library visits, parental encouragement, positive attitudes toward reading, parental teaching of literacy skills, parent-child shared reading, and the number of books at home were all positively linked to children's subsequent ability in the second language. There were also positive influences on cognitive factors such as phonological awareness. One important finding was that parental literacy-related activity was a better predictor of subsequent learning than the number of books in the home. The number of books in a home has been found to be a good predictor of children's subsequent

literacy achievement in dozens of research studies, but Dong and Chow's findings confirm that what matters most is the parents' modelling of good literacy behaviours, and their sharing of books with their children, even if the language of those books is different from that of the school the children will go on to attend.

In many countries, Family Literacy Programmes and Book-start initiatives aimed at supporting families and children have shown positive effects on children's later literacy performance. In a pan-European analysis, book ownership, as part of a broader literacy environment, was also found to be associated with language and literacy development and later reading attainment (Garbe et al. 2016). Not all parents are confident providers of literacy-related activity, however. This being the case, the importance of ECEC to language and social development has long been recognised (Peisner-Feinberg, 2001). There is a strong positive relationship between the number of years children attend pre-primary institutions and their later reading achievement at age 10, as demonstrated by PIRLS data (Mullis et al., 2017). This relationship also pertains at age 15, as confirmed by PISA data (Del Boca et al.,2023).

In 2021 the European Commission declared the right of every child to affordable, good quality ECEC, based on the European Pillar of Social Rights adopted by the European Union in 2017, and following the 2019 Council Recommendation on High quality early childhood education and care systems. Furthermore, the Commission emphasised that "children from disadvantaged backgrounds have the right to specific measures to enhance equal opportunities". Although the importance of pre-school ECEC has been recognised, there is still a lack of Europe-wide data on process quality, the more proximal processes of children's everyday experiences, and the interactions that occur between children and their environment, including their relationships with teachers, peers and families (EACEA-Eurydice, 2019).

The majority of the available data refers to structural features of ECEC and shows large variations in those characteristics that are necessary for quality: namely, access, affordability, enrolment rates, guidelines, qualification requirements of ECEC staff, teacher-child ratio and group-size. The right of children to have access to affordable ECEC of good quality has not been operationalised in all European countries. As *Education at a Glance* (OECD, 2024) points out, many children from disadvantaged backgrounds and those with migrant backgrounds, who are in greatest need in order to accelerate their language learning before school, are not able to access ECEC.

We must stress, however, that while much remains to be done, there is excellent pre-primary ECEC in many European countries, with mandatory attendance and an emphasis on "emergent literacy" practices. These will be discussed in detail in Chapter 4, but they include playful reading and writing activities, with an emphasis on print awareness, phonological and phonemic awareness, and active engagement with reading and writing. These activities prepare young children for learning to read and write as soon as they reach primary school.

2.3. Broad agreement across Europe about how initial reading should be taught and then developed (ages 6-12)

There is a vast body of academic research literature on reading and writing development and instruction. It is clear that the following aspects are important in initial reading instruction (National Reading Panel, 2000):

- phonological awareness
- phonics
- vocabulary
- fluency
- comprehension

The development of decoding and word recognition is a key focus in initial teaching of literacy in the early school grades. To grasp the alphabetic code used in the different European orthographies (spelling systems), children must gain a cognitive clarity about the functions and features of written language (Downing & Valtin, 1984). Explicit teaching of grapheme–phoneme correspondences (or phonics knowledge) is essential not only in the first year but also in higher grades, so that children understand the systematic relationship between sounds and letters, enabling them to decode words accurately when reading, and to analyse words into phonemes when writing. A relatively small proportion of children seem to be able to learn to read with hardly any formal instruction from a teacher, but nearly all benefit from the systematic teaching of phonics. For those children who might not have had as much story and print-related play, formal instruction is needed that includes structured storybook reading, as well as emphasis on the key areas of phonemic awareness, phonics, fluency, vocabulary and comprehension (Romeo, Uchida & Christodoulou, 2022).

In Europe, the various orthographies differ in the complexity of their grapheme–phoneme relationships (for example, Finnish and Spanish are two of the most consistent orthographies, while English and French are two of the least consistent). Thus, languages differ in terms of the amount of phonics instruction children need in order to learn the grapheme–phoneme relationships of their specific orthography. Goswami (2010), for example, found that German children who were beginning to learn to read developed accurate phonological awareness much more rapidly than English children, who were dealing with a far less consistent set of grapheme–phoneme representations.

There is general agreement across Europe that initial literacy instruction should use a balanced approach: that reading for meaning and understanding should not be taught separately from instruction about grapheme–phoneme relationships, and that learning to read and to write should be parallel and interactive activities. Indeed, Wyse and Hacking (2024) claimed a demonstrably greater gain in a number of aspects of literacy development for children who were taught reading and writing together. Corroborating evidence for this claim, for both younger and older readers and for both word identification and comprehension development, comes from syntheses by Graham and Harris (2020). It is also critically important that children are encouraged to enjoy reading. Teachers need to read stories with their students and to offer a positive model of reading as an activity in which everyone can participate and be successful.

While literacy instruction during the early years has a major focus on decoding skills, complementary emphases on code, language and meaning should be prominent in instruction at all levels. Across the developmental continuum, there should be a shift toward greater emphasis being placed on language and meaning (Pearson et al., 2020). There is evidence to suggest that delaying such an emphasis on language until foundational code-breaking skills have been fully developed can be associated with lower levels of comprehension at a later stage (Cervetti, et al; 2020).

It is important for every teacher to understand how enormously valuable it is for children who are learning to read to sing songs, to hear stories and poems read aloud, and to participate in discussions about what they have heard (Fikrat-Wevers, van Steensel & Arends, 2021). First of all, stories introduce children to other worlds, to other children, and to other cultures. Stories also invite them to find a place for themselves in those worlds. Literature develops the imagination; it offers a safe environment away from real life in which a child can encounter dragons, wolves, giants, danger and fear, but within which he or she can also explore the possibility of finding hope, safety, security, friendship and love. Stories about animals enable children to enter that neutral space for projection, wherein their own fears, anxieties, feelings, troubles and lives can be explored safely. And of course, as the events in a story unfold, the cognitive side of reading is also being developed: children's vocabulary is being extended; their phonological awareness is being developed by the rhymes in songs and poems, and through repeated phonemes in characters' names and locations. All stories and poems use language to build an imagined world, and that language extends children's vocabulary, as well as their familiarity with new sentence structures and grammar that extend far beyond the simple phrase structures of playground and classroom talk.

Within a balanced approach that includes stories, poems, songs, nursery rhymes and reading for enjoyment, all European education systems teach "decoding" – that is, helping children to develop the ability to move from letter recognition and knowing the alphabet to matching the letters or groups of letters to the sounds that make up words. While we have some knowledge from research about some aspects of initial teaching of reading in the European Union – for example, the information on pedagogical goals and curricula provided by EC-EACEA (2014) – we lack a detailed overview from across the education systems in Europe concerning the methods, materials and didactic approach to teaching decoding in the first months of primary school. Brooks and Burton (2017) presented an overview of various initial teaching methods, but there is a lack data on how widespread these methods are in Europe. In some classes, mastering letter recognition and letter names is the first important task a child encounters, whereas in other classes only letter sounds are taught. In some classes, basal readers are used that apply a systematic approach to "decodable" texts (i.e. books that use only a very limited vocabulary, with much repetition – for example, "Ned is a vet. Can Ned get the cat?"); in other classes, teachers introduce well-known children's books. In some classes, children begin writing before they can read; in others, writing is introduced only after word reading is well established (Snow, 2017).

As children begin to become familiar with simple letter–sound relationships, word recognition begins to speed up. As fluency develops, children become able to carry out the lower-level skills more automatically, which means that they have more attention available

for the task of comprehending what they are reading (Stanovich, 2009). It is at this point that children use their vocabulary knowledge, letter–sound knowledge, and phonemic segmentation and blending skills to enable them to decode unfamiliar words – words that they know, but have not met in print before. In England, for example, a child who can read the word "toot" is able to work out by analogy that the new word "hoot" is almost the same as "toot", but with the sound "tuh" replaced by "huh". Clearly, the greater a child's speaking and listening vocabulary, the easier it will be for them to recognise much more orthographically complex words such as "slight" (if they already know "flight"), or "stable" (if they already know "table"). It is also clear that children with good phonological awareness will find it much easier to internalise and apply their developing knowledge of how letters and groups of letters combine to form phonemes in their language. They can then use that knowledge to encode words that they know but have not met in print before.

Stanovich used the phrase "Matthew effect" (loosely based on the Biblical parable of the talents: "to those who have, more shall be given, but to those who have not, even this shall be taken away") to describe the reciprocal advantages of acquiring early the skills and knowledge that relate to reading. Children who acquire vocabulary knowledge and phonological awareness early learn to read quickly. This then enables them to further extend their vocabulary, their comprehension and their learning. These differences are not linear; they are exponential. Experimental evidence supporting this comes from a recent large-scale study from Switzerland, which monitored both the vocabulary and reading comprehension of 282 German-speaking children from Grade 1 to Grade 3 (Röthlisberger, Zangger & Juska-Bacher, 2023). The study found was that over the three years, the influence of decoding ability decreased in predicting reading comprehension, but the influence of vocabulary knowledge increased. It was also the case that ability in reading comprehension at age 7 predicted subsequent ability in this area at age 8. By the age of 9 there was an even wider spread of comprehension scores between poor and good readers.

Learning to read independently is an extremely important stage in literacy development, because it is at this point that reading becomes a tool for learning. However, such learning cannot occur unless the child already has enough vocabulary and language knowledge to enable them to apply their new decoding skills within a reasonably extensive knowledge base. Research has shown that although teachers may work to help build learners' vocabulary, it is through reading that students obtain the greatest gains. This was expressed forcefully 40 years ago by Nagy and Anderson: "We judge that beginning in about the third grade, the major determinant of vocabulary growth is the amount of free reading" (Nagy & Anderson, 1984, p. 327). It remains to be seen how much this will be changed by young peoples' reading habits in this digital age, but at present we must encourage all young people to read books, and to read widely.

Fluency plays a key role as well, and there are many ways in which teachers can support children in becoming more fluent readers. The simplest is the teacher reading a story to the class. This can broaden children's vocabulary and make them more familiar with the structure and grammar of a story. It also offers a model for intonation and prosody, and can lead to a shared discussion of the book – thus modelling the process of reading comprehension for the whole class, including those who are unwilling to put up their hands. The next level is reading while listening: children have their own copy of a book, and they follow along as the teacher reads. As Rasinski's research has demonstrated, reading while

listening significantly helps to develop a child's fluency (McTeer, Rasinski & Bintz, 2022). Lastly, it is important for teachers to be aware that re-reading a familiar book is a very valuable stage in increasing fluency. Word recognition speeds up and becomes automatic once a child has encountered the word in print many times. A child may read aloud or may read the words in a book and hear them silently in their head, but it is now believed that for most readers, most of the time, the phonological representation of the word is "heard" in the head after, not before, the word has been recognised (Stanovich, 1980). At this point, it is important to note that learners benefit from explicit or formal instruction in the application of comprehension strategies. Explicit teaching of comprehension strategies has been shown to improve reading comprehension among readers with different levels of ability. In fact, it is the weakest readers who benefit most from explicit instruction in reading comprehension. The pedagogy associated with these gains will be discussed in detail in Chapter 4.

Chapter 3. What does research tell us about why some children fail to learn to read?

3.1. Why do some children fail to learn to read? What does the research into post-COVID-19 data within and beyond Europe tell us?

While reading test scores in Europe have been in decline for more than a decade, there is no doubt that the school closures connected with COVID have also seriously exacerbated this situation. Schools in the Netherlands were closed for only eight weeks, while schools in the UK were fully or partially closed for two periods totalling 27 weeks. In Greece, too, a stop-start policy began from March 2020, and schools did not fully reopen until May 2021. As we have already noted, the impact of school closures was greatest in the homes of the poorest and least educated. Children's literacy development will have been especially slowed in homes in which the parents were not able to support their children's language and literacy, and in homes in which there were few books, and few or no computers or tablets – especially when there was poor or no internet access (Donelly & Patrinos, 2022). But exactly what effects did these factors have on children's literacy development? Conversely, in homes that had many devices and good broadband, was children's access to digital technology a boon or a disaster?

In their multi-national survey (which included the Netherlands, Belgium, Switzerland and Germany), Donelly and Patrinos (2022) confirmed some findings that we have already noted. Perhaps the most important of these was that it was primary school students whose learning was most damaged, with a significant learning loss related to reading at each of four levels, from age 8 to age 11. We also know many of the areas in which remedial pedagogy post-pandemic needed to be focused.

In their meta-analysis of 53 studies, Hall et al. (2023) presented a detailed account of why some children fail to learn to read. All of the areas covered will have contributed to post-COVID-19 learning losses. Hall et al. highlighted a number of areas of learning which, if compromised, might lead a child to be at risk of having reading difficulties:

- Language development
- Phonological awareness
- Phonics knowledge
- Word recognition
- Spelling difficulties
- Problems with comprehension

The ability to learn to read is first and foremost dependent on language development, but language development itself begins with the ability to process sounds. From birth, as long as a child has hearing (which is physiological), their brain processes the aural input; their phonological awareness develops, and as he or she attends to their parents' baby talk (in English, we use the term "motherese"), he or she begins to recognise and make sense of what they hear. Children are particularly aware of repeated syllables ("ma-ma", "pa-pa"), and they also respond to the singing and repeated sound patterns in nursery rhymes ("Hey diddle, diddle, the cat and the fiddle"; "Frère Jacques, Frère Jacques"; "Twinkle, twinkle,

little star"). Parents might not know it, but the two-syllable repeated sounds of words in motherese (for example, "bic-bic" for biscuit, "tick tock" for clock) have a positive impact on subsequent speech development. Ramirez et al. (2020) reported that children of parents who were coached to speak to them using motherese developed vocabulary at twice the rate of the children in a control group. The brain of a child whose phonological development has been accelerated by "baby talk" will also find it much easier to learn to read – partly because of their wider vocabulary, but also because reading involves the process of matching groups of letters on a page with phonological representations of words or parts of words in their head, and their brain has been making that meaning from words and parts of words since birth. In contrast, children with underdeveloped phonological awareness (either due to pre-birth issues or a lack of normal post-birth language development) will not only find it difficult to learn to read, they may also be unable to learn from phonics teaching, since it is their phonological awareness that enables them to then develop phonemic awareness – the ability to connect the letters on the page with the phonemes, syllables and words that make up a text. There can be little doubt, therefore, that infants whose life experience during lockdown involved relatively few interactions, and whose only sustained language interactions before lockdown were generally within a playgroup or nursery setting, will have suffered serious learning loss during lockdown.

There are many processes taking place simultaneously during reading, and if any of those processes are slowed down, the whole process of gaining meaning may become arduous, or may break down altogether. Even though Gough and Tunmer (1986) were careful to state that their much-discussed "The Simple View of Reading" carried no implications for instruction, it has been interpreted by many scholars and advocates as implying that the teaching of reading should be fairly straightforward (see, for example, the Rose Report in the UK: Rose, 2006). In the Simple View, reading is conceptualised as the product of two components: decoding x language comprehension. Most children come to school with reasonable language comprehension, it has been argued (Rose, 2006), so if the teacher teaches decoding through systematic instruction in phonics, the job is done. Once readers have decoded written language into oral language, they can comprehend it using the very same processes they use to comprehend when listening to others talk. The problem with this "simple view", however, is that reading isn't that simple. As several scholars have recently made clear (e.g. Cervetti et al., 2000; Duke & Cartwright, 2021; Hall et al., 2023; Tierney & Pearson, 2024) those two broad areas of decoding and language comprehension entail substantial internal complexity. As Hall et al. (2023) note, there are many more than just two processes at work when a child reads. Word recognition depends upon visualisation processes that store representations of words and parts of words, as well as the graphic symbols that represent them. A reader draws upon many different types of knowledge when decoding. Even the alphabetic principle has to be learned. A cup is a cup whether its handle is pointing one way or the other, but the letters "d" and "b" stand for very different things, and "was" is not interchangeable with "saw". A child's ability to profit from instruction in phonics is itself dependent upon their knowledge of the alphabet, familiarity with different typefaces, and their ability to store and connect their phonological awareness with their understanding of the ways in which letters and groups of letters behave in words.

Decoding print and grasping a word's meaning is not always a one-to-one mapping: decoding a word and understanding its meaning often demands morphological knowledge.

In English, this mostly relates to the parts of a word that form verbs and plurals, but each European language has its own morphological rules, mostly involving nouns, verbs and adjectives, as well as semantic knowledge. Reading and pronouncing words in English is especially tricky, in that many of the most common words don't actually obey the most common phoneme–grapheme rules ("come" and "was", for example). After considering the data from hundreds of studies, Vellutino et al. (2004) concluded that the main reason for persistent failure to learn to read fluently is probably attributable to a problem with phonological coding, and associated problems in acquiring or developing phonological awareness. These two problem areas would also help to account for the difficulty that many very poor readers have with spelling.

Those who criticise Gough and Tunmer's Simple View (e.g. Tierney & Pearson, 2024; Wyse & Styles, 2007) argue that it is naive to assume that most children come to school with "language comprehension" already in place, and that all they need is phonics instruction in order to be able to decode print and read with understanding. In homes where books are present, parents often begin to introduce their children to stories before the age of 2. In homes where there are no books, the only experience a child may have of sharing and discussing a story might come from a playgroup or kindergarten class. Again, missing out on such learning for months at a crucial point in their lives would seriously delay literacy development.

The impact of the COVID-19 pandemic on young children's language development and reading has been significant and serious (Molnár & Hermann, 2023). For example, reported data on learning loss in early schooling reveals that kindergarten children and students in the 1st to 4th grades were more significantly and negatively affected by COVID-19 restrictions than their older peers. The average learning loss in reading was estimated as being equivalent to five weeks of schooling. This difference was also extremely large in schools with a high share of disadvantaged students. More specifically, many low-SES students in the 1st to 4th grades made little or no progress while learning from home.

The language comprehension required to read is quite complex. It includes an understanding of story structure, a reasonably good working vocabulary, and also what experts call "syntactic awareness" – the awareness of grammatical forms, and of the ways in which words are woven together in a written text. Language comprehension in reading requires the capacity to bring all of that prior knowledge to the task of making meaning from a text, connecting the fragmented and partial representations of the text that are in working memory, and integrating them into a coherent model of what the text might contain (Kintsch, 1988). The fundamental approach to supporting a struggling reader must therefore follow this principle: if a child has not mastered the early stages of reading, problems with word recognition and decoding must be dealt with, even if there are also problems with language comprehension. If a child is making good progress in decoding and word recognition, then the focus should gradually shift to developing comprehension. The assumption that once a child has acquired the basic skills of reading, and is reasonably fluent, they can be left on their own to develop comprehension (since this will take care of itself), is no longer tenable.

On a more positive note, however, even for students with underdeveloped phonological awareness and weak phonological coding skills, there is now a great deal of evidence that,

especially with targeted remedial support, all children can be helped towards becoming fluent and confident readers. It is important to stress that while weaknesses in any or all of the above areas will cause problems in reading development, studies have shown that good teaching can enable progress to be made in improving literacy, even for those with severe problems. The Hall meta-analysis of 53 experimental studies from all over the world evaluated reading outcomes for over 6,000 students who had reading problems (Hall et al., 2023). It found an overall positive outcome across the studies, with a highly significant mean effect size (Hedge's g) of 0.33. Chapters 4 and 5 will look at various interventions in greater detail, but for now, some important general points can be made:

- The effect size for interventions was greater for students aged 5-7 than for those aged 8-11 (i.e. it was more effective to deliver the intervention early)
- "Dosage", i.e. longer, more sustained interventions, increased the effect size
- Interventions (including those for older students) that included a component of teaching phonological awareness outperformed those that did not
- One-on-one interventions did not differ in effect size from small-group interventions (i.e. it appeared more efficient to deliver interventions to small groups rather than to individuals)
- Multisensory interventions (e.g. drawing with a finger in sand, or tracing letter shapes with a finger in the air, which are explicitly mandated in some US states) had no additional impact on effect size
- Teaching spelling in addition to teaching word reading added to an intervention's effect size
- Teaching comprehension added to an intervention's effect size, but the effects were smaller than those for instruction in word recognition

The cognitive aspects of reading do not tell the full story, however. It is now widely accepted that reading is a socio-cognitive process. Reading takes place within a cultural and social context, and neurological studies have confirmed that the visual and cognitive processes that allow us to read are intimately related to the areas of the brain that control attention, motivation and emotion (Li, Gow & Zhou, 2020). Children who are anxious, afraid, upset, distracted or who lack motivation will not find it easy to learn to read. Pedagogical approaches that take account of the emotional aspects of reading are therefore much more likely to be successful. A study from Germany that took this approach was that of Valtin and colleagues (Valtin, Naegele, & Sasse, 2013), who argued that reading and spelling difficulties needed to be seen from both a cognitive and an emotional perspective. They developed an integrated approach that combined reading, spoken language, written language, spelling, games and play into a course, the basic principles of which were:

- personalised diagnosis with continuous observation, evaluation and treatment;
- development of the student's self-esteem and motivation;
- a precise match between the stage of the child's reading/spelling development, and the learning strategies offered to the child; and
- focus on the child's strengths rather than his/her deficits.

As we shall see in Chapters 4 and 5, this integrated approach, with its emphasis on personalised learning, has much to recommend it.

3.2. Was technology a boon or barrier during lockdown?

We know that for many European children during lockdown, digital devices – phones, tablets or computers – provided a social lifeline for children, as well as a source of connection through the internet with school learning. We also know that those children who did not have access to both of these things were doubly disadvantaged. But is there any evidence that access to digital technology might actually have done more harm than good?

The answer to this question focuses on two areas: first, on infants and their early literacy development; and second, on the uses of technology among older students, especially those in secondary education.

The first question we need to ask about infants' learning is whether there is any evidence that media exposure in very young children harms their development. The answer is clear – there is evidence that early media exposure is harmful. Ramirez, Hippie and Shapiro (2021) studied day-long audio recordings of parental interactions with infants collected in their homes when the children were 6, 10, 14, 18, and 24 months old. The equipment also automatically detected the infants' exposure to electronic media (this generally involved TV, DVD or video). What the researchers found was that exposure to electronic media negatively impacted parent-child speech and interaction: when electronic media were active, parents spoke less and interacted less with their child. Every minute of additional exposure to electronic media per day correlated negatively with the amount of vocalisation by the child during that day. A recent meta-analysis of research into infant screen time corroborates these results (Muppalla et al., 2023). This paper reported that the average age at which children begin to encounter electronic media on a regular basis has fallen to four months after birth. Studies have demonstrated a negative correlation between the amount of screen time at the age of 2 and academic performance at age 10, with co-morbid associations with poorer attention and delayed social development. By contrast, Muppalla et al. reported that after the age of 2, if screen time was spent co-watching with parents, some studies have shown a positive correlation with overall language development.

The implications of these studies are in harmony with the research we have already cited that emphasises the crucial importance of interaction, and particularly parental interaction, in early language learning and development. Webb et al. (2024), working with children aged 18-21 months, found that infants who played with tablet computers had reduced engagement with adults. The infants did not attempt any language-related responses when playing a tablet game. They were attracted by colours and shapes on the screen and paid attention to these but were less likely to respond to adults while playing with the tablet. Playing with the tablets was not damaging in itself, but the researchers noted that while the children were playing with the tablets (as opposed to what happened when they were playing with wooden toy animals in a farm scenario), there was no language development, nor was there any social or emotional learning. Another recent systematic literature review by Massaroni et al. (2023) also reported on the effects of prolonged screen time in the early years of life, finding negative effects on language development and communication skills. The authors also cited studies that showed negative relationships between pre-school screen time and children's subsequent attention to environmental stimuli, noting

poorer social development, poorer problem-solving skills, and reduced social skills when communicating with others (for example, turn-taking in conversation). Once children pass the age of 2, however, tablets functioned more like books: children could learn from them on their own, but they learned much more if the content was discussed with their parents.

The WHO guidelines for physical activity of children under the age of 5 are also relevant here (WHO, 2019). These guidelines are aimed at policy makers in education and were based on the findings of public health and medical experts who had conducted systematic and worldwide research reviews. With regard to reading and screen time, the guidelines recommended:

- For infants under 3: there should be storytelling and reading with a caregiver every day, but no exposure to screen time at all (no TV, no phone or tablet, no laptop).
- For children aged 3 or 4: engaging in reading and storytelling with a caregiver every day was encouraged, but screen time should be no more than 60 minutes in one day.

A number of studies have been conducted on health-related behaviours concerning the use of technology during COVID-19 confinement, many of which covered the age range from pre-school to secondary. One survey (Lopez-Bueno et al., 2020) of the parents of 860 Spanish children aged between 3 and 16 (mean age 9.6) collected data on a number of before-and-after confinement variables, including the children's physical activity ("How many minutes of physical activity does your child usually perform weekly?") and their screen time ("How many hours is your child usually exposed to screens such as TV, cell phone and tablet daily?,"). The results were concerning. Parents reported a reduction of more than 50 % in their children's physical activity during lockdown, and an increase in exposure to screen time of more than 200 % (from a mean of 2.0 hours per day to 4.9). This increase was the same for both girls and boys, and was found at all age levels. Lopez-Bueno and colleagues were particularly concerned about public health issues, especially obesity and diet, but the team was also concerned about the possibility that screen time per day might not decrease after lockdown ended.

Among secondary school students, studies from across the world confirm that, for both girls and boys, reading on a screen is now more common than reading a printed book. Researchers have sought an answer to the question of whether this a problem, or whether it is simply the path that adolescent readers have chosen, from which any challenges involved in coping with these new media will disappear over time. A meta-analysis from Spain (Delgado et al., 2018) reviewed studies that compared reading on-a screen with printed reading, and concluded that although research outcomes have been mixed, a number of important differences have now been confirmed by research:

- Digital-based reading, particularly reading for information, is typically in short bursts compared with paper-based reading.
- Paper-based reading comprehension is deeper and more effective than digital-based comprehension, since short-burst reading encourages a shallower kind of processing that can lack the sustained attention to complex arguments and processes that characterises paper-based reading.

- As students move through secondary school and texts become more complex, the negative effects of digital reading do not decrease – in fact, they are greater.
- However, digital texts frequently offer tools to potentially support weaker readers (e.g. text-to-speech software, online glossaries, the ability to change typeface, font size, background colour, etc). These can mitigate some of the negative aspects of online reading.
- Adaptive texts, which match the difficulty level of the text to the reading level of the student, can support both motivation and comprehension.
- The poorer results seen for the comprehension of digital texts did not apply to narrative texts: when students were reading stories on a computer or on a tablet rather than on paper, comprehension was not poorer.
- Studies have been carried out on digital versus paper reading for 18 years now, and if anything, the effect sizes favouring paper over digital reading are greater among older students; in other words, familiarity with digital technology does not appear to lessen the negative effects of digital reading.

Researchers are still investigating the causal relationship between digital reading and poorer comprehension. Are today's students simply used to quick and shallow reading, since most of their reading concerns texts that are no longer than a phone message or post on a Facebook page? It's easy to make this rather apocalyptic judgement of young people today, but in fact short-burst reading is not new. In the UK in the 1970s, the Effective Use of Reading project (Lunzer & Gardner, 1979) collected classroom data on secondary school students' reading, and reported that "short-burst reading" (i.e. reading in periods that were no longer than 15 seconds) was the most common type of reading. This suggests that poorer learning from online texts may be related to short-burst reading of multiple information texts in multiple formats on a screen, compared with more sustained reading from the more standardised formats of paper-based texts.

3.3. The overall picture: impacts of parental interaction and the use of new technologies

Overall, research findings make it clear that the reduced levels of interaction with adults that many children experienced during lockdown have had a long-term negative impact. The development of children's literacy crucially depends on interactions with others and with the world. Where such interactions were significantly reduced, this will have impacted children's development in a number of ways.

Access to technology during lockdown was uneven, and while it has provided learning opportunities for many, there will have been negative effects for some – particularly the youngest. Reading for information on a screen can be very valuable, but students' reading of digital media appears to lack depth compared with reading from books. This is something for teachers to be aware of, particularly as the need to deal with complex and extended texts becomes essential for learning at the levels of upper-secondary and higher education.

The importance of parents reading and sharing books with children, from infancy to at least the end of primary schooling, must therefore continue to be emphasised and encouraged. Among older children and students, the importance of reading and learning from traditional paper books at least some of the time should not be neglected.

Chapter 4. Exploring effective practice: what does research suggest that education systems in the EU need to do to improve literacy at ECEC and primary levels?

4.1. Overview: broad agreement on the pedagogy of literacy across the scientific and educational communities

To help achieve the goal set by the EU High Level Group of Experts on Literacy (Brooks et al., 2012) that "All citizens of Europe shall be literate", the literacy experts from 28 European countries who contributed to the European Literacy Policy Network Declaration (ELINET, 2016) defined the conditions required to put this basic literacy right into practice. These conditions have implications for parents, teachers and governments, and cover all the years from birth to the end of formal schooling – but they place the greatest emphasis on the importance of the child's early years for building achievement in literacy:

- **Young children** are encouraged at home in their language acquisition and literacy development.
- **Parents** receive support in helping their children's language acquisition and literacy development.
- **Affordable high-quality pre-school, or kindergarten**, develops children's language and emergent literacy development through play.
- **High-quality literacy instruction** for children, adolescents and adults is regarded as a core goal for all educational institutions.
- **All teachers** receive effective initial teacher education and professional development in literacy teaching and learning in order to be well prepared for their demanding tasks.
- **Digital competence**, including critical and creative use of digital media, is promoted across all age groups.
- **Reading for pleasure** is actively promoted and encouraged.
- **Libraries** are accessible and well resourced.
- **Children and young people who struggle with literacy** receive appropriate specialist support.
- **Policymakers, professionals, parents and communities** work together to close the gaps in social and educational levels by ensuring equal access to literacy.

Chapters 4 and 5 of this report offer detailed and evidence-supported advice for parents, teachers, policymakers and governments on how these suggestions should be put into practice. In these two chapters, the focus is on pedagogy. In addition to reporting on classroom research, they include examples of good practice, each of which is intended to provide some explicit guidance on how the suggestions from research might be operationalised in the home, in the classroom, in teacher development, and in policy.

4.2. Effective practice in the early years. Health care, family literacy programmes, ECEC: early language and social development; pre-

school development; phonological awareness and vocabulary development; engagement with stories and books (ages 0-6)

4.2.1. Good health care from birth

Children's literacy development begins from birth. During the first five years of a child's life, developments in language and visual processing are both crucial to the early stages of literacy. From this perspective, monitoring and encouraging children's linguistic development from birth as part of the child's overall neurological, cognitive and psychosocial development is therefore vital – and the early checks on children's hearing and eyesight that take place in nearly all European countries are crucial. These are particularly important to enable early intervention if problems are detected. The Neuvola programme from Finland (Finnish Ministry of Social Affairs and Health, 2024) has now been copied all over the world, and its emphasis on prioritising health, language development and the love of books from birth is thought by many experts to have contributed significantly to Finland's achievements in literacy.

Box 1. Good practice example: NEUVOLA, Finland's programme for monitoring children's healthy growth and development

The Neuvola programme is a national, state-funded programme in Finland to provide systematic preventive healthcare to mothers during pregnancy and to their pre-school children. Before they start school at the age of 7, children undergo numerous health checks covering their teeth, eyes, ears, motor skills, speech and psychosocial behaviour. Any problems identified are immediately addressed therapeutically, with the aim of encouraging children's healthy growth, but also preventing future learning difficulties at school. Treatments usually include various multi-professional interventions, planned in cooperation with medical staff and the family. The Neuvola programme has existed in Finland since the 1920s. It is funded by the Ministry of Social Affairs and Health, and is evaluated by the National Institute for Health and Social Affairs. By law, all municipalities are obliged to provide appropriate services for expectant mothers and pre-school children. Although participation in this programme is voluntary for mothers and children, almost 100 % of all those approached take up the offer. The programme has gradually been extended over the decades, and currently also includes professional development training for Neuvola staff, as well as a family literacy element to support parents. The family literacy programme includes a box of natal support items including a bag of books for the family, along with guidance for parents on how to read with their children and support their speech and language development. There is even an online chat service through which parents can talk with healthcare providers in real time. Many experts credit the Neuvola programme for Finland having one of the lowest infant mortality rates in the world, and literacy specialists believe that the programme has also made a significant contribution to Finland's historically high PISA reading scores.

Source: Finnish Ministry of Social Affairs and Health, 2024.

4.2.2. Support for children's early literacy development in the family

As we have already noted in previous sections of this report, children's early language development is a key determinant of their future success in learning to read. Children cannot learn to read unless they already have some vocabulary, a working knowledge of (at least some of) the alphabet, a reasonable level of language development, and some experience of stories and books. If they do not have all these things, then of course the

school will help children to develop them – but if they do have all of them, children can begin to learn to read on their first day at school. All parents want their child to succeed, but that does not mean that parents know what their role might be in helping their child to be ready for school. This is why family literacy programmes can be enormously helpful in giving parents the support, information and resources that can help them to not only help their child, but also to learn how rewarding and enjoyable it can be to become a partner in developing their learning and literacy.

Many socially advantaged parents are able to learn how they can help to encourage speech, language and literacy activity with their child; however, many are not – and although many family literacy programmes focus in particular on parents from disadvantaged backgrounds, it is important for providers to remember that parenting is unknown territory for all new parents, and that every parent needs support. Family literacy programmes provide support for parents to help their children develop print and digital literacy – but when necessary, they also support parents in developing their own literacy skills, bringing into and creating a culture of reading and writing for pleasure across the whole family.

A recent meta-analysis from the Netherlands (Fikrat-Wevers, van Steensel & Arends, 2021) of the effectiveness of 48 family literacy programmes from all over the world reported some valuable findings in relation to the need for programmes to be sensitive to cultural differences, particularly for programmes serving minority and second-language populations. Effect sizes were broadly positive across all 48 programmes (Cohen's d 0.5)[1], but there were some important variations. Most importantly, it was clear that family literacy programmes were effective and valuable, particularly for the literacy development of children from low-SES families. Also, and perhaps surprisingly, the programmes that yielded the largest effects were those that supported home literacy by focusing on a limited set of activities, with no more than a single centre-based session, but with a strong emphasis on shared reading at home. These effects were generally even stronger than those of programmes that included multiple centre-based meetings (in a school or community setting). Perhaps this was because many of the centre-based meetings also brought in other school-curriculum skills, which touched on areas with which the parents were unfamiliar, or with which they had negative associations due to their own previous experiences with school.

The value of offering literacy-related materials and support to parents, but without requiring them to risk feeling inadequate by having to visit a school or to interact directly with teachers, is one of the features of the Finnish Neuvola programme (Grym & Borgermans, 2018), described in the good practice example above. This was also a feature of the *Boots Books for Babies* project in the UK (Bailey, Harrison & Brooks, 2002), which offered new parents a canvas bag that included two board books, cards with advice on literacy development and library use on one side and nursery rhymes on the other, and information about local library and community services, together with an invitation to a coffee morning at a local library. Books and rhyme cards in other community languages

[1] Cohen's d is an effect size used to indicate the standardised difference between two means. In educational research, effect sizes above 0.2 are considered reasonable; between 0.3 and 0.4 or above, they are considered large.

were also available. The pack was typically given to the baby's mother by the health visitor (a community-based worker trained to work in the perinatal field) or health care assistant, at the end of the (mandatory) 9-month hearing test. This was generally accompanied by a brief explanation of what the pack contained and of the importance of books and reading for young babies. The project, which operated only in the poorest areas of a large multicultural city, reported a 54 % increase in library memberships for infants over the three years of the project (while unfortunately, library memberships for infants elsewhere in the city decreased over the same period). This is, of course, only one example of a successful book-giving programme. The BookStart project, which began in the UK in 1992, has now spread worldwide. It has distributed millions of baby books, together with an information flyer about shared book reading, to the parents of babies under 1 year of age in dozens of countries. A meta-analysis of 44 infant book-gifting programmes (De Bondt, Willenberg & Bus, 2020) reported a very large improvement in children's home literacy environment (d = 0.31), which subsequently resulted in children scoring higher on measures of literacy-related skills prior to and during the early years of school (d = 0.29).

Box 2. Good practice example: The European Framework of Good Practices in Raising Literacy Levels of Children, Adolescents and Adults

The European Framework of Good Practices in Raising Literacy Levels of Children, Adolescents and Adults (Garbe, Mallows & Valtin, 2016) outlines the features of successful family literacy programmes. Such programmes, it argues, are informed by an understanding of the literacy needs of all participants, children and adults, and emphasise the importance of reading for pleasure and the parent-child bonds that are strengthened through shared reading.

In successful family literacy programmes:

- Health care professionals are involved in programme design and implementation. These professionals are in touch with the family from the first months of life, are usually trusted by parents, and help to facilitate universality and continuity.
- Information is provided to parents about the importance of reading to their children a variety of books and other texts, appropriate for each developmental stage.
- Language courses are provided for migrant parents who do not speak the language of the host country.
- Support is available for migrant families in creating a culture of reading for pleasure by using "silent books" (i.e. picture books without text so that parents can tell the story based on illustrations) during the first phases of the programme.
- Strong working partnerships are built across a number of policy areas, and there is an emphasis on reaching out to families through a broad range of family services. Programmes may thus involve paediatricians, nurses, libraries and ECEC centres, among others. This is likely to require multi-sector involvement and multidisciplinarity in family literacy promotion through the establishment of formal agreements between the various agencies and professionals involved in providing services for children, and through the offer of multidisciplinary training courses for all professionals involved.
- Policymakers commit publicly to the importance of literacy education in the family, and to the inclusion of family literacy programmes among their policy priorities.
- An evidence-based approach is taken towards family literacy programmes, in order to provide policymakers and partners with evidence of their impact.
- Support is provided for the establishment and expansion of book-gifting programmes.

Features of successful book-gifting programmes

In successful book-gifting programmes (De Bondt, Willenberg, & Bus, 2020):

- Books are chosen that are accessible and appropriate in terms of age, interest and culture.
- Evidence-based messages for parents in book packs encourage shared reading in the home.
- Added-value activities are provided by local partners to encourage parents and children to participate in fun book-related events, and access points for referrals to family literacy programmes.
- Joining a library is actively promoted and encouraged.
- Partnerships with health, early years and other professionals encourage access to and participation in book-gifting programmes among all families.
- Government funding and support from publishers contribute to making programmes cost-effective and sustainable in the long term.

4.2.3. Early childhood education and care (ECEC)

One of the lessons learned from the COVID-19 pandemic is that ECEC played a crucial role in countering the negative effects of the pandemic on children, families and communities. This highlights the need to raise the profile of ECEC within the field of education/care sector policies (European Commission: Directorate-General for Education, Youth, Sport and Culture 2021).

To raise the quality of ECEC, countries must take into account those areas of the European Quality Framework (Council of the European Union, 2019) that address five key components:

- Accessibility;
- staff training and working conditions;
- curriculum;
- monitoring; and
- evaluation.

This section of the report focuses on the first three components.

Accessibility

Broadening participation in ECEC is a key target for the EU. The Education and Training Monitor's comparative report (European Commission: Directorate-General for Education, Youth, Sport and Culture, 2024) tracks progress towards the achievement of EU-level targets – which, in the case of participation in ECEC, is: "At least 96 % of children between 3 years old and the starting age for compulsory primary education should participate in early childhood education and care by 2030". And the EU is making progress towards this 2030 target. In 2022, 93.1 % of children between 3 years old and the starting age for compulsory primary education participated in ECEC. Most EU countries have surpassed 90 % participation, with seven countries already achieving the 2030 target of at least 96 % (France, Belgium, Denmark, Lithuania, Spain, Sweden and Portugal). However, progress is uneven across the EU: Romania and Slovakia lag behind, with participation rates below 80 %. Eight EU countries showed no improvement or even experienced a decline in participation between 2021 and 2022 (Czechia, Cyprus, Germany, Hungary, the Netherlands, Romania, Finland and Sweden).

Another EU target concerns children below age 3: "At least 45 % of children below the age of 3 participate in formal childcare, with specific targets applying to EU countries that have yet to reach the 2002 goals" (European Commission: Directorate-General for Education, Youth, Sport and Culture 2024). The participation rates for children under 3 years old in formal childcare vary significantly across EU countries. While the EU average is 37.4 % as of 2023, individual country rates range from as low as 1.0 % in Slovakia to as high as 69.9 % in Denmark and 71.5 % in the Netherlands. This wide disparity reflects differences in national policies, employment patterns, childcare infrastructure and cultural attitudes towards early childhood education and care. Generally, parents have to pay for their child to attend. Only seven EU Member States (Denmark, Germany, Estonia, Latvia, Slovenia, Finland and Sweden) as well as Norway guarantee a place in publicly funded provision for each child from an early age (6-18 months) (EACEA-Eurydice, 2019). Average monthly fees are the highest in Ireland, the Netherlands, the United Kingdom and Switzerland.

The present report therefore encourages every education system to widen the accessibility of free pre-school education for all. All children benefit from ECEC – but vulnerable and marginalised children benefit the most. Therefore, ensuring the affordability of ECEC is key to promoting the participation of disadvantaged children. However, in almost all EU countries, there is a participation gap between children at risk of poverty or social exclusion and those who are not at risk. On average, the participation gap is 7.8 percentage points for children in the older age group (3+), and no less than 15.8 percentage points for children aged 0-2 (European Commission: Directorate-General for Education, Youth, Sport and Culture 2024).

As we shall show in further detail in Chapter 6, the cost-benefits of early pre-school childhood education and care make it a massively worthwhile investment.

Staff training and working conditions

Teachers, caregivers and educators have a significant impact on children's development and learning. It is therefore important to ensure that ECEC staff have appropriate qualifications and experience. However, there is great variation in the qualification requirements for ECEC staff across Europe, ranging from below Bachelor's degree level, to Bachelor's or Master's level. In Finland and Greece, for example, ECEC teachers are required to have at least a Bachelor's degree. Across Europe, there is also wide variation in the levels of continuing professional development staff is required to undertake (EACEA-Eurydice, 2023).

Women dominate the ECEC workforce; according to OECD (2023) data, 96 % of pre-primary teachers are women. It is widely acknowledged that young children, especially boys, need male role models to guide their social behaviour and attitudes toward literacy. Improving the gender balance of ECEC staff has therefore been one of the quality criteria proposed by the European Commission (2022). More recently, the OECD stated: "The gender imbalance of teaching staff in ECEC raises questions as to why women are much more likely to enter the profession and what the implications are for the understanding of gender among children, staff and society. On a staff and societal level, having more men in the ECEC workforce could help to challenge dominant discourses about masculinity regarding the participation of men in young children's lives" (OECD, 2023, p. 173).

Another important indicator of quality is the ratio of children to staff in ECEC. When groups are smaller and staff-child ratios are higher, educators can provide more stimulating, responsive, warm and supportive interactions, and are able to focus more on the needs of individual children. In Europe, the staff-child ratio in ECEC varies according to the age of the child, and differs considerably between education systems. Overall, the staff-child ratio tends to be lower for younger children (usually under 3 years) than for older children. For children aged 2 years, more than two-thirds of education systems in Europe have an actual staff-child-ratio of 1:10 or less, and only six have a staff-child ratio higher than 1:10. By the time children reach the age of 4, more than 60 % of education systems have a staff-child ratio of between 1:11 and 1:30, while only eight education systems have a staff-child ratio of 1:10 or less.

All the of quality aspects cited above are at risk, however, because most European countries are facing significant staff shortages in ECEC (European Commission, 2023). There are many reasons for this. Among them are low salaries, limited career opportunities, bad working conditions or health-related problems. The European Working Group on ECEC has identified staff shortages as a major challenge to the sector in most European countries, which needs to be addressed rapidly and efficiently. It suggests the following measures: valuing the profession and its educational and social added-value; creating clear career ladders for progression accompanied with continuing professional development opportunities; improving working conditions; reducing staff/child ratio, increasing salaries and providing additional financial incentives; offering more child-free time to foster professional development and teamwork; and offering more stable working hours and contractual status, and a better working environment.

To sum up: All children benefit from ECEC – but vulnerable and marginalised children benefit the most. Therefore, ensuring the affordability of ECEC is key to promoting the participation of disadvantaged children. However, ECEC quality is in acute danger due to significant staff shortages. This system-level problem must be addressed urgently.

Curriculum

In her analysis of kindergarten curricula in different European countries, Tafa (2008) showed that the once-prevalent concept of "reading readiness" (simply waiting until children are mentally ready to learn to read) has been replaced by the insight that children develop ideas about the function and features of written language from an early age, and that European kindergarten curricula should support and enhance young children's emergent literacy. Emergent literacy covers many activities, projects and programmes, with the aim of preparing young children for the formal teaching of literacy. This can include developing language, developing phonological and phonemic awareness (e.g. engaging in playful activities that help them to recognise and manipulate syllables, rhymes and phonemes in words), familiarity with stories and information books, and also drawing with a pencil, and "pretend writing" (or "emergent writing", which can include scribbling and invented spelling). Since 2020, several European countries have changed their educational guidelines for ECEC, mainly with a focus on language development (EACEA-Eurydice, 2023).

The good practice example below highlights a useful curriculum framework.

Box 3. Good practice example: An emergent literacy curriculum

The ELINET group (Garbe, Mallows & Valtin, 2016) has developed a useful research-based framework for assessing and fostering emergent literacy skills. From research into emergent literacy development and instruction, the following features of successful activities and programmes can be identified:

- Pre-school teachers should provide a literacy rich environment in which children learn and engage in the communicative functions of reading and writing, with the aim of developing curiosity and motivation to learn to read and write in school.
- Competence in the language of the school is key to learning to read and spell, so many children need a comprehensive programme to develop their oral language before entering school. ECEC and pre-school programmes should be comprehensive, with the aim of improving children's clarity of speech and broadening their vocabulary, grammatical accuracy and range as well as their communicative abilities. Kindergarten teachers should provide situations in which children can experience different functions of language in social play and role play, including conflict situations and problem solving.
- Children should be read to often, with the aim of familiarising them with decontextualised language and the more complex syntax of written text, as well as increasing their interest and motivation to learn to read.
- Children are actively engaged in literacy activities in print-rich classrooms intended to help them understand the communicative nature of reading and writing: writing is for sharing thoughts, sending messages, remembering something important, while reading is for understanding others' thoughts and feelings, gaining information and pleasure.
- Children are motivated to engage in writing activities: preparing picture books, using emergent writing in communicative contexts and for different purposes, exploring different materials for painting or drawing. These activities also help children to develop their fine motor control, which is needed for good handwriting and use of a keyboard.

The overarching goal of ECEC literacy activities is to help children to understand that print carries meaning, and to familiarise them with the world of books. By having their attention drawn to features of print – e.g. the direction of print, letters, words and punctuation – children get to know the technical vocabulary of the units of print (page, line, word, sentence, number, letter) and of literacy-related activities such as reading, writing and painting. In ECEC, children are encouraged to develop metalinguistic skills. This occurs naturally when they play language games using rhymes, tongue-twisters and poems, as well as through singing and clapping syllables, and by identifying relationships between morphologically related words (e.g. plurals). Using specific tasks, embedded in playful contexts, children can be prepared for phonemic awareness. This is an important subset of phonological awareness, consisting of the ability to analyse words into sounds and to synthesise sounds into words, which is an essential part of word recognition. As Lundberg showed in two separate studies (Lundberg et al., 1980; 1988), children who demonstrated good phonological awareness during their pre-school education made the most progress in reading and spelling one year later. Should ECEC programmes teach systematic phonics? Most ECEC centres prefer to focus on developing children's emergent literacy skills through playful experience, not by systematic training in phonics.

Besides offering affordable, high-quality ECEC provision, governments and local educational administrative systems should also provide measures to ensure early identification of, and support for, children with language problems. Since literacy

competence builds on oral language proficiency, word knowledge and syntactic knowledge, measures must be taken by governments and institutions to ensure that children with delayed language development, as well as second-language learners, acquire adequate levels of oral language. The aim should be that all children entering school can speak the language of the school so that they can profit from reading and writing instruction. As the EU High Level Group of Experts on Literacy (Brooks et al., 2012) recommended that all children should be assessed for their oral language proficiency by the age of 4 at the latest, and those who are in danger of falling behind in their acquisition of language competence should receive appropriate supplementary courses.

4.3. How should initial reading be taught, and then developed (ages 6-12)?

A number of key components are involved in the teaching of reading, and although we tend to think of the first year of primary school as the crucial one, every one of the components in the list below is important throughout the primary years. Around these, we shall attempt to build a complete picture of the pedagogy that drives successful and comprehensive literacy teaching which, in European countries, typically lasts six years, from age 6 to 12.

Key Component 1: Providing a culture of reading at whole-school level
Key Component 2: Providing a pedagogy informed by personalisation
Key Component 3: Promoting word decoding and reading fluency
Key Component 4: Developing comprehension
Key Component 5: Fostering reading engagement and reading for pleasure
Key Component 6: Evaluating pedagogy carefully when using digital resources
Key Component 7: Fostering critical digital literacy
Key Component 8: Supporting struggling readers

Primary school is vitally important for children's learning progress, and can be considered the critical period during which the transition from "learning to read" to "reading as a tool for learning and thinking" takes place. To acknowledge the present age of online information, Leu et al. (2015) suggest that this slogan should be updated to "We learn to read, and then we read to learn online", since children's reading experiences are increasingly occurring in digital formats. Perhaps we are even on the cusp of "We learn to read online, then we learn to read books". The early years are also an important time to close any gaps in language and literacy development that are already present when children start school.

In contrast to oral language, written language does not develop without instruction and practice. Learning to read and write is a significant milestone in children's overall cognitive development. Success or failure in the early phases of literacy acquisition are determinants not only of later academic achievement, but also of learning-related personality factors including self-efficacy, identity and motivation (Sparks, Patton & Murdoch, 2014). Effective literacy instruction is therefore of the utmost importance. Reading is a developmental process, and effective teaching needs to cover all of the important stages. These begin with learning accurate decoding skills, and move on to the automatisation of word recognition and ensuring the development of the ultimate goal of reading – namely,

comprehension. Learning can only happen if the child is motivated and engaged, and if the pedagogy is appropriate to the needs of the individual child. Furthermore, the instruction will be more effective if it takes into account the interests of the child and his or her life experiences and culture.

We would also emphasise from the outset that none of the pedagogic strategies outlined below will be effective unless teachers are given time, both pre-service and in-service, and support to put them into practice.

Key Component 1: Providing a culture of reading at whole-school level

The High Level Group of Experts on Literacy (Brooks et al., 2012) was commissioned by the EU to make proposals for reducing the number of poor readers in Europe. As its first field of action, the High Level Group emphasised the importance of providing a literate environment. We therefore begin this part of our report with suggestions concerning schools. A culture of reading in schools is a basic prerequisite for successful implementation, and requires that the school provides space, time and opportunities for reading.

Box 4. Good practice example: Creating a school-wide culture of reading

Merga's recent international evidence-based review of the ways in which literacy levels in schools have been increased by creating a school-wide culture of reading provides practical examples of how schools can bring this about (Merga, 2023):

- Reading spaces are created to make reading inviting and enjoyable. For this purpose, there are comfortable reading corners in classrooms and/or throughout the school, as well as a well-equipped school library.
- The school provides access to a wide variety of reading materials, including books, magazines, newspapers and digital resources. Book recommendation walls are established.
- The school enables numerous engaging reading experiences. Dedicated reading time is incorporated into the school schedule (e.g. DEAR – Drop Everything And Read). In some schools in Germany, reading nights have been established, with which family members also engage. Reading is promoted as a social (and not just a solitary) activity.
- The school invites the exchange of ideas about what has been read by organising book clubs or reading circles for students to discuss books and create reading partnerships or buddy systems, as well as hosting author visits or virtual author interactions.
- Reading activities and achievements are celebrated and recognised. Schools could participate in celebrating World Book Day (23 April) or International Literacy Day (8 September) or – as in Germany – a nationwide "reading aloud day" when, for example, celebrities read in schools.

Source: Merga, 2023.

Schools from 23 European countries participate in the EURead programme. This has much in common with the UK BookStart programme, encouraging the reading and sharing of books at home and in school, not just during the early years but throughout schooling (Lengyelné Molnár & Radics, 2021). A fine example of a national campaign associated with EURead is Czechia's "Week of Reading to Kids". Held annually during the first week of June,

this event involves over 300 organisations, and attracts tens of thousands of participants, including children and adults.

A study by Band of 80 schools in England that were aiming to improve their culture of reading (Band, 2019) demonstrated that on its own, teachers' enthusiasm for reading is not enough. Her study showed that while teachers knew their pupils' reading levels, very few knew about the children's preferences as readers, or what their favourite genres or authors were. The study also highlighted a lack of knowledge about children's books, which meant that teachers were limited in what they recommended, and that they were making some gender-based assumptions about pupils' preferences. On a larger scale, the Teachers as Readers project, led by the Open University and the United Kingdom Literacy Association (Cremin et al., 2014) helped teachers to put in place a number of changes that brought about significant improvements in their school's culture of reading: in many schools, the first step was to refurbish and restock the school library to make it a more welcoming environment filled with many new, exciting and colourful books. Under the project, schools made students into librarians and teachers also undertook to broaden their own reading. In addition, schools engaged more fully with parents, distributing newsletters that offered library and book-buying suggestions, and encouraging more shared reading at home.

Establishing and maintaining a culture of reading that permeates a whole school is clearly a serious undertaking, but it is also clear that if such a scaffolding is in place, many of the other initiatives set out later in this chapter will be even more successful and enduring.

Key Component 2: Providing pedagogy informed by personalisation

Teaching is only effective if the tasks and materials match the learning level, the needs, and the strengths and weaknesses of the student. In this context, the assessment and monitoring of student progress is essential: assessment may be summative, and may be used to evaluate broad trends over time, but more importantly, as often as possible it should be formative – that is, it should be used to provide feedback for both student and teacher about day-to-day progress and the optimal curriculum for students.

A study of the impact of formative assessment by Li (2016), based on PISA data for over 5,000 students in US schools, found that there was a highly significant relationship between a teacher giving students personalised formative assessment feedback, and students' subsequent PISA reading scores. In Li's analysis, the items in the formative assessment included the teacher explaining beforehand what was expected of students in a reading task, telling the students how their work was going to be judged, and providing feedback immediately after they had completed the task. Interestingly, Li's structural equation data found that of the three racial groups in the study (White, Black, Hispanic), black students were the group for whom formative feedback was most strongly associated with improved reading performance. In Li's study, those black students who were most at risk of reading failure benefitted most from formative feedback.

In order to offer tailored instruction, frequent and continuous assessments of a student's learning level are valuable for both teacher and student. When the teacher can tailor tasks and content to the student's needs, learning is likely to proceed more smoothly, with better student engagement. Meanwhile, the student also gains, as when they receive feedback, students can feel that (a) they have made progress, and (b) they can see how they might continue to make progress. Particularly for students who are beginning to read, it is important for the teacher to be aware of the progress being made by every student.

The problem for teachers is that there are many sub-areas of competence during the first three years of learning to read, and it would be impossibly time-consuming for the teacher to regularly and individually test every child in all of the necessary knowledge areas, all of which regularly appear as items in commercial reading tests:

- Knowledge of letter names
- Knowledge of letter sounds
- Recognising rhyming words
- Phonemic segmentation
- Ability to sound out non-words
- Rapid naming of high-frequency words
- Vocabulary
- Simple sentence comprehension
- Short passage comprehension

Fortunately, the exponential development of computer hardware and software over the past decade can make the teacher's assessment life simpler, in three ways: first, there are now many well-constructed digital tests that measure each of the above areas; second, many computer-based assessment instruments incorporate adaptive testing, thus making the assessment less challenging for the student; third, the best online assessment systems also give the student immediate feedback on correct answers, with a game-like scenario that provides the teacher with helpful pedagogical direction and enables the student to feel that they are making progress.

Box 5. Good practice example: Personalised formative assessment by digital game-based technology

Hautala et al. (2020) developed a computerised game-based assessment (GBA) system for screening struggling readers in Finland. This aimed to provide substantial time and cost benefits over traditional paper-and-pencil assessment, while also offering the potential to individually adapt learning content within a game-like scenario. The system was designed to be adaptive, and aimed to both reduce the number of tests required to simultaneously assess a number of skill areas, while at the same time providing the teacher with diagnostic information that would inform their pedagogy. In this sense, it was potentially an instrument for both formative and summative assessment. The system offered a wide enough range of adaptive tasks to be capable of being used by students from Grade 1 to Grade 4. It had a number of features to enhance student engagement: animated characters with speech capability, progress bars on the screen, virtual rewards in the form of "coins", with which "stickers" could be bought to add to a sticker book. The system also provided immediate feedback, with gentle sounds and a green overlay for correct answers and a red one for errors. All of these features had been devised following a detailed scoping analysis of research into GBA systems from Europe and the US carried out over the past 20 years.

The GBA was based on five types of tasks: word reading, pseudoword reading, sentence reading comprehension, word spelling, and pseudoword spelling. The results of these tasks were grouped into composite measures of reading fluency, sentence comprehension, accuracy and spelling. It is important to note that the computer-based testing was administered to a whole class at once, using tablet devices (each student had their own set of headphones, and there were no spoken response tasks), over a maximum of one hour (students who finished early played on their choice of educational games on the same tablet). This saved one hour per student in teacher testing time.

This online GBA system thus saved on average of an hour of teacher time per student, and produced accurate and reliable data on students' reading abilities – providing information that could be used for initial screening or for assessment of individuals' reading, comprehending and spelling skills.

Establishing age-specific achievement goals and standards for each grade level is a potentially valuable way for teachers to understand learners' rates of progress, as well as identifying their individual strengths and weaknesses, and allocating attention and resources accordingly. The High Level Group of Experts (Brooks et al., 2012,) argued that minimum standards for literacy achievement should be adopted by all education systems, entitling those pupils who were not yet able to meet them to receive special support. All EU Member States have now developed standards for reading that should be reached at the end of primary and secondary education. However, only some education systems in Europe (these include England, Lithuania and Germany) have defined detailed learning objectives for each school year, which form the basis of assessments that allow the monitoring and the early identification of reading difficulties.

To adapt their instruction to students' current needs and abilities, teachers need to obtain information about their students' performance and development multiple times per year. An example of an online literacy assessment tool that is already widely used in Germany is the quop-L2 reading assessment test (Förster, Erichsen & Forthmann 2021).

Quop is an online tool for the assessment of learning progress in students in Grades 1-6. This instrument assesses the development of reading comprehension in German at the levels of word, sentence and text. Students take a short quop test on the computer every two to three weeks throughout the school year. As the students improve as readers, they can complete the tests faster and better. When these test results are plotted on a diagram, a curve of learning progress is created. This gives teachers, pupils and parents feedback on whether the child's learning progress is appropriate for their age and grade level and makes it possible to recognise very early on whether the child needs support. Most importantly, statistical analysis has shown that progress in the quop-L2 assessment at the levels of sentences and texts was related to improvements as measured by standardised reading tests at the beginning and end of the school year.

When a teacher has a deeper knowledge of his or her students' accomplishments and needs, there remains the question of how to put this knowledge into practice. Average class size in primary schools in Europe ranges from 17 in Latvia to 26 in the UK, but even in Latvia it is not easy for a teacher to prepare and teach 17 individual lessons. The key to personalisation in primary classrooms is therefore differentiation and small-group work. A number of research projects carried out under the banner of the Center for the Improvement of Early Reading Achievement (CIERA) in the late 1990s set out to capture and share the professional practice of outstanding teachers of early reading (Taylor et al., 2000). One aspect of the professional practice of exceptionally successful teachers that were followed by CIERA (all of whom were working in schools in high poverty areas) was their work with small groups of students who were all at a similar level in terms of their ability to work on a specific task. Small-group work does not in itself lead to better learning, but these teachers used a very flexible approach to small-group work, with membership of each group being dependent upon a student's needs at a given time. Thus, a child might be a member of three or four different groups in a single day. In such classrooms, differentiated small-group work helped to ensure that the time students spent on tasks over the school day was twice as great as that of students in the classrooms of lower-achieving teachers. What this also meant was that while the class teacher was working

with a small group, the other students in the class were acquiring greater self-efficacy and autonomy.

Key Component 3: Promoting word decoding and reading fluency

Research in the field of written language acquisition has led to the realisation that learning to read and spell is a dynamic and, in many ways, a rather complex process, as children move from the stage of stumbling letter recognition to fluent reading:

- First, there is a pre-alphabetic or logographic stage: children understand that the squiggles on the page represent language, but rely on some visual cues. Examples of this include a child who said he recognised the German word *Maus* (mouse) by the little "ears" – pointing at the tip of the capital letter 'M'; and a child who can recognise the word "Pepsi" on a can of drink, but not when it is written on paper.
- Second is the alphabetic stage: this is when the child recognises a connection between graphemes (the written representation of a sound) and its phoneme (the sound associated with that letter or group of letters); this enables the child to "sound out" parts of a word, and then recognise it.
- The third stage is the orthographic phase: letters in spellings come to represent phonemes in pronunciation in the brain, and the child recognises a word based on its spelling pattern, not by sounding it out. It has also been shown that when the teacher introduces children to new vocabulary, children are more likely to remember both the new word and its spelling if they learn to both decode and to spell the new word at the same time (Ehri, 2020).

There is agreement among researchers that the progression through these stages is not strictly linear, and that children may show characteristics of multiple stages simultaneously.

The challenge of initial instruction is to teach children that the arbitrary visual symbols in a book – patterns of lines, curves, and dots – have a communicative meaning and refer to specific language units. Adults tend to underestimate the complex and abstract skills children need to acquire when cracking the alphabetic code. Young children have difficulties thinking about words as distinct from their referents. When asked which word is longer, "cow" or "butterfly", they answer "cow" (because it is bigger, has four legs, etc).

The ability to make language an object of thought is a prerequisite for literacy learning and grasping the alphabetic principle – namely that one, two or even three letters (graphemes) in written language represent a single specific speech sound (phoneme) in spoken language. The abilities that lead to word recognition include:

- Phonological awareness – the ability to hear and be aware of sounds in one's head (this develops from birth)
- Knowledge of the letters of the alphabet, and knowing the different ways in which a letter can be represented on a page using different typefaces and upper/lower-case letter forms (A, a, 𝒶)

- Phonemic awareness – a subset of phonological awareness that entails the ability to segment the stream of speech into elemental units of sound and to blend these elements into syllables and/or words
- Blending – the ability to blend phonemes into syllables and words
- Analogical word recognition – the ability to use analogies to blend known phonemes to permit the recognition of new words

Teaching these skills is the formidable task that faces every teacher of beginning reading. Even if the teaching has been exemplary, it is likely that a child at the end of the first year of instruction in reading is still coming to terms with applying these skills in new contexts, with unfamiliar spellings and vocabulary.

For decades, a lively and passionate debate has taken place in Anglo-American research about the role of phonics instruction. The authoritative US National Reading Panel (2000) stated that the explicit training of phonics yielded better results than unsystematic or no phonics instruction. However, teaching decoding is not enough: the goal of reading is not word recognition, but comprehension. The consistent conclusion across a broad range of syntheses is that phonics instruction is a necessary but not a sufficient condition for early success; instead, phonics works best when embedded within a broad and rich language and literacy curriculum.

Many reading schemes for children who are learning to read in English include so-called "decodable" texts – that is, stories that contain many simple and repeated words with regular and predictable spellings. The problem with "decodable" texts is that they are often boring, with a meaningless plot, and do not engage children's interest (however, Dr Seuss's *The Cat in the Hat* is a wonderful counter-example). The explicit teaching of the basic principles of decoding needs to be combined with engagement in stories, authentic literature, vocabulary development and the imagination of the child – all of which are elements of a balanced approach.

However, to ensure that children are able to read real books independently, they need to acquire a repertoire of "word attack" skills for unlocking unfamiliar words. Scanlon and Anderson (2020) offered an "Interactive Strategies Approach" for using context as an aid in word recognition. Ehri (2005) suggested that it would be valuable to teach children combined approaches to reading words (e.g. sequential decoding; decoding by analogy, by sight, and by context). Estimates of how many times a child needs to encounter a word in order for it to become a "sight word" – i.e. a word that is recognised immediately, without conscious decoding – vary from seven to 20. The reason for this variation is simple: decoding speed varies for different words depending on such factors as vocabulary, word frequency, orthographic complexity and context. Gaskins and Pressley (2007) suggested that children become "word detectives" and provided them with "Talk-to-yourself" cards that offered explicit metacognitive strategies and specific instructions on how to apply them. The authors argued that children are highly motivated to learn independently when the goals, methods and procedures of teaching are made transparent to them.

Another effective teaching method is explicit modelling. The teacher explicitly models decoding strategies multiple times before expecting students to use them independently. The "I do, we do, you do" gradual release model is recommended for teaching decoding

strategies. Teachers use a think-aloud approach when modelling, verbalising their thought process as they decode words, which helps students to understand how to apply the strategies.

Box 6. Good practice example: Integrating reading, writing and comprehension

The approach "*Ich schaffe es*" (meaning "Yes, I can") provides an illustrative example of how these findings can be realised in practice. It was developed by Naegele and Valtin (2006) for children in the first year of school who still had problems recognising words. The first part of the booklet is about cognitive clarity: basic insights into written language and knowledge of the terms sound, letter, syllable, word and sentence, as well as grammatical terms (noun, verb, adjective). "Talk-to-yourself" cards are provided to give specific advice on how to decode words. These tasks are embedded in a framework story: An alien, "Robo" lands on earth and learns from the children how to read and write. Robo learns that children in Germany read letters, while children in Japan use syllables and Chinese children use logograms. In the texts, graphemes (such as *ch*, *sch*) and diphthongs are highlighted in blue.

The second part offers reading material. Short texts with questions on comprehension are followed by diverse exercises of copying, spelling and grammar, free writing exercises, specific spelling and grammar exercises, and various tasks to promote reading with comprehension, e.g. brainteasers, or comparisons between pictures and texts describing them that contain incorrect or inapplicable words.

The vocabulary load is deliberately kept small and consists of approximately 350 simple words. These words are contained in a separate word list, and there are numerous exercises in the booklet to encourage the child to practise these words (e.g. by searching for semantic or orthographic similarities).

In addition to the list of words, the children practise the most common function words in German, so-called "mini-words". They are practised in "flash reading exercises". Various tasks encourage the children to search for information and to learn independently.

Source: Naegele and Valtin, 2006.

As students practise and improve their word-decoding skills, they are gradually able to accurately recognise and decode more words and become able to read more rapidly and effortlessly. In Anglo-American literature, the term "reading fluency" has become established for the automation of basic reading processes. Fluent reading is important because it speeds up the reading process and thus leaves the reader with more cognitive resources for connecting with prior knowledge and for comprehension. Pupils need to be able to carry out the lower-level skills more and more automatically so that they can turn their attention more fully to the task of comprehending what they are reading.

Fluent reading is characterised by accuracy, automaticity, appropriate reading speed and a meaningful prosodic organisation (phrasing, intonation, emphasis, etc.) of what is read (National Reading Panel, 2000). Reading fluency can be improved through increased practice. Fluency starts with accuracy in decoding. Thus, speed is a result of accuracy. In Germany, 100 words per minute or more are viewed as sufficient reading speed for a beginning reader (Rosebrock et al., 2017). The more that a child develops both accuracy and speed, the more they develop automaticity and are able to enjoy reading as a pleasurable activity.

It is difficult or impossible for a child to read fluently if they cannot begin to automatise word recognition. Fluency instruction seems to work best with children from soon after beginning instruction in decoding, and for the following 18 months (Kuhn & Stahl 2003).

Several studies have confirmed the effectiveness of various fluency teaching activities (e.g. National Reading Panel, 2000). Kuhn and Stahl (2003) examined theories and studies concerning fluency instruction and development in reading, and reported that fluency instruction is generally beneficial, although it is unclear whether this is due to specific teaching methods or simply because it increases the amount of text children read. Approaches that provide assistance (such as guided reading or modelling) appear to be more effective than those that do not provide such support. Effective fluency instruction incorporates elements of rhythm and expression, the prosodic features of language.

A variety of methods can be used to train fluency. Repeated oral reading involves having students read the same text multiple times, which helps to improve speed, accuracy and expression. This process can take various forms, such as solo reading or echo reading (teacher reads, student repeats). Teachers can be models for fluent reading, demonstrating expert prosody and helping students to understand appropriate pacing, expression and punctuation. Another method is choral reading (reading aloud together). Approaches also include other fluency exercises such as partner reading (students read together and take turns) and readers' theatre (students reading aloud from scripts adapted from literature). Other forms include guided repeated reading – combining repeated reading with guidance and feedback from a teacher, a peer or from the child themselves. In the last of these, the students record themselves reading passages, listen to the recordings, and evaluate their own performance in order to set goals for improvement.

The AI-supported Microsoft Reading Coach (Microsoft, 2024) is a free tool that is available to schools as part of the Teams app. As well as offering a text-to-speech facility, it can also record a child reading aloud and score it for accuracy and fluency. These fluency reports are available to both student and teacher, and the child can re-record their reading and evaluate their own progress. If each student has a microphone and headset, there is nothing to prevent every child from having a fluency coach with personalised content (uploaded by the teacher) and instant feedback on progress, with graphs and rewards for achievement. Microsoft Reading Coach supports multiple languages, including most of those spoken in Europe. Formal, peer-reviewed evaluations are not available at the time of writing, but online teacher reviews are extremely positive.

In German-speaking countries, so-called "reading tandems" – a form of paired reading – are practised in schools (Gold & Küppers 2024). A less capable reader (known as a reading "athlete") reads an age-appropriate text aloud or semi-aloud together with a reading-competent classmate (a reading "coach"). The reading coach guides his finger along the line and serves as a model for pronunciation, intonation and speed. In addition, he has the task of monitoring the reading process of the weaker-reading child by correcting mistakes (after sufficient waiting time), and praises when no mistakes are made. As soon as the reading athlete feels confident, s/he reads unaccompanied. Studies show that both reading athletes and reading coaches benefit from this type of reading (Rosebrock et al., 2017). For the training to be effective, it needs to be practised systematically over a period of time.

Audiobooks offer promising possibilities for children to foster not only reading fluency but also language competence. Children listen to a competent reader and follow the text, for instance by pointing to the words and reading along half-aloud. In this way, they learn the meaningful prosodic organisation (phrasing, intonation, emphasis, etc.) of what is read.

Some audiobooks allow you to listen at normal speed, or to play it at twice the speed or half-speed (Alcantud-Diaz & Gregori-Signes, 2014). If audiobooks are used in conjunction with e-book readers, this allows the features of written language (size, typography, colours) to be changed, according to the needs or preferences of the child.

Box 7. Good practice example: FiLBY-2 Fluency training in second grade

This programme is part of the Bavarian State Institute's "*Initiative #lesen.bayern – Fit im Fach durch Lesekompetenz*", which translates as "Fit (i.e. in good shape) in the subject through reading competence" (Bavarian State Institute, 2024).

Pupils train their reading fluency like athletes. They listen to a trained speaker from a Bavarian Radio Station who has recorded each of the FiLBY-2 reading texts at three different reading speeds. By listening and reading along half-aloud, the pupils learn from the model and can improve their reading fluency - even while at home. The children read informative and sometimes funny texts from science lessons with titles such as "Why do planes not fall out of the sky?", "How long does it take bees to produce a jar of honey?", and "What happens to the cheese sandwich in your stomach?" At the end, the children have to answer questions about the texts they have read.

All parts of the programme (the audio-texts, the printed texts, comprehension questions, detailed information and guidelines for teachers) can be downloaded for free (Bavarian State Institute, 2024). A study based on nearly 9,000 primary school children showed that all children benefitted from the programme in terms of their reading fluency – especially the group of weaker readers, who made better progress than the control group.

These techniques have been shown to be effective across multiple studies and can be adapted to suit the different learning needs of primary-age children. The most successful approaches often combine multiple strategies and provide ample opportunities for guided practice and feedback. It is important to note that fluency practice should be combined with comprehension instruction, as fluency is closely connected with understanding what is read. Familiarising students with the words they will encounter in a text prior to reading it improves fluency. It is also important to provide a wide range of appropriately challenging and engaging texts so that children are motivated to read them.

Key Component 4: Developing comprehension

Developing comprehension of what has been read should be an instructional aim from the first day of teaching reading. In the first year of school, basic reading skills are a major focus, but comprehension must be developed in tandem with decoding. As children become more skilled and competent readers, more demanding, higher-order reading skills need to be developed. These include being able to retrieve explicitly and implicitly stated information, to make inferences, to interpret and integrate ideas and information, and to evaluate and critique what has been read.

The characteristics listed in all of the four components covered in this chapter of the report have an influence on how, and in what ways, reading is successful (Artelt et al., 2005). Together, they illustrate that comprehension is a complex, multifaceted process that requires development at both primary and secondary level. In order to be able to use reading for learning, students need to be able to read simple texts, retrieve explicit information and make straightforward inferences. To succeed in school, however, they need to be able to deal with longer or more complex texts, and to interpret beyond what is explicitly stated in the text. Without support, children will have difficulties in secondary

school. It is important to review reading instruction in relation to the development of comprehension, focusing on reader-related activities and especially reading strategies, because research has shown that it is possible to train these strategies and improve comprehension.

One approach used to guide teachers in developing reading comprehension has been to compare good and poor readers, identifying differences in their reading behaviour. Duke, Ward and Pearson (2021) provided a synthesis of studies on reading behaviour and text comprehension based on the observations of proficient and less proficient readers. They reported that good readers behave actively, pursuing clear reading goals from the beginning, continually checking to see if the text (and their reading of that text) meets their goals. Good readers often skim the text prior to reading it in depth, registering certain features such as text structure and sections that may be relevant to their reading goals. While reading, they often make predictions about what is to follow; they read selectively, making rapid decisions about their reading ("What do I read quickly or slowly?", "What do I skip?", "What should I read again?"). Good readers form tentative hypotheses – constructing, revising and questioning the meaning of what they read while reading. They activate their prior knowledge and link it to the content of the text. They think about the author, the linguistic style and intent of the text, and possible historical contexts. They control their understanding of the text and adjust their reading behaviour where necessary. Good readers try to understand the meaning of unknown words or concepts in the text and deal with inconsistencies or deficits in their understanding; they assess the quality and meaning of the text, and respond to it both intellectually and emotionally.

Studies of poor readers show marked differences in reading behaviour, both in reading habits and in the application of reading strategies. The reasons for poor readers not adopting reading strategies relate to a lack of knowledge and a general low motivation towards reading. Effective reading requires commitment and attention, whereas poor readers tend to be passive. Comprehension may become such a problem for struggling readers that they avoid it, and a downward spiral results.

The reading strategies in Table 1 below outline clearly the skills that poorer readers need to develop with their teacher's help.

Table 1. Reading strategies before, during and after reading

PHASE	READING GOAL	READING STRATEGIES
BEFORE READING	Make sure of the reading task, and adopt a purposeful reading plan with a step-by-step approach	Activate prior knowledge.
		Form hypotheses about possible content.
		Formulate questions about the text.

DURING READING	Monitor their own comprehension, compare implicit and explicit information with previous knowledge, and identify gaps in comprehension.	Mark relevant words or text items. Develop questions about what has been read.
		Identify difficulties in comprehension (not knowing a word, not grasping the sentence.)
		Draw inferences or interpretations. Discover ambiguities and inconsistencies in the text.
AFTER READING	Overcome comprehension problems. Process the text, using non-textual media to grasp and reproduce text structure and message.	Check whether hypotheses have been confirmed, and whether questions posed in advance about the text have been answered.
		Summarise the text (orally or in writing).
		Prepare graphics, models, pictures to visual represent text statements.

Source: Reading strategies (adapted from Artelt & Dörfler, 2010, p. 30).

There is a growing body of research on the implementation of comprehension skills and metacognitive strategies in the classroom. Three of the most effective instructional methods have been **explicit instruction, think-alouds and reciprocal teaching.**

Explicit instruction by the teacher can include the following five components (see also Duke et al., 2011):

1. Explanation by the teacher (see Duke et al. for advice on when and how this strategy should be used)
2. Demonstration of the strategy, first by the teacher, then by the students
3. Guided practice in a small group
4. Independent execution of the strategy
5. Accompanying formative or summative assessment

This method follows the scaffolding principle: namely, that in the course of learning, students assume more responsibility for completing tasks, and teachers less.

The "think aloud" instructional model involves modelling and enhancing metacognitive interactions with texts. As students perform a reading task, the accompanying thoughts are spoken aloud by either the teacher or a child. By

commenting on her own actions, the teacher is well able to illustrate the meaningful use of new comprehension strategies. Having students verbalise their thoughts reduces their impulsivity, which might otherwise lead to hasty conclusions or cursory reading, and encourages students to read more carefully as well as to apply strategies. It also trains their ability to independently check for comprehension while reading, as they must constantly ask themselves if what they are reading makes sense.

Reciprocal teaching became well known following the classical study by Palincsar & Brown (1984), which has been cited in over 12,000 research papers and replicated in dozens of subsequent studies – often in schools with historically low reading achievement scores. This has nearly always been accompanied by reports of significant gains in reading comprehension at both primary and secondary level (see Carter, 1997, for an example). The "reciprocal" aspect of this approach involves pupils in small groups of four to six children taking turns adopting the role of the teacher within structured classroom discussions. The method of reciprocal teaching involves four strategies (making predictions, formulating questions, seeking explanations and summarising). These are first demonstrated by the teacher, and then gradually imitated by the students until they can use them independently. The lesson begins by making predictions about the text based on its title or other clues. All students then read the first paragraph silently. After this, one student takes on the role of teacher and (1) formulates a question about the passage, (2) summarises the passage, (3) gives explanations (if necessary), and (4) predicts what will happen in the next passage. The class teacher then guides this students as much as necessary in carrying out these tasks, and gives feedback at the end. Hattie (2009) reviewed over 800 papers on educational achievement and reported an exceptionally high effect size of 0.74 (Cohen's *d*) for reciprocal teaching, which suggests that it is one of the most valuable approaches available to teachers for improving comprehension.

Box 8. Good practice example: Reciprocal teaching for reading comprehension

Grade Level: 4th Grade
Duration: 60 minutes

Objectives:

- Students will be able to demonstrate improved reading comprehension through discussion and questioning.
- Students will practise four key strategies: predicting, questioning, clarifying and summarising.
- Students will work collaboratively in small groups to enhance individual understanding of the text.

Materials needed:

- A selection of age-appropriate texts (e.g. short stories or informational articles)
- Graphic organisers (for summarising and questioning)
- Sticky notes for predictions
- Whiteboard and markers
- Posters of the four strategies (predicting, questioning, clarifying, summarising)

Introduction (10 minutes)

1. Begin with a brief discussion about what students do when they don't understand what they read. Explain that reciprocal teaching is a technique in which students take turns to lead the group in reading and discussing the text using specific strategies.
    - Introduce the four key strategies:
        - Predicting: what do I think will happen?
        - Questioning: what questions do I have about the text?
        - Clarifying: what words or parts are confusing?
        - Summarising: what is the main idea of the text?

Direct instruction (15 minutes)

1. Model the strategies:
    - Read a short passage aloud to the class.
    - Demonstrate each strategy:
        - Predicting: make a prediction about what might happen next and write it on a sticky note.
        - Questioning: ask a question about the text and write it on the board.
        - Clarifying: highlight any confusing words or phrases and explain them.
        - Summarising: summarise the passage in a few sentences orally.

Guided practice (15 minutes)

1. Group formation: divide students into small groups of 4-5.
2. Reading Together: assign a new text to each group.
3. Each student is assigned a role in their group for the first reading:
    - Predictor: makes predictions before reading.
    - Questioner: asks questions during reading.
    - Clarifier: addresses confusing parts during reading.
    - Summariser: summarises the main ideas after reading.
4. Facilitate the discussion: encourage groups to discuss their assigned roles and use the strategies collaboratively.

Independent practice (15 minutes)

1. Switch roles: give students another short text. In their groups, they switch roles and repeat the process, focusing on each strategy.
2. Group summary: after reading, have each group prepare a brief summary to share with the class.

Closure (5 minutes)

1. Share summaries: each group presents their summary to the class.
2. Reflect: ask students to share which strategy they found most helpful and why.

Source: based on Palincsar and Brown, 1984.

This lesson plan encourages collaboration and critical thinking, and enhances reading comprehension skills among 4th-graders using the reciprocal teaching approach. Another practical example in which explicit teaching of reading strategies was combined with fostering self-regulated learning is the programme "*Wir werden Textdetektive*" (We will be text detectives) developed by Gold et al (2004) for Grades 5 and 6.

Box 9. Good practice example: WWT – "We will be text detectives" Good practice example: WWT – "We will be text detectives"

The WWT programme can be used as part of regular German lessons with all pupils in a class. The implementation takes around 28 teaching units, spread over a school semester.

In the WWT programme, training is embedded in a story. Like a detective, the pupils are asked to proceed purposefully and systematically, and to act as "text detectives". This is why the reading strategies taught are referred to as "detective methods". The teachers uses direct instruction to explain and model seven cognitive and metacognitive reading strategies ("detective methods"). As prompts, the children are given bookmarks with "speak-to-yourself"-cards. For example:

What is my goal/my task?
Which detective method (DM) should I choose?
DM 1: I pay attention to the title! What do I already know about the topic?
DM 2: I imagine a picture or a movie about the events in the text!
DM 3: Stop! I must first solve the difficult words before I continue reading!
DM 4: Have I understood everything? Why, where, who, when, how does something happen?
DM 5: I underline important words and summarise lists under headings!
DM 6: I reduce the text by half by writing down the content in my own words.
DM 7: Have I memorised important things? Or do I have to reread important passages?

The WWT programme includes the following strategies: paying attention to the text, visualising, dealing with text difficulties, checking comprehension, underlining important points, summarising important points and checking retention. These are combined with higher-level metacognitive principles of self-regulated, planned use of these strategies ("When do I use which strategy?"), and drawing up a reading plan. This reading plan includes awareness of a reading goal ("With what goal am I reading the text?"), a situation-appropriate selection of reading strategies ("Which strategies should I use?") and self-monitoring measures ("Was the selected strategy successful? Or should I read the text again using another detective method?") Pupils are provided with a checklist, the purpose of which is to provide students with clues for monitoring the solution process. Children are encouraged to ask themselves: "Task solved? What did I do well? What can I improve next time?"

The effects of the WWT programme have been documented in several studies. If the programme was implemented only once, children had improved their knowledge about reading strategies by the end of the training. However, the transfer to reading comprehension was minimal at best (Walter, 2020). To improve on this, it has been suggested that such exercises should be incorporated into classroom instruction over a longer period of time. It has thus been found that learning outcomes can be improved through additional booster sessions (Souvignier & Trenk-Hinterberger, 2010). Walter (2020) employed a reduced version of the programme's four strategies (activate prior knowledge, clarify text difficulties including word meanings, summarise and generate questions) and showed that even students in Grade 4 with learning difficulties could

improve their reading comprehension when the teacher offered special support for children with decoding difficulties and when teachers used reciprocal learning.

Another form of online support for developing comprehension shared through the Bavarian State Institute's system is the FiLBY-3 programme. This offers strategies for literary learning, as well as strategies aimed specifically at factual texts. Pupils work with a set of reading strategies, with specific instructions available to foster self-regulated learning. The part of this programme that refers to informational texts can be downloaded. It comprises audio-texts, introduced by an adult who verbalises these reading strategies, booklets containing multiple choice questions regarding comprehension. In effect, this suite of programmes is a teacher development course on reading comprehension. The implementation of this programme in schools was interrupted during the COVID-19 pandemic due to school closures. However, teachers who continued this training online achieved better results in reading comprehension than those who discontinued the programme (Wild et al., 2022).

Implementing reciprocal teaching methods encourages collaborative learning, which allows students to work together and support each other. In addition, providing frequent motivational support through encouragement and positive reinforcement can significantly enhance students' engagement and confidence in their reading abilities: "Teaching of a variety of reading comprehension strategies leads to increased learning of the strategies, to specific transfer of learning, to increased memory and understanding of new passages, and, in some cases, to general improvements in comprehension" (National Reading Panel, 2000, pp. 4-52).

Key Component 5: Fostering reading engagement and reading for pleasure

In 2023, the National Literacy Trust's annual survey of over 70,000 young people in the UK recorded the lowest level of reading enjoyment since it first asked this question in 2005 (National Literacy Trust, 2024). A large part of the reason for this was that more of those who traditionally enjoyed reading – particularly girls aged 8 to 11 – no longer said that they enjoyed it. A study by Luyten (2022) of seven European education systems based on PISA 2018 data reported an increase in negative attitudes towards reading in all but one country. We know from PIRLS 2021 that reading for pleasure is related to positive attitudes towards reading, and positive reading self-concepts – both of which are correlated with reading competence. As PIRLS 2021 data show, on average and in almost every country, students who liked reading very much had, on average, higher reading achievement than those who reported that they did not like reading (Mullis et al., 2023). Comparison data from 2001 to 2021 point to a clear international downward trend in reading behaviour. In almost all countries, the proportion of children who read for pleasure almost every day has fallen considerably since 2001 – in some countries by as much as 10 percentage points. Pupils' reading behaviour must be considered in the context of children's changing media behaviour overall. Current findings from the representative German KIM study (Medienpädagogischer Forschungsverbund Südwest, 2022) demonstrate that reading is at the bottom of the list of activities that children between the ages of 6 and 13 do every or almost every day. When asked in 2022 about their three favourite activities in their free time, only 4 % of children mentioned reading. In 2010, the corresponding percentages had been

15 % for girls and 5 % for boys (Medienpädagogischer Forschungsverbund Südwest, 2010).

It is a matter of serious concern that children's enjoyment in reading is decreasing, in view of the fact that the habit of reading in childhood is linked to positive academic, social and emotional outcomes, independent of SES. Longitudinal data also show that there is a reciprocal relationship between leisure time reading and reading comprehension (Torppa et al., 2020). Students who enjoy reading tend to read more, and read more frequently. This behaviour broadens their reading experience and improves their comprehension skills. However, this effect only applies to book reading; it does not apply to the reading of magazines, newspapers and comic books (Torppa et al. 2020). An important educational task is to avoid a vicious circle in which children who do not enjoy reading read less, or avoid reading at all.

If one wants to foster reading engagement and reading for pleasure, it seems advisable to gain clarity about these motivational concepts (Aukermann & Chambers Schudt, 2020; Guthrie & Wigfield, 2005). Reading engagement, as one component of internal motivation, is seen in newer research as a four-dimensional construct (McGeown & Conradi Smith, 2024) including:

- Behavioural engagement: time spent reading (frequency and duration) and text types read
- Cognitive engagement: level of cognitive effort and perseverance in reading, especially with difficult texts, and motivation to use strategies to understand the words or the text,
- Affective engagement: the emotional response to the text that children experience while reading, and the extent to which they are interested in what they read
- social engagement: children's participation in different types of reading activities with others, as well as sharing and discussing texts with others.

Many educators would trace the constructs listed above back to the writings of Jerome Bruner. Bruner was one of the fathers of cognitive psychology, but also argued that cognitive science must never lose sight of the sociocultural dimensions of human development. For Bruner (1986/2009), reading was not simply about pleasure and enjoyment; it was important to understand reading in relation to the role of narratives in life. The capacity of narratives to engage the reader in imagining and constructing other worlds, and in trying to make them a reality, he believed, was an essential feature of the human capacity to transform our own selves as well as our social contexts.

Box 10. Good practice example: Reading Engagement Matters! A Scale to Measure and Support Children's Engagement with Books

McGeown and Conradi-Smith (2024) developed the Reading Engagement Scale (RES), a 12-item measure for children aged 8-12 years. This scale assesses the four dimensions of reading engagement: behavioural, cognitive, affective and social. It has been validated through studies involving more than 1,000 children across different countries, and is designed to be a practical tool for teachers to understand and support children's reading engagement. The authors provide

suggestions for using the scale to inform teaching practices, and offer various ideas for interventions to enhance children's reading engagement.

The scale can be downloaded from
https://ila.onlinelibrary.wiley.com/doi/full/10.1002/trtr.2267

The scale is accompanied by numerous recommendations for teaching practices and activities to foster reading engagement and reading for pleasure. These centre on the dimensions of opportunities, support and feedback. Students need opportunities for reading that enable their control, agency and responsibility while respecting their choice, interests and cultural background.

The four dimensions of reading engagement (McGeown and Conradi-Smith 2024) offer a heuristic framework for describing opportunities for reading.

- Behavioural: motivating pupils to spend more time reading by providing access to a wide range of reading materials to choose from. Children can access high-quality fiction content not only in paper books but also on various devices (smartphones, tablets, e-readers or laptops). Indeed, digital books for children are a popular way for children to find joy and enjoyment in reading.
- Cognitive: presenting and discussing metacognitive strategies to support comprehension.
- Affective: offering a selection of texts that reflect the interests, preferences, lives and experiences of children in the class and which encourage them to explore personally meaningful content. Talking about recreational reading and being a reader.
- Social: encouraging discussions about texts or reading material with a partner, in small groups or as a class by incorporating partner reading, literature circles or whole-class novel reading, and recommending texts to one another.

Offering opportunities, however, is not enough. Weaker readers need support in order to foster their reading fluency and comprehension strategies so that they can avoid the vicious circle whereby struggling with reading leads to disliking and avoiding it, resulting in further skill deficits and decreased motivation. Therefore, learning tasks should be tailored to the individual's level of reading development. This will allow students to experience competence and success. Furthermore, students require incentives. To encourage engagement, tasks should be meaningful in a double sense: fulfilling an educational purpose, but also being perceived as personally meaningful by the student. This can happen when authentic contexts are provided and texts are tied to larger projects and real-world problems (Miller, 2014). Examples include pupils searching and reading literature about healthy nutrition and designing a classroom poster providing suggestions for healthy snacks, Or students creating a poster featuring a book they have enjoyed.

A research team from the Open University in the UK has developed *Reading and Writing for Pleasure: A Framework for Practice*. This describes effective approaches for nurturing reading for pleasure (Cremin et al., 2023). The framework suggests a combination of access to diverse, relevant texts and dedicated time for reading, with optimal individually and socially oriented approaches to reading for pleasure that are enhanced by responsive adult involvement. At the level of the individual, these approaches are learner-centred, focused on developing autonomy, sensitive to young people's personal interests, respectful of their literate identities and considerate of their broader cultural practices. From a social perspective, these approaches provide rich

opportunities for casual interactions around texts, as well as inclusive and non-hierarchical environments and exposure to adult role models.

In the US, social and emotional learning (SEL) is gathering increased momentum as research documents the impact these variables have on achievement in literacy and other curricular domains. They appear to be natural complements to cognitive variables. Whatever the label, the key issue is that when these dispositions are present in the learning environment, they have a positive effect on learning and reading performance (Finn & Zimmer, 2012).

The OECD (2007) has also endorsed this perspective. Its book *Understanding the Brain: The Birth of a Learning Science/ New Insights on Learning through Cognitive and Brain Science* presents the following argument on human learning and development:

> *Far from the focus on the brain reinforcing an exclusively cognitive, performance-driven bias … [research] suggests the need for holistic approaches which recognize the close inter-dependence of physical and intellectual well-being, and the close interplay of the emotional and cognitive, the analytical and the creative arts*. (OECD 2007, p. 18).

Key Component 6: Evaluating pedagogy carefully when using digital resources

There is an ongoing debate about whether ICT is a benefit or hazard. It is, of course, both. In their book *Reader come home*, Wolf and Potter (2018) vividly outline the dangers in today's digital world for the reader and especially the young child learning to read. Screen time can reduce the amount of face-to-face interaction with teachers, parents and peers, which provides some of the most valuable learning opportunities for young children. Furthermore, digital media can have a negative effect on children's social, physical, emotional and cognitive development during the early years.

As digital reading continues to eclipse traditional paper-based reading, understanding how different types of media impact reading comprehension has become increasingly crucial. Various studies have attempted to answer the question of whether a child's reading competence improves when texts are presented on screens rather than in print. The main message is: "Don't throw away your printed books" (Delgado et al., 2018). Several meta-analyses have reported similar results for both children and adults (Delgado et al., 2018; Clinton, 2019). Reading on paper was found to be better than reading on screen in terms of reading comprehension, but no significant differences were seen between reading on paper and reading on screen in terms of reading speed. The largest analysis (Delgado et al., 2018) included 54 studies with more than 170,000 students published between 2000 and 2017. The authors found that reading on paper offered an advantage over digital reading when reading informational texts, but not narrative texts. The study by Clinton (2019) yielded similar results, and pointed out that this finding supports the view of other researchers that reading from screens is more appropriate for light reading for pleasure (which is more likely to take the form of narratives) than for challenging reading, which is more likely to be from expository texts.

Delgado et al. (2018) reported that the advantage shown by paper-based reading had increased rather than decreased during the period 2000-2017, casting doubt on claims that so-called "digital natives" display superior performance on screen. The authors argued that if simply being exposed to digital technologies was enough to gain digital skills, then we would expect to see digital reading giving an increasing advantage over time – or at least, that the inferiority of screen reading should decrease over time. However, the screen inferiority effect had increased in the preceding 18 years, and there were no differences in media effects between age groups. This is a strong argument for the necessity of training digital skills. Delgado points to encouraging findings that screen reading inferiority might be eliminated by simple methodologies (e.g. writing keywords summarising the text, framing the task as central) that engage people in deeper processing. However, these studies were based on undergraduates, not school students.

The majority of studies included in the meta-analyses above are based on undergraduate students and adults. There is a lack of studies investigating children. Therefore, the large-scale study carried out by Støle, Mangen and Schwippert (2020) is of interest. When preparing for a digital national reading test in Norway, Støle et al. (2020) conducted an experimental study of more than 1,100 students aged 10. Each child had 50 minutes to complete comparable reading tasks online and on paper. A little over half of the students achieved similar results in the two test modes. Students on average achieved lower scores on the digital test than on the paper version. Almost one-third of the students performed better on the paper test than they did on the computer test, while 14 per cent of the students showed better results in the computer test. Further analyses explored whether one test mode favours certain student groups of different performance levels. The effect of the mode of testing reached significance not only for average achievement, but for students at all three levels of reading comprehension, and among both boys and girls. The authors did not find support for their hypothesis that boys perform better on computer tests than girls. However, at the highest skill level, there was a larger effect in favour of paper for girls than for boys. In other words, top-performing girls were particularly disadvantaged by the digital test mode. Hence, the authors warn, the digitalisation of reading tests appears to come with a specific disadvantage for girls who are at the highest level of reading performance.

To sum up, current research suggests that reading online often results in lower understanding and less critical reflection compared with print reading. It is important to note, however, that research in this area is ongoing. It should also be noted that some authors who praise the benefits of digital education (Conrads et al., 2017) plead for "pedagogy first", i.e. first deciding on a pedagogical objective and then considering a technological tool that might support its achievement, and state that "technology can amplify great teaching, but great technology cannot replace poor teaching" (Conrads et al., 2017, p.15). These authors argue that digital tools must be embedded strategically within cohesive, evidence-based educational programmes. This means that teacher competence and teachers' attitude towards teaching literacy using digital technology are prerequisites for implementing digital technology in the classroom.

Does the ability to alter the characteristics of digital text help young readers?

There are now many digital applications that support children in their acquisition of decoding skills, fluency and comprehension. Many apps now permit the reader to adjust the appearance of the digital text, altering the typeface and font size as well as the colours of the characters and background, and text spacing. The British Dyslexia Association (2018), in its *Dyslexia Style Guide 2018*, provides principles for the visual properties of texts (typeface or "font", headings, structure, colour and layout) to facilitate reading for students with reading problems. Many students with reading problems have self-reported preferences for text and/or background colours, but the research evidence supporting the value of such changes is weak. Walker et al. (2018) reviewed the relevant research and stated that there is still no consensus as to the visual attributes of printed texts that are best for beginner readers. While it is acknowledged that a clear distinction between letters is important for children's reading, it remains unclear whether serif or sans serif typefaces are easier to read. The authors recommend that, where possible, children's preferences should be respected.

Another approach to fostering both fluency and comprehension is text-to-speech, in which either a pre-recorded or computer-generated voice reads digital text aloud for the user, often simultaneously highlighting the words as they are read (Biancarosa & Griffith, 2012). Various print-to-speech programmes exist for children with reading difficulties and for second language learners. Microsoft's Immersive Reader is a free tool that can read aloud any Word file, and permits the reader to speed up or slow down the reading speed, or to add a pale colour for the text background. It spontaneously recognises the language of the text, and will switch pronunciation from English to French to German without any reader intervention. As we have noted in an earlier section of this report, the AI-supported Microsoft Reading Coach (Microsoft, 2024) is another free tool which, as well as offering a text-to-speech facility, also records a child's reading aloud and scores it for accuracy and fluency. This may well benefit comprehension, since the computer's decoding of text can free-up additional cognitive resources for comprehension.

Besides print-to-speech functions, digital tools may include other multimedia features such as animated pictures, music and background sound effects that complement oral or written stories and support textual information. Some tools include hotspots, which are places in the app that activate sounds or actions when touched. The results are mixed: Takacs, Swart & Bus (2015) reported that for children at risk for language delays due to less stimulating family environments, multimedia elements (animated pictures, sound) were especially helpful; however, interactive elements (hotspots, games) were detrimental. The leitmotif across a growing number of studies is that some multimedia effects may be too distracting, and may diminish young children's ability to attend, to imagine on their own, and to develop language skills that promote focused comprehension.

Digital tools to support the teacher by reinforcing pedagogy

Digital tools can also be used to train specific reading skills. Specific apps may offer children opportunities for repetition and the multiple exposures they need to become familiar with new words or new spelling patterns. This may refer to learning and consolidating letter knowledge and correspondence rules and to sight words (with

specific orthographic difficulties). GraphoGame, originally a Finnish audio-visual reading game for smartphones and tablets, is designed to train basic reading and spelling skills (in particular, systematic phonics) without adult supervision (Lyytinen et al., 2021). Children hear sounds, syllables or words through headphones, and have to match them with written forms. The number of repetitions depends on the errors the child makes, and the student's learning progress can be tracked. In-game rewards and coins support motivation. GraphoGame, now renamed GraphoLearn, was originally designed for transparent orthographies, but the programme is now available in English and French. The meta-analysis provided by McTigue et al. (2020), measuring GraphoGame's impact on word-reading outcomes, did not yield an overall meaningful effect size ($g = -0.02$). However, when the programme was combined with adult interaction, the mean effect size was $g = 0.48$, suggesting that the programme's effectiveness was much greater when it was mediated and supported in class by the teacher. Another evaluation of the US version of GraphoLearn was conducted during 2020 on 172 US infants who had been unable to attend school during the COVID-19-related lockdown (Richter et al., 2022). Pre- and post-programme literacy was assessed via Zoom, using a nationally standardised adaptive test. Interestingly, the average literacy growth was just a fraction over that which would have been predicted if the children had been in school. This was therefore a non-significant gain statistically, but a highly significant gain using a t-test that compared the changes over the 49 days of school closure (as we noted in Chapter 1, many children's learning did not improve at all during lockdown). This suggests that GraphoLearn might have had a positive mitigating effect on the detrimental impact of the pandemic. However, not all students benefitted from the programme: children who had better word recognition skills on entry to the study were able to gain significantly greater reading skills after playing GraphoLearn. The specific link between baseline word recognition skill and early literacy growth suggests that GraphoLearn is particularly effective for early readers who already have some word recognition abilities, and potentially less so for those who have yet to develop these (relatively advanced) skills.

A useful review of the research literature on digital tools to support early years education has been provided by Kontovourki and Tafa (2020). They make the point that knowledge about pedagogical practices that support the integration of digital technologies in early years educational settings remains limited, especially when compared with research on older children and young people. In the US alone there are over a million apps available just for the iPhone, and given the incredible speed at which new apps are released, it is difficult or impossible to get an overview. Some researchers point to the fact that thousands of apps (most of which require a subscription) claim to be developmental or educational; however, only very few have educators, developmental specialists or a literacy expert involved in the content and design of the app (Wolf & Potter, 2018). Although these apps can engage students by making learning fun, many do not appear appropriate for literacy learning. Eutsler, Mitchell, Stamm and Kogut (2020) provided a systematic review of mobile literacy learning between 2007 and 2019, examining the influence of mobile technologies on the literacy achievement of students from pre-kindergarten to Grade 5. Results indicate that mobile technology may be better able support instruction in certain domains (especially comprehension and vocabulary), but that overall, the use of mobile technology did not appear a strong indicator of students' literacy achievement in any

one domain. The authors point to the need to design studies more effectively and to provide greater clarity and transparency when reporting study characteristics. In an earlier review of technology tools to support reading, Biancarosa and Griffiths (2012) had already called for digital tools to incorporate Universal Design for Learning, a framework to improve and optimise teaching and learning based on scientific insights into how humans learn.

Key component 7: Promoting critical digital literacy

The ELINET declaration of the right to literacy (ELINET, 2016) was written by a group of 40 European literacy experts representing 20 countries. On the topic of digital literacy, they agreed the following:

> *The most effective literacy teaching for the 21st century makes extensive use of digital technology and fosters digital literacy and digital competence. Digital literacy is not just reading and writing online but includes specific abilities, including: being able to find information on the internet (identifying key words, searching for phrases, scanning heterogeneous links); using navigation devices (such as assessing the relevance of verbal expressions, understanding the hierarchical structure of information); accumulating information across multiple digital pathways; and critically evaluating sources of information*.

Foundational factors such as the presence of a digital literacy curriculum and appropriate ICT infrastructure are certainly necessary, but these alone are not sufficient. In addition, teacher-related factors are also important – especially teachers' confidence and skills in using ICT effectively in their teaching practice. Thus, investment in both initial teacher training as well as continuing professional development is essential. The next section of this report describes the digital skills children need, and provides some data about the skills children possess. According to PISA's definition, digital reading requires the triangulation of different sources, navigating through ambiguity, distinguishing between fact and opinion, and constructing knowledge (OECD, 2023a, p. 83). This concept implies that fostering digital literacy does not simply consist of setting reading tasks in which the texts are presented on screens instead of in print. Digital literacy involves not only the technical ability to use digital devices and platforms, but also the critical thinking skills needed to navigate and select accurate and relevant information. In order to find reliable information online, children must be able to locate information on the internet (identifying keywords, searching for phrases, scanning heterogeneous links), using navigation devices (such as assessing the relevance of verbal expressions, understanding the hierarchical structure of information), accumulating information across multiple digital pathways, and critically evaluating sources of information.

More recent studies of digital reading comprehension have suggested that the processes used by skilled readers to comprehend online text are similar to, but also more complex than, those that previous research has suggested are required to comprehend traditional informational text (Coiro, 2021). As Hartman and colleagues put it, "The accumulation of many small and large differences of frequency, degree,

and speed has indeed produced a qualitative change and a new kind of cognitive challenge for comprehending online" (Hartman, Morsink & Zheng, 2010, p. 132).

In 2016, the 4th-grade PIRLS reading assessment (Mullis et al, 2017) was extended to include online reading, which the authors describe as follows:

> *ePIRLS is a computer-based assessment that uses an engaging, simulated internet environment to present fourth grade students with authentic school-like assignments involving science and social studies topics. (…) An Internet browser window provides students with a website containing information about their assignments, and students navigate through pages with a variety of features, such as graphics, multiple tabs, links, pop-up windows, and animation. In an assessment window, a teacher avatar guides students through the ePIRLS assignments, prompting the students with questions*. (Mullis et al., 2017, p. 3).

In ePIRLS, four international benchmarks were established for characterising a pupil's performance level. The ePIRLS "High International Benchmark" required the following skills:

> *When reading and viewing relatively complex Online Informational Texts, students can: Make inferences to distinguish relevant information and provide comparisons; Interpret and integrate information within and across webpages with interactive features to provide examples and make contrasts; Evaluate how graphic elements and language choices support content*. (Mullis et al., 2017, p. 29).

However, Godaert et al. (2022) reported that at the end of primary school, students were still having trouble with certain digital competences, such as judging and assessing the relevance of digital information, providing digital content in a socially acceptable and comprehensible way, and performing complex search activities. This generation is not as computer-savvy as is often assumed.

In navigating information on search engines, younger children tend to rely predominantly on superficial cues to guide their selection choices, e.g. focusing on highlighted words, as opposed to the semantic information provided in the search result descriptions. Equally, learning to differentiate between reliable and unreliable sources of information is a skill that students must hone throughout their school careers (Salmerón, Macedo-Rouet & Rouet, 2016).

Interestingly, Swart et al. (2023) noted that primary-aged Dutch children engaged in non-digital play that re-enacted the multimedia worlds they inhabited online, playing shoot-'em-up versions of Fortnite, acting out their own Murder Mystery dramas, and discussing how they would meet up later in the day online to continue playing. The researchers also noted that many children enjoyed helping and advising their peers and were happy to play single-player games as a mini-team. This study helps to challenge the suggestion that online gaming encourages solitary and asocial behaviour; where possible, both boys and girls looked for opportunities to collaborate with friends (in

Fortnite, or on TikTok), rather than to engage with unknown others. In this sense, the children were engaging in the collaborative building of digital literacy skills.

There is now a growing body of literature on how teachers might be able to develop their students' critical digital literacy skills; however, conducting a meta-analysis of this is made more difficult by the fact that the evolving nature of both the internet and teachers' pedagogy make comparisons increasingly complex. Harrison (2023) reviewed 30 years of research into the evaluation of students' use of internet search, and identified more than 600 papers. Together, these suggested three broad areas of focus: first, on interaction processes (including observation, client-side data logs, search-term selection and revision); second, on search completion (including search success, search time, and knowledge production); and third, on dialogic criticality (including evaluating relevance, dialogic collaboration and "post-truth" criticality). Evaluating internet credibility is a highly complicated process, but it can be taught. Zhang and Duke (2011) conducted a randomised field trial of the WWWDOT framework (see the good practice example below) among 242 students in Grades 4 and 5 at three schools in the USA. The sessions were intentionally brief, the web sites investigated were from a constrained set with acceptable readability levels, and the questions prompted by the WWWDOT acronym were not too demanding for 10- and 11-year-olds.

Box 11. Good practice example. The WWWDOT framework for evaluating a web site

The WWWDOT framework was designed to support fourth- and fifth-grade students' critical evaluation of information on web sites by encouraging them to think about at least six things when they consider using a Web site for information: who wrote it; why it was written; when it was written; does it help to meet my needs?; organisation of the site; and to-do list for the future:

Who wrote this and what credentials do they have?	• Check author's name, credentials, contact information. • If no author is identified, check who sponsors the Web site. • If no sponsor is identified, check signs of qualification of author such as self-contradictions or spelling/grammatical mistakes.
Why did they write it?	• Be aware of possible purposes of writing: to entertain, to share, to support, to inform, to educate, to sell, and to persuade. • Be aware that one topic can be approached differently with different purposes.
When was it written and updated?	• Understand there are three categories of works: timeless, limited life, time sensitive. • Understand that timeliness may also reflect whether the author is still maintaining the site.
Does this help meet my needs (and how)?	• Ask questions, including: Does the site give the type of information that I need? Is it too difficult for me?
Organization of Web site	• Be aware that knowing how a Web site is organized helps readers to navigate and find information. • Be aware that knowing how a Web site is organized can help readers understand the content
To-do list for the future	• Have a plan, which may help diminish distraction. • Use a to-do list to keep track of additional Web sites and other sources to achieve a better understanding of the topic.

Source: Zhang and Duke, 2011.

The results of the WWWDOT intervention were illuminating. First, the children in the experimental group had post-test scores on the measures of internet criticality that were significantly higher than those of the control group. Their website evaluation skills were improved, they demonstrated an awareness that information on the internet is not always accurate or true, and they were better able to give reasons for their decisions. However, although the experimental group scored more highly for the accuracy of their final judgement of website trustworthiness, this did not reach statistical significance. The authors were not dismayed by this result. It could be, for example, that the children in the experimental group became so cautious that they did not give the highest trustworthiness score to the most trustworthy site. Equally, students in the experimental group reported that after becoming familiar with the WWWDOT approach, they were less confident, not more, in judging a site's trustworthiness. This too can be interpreted in part as a gain in criticality, rather than a failure.

One possible reason for Zhang and Duke's slightly disappointing results is that the outcome measure was based on individuals carrying out a task in isolation. Researchers who have focused more on collaborative learning using the internet believe that small-group discussion can encourage more confident and critical evaluations. Dwyer, for example (2013), worked with triads of 9-year-old elementary school students (all of whom had earlier been identified as poor readers) who tackled internet search tasks. She reported on their developing skills as they moved from an uncritical "snatch and grab" approach to a procedure of "skilful investigation", in which the relevance of each search result is assessed by systematically critiquing evidence and matching this to the goal of the task. Dwyer ensured that each member of the triad took on a specific role – that of Questioner, Navigator or Summariser – in order to promote more effective enquiry-based learning. In this respect, Dwyer's approach mirrored the reciprocal teaching of Palincsar and Brown (1984). In reciprocal teaching, the children are taught to work in a teacherless group of four, with each student taking turns to adopt each of the teacherly roles of Predictor, Questioner, Clarifier and Summariser.

Dwyer's work also followed the principles developed by Neil Mercer (2009), whose main career focus has been on encouraging student self-efficacy through collaborative teacherless group work in primary schools. Mercer made it clear that constructive dialogic discourse does not just occur spontaneously in primary school classrooms; it only happens when the children have explicit aims for their talk, ground rules for speaking, and a task that they consider worthwhile (Mercer, 2009). Harrison (2018) adapted this approach in his study of elementary school triads working collaboratively to determine the trustworthiness and relevance of internet sites. He identified nine strategies for enhancing critical internet literacy. These included "Be alert! Be suspicious!", "Read between the lines", "Make late decisions", "Integrate information across sources" and "Make joint decisions". Collaborative learning is not always popular in schools, because it can be difficult to identify the contribution of individuals, but if Dwyer and Harrison are correct in their assertion that collaborative enquiry produces better outcomes, we perhaps need to develop better tools for assessing such work rather than holding back learning because such tools are not yet available.

Studies of the digital literacy skills of primary school students are relatively rare, since existing research predominantly targets teenagers and adolescents. The longitudinal study by Lazonder et al. (2020) is a welcome exception. Lanzonder and colleagues collected data on Dutch students' digital literacy skills (searching for information; being aware of internet safety and avoiding phishing, pop-ups, etc.; transforming information using Word; creating a PowerPoint presentation). Over time, children's skills in all four areas improved, but improvement was most rapid in the measures on searching for information, which the researchers attributed to the students' use of the internet outside school hours. Interestingly, digital literacy development was unrelated to SES and migration-background factors, suggesting that the impact of education can have a powerful mitigating effect on factors that often correlate with lower levels of performance.

Future research will need to take into account the ways in which text forms (narrative, informational or multimodal) interact with the range of digital devices that students will be using (computer, tablet or phone) and the application within which the text is located

(programme, digital textbook, virtual world). Each type of digital medium will have its own unique features, and as Coiro (2020) pointed out, efforts are now needed to guide the selection of platforms in future research and practice, within and beyond classroom settings. As Hagerman (2019) argued, reading always takes place within a context, and the "local situatedness of technology use" (p. 116) will be central to the making of meaning. This is a theme to which we will return in Chapter 5, as we focus on the reading of older students.

Key Component 8: Supporting struggling readers

Learning to read is not a simple matter. Efforts to support those who have not made a good start in reading can be broadly classified into three groups:

- supporting overall language development;
- supporting word recognition, reading accuracy and fluency; and
- developing reading comprehension.

These three areas are not independent, of course, and researchers agree that interventions should:

- establish age-related minimum standards for literacy achievement, supported by assessment, in order to address pupils' individual literacy needs early;
- provide low-performing pupils and schools with the assistance they need, as early as possible; and
- support parents in understanding learning difficulties and to collaborate better with schools in addressing these.

Supporting overall language development

There is nothing spectacularly novel about creating a classroom environment that is colourful and full of books for all ages, with posters, beanbags to sit on while reading, and books of all shapes and sizes, including puzzle books, comic books, audio books and e-books. Indeed, such a classroom – especially if it includes a lunchtime or after-school drop-in zone – can become for many children a haven, and their favourite place to be in the whole school.

Two related approaches to helping poorer readers become more confident in both reading a book and listening to another person reading are paired reading, and peer-tutoring in reading. Keith Topping's work in this field is widely known, and his papers offer a number of approaches, all of which have been successful in different contexts (Topping et al., 2011).

Box 12. Good practice example: Using peer-tutoring and paired reading to improve reading skills

Many children who are struggling to learn to read have not had the experience of being read to, so they will have missed out on the knowledge of stories, story structure and wider vocabulary that hearing stories can bring. In many primary schools, peer-tutoring (which sounds a rather formal term) is a priceless tool for providing one-to-one support to struggling readers. Often, the "tutor" is a slightly below-average reader, but someone who is kind and caring, and who is –

very importantly – two years older than the tutee. In this situation, both the tutor and tutee can experience a gain in confidence in engaging with books in a relaxed atmosphere, with no teacher to tell the reader that she or he has made a mistake. The other important aspect of peer-tutoring is that it must involve a conversation about the book: how the listener feels about the book, whether they liked it, and why; what happened, and what they think might happen next. This sharing of thoughts and feelings, projected away from the individual on to the people or animals in the book, can be a valuable stepping-stone on the path to creating two readers with a socioemotional connection with what they have read.

Paired reading involves one younger and one older student reading a book together; any "error" is only corrected after a four-second wait, and there is an emphasis on praise, encouragement and plenty of talk about the book. A large-scale randomised-controlled trial of reading tutoring in Scotland (Topping et al., 2011) used the paired reading technique. In long-term evaluation, cross-age tutoring was significantly better than both regular teaching or same-age tutoring. Reading gains were also significantly greater for pairs who stopped reading to talk every five to seven minutes. Significant gains in self-esteem were seen for both tutees and tutors.

As we have emphasised, an important key to helping struggling readers is personalisation. This in turn requires that the teacher has ongoing formative assessment procedures in place to ensure that: first, the teaching is focused and appropriate; and second, that progress can be monitored and rewarded. Given the rapid advances in technology and the exponential speed of technological change, it is appropriate to foreground the likely importance across Europe of digitally supported literacy instruction, which would support teachers by providing personalised tuition. The recent meta-analysis of technology-delivered literacy instruction by Dahl-Leonard, Hall, and Peacott (2024) examined 53 studies and reported a highly significant overall effect size of 0.24 (Hedge's g). Half of the studies focused on students with one of more areas in which there was actual delay or they were "at risk of" reading delay. As one would expect, though, the different studies had different areas of focus: some mainly aimed to develop early reading skills, such as phonological awareness and letter knowledge, while others aimed to develop a wider range of skills, such as vocabulary, fluency and reading comprehension. Treatments with instruction in phonics/decoding/word reading tended to have larger effects ($g = 0.27$) than treatments that did not ($g = 0.11$), but this was to be expected: computers are good at offering repetition and reinforcement, but skills such as developing vocabulary and comprehension are much harder to develop.

Another important finding relates to what researchers term "dosage"; it was found that mean time a student spent with a programme varied between 2 hours and 126 hours. However, after 40 hours, no further increase in effect size was recorded, which perhaps suggests a ceiling for learning related to phonics, and the use of an alternative route other than these computer programs for developing comprehension.

Supporting word recognition, reading accuracy and fluency

A pan-Australian consortium of literacy specialists composed of government, state and university experts has published a helpful guide to supporting struggling readers during the early primary years (Auspeld, 2024). After stressing the importance of personalisation built upon the careful assessment of children's needs, the site offers

clear hints about the areas on which teaching needs to focus, beginning with phonological awareness.

Box 13. Good practice example: Developing phonological awareness

A critical part of reading development is the ability to 'tune in' to the words and speech sounds of English.

Instruction in early literacy skills should always include components of phonological awareness. Phonological awareness is a broad term referring to the ability to identify and work with smaller parts of spoken language.

More specifically it refers to the ability to:

- *identify and discriminate between different sounds (both environmental and speech sounds)*
- *show awareness of the rhythm of songs, rhymes and spoken language*
- *identify and produce rhyming words*
- *blend syllables together to form a word and break words into syllables*
- *orally blend sounds to form words and orally segment words into individual sounds*

Students requiring remediation of their reading accuracy in lower primary years will often benefit from explicit instruction in phonological awareness skills, in particular phonemic awareness tasks. (Auspeld, 2024, p.2)

The areas of emphasis in the good practice example above are precisely those advocated by Goswami (2010). After a careful and detailed technical analysis of the development from birth of auditory processing and speech perception, she concludes that many of the most intractable challenges for children who fail (or are likely to fail) to learn to read are attributable to poor phonological awareness. Furthermore, such weaknesses are not related to IQ – they are caused, at least in part, by differences between children in very basic sensory processing mechanisms. Support in terms of remediation, argues Goswami, can come from activities similar to those that many children experience in infancy, namely word-play with sound patterns and rhymes ("Speak in rhyme, all the time"), clapping and tapping games, play with music and singing, enjoying short poems and rhymes. Notice that none of these activities involve writing, or reading; they are all concerned with processing sounds in the head and in speech. The good news is that these are activities that the whole class can enjoy. There is no need for the teacher to put the spotlight on weaker readers, but for those with a weakness in phonological awareness, these language games can enrich the potential ability to learn to read, and can benefit their overall reading development.

Auspeld's advice for teachers then turns to the teaching of phonemic awareness, beginning with orally blending, segmenting and manipulating phonemes in words, but then quickly moves towards linking those sounds to letters. The key pedagogical emphasis as the teacher moves on to teach blending is that blending and segmenting are reversible processes. The advice is clearly focused on progress, and on taking a systematic approach:

High quality phonics teaching is most effective when...

- *it involves the effective combination of language (either spoken or written) and visual images (e.g. pictures, icons, diagrams, displays, slides, graphic organisers etc.) to deliver information;*
- *it is systematic, that is to say, it follows a carefully planned programme with fidelity reinforcing and building on previous learning to secure children's progress;*
- *it is taught discretely and daily at a brisk pace;*
- *there are opportunities to reinforce and apply acquired phonic knowledge and skills across the curriculum and in such activities as shared and guided reading.* (Auspeld, 2024, p. 3)

Developing the reading comprehension of struggling readers

In 2009, the US Institute of Education Sciences (IES) allocated USD 120 million to establish the Reading for Understanding (RfU) initiative (Pearson et al., 2020). These following four of its key findings are particularly relevant to primary education:

- Traditionally, it has been assumed that "learning to read" precedes "reading to learn", but what the research found was that these two learning pathways are parallel, not sequential: learning to decode does not precede developing comprehension – the two are intertwined and learned simultaneously. Accordingly, teachers need to be aware of how to teach comprehension from the moment a child enters school.
- The facets of learning that entail engagement, motivation, self-efficacy and social well-being deserve greater attention in the study of comprehension and learning. These aspects of reading develop at the same time as the child is beginning to learn to read.
- The RfU initiative taught researchers how much it takes to achieve even small effects with regard to increases in student performance in reading comprehension. Even with optimal teaching strategies, it was difficult to establish gains with effect sizes much above 0.2. What was clear was that promoting comprehension was most likely to be effective when students engaged in collaborative discussions about interesting and thought-provoking texts, texts related to some issue, or a problem or project that was worth discussing.
- Even in Grade 1, a child's ability to evaluate their own understanding was found to be not only an important skill to develop, but an accurate predictor of higher-level language and comprehension skills in Grade 3. Self-monitoring enables a learner to repair their understanding as they attempt to construct a coherent mental representation of a text. Clearly, this is a two-way process: self-monitoring improves comprehension, but the knowledge of the world and of the text that a child possesses also enhances their ability to engage in the metacognitive process of self-monitoring.

In the UK, Hulme and Snowling (2011; see also Clarke et al., 2014) have led research into poor comprehenders – in particular, those children who can decode accurately, but whose comprehension is poor, and far below what might be expected given their oral reading ability. These researchers devised and tested interventions to help such students develop their comprehension skills. The randomised controlled trials in the York Reading for

Meaning project (now called REACH) were both thorough and multifaceted. Three intervention treatments were developed, each involving 60 carefully structured 30-minute lessons delivered over 20 weeks by trained teaching assistants. One intervention focused on oral language, another on text-based reading strategies, and the third combined both oral language and text. The results were encouraging, and were found in both short-term and long-term follow-up testing. All three interventions resulted in highly significant gains in reading comprehension on the WIAT-II test. This is interesting, since this test includes sub-tests of literal, inferential and lexical comprehension, as well as tests of oral reading fluency and word recognition in context. What is striking about the results is that not only were the students in the oral language intervention group ahead of those in both of the other two groups, but the effect size for the oral language group was almost double that of the others.

These effect sizes are not only statistically significant, they are educationally significant. They immediately raise two questions. First, what did the York team do that helped to achieve such outstanding and enduring effects? And second, why did a USD 120 million project in the US, led by two of the most experienced reading researchers in the world (one of whom was the co-inventor of reciprocal teaching), achieve an effect size of only 0.2 with their intervention studies? We offer at least a partial answer to the first question in the good practice example below.

Box 14. Good practice example: the York Reading for Meaning project oral language programme

The York Reading for Meaning project oral language programme had a number of features that will have made important contributions to the success of the intervention. Some of these would not be difficult to replicate in any classroom, if teachers were given appropriate training and support, and if the necessary books and other reading materials were made available. Others will be more difficult and/or more expensive to implement.

- The programme involved three x 30-minute sessions per week, delivered in two x 10-week blocks (most schools ran these flexibly, using a mixture of normal lesson time, after-school sessions, before-school sessions, etc.). The intervention was supplementary to classroom teaching – it did not replace it.
- Each session comprised six strictly observed bite-sized "little and often" learning experiences, consisting of an introduction (3 mins); vocabulary (5 mins); reciprocal teaching with spoken language, which included the "text for the day" – see Good Practice example 8 on Reciprocal Teaching (7 mins); figurative language (5 mins); spoken narrative, which might involve recording a story (7 mins); and a plenary (3 mins).
- The content of each session was chosen by the teacher in response to the needs of the group; content might be associated with a fiction or non-fiction theme from the curriculum.
- The text content prompt for reciprocal teaching might include a listening comprehension task.
- There might be a listening comprehension prompt in the form of fiction, non-fiction, or a poem (if this approach was used in more than one school, prompt materials could be shared online).
- The teaching assistants who delivered the Reading for Meaning project interventions had been trained, and the York team had a great deal of confidence in the ability of the teachers to deliver the intervention with a high degree of fidelity to the project's goals.

The York team's answer to the question of why this intervention was so successful and enduring gave prominence to one key variable: vocabulary. The oral language group sub-test results showed greater gains in vocabulary than on any other single variable. This was

interesting, in that vocabulary was indeed part of the focus in every session, but also the sessions gave attention to discussing stories, discussing figurative language, and discussing more complex areas such as prediction and inference. The additional increase in comprehension skills, even months after the programme had ended, also suggests that something had changed in the learning disposition of the students in the oral language group. It is possible, for example, that the 60 experiences of reciprocal teaching, in which every student has to take responsibility for a "teacherly" role, may have helped the students to develop a sense of personal agency in relation to their learning and the learning of others, which carried over into other areas of their learning. In reciprocal teaching, every student undertakes roles, both as a leader of learning and as a supporter of the learning of others. If the programme is working as it should, the level of student engagement is close to optimal, and when students are engaged, deeper learning is much more likely.

On the question of the very high effect sizes in the York project compared with the RfU study, we would offer a simple explanation: the York programme was delivered by trained specialists, whose main task was to manage the sessions using materials that had been specially developed by the team beforehand. Furthermore, the children were taught in small groups, often in pairs, not in large classes. By contrast, the RfU studies were generally in more "real-world" contexts, not delivered to groups of two children over 60 sessions. Also, in the real world, with large, complex studies, an overall effect size of 0.2 is technically "small", but is often associated with educationally worthwhile interventions. Despite these differences, three factors in the York project remain salient:

- First, developing vocabulary seems to be an extremely valuable pathway to developing comprehension.
- Second, developing oral language is another valuable route to developing comprehension.
- Third, the value of reciprocal teaching in developing both oral language skills and student self-efficacy should not be underestimated.

The two large-scale studies on developing the reading comprehension of struggling readers described above were undertaken in the USA and the UK. Although both of these countries have substantial multilingual populations in their schools, neither has the unique constellation of challenges that face Europe in terms of literacy development. The book by four Dutch language specialists, *Putting PIRLS to Use in Classrooms Across the Globe: Evidence-Based Contributions for Teaching Reading Comprehension in a Multilingual Context* (Bruggink et al., 2022) is therefore particularly welcome, not least because it draws upon evidence-based didactic principles from the Netherlands, Belgium, Georgia and Spain, as well as other education systems in the PIRLS network – all of which have only moderate differences in performance between multilingual and monolingual students.

Box 15. Good practice example of Reading education for multilingual students

The literacy practices below are put forward as examples of how a multinational perspective on the development of comprehension can enrich a school's culture as well as increasing motivation and engagement:

- Integrating reading comprehension with other school subjects; in mathematics, including measurements in the units of different countries, based on recipes from the home countries of different students.
- Storytelling that draws on books, tales and artefacts from different countries.
- Activating prior knowledge using multicultural perspectives (through drama and by encouraging students to talk about their native country to the class); also encouraging the activation of prior knowledge in native languages.
- Allowing and encouraging the use of multiple languages in class.
- Using many picture books as part of teaching, to enable more students to interact with the lesson content in their own language.
- Playing language games, inviting students to guess words from another language that are acted out by the students.
- Giving every teacher training in vocabulary development, with new words being displayed and used in conversation every day.
- Accepting, celebrating and displaying dual-language books in the school library.
- Finding non-fiction books and biographies about topics and people from other countries that are represented in the class.
- Encouraging the use of computer programs that offer translation and read-aloud tools.
- When introducing new vocabulary, also teaching grammar that is connected to the use of that vocabulary.
- Taking a whole-school approach to developing vocabulary, with shared knowledge of a "word of the day" across subjects and classes.
- Helping students to memorise new words by introducing them in semantically related families.
- Giving small groups the task of producing a picture to illustrate their word, then each group making a presentation of their word with its picture.
- Organising parents' evenings in which different languages and cultures are represented.
- When teaching vocabulary, encouraging drawing, visualising and talk, as well as meaning.

Source: Bruggink et al., 2022, Chapter 5.

In the examples above, Bruggnik et al. encourage teachers to be aware of the socio-emotional aspects of reading comprehension, and also to be sure to develop students' metacognitive strategies – planning, monitoring understanding, and evaluating both the texts and their own reading processes.

We know from both PIRLS and PISA that monolingual students show larger learning gains than dual-language learners, and that there is a positive relationship between the amount of time a child uses the language of school instruction at home, and their academic achievement (Heppt & Stanat, 2020), though this effect levels off as the child moves through school. Heppt and Stanat conducted a study in Germany of the language children used at home and at school, and argued that even in elementary school, learning demands a higher level of language competence than that used at home in most families, and that academic proficiency should not be expected to come about without support. Therefore, they suggested that in order to help students from diverse linguistic backgrounds to avoid being disadvantaged in later schooling, language support should be provided in the early years to assist dual-language students to manage the demands of specialist academic language, and that this should focus particularly on the period from Grade 2 to Grade 4.

The importance of teachers' professional development

As we stressed at the beginning of this chapter, there are far-reaching challenges for pre-service teacher education and in-service professional development in the many pedagogical and structural implications that arise from the research presented here. As we have shown, the after-effects of school closures have alerted governments to the need to be better prepared to support students' learning if and when cataclysmic events cause schools to be closed, and for learning to continue at home. At the same time, advances in digital learning and in the accessibility of digital devices and broadband internet, both at home and in schools, are changing our societies in ways that we are only just beginning to understand.

As new software and the ubiquitous use of devices permeate the classrooms of Europe, (albeit at differing rates), the role of the teacher is changing. New software has the potential to speed up personalised learning, giving students useful and more rapid feedback than any teacher could provide. Equally, the time is rapidly approaching when most teachers will not be spending hours devising lessons and marking exercise books. Instead, they will become managers of learning rather than fountainheads of knowledge. They will certainly not be redundant, but their role will be different. These changes will place exceptional demands on teachers, and on their ability to adapt to new modes of learning and assessment. They will need support in coming to terms with these new demands.

Policymakers will need to give careful thought to the ways in which teachers, teaching assistants, head teachers and local network administrators will be guided and supported in the coming decade. Government-mandated curriculum guidelines and national assessment systems will not do this job, and we know from past experience that bringing in new technologies can create mayhem as well as wonderful educational opportunities. What will be needed is teams that can work at a local level to support change and to ensure continuity and stability, as well as opportunity and promise. Teachers say that they learn best from other teachers, and such teachers – the ones who are ahead, but not too far ahead, of the learning curve – will be priceless assets in the process of developing new approaches to learning.

Chapter 5. Exploring effective practice: what does research suggest that the education systems of the EU need to do to improve literacy at secondary level and beyond?

A major goal of this report is to support teachers in schools in Europe as they take on the significant challenge of improving reading standards. If the students of those teachers are to achieve at the age of 15 the standard described as Level 2 on the PISA reading tests as "basic proficiency" or "baseline proficiency", they will need to achieve much more than simply being able decode individual words in short texts. As we pointed out earlier, readers at Level 2 need to display many skills. They "can identify the main idea in a piece of text of moderate length. They can understand relationships or construe meaning within a limited part of the text when the information is not prominent by producing basic inferences, and/or when the text(s) include some distracting information. They can select and access a page in a set based on explicit though sometimes complex prompts, and locate one or more pieces of information based on multiple, partly implicit criteria. They can reflect on the author's purpose, they can reflect on typographical features. Typical reflective tasks at this level require readers to make a comparison or several connections between the text and outside knowledge by drawing on personal experience and attitudes" (OECD, 2023a, p. 100).

The skill set described above foregrounds some important areas of reading comprehension: drawing inferences, prioritising key information and ignoring distractions, locating information on the basis of multiple criteria, reflecting about the author's purpose, evaluating arguments, and connecting what they are reading with their own background knowledge, experience and attitudes. We would also make the point that at secondary level, "basic proficiency" is not a sufficiently high goal for many students; most schools will want their students to aim higher.

Nevertheless, for many students, Level 2 demands a daunting array of skills, and it would not be at all surprising if some teachers felt that the goal of getting every student up to this level was unattainable. However, there are two important reasons for optimism in relation to this challenge. First, we now know that an absolutely central plank in the pedagogy that can make a significant improvement in reading comprehension is not reading: it is talk, and that is something the vast majority of children at secondary level can be quite good at, providing that the challenge is pitched at the right level, and the topic is interesting. Second, no teacher is on their own in facing this challenge. Teachers in every secondary classroom in Europe are now beginning to accept (if they haven't already accepted) that as well as being an expert in their own subject, they also have a responsibility to make their contribution to literacy development. This is especially true when they understand how much more their students will enjoy their subject if they are fully engaged with it, and if the teacher recognises that their students are making progress.

Reading comprehension is one of the most difficult tasks that the human brain can manage, and reading comprehension tasks in secondary school are incredibly demanding. Every subject at secondary school level involves vocabulary that the child has not encountered before, written in sentences that are longer and more complex than they have met before.

They contain concepts, processes and information structures that are different for every subject, with text structures that are not only different for every subject, but are rarely signposted (Armbruster, 1986). If we add to that the challenge of requiring students to locate and evaluate information from a range of sources, the task becomes even more difficult. Furthermore, if we then bring in online reading tasks, we enter the realm of unedited and hyperlinked content – often written with the aim of making money or delivering propaganda rather than truth.

In this chapter, therefore, we will have much to say about the strategies teachers can use to help their students become more fluent, confident and knowledgeable readers. There is now a valuable and substantial body of research literature on how this might be achieved – particularly with regard to the two related fields of content area literacy and disciplinary literacy, which will be discussed in detail below. Before we look in depth at those areas, however, it is worth reminding ourselves of some key insights from research into reading comprehension that were discussed in depth in Chapter 4, and which are relevant and important in the present context.

Two of the most successful projects described in Chapter 4 that were aimed at developing reading comprehension were developed 10,000km and 30 years apart – and yet they had some very important overlapping features. These were reciprocal teaching (Palincsar & Brown, 1984) and the York Reading for Meaning project (Clarke et al., 2014), which also included a reciprocal teaching element. Both projects involved getting students to discuss the texts from which they were learning, and these discussions were in each case carefully structured. The students worked in a small group, with each student taking on a specific role and set of responsibilities. It is important to understand that this approach involves a major shift in pedagogical agency: it requires the teacher to be willing to give up the role of leading learning, and to hand that job to the student. Before we analyse dozens of interventions that have improved reading at lower- and upper-secondary school level, it might be valuable to showcase one example of what was achieved when 18 teachers in a specialist subject area worked to introduce what was to be an outstandingly successful intervention to develop comprehension in their subject.

Vaughn and her colleagues (2017) reported on work in the US carried out with social studies teachers, in which the teachers radically altered their usual pedagogical practice. Instead, they adopted an approach that was termed PACT ("Promoting Adolescents' Comprehension of Text). PACT was in some respects more comprehensive than either reciprocal teaching or the York programme, but had many features in common with these: as well as focusing on vocabulary and metacognitive strategies, there was also a great deal of emphasis on student agency and on using talk in carefully structured and supportive contexts. In the study, the participants were 660 students in eighth-grade classes in schools that had a high number of students learning English as second language (more than 50 % of the students reported that they spoke a language other than English – mostly Spanish – at home). The control group was made up of classes of the same age, taught by the same teacher, but this time using what had been the teacher's usual approach prior to the intervention. The PACT approach (see the good practice example below) was thorough. Before embarking on the 20-week PACT programme, the 18 teachers undertook a full day of professional development, followed by an additional half-day after the first month, supplemented by regular classroom visits from research support personnel who also helped to model the PACT components.

Box 16. Good practice example: PACT – Promoting Adolescents' Comprehension of Text

This 20-week initiative comprised five components:

- Comprehension canopy: the teacher introduces a new topic using a brief video clip to activate background knowledge and an overarching high-level comprehension question that will be answered and revisited during the unit; for example, "How did the colonial regions develop differently?".
- Essential words: five key words are introduced, together with paired and whole-class discussion activities; these activities will be revisited at various times later.
- Knowledge acquisition through text reading: three times a week, teachers lead students through a critical reading routine that lasts approximately 15 minutes and requires students to read informational text related to the topic. Teachers share a video clip or a map to set up the context for the content to be read. Students read the text as a whole class with the teacher, in pairs, in small groups, or independently. In addition, students address a variety of content- and inference-based questions related to the canopy question verbally and in writing throughout the reading.
- Team-based learning (TBL) comprehension check: working in a team of two, the students answer a comprehension quiz comprising 10 items (five questions on vocabulary and five on concepts or key ideas). This is done first alone, then in their pair (in some versions of PACT, each pair then compares answers with another pair before the teacher gives out the answers). The focus is on close reading and high-quality reasoning to support evidence or knowledge claims. Teacher provides the answers and then fills in knowledge gaps.
- TBL knowledge application: at the end of every unit, students in groups of four prepare and deliver their answer to a difficult question (and the reasoning behind it) to the whole class (for example, "What might have happened to prevent the Revolutionary War"). The teacher helps the students to integrate their presentations into an answer to the canopy question.

Source: Vaughn et al. (2017).

Each of the components contained reading, comprehension and small group work, but clearly the team-based learning components also developed self-efficacy as well as close reading, metacognition and discussion. A great deal of preparation is involved in putting together units to be delivered using the PACT approach, and it would be both more efficient and potentially more valuable if a number of teachers collaborated to plan PACT units.

The students in the PACT programme gained more knowledge in the content area than the students taught by the same teacher in the "business as usual" groups (effect size 0.40), though in classes with very high numbers of English language learners, these gains were less. The PACT students also achieved higher scores on a standardised reading comprehension test, but this difference did not reach statistical significance (effect size 0.12).

As teachers and their leaders in Europe consider introducing new pedagogical approaches to deepen engagement and enhance student learning, it is important not to underestimate the demands that such changes make on both teachers and students. Changes in teachers do not occur overnight. They only become embedded and successful if they are supported by clear policies, by professional development activities, and by curriculum resources that the teachers themselves believe will serve their students well. In the PACT intervention,

expert teachers modelled the new approaches, prepared many of the classroom materials, and provided in-class support to their colleagues. The initiative was not a "one-week wonder"; it was a carefully developed package delivered over 20 weeks. This programme demonstrated in many ways how professional development can be done. It was not cheap, but its outcomes will have been far more enduring for both teachers and students.

5.1. Developing literacy across the curriculum – at secondary level and beyond

5.1.1. Developing literacy at lower-secondary and upper-secondary school levels

Teaching reading has often been seen as the responsibility of primary school teachers or, at secondary level, of language and literature teachers. However, while progress has been patchy, teaching literacy across the curriculum – that is, as part of every school subject – has come to be seen over the past 50 years as a way to provide students with more extensive and more specialised literacy teaching to improve their literacy levels and content-area learning (Ortlieb, Kane & Cheek, 2024). In the US in particular, there have now been more than six decades of teaching literacy across the curriculum, often referred to as "content area literacy". In practice, this has generally been realised through the teaching of study skills that help students to learn content knowledge from texts that are typical to the content area, such as reading comprehension strategies and vocabulary (Shanahan & Shanahan, 2012; Ortlieb, Kane & Cheek, 2024). In the 2000s, attention shifted to teaching discipline-specific literacy practices, which include the ways of reading and writing texts that are typical to the content area, as well as the knowledge construction practices of the disciplinary community (Moje, 2015; Goldman et al., 2016; Pearson, et al., 2020).

In Europe, the introduction of teaching literacy across the curriculum has been much more recent than in the US. In 2009, William Brozo and a group of European scholars examined the national curricula in Ireland, Sweden, Germany and Bulgaria to see if content-area reading formed part of the curricula. The results showed that reading comprehension strategies were included in the English curriculum in Ireland and taught to some extent in primary grades, and the Swedish policy documents stressed that all teachers are responsible for language development (Brozo et al., 2009). In Germany this approach was not included in the curriculum at all, and in Bulgaria the notion of content-area literacy was unfamiliar to educators. Thus, content-area literacy was rarely part of the curriculum or teaching in these countries at that time (Brozo et al., 2009). Nevertheless, some signs of growing interest became evident in the EU-funded project ADORE (Teaching Struggling Adolescent Readers. A Comparative Study of Good Practices in European Countries), which explored key elements of supporting adolescent struggling readers in general education in 11 countries (Garbe, Holle & Weinhold, 2010a; 2010b). In school and classroom visits, the research group did encounter and collect data on content-area literacy teaching in at least Hungary, Germany and French-speaking Belgium. In these classroom practices, teachers included reading comprehension strategies into various content-areas and in remedial classes (Steklács, 2010). One of these good practice examples included a school literacy programme in Germany that stressed the importance of reading across all content areas.

Since then, teaching literacy across the curriculum has become part of curricula and policy documents in many European countries. Country reports on literacy curricula compiled by the ELINET project (ELINET, 2016) confirmed that this approach had become more common in the secondary school curricula of several European countries. One of these countries was France, where the curriculum explicitly stipulated that all teachers were expected to contribute to students' literacy development (Johnson & Johnson, 2016, p. 42). In Germany, North Rhine-Westphalia and Bavaria also included literacy-related goals in the curricula for mathematics and science subjects, albeit that these were not labelled as content-area literacy (Garbe et al., 2016).

Currently, teaching disciplinary language and literacy is considered to be the mainstream approach in multilingual classrooms in many educational systems (Walldén, 2022). This brings the needs of multilingual students closer together with those of the native students, who also need to learn disciplinary languages and literacy practices for their secondary studies in various content areas. This approach emphasises the role of language – including literacy practices – for content learning and language awareness in teaching (see, for example, Erath et al., 2021). For example, in Sweden, disciplinary literacy is included in the curriculum in primary grades (Walldén 2020; 2022). This is also the case in Finland, where disciplinary literacy is a central part of the cross-curricular topic of multiliteracies and is thus integrated into all content areas in the national curriculum, at both primary and secondary levels (Finnish National Agency for Education, 2014; 2019). In Finland, the curriculum also emphasises language-awareness in all teaching. Estonia – a country with high achievement in the PISA assessment – has a curriculum that highlights literacy practices in various subjects (Aruvee, 2023). Disciplinary literacy is also reflected in PISA assessments, for example in mathematics, which supports teaching disciplinary literacy and procedural knowledge in addition to content knowledge in many countries. In the US, the National Assessment of Educational Progress (NAEP) will, in 2026, begin reporting reading performance by disciplines (literature, science and social studies).

However, content-area literacy or disciplinary literacy is not yet included in curricula in all European countries. Moreover, the curriculum as it is enacted often differ from that which is intended, and there is a need to develop classroom practices that support disciplinary literacy. For example, in Finland, classroom activities even at upper-secondary level show that content-area teaching is still dominated by content knowledge. This is evident, for example, in a study by Puustinen and Khawaja (2022), which showed that historical literacy practices relevant to knowledge construction in the discipline were rare or non-existent in the nine history classrooms observed (a total of 3,130 minutes of data). In Estonia, too, a study by Aruvee (2023) recently showed that while many text-related activities take place in content-area classrooms, such as in history, physics, handicraft, home economics and music, language is approached from the perspective of correctness, and content-area teachers lack the knowledge to teach disciplinary language and textual analysis.

In the US, adolescent literacy has become a more important area for pedagogy. Important theoretical and practical work has been carried out on the reading problems faced by adolescents in content-laden secondary school classes (Biancarosa & Snow, 2006; Snow & Moje, 2010). Attention has focused on the question of whether literacy practices are general (applying to all subjects) or subject-specific. Chief among the perspectives arising from this work is the idea that there were indeed discipline-specific vocabulary and

discourse patterns and epistemologies. Phrases such as "thinking like a historian" or "reasoning like a scientist" became more common. These issues were central in the work of the Reading for Understanding (RfU) initiative in the US (Pearson et al., 2020).

Pearson et al. concluded (2020) that at middle and high school levels, there was a strong discipline-specific character to reading comprehension: there are practices that are either unique to each discipline – or are at least enacted differently across disciplines. The RfU project also demonstrated that the conventional wisdom of transitioning from learning to read to reading to learn is a false dichotomy. Students in Grades 5-12 must engage in new learning throughout their school careers – dealing with new strategies, text structures, genres, stances and forms of knowledge – to fully comprehend school texts. Specifically, these challenges include: "(1) the amount of unfamiliar content presented in texts, rendering less effectual the typical strategy of encouraging students to use their prior knowledge to make connections and draw inferences, (2) the complexity of academic language encountered in text (including unfamiliar, multisyllabic words and less familiar syntactic constructions), and (3) the task demands associated with, for example, integrating information from multiple texts, critiquing arguments for claims made in texts, and building one's own arguments from text-based evidence" (Pearson et al., 2020, p. 273).

In meeting some of these challenges, Goldman, Snow and Vaughn (2016) noted three useful approaches. The first of these was *active, purposeful, engaged reading*. This involved identifying explicit goals for reading that were connected to students' lives, such as using essential questions to which the students return as they read. The second practice was *social support for reading*. Working in pairs or small groups, students prepared for debates, jointly wrestled with the ideas in the text, and shared common challenges and successes in interpreting and learning from the text. Whole-class discussions were used as occasions to model repair strategies and as occasions for teachers to teach disciplinary-specific uses of language and reasoning. The third approach was *promoting deeper learning* by activating prior knowledge and requiring students to apply the information they were acquiring to solve a novel problem or articulate an explanation.

Disciplinary knowledge complements the declarative and procedural knowledge that is necessary for the literal and inferential interpretation of text; it allows student readers to move from beyond literal and inferential comprehension to forms of understanding that include analysis, critique, evaluation and, above all, integration (Goldman et al, 2019; Shanahan, et al., 2016). Teachers must attend to students' ongoing need to learn to read texts and to participate in tasks of increasing complexity and challenge. In an important paper, Wilkinson and Son (2011) proposed that we were on the verge of taking a major turn in comprehension pedagogy. This comprised a focus on (a) talk, and (b) collaboration as a means of improving comprehension and learning in our schools. It seems clear that the RfU programme shifted the emphasis of comprehension instruction towards talk, with an emphasis on students actively and collaboratively constructing and extracting meaning from texts. This emphasis on talk; on students working together to actively construct meaning, with a new emphasis on self-regulation and agency, is exactly what the present report argues is now a feature of research across Europe.

The two main approaches to teaching literacy across the curriculum – namely, content-area literacy and disciplinary literacy – have often been seen as alternatives, or even opposites. However, many scholars see them as approaches that are compatible and complementary to one another (e.g. Brozo et al., 2013). Moje (2015), in her enquiry-based model for teaching disciplinary literacy, sees reading comprehension strategies as tools needed in the enquiry process, and as something to be taught in that context. Fang and Colosimo (2023) have also presented a heuristic for teaching disciplinary literacy in science, and include reading strategies adapted to the reading of science texts in their heuristic. Indeed, there is evidence that both approaches can yield positive outcomes, as summarised by Fang and Drake Patrick (2024).

Teaching more specialised disciplinary literacy is sometimes only considered suitable for secondary school students. Indeed, the higher the grade level, the more demanding and abstract are the texts that students encounter in their studies. However, a meta-analysis by Hwang, Cabell and Joyner (2021) showed that the integration of literacy instruction into content areas supports the learning of disciplinary vocabulary and reading comprehension as well as content knowledge even in primary grades, with large effect sizes. Studies at secondary school level have yielded similar results. For example, a meta-analysis by Graham, Kiuhara and MacKay (2020) showed that writing-to-learn activities in science, social studies and mathematics teaching had a positive effect on learning content-knowledge in all disciplines studied at elementary, middle-school and high-school levels. The writing activities in the studies analysed varied a great deal, as did their individual effect sizes. Overall, the authors concluded that writing activities enhance learning, but that some types of activities – such as those involving graphical representation but lacking metacognitive prompting – failed to produce statistically significant effects.

Teaching reading strategies in the context of disciplinary texts has gained positive results in reading comprehension and strategy use in many interventions. As we have already mentioned, Vaughn and colleagues (2017) developed and experimented with an approach that improved both reading comprehension and content learning in middle-school social studies. Second-language learners also benefitted from instruction in a reading comprehension strategy, combined with motivational and reading engagement support in a social studies unit (Taboada Barber et al., 2021). In reviewing the sizeable body of pedagogical studies on older students in the Reading for Understanding Initiative, Afflerbach and his colleagues (2020) reached the following broad conclusion:

> *The RfU work on curriculum and instruction was designed with the overall goal of moving the needle on students' reading comprehension achievement. Not all treatments led to statistically significant student gains of remarkable magnitude. Even so, innovative multicomponent approaches to comprehension instruction, when supported by teacher professional development and evaluated with relevant measures, led to a range of significant effects of respectable magnitude on comprehension and related outcomes—especially for older students. Perhaps, however, it is more important that we know that when these components are integrated into engaging and consequential curriculum activities, good outcomes are possible for knowledge development, either at no cost to comprehension (the more common finding) or in concert with advances in comprehension. And, as a bonus, in many cases, other kinds of development (vocabulary, morphology,*

> *metacognition, perspective taking, or constructing/evaluating arguments, for example) are enhanced as well*. (Afflerbach et al., 2020, p. 247).

In all, these studies show that: 1) general comprehension strategies are useful in many ways if integrated into the disciplinary content; and 2) positive results can be achieved using several types of interventions that focus on supporting learning from/with text in content areas. One project that aimed to support teachers' professional development in introducing these strategies to students within their own subjects was the BaCuLit project. This was originally developed by partners in seven European countries, and evaluations of it have been published in Hungary, Romania and Germany.

Box 17. Good practice example: basic curriculum for teachers' in-service training in content-area literacy in secondary schools

The BaCuLit project was funded by the Comenius Programme of the European Union (2011-2012). The project was built around the need for teachers' in-service training in content-area literacy recognised in the ADORE project (Garbe, Holle & Weinhold, 2010a). The BaCuLit project developed, implemented and evaluated a curriculum for teachers' in-service training in this area. It included 10 partners from universities and in-service teacher training institutions from seven European countries. Two American experts also supported the project's work.

The BaCuLit curriculum aimed to enhance teachers' expertise in content-area literacy, and provides the basic curriculum that defines the minimal knowledge every secondary content-area teacher in the EU should have about teaching literacy skills in their content-areas. The BaCuLit Curriculum consists of a handbook for teacher-trainers, accompanied by a PowerPoint presentations with annotations for the trainers, which provide the frame for each course unit, as well as a workbook for teachers, which contains all the materials for participants in the training. Themes covered in the training include principles for lesson planning, text structure and textual diversity, vocabulary instruction, teaching cognitive and metacognitive reading strategies, formative assessment of content literacy and learning, and practice of lesson planning.

BaCuLit training for in-service teachers was designed according to the following principles: 1) teachers are given the opportunity to interact with each other to exchange and reflect on their own classroom experiences in their disciplinary subjects and on their teaching beliefs; 2) teachers are invited to practise new literacy-related teaching and learning strategies within the courses; and 3) teachers are offered guided support and feedback in adapting literacy practices for use in their own content-area classrooms.

BaCuLit training was further developed into a blended course in the project Developing a Blended Learning Course in Content Area Literacy for Secondary Teachers (Ble*Teach), which was funded by Erasmus+ from November 2015 to April 2018. This project involved partners in Belgium (French-speaking Community), Germany, Hungary, Portugal, Romania and Russia, and aimed to enable teachers of all school subjects to integrate disciplinary reading, writing and learning strategies into their daily classroom practice in order to make content learning in their students more effective (for an evaluation of BaCuLit, see Szabó & Steklács, 2013).

The disciplinary literacy approach connects literacy practices to disciplinary habits of mind and knowledge construction practices (Moje, 2015; Fang & Colosimo, 2023). Research has shown that disciplines differ in their aims, genres, semiotic resources, communication practices, standards of evidence and use of language (Shanahan & Shanahan, 2012; Fang & Colosimo, 2023). On the basis of a conceptual meta-analysis, Goldman et al. (2016)

define the discipline-specific core constructs that are critical to comprehending, construction and evaluating evidence-based arguments. These include epistemology (beliefs about the nature of knowledge), enquiry and reasoning practices, concepts and frameworks, types of texts and media, and language structures. While these core constructs are the same for each discipline, Goldman et al. (2016) show how they are realised differently in literature, science and history. For example, in science, the use of language is precise and typically includes nominalisations, passive voice and technical expressions. Historians, on the other hand, construct representations of the past that are the result of historians' interpretations of sources. The interpretative nature of knowledge is reflected in their use of language use to express the author's perspective, the certainty of arguments, and temporal and causal relationships. Such differences between disciplines mean that any teaching interventions and practices need to take into consideration any disciplinary cultures and epistemic knowledge, i.e. knowledge construction practices. Therefore, pedagogical models developed for disciplinary literacy teaching are often enquiry-based.

While the teaching of disciplinary literacy has a shorter tradition, research is now available on several types of interventions in many disciplines. This shows effects in terms of both the content and the epistemic knowledge of students. For example, Chen, Aguirre-Mendez and Terada (2020) studied an argumentative writing intervention in chemistry for college non-science majors. Their study showed that argumentative writing instruction improved students' conceptual knowledge (effect size 0.65), particularly for low-performing students (effect-size 0.78). Moreover, students' epistemic knowledge (measured in terms of writing quality) improved, too – although progress became slowly over the course of time. These gains were identified in pre- and post-tests and writing assignments, but also by students themselves. Moreover, 66 % of the students pointed out that argumentative writing also enhanced the critical thinking skills they needed in real-world situations. Conceptual performance was predicted by epistemic perspectives in the writing activities making visible the relationships between claims, evidence and the research question. The essential component for the intervention's success was the opportunities provided by argumentative writing to move between content and epistemic spaces – the different ways in which knowledge is constructed in a subject.

Bråten, Brante and Strømsø (2019) examined the effects of an intervention that focused on teaching students to take into account source information in research into socio-scientific topics involving multiple documents. The study was conducted in a Norwegian upper-secondary school, and included a six-week intervention that taught students how to carry out sourcing. The intervention featured contrasting cases in the context of regular content-area teaching. These were presented by the students' own teacher, who had been trained on how to implement the intervention. In the post-test, students were asked to use two texts to write a letter to the editor of a publication, and to justify their selection of texts. Several measures of reading comprehension, prior knowledge and interest were included in the intervention, as were delayed post-tests. The results showed that students who participated in the intervention generated more source-related justifications for their text selection than the control group (effect size 1.00). Moreover, they revisited the selected texts more often and took more time over reading them. In their writing, these students linked information from texts to the source information. The features of success identified in this intervention included a comprehensive approach to sourcing, which was

seen as a means to understand the text; the sustained duration of the intervention; and the approach of using contrasting cases, which gave students many opportunities to learn about sourcing. Moreover, for students' motivation it was considered important that the intervention was implemented by teachers and was meaningful in terms of academic success.

In contrast to these relatively long interventions, De La Paz, Wissinger, Gross and Butler (2022) examined a one-week intervention aimed at supporting students' contextualisation of historical sources in culturally diverse urban classrooms (Grades 10-12). The researchers compared the use of cognitive scaffolds (IREAD) in individual work against the same instruction without these scaffolds, using small-group and whole-class discussions. The results showed that after the one-week intervention, students who were taught using the cognitive approach scored more highly on historical writing (effect size 0.33) and employed greater contextualised thinking (effect size 0.44) and use of evidence (effect size 0.32) in their post-intervention essays. The authors concluded that providing students with cues, routines and strategies enables them to employ the higher-order strategies needed in close reading and the contextualisation of historical sources. Moreover, in some small-scale qualitative studies, enquiry-based approaches have also proven successful in disciplinary teaching. For example, enquiry-based learning implemented in the form of a one-week, hands-on history project in a Finnish upper-secondary school resulted in students' enhanced understanding of knowledge construction practices in history, and the interpretative nature of historical knowledge (Veijola et al., 2019). Erath et al. (2021), in their literature review on studies enhancing language in mathematics learning, also show evidence suggesting that enquiry-based teaching supports both the learning of deep mathematics and the disciplinary language of mathematics. All in all, disciplinary literacy teaching supports deep learning of content knowledge and epistemic knowledge.

5.1.2. Developing literacy in vocational education and training (VET)

The studies and initiatives presented above have been implemented in the context of general education. However, upper-secondary education also encompasses vocational education and training (VET), which in many European countries is an alternative track for general upper-secondary education. The share of students enrolled in VET programmes after compulsory education varies from 13 % in Malta and 33 % in Iceland, to 71 % in Finland and 73 % in Czechia (Salas-Velasco, 2023). In addition, the structures and aims of VET vary a great deal by country. Based on a cluster analysis of 18 European VET systems, Salas-Valesco (2023) classified them into five categories: 1) less vocationally oriented countries, with a low share of students in VET (e.g. Estonia, Sweden); 2) highly vocational-oriented countries, with school-based training (e.g. Czechia, Finland, Netherlands); 3) countries with school-based training combined with some apprenticeships (e.g. Norway, France); 4) countries with a hybrid-model including school- and work-based VET (e.g. Austria, Iceland, UK); and 5) countries with strong work-based VET (e.g. Denmark, Germany). Vocational training is typically oriented towards the labour market. This offers learners opportunities for learning towards a specific vocation, thus enhancing their employability. However, the European Commission also defines aims for VET that are more general, such as supporting learners' personal development and active citizenship. Moreover, the Council Recommendation on VET highlights the need for a balance of

vocational skills as well as the skills and key competences needed in constantly changing labour markets and for lifelong learning. The latter include solid basic skills such as literacy.

Providing general guidelines for developing literacy teaching in VET is challenging, as different VET systems may have differing structures and aims for education as well as for literacy. Nevertheless, there is a need to develop literacy teaching in VET, as many people who have completed initial vocational education and training still face challenges in terms of their reading skills (European Commission, 2024).

Even in school-based VET, literacy teaching most often has aims that focus on the vocation for which students are training. These may vary in terms of literacy requirements. Practically all vocations, including blue-collar work, such as on a construction site, may include complex work-context genres that vocational students need to learn (Karlsson, 2009; Parkinson, Demecheleer & Mackay, 2017). In this respect, the literacy practices of different vocations and professions are disciplinary, as they are negotiated by the vocational community and interlinked with their practical tasks (Moje, 2015). Indeed, vocational literacy is usually introduced in VET in the context of work activities (Parkinson & Mackay, 2016), i.e. in workplaces and work-based learning at school. In these contexts, vocational literacy is not always taught explicitly, but is learned in the context of practical tasks under the guidance of a vocational teacher or more experienced colleague, through a process of socialisation (Black & Yasukawa 2011). Interaction appears to play an essential role in the learning process (Parkinson & Mackay 2016), and learning requires not only the provision of learning in the work environment, but also active observation and engagement by the learner in the process. The true integration of workplace literacies with work tasks requires collaboration between the language teacher and the vocational teacher, who share an understanding, values and beliefs in the value of each other's content area (Casey et al. 2007). According to Black and Yasukawa (2011), such integration results in positive gains in terms of both literacy and vocational skills.

In many countries, VET also aims to develop students' general, non-vocational literacy skills. This is the case, for instance, in countries that have less vocationally oriented upper-secondary education, such as Estonia and Sweden (Salas-Valesco, 2023). Estonian school-based VET provides eligibility for higher education, and the majority of the content in the training is general rather than vocation-specific (Renold et al., 2016). In Finland, too, VET provides eligibility to higher education, and thus literacy teaching in VET is not limited to vocation-specific literacy practices, but also aims to provide academic literacy competencies that are adequate for higher education (Pietilä & Lappalainen, 2023). In classrooms in the vocational track, the aim is to integrate vocation-specific literacy practices into professional knowledge. Quite often, however, this is only realised in a limited sense, with the focus being mainly on workplace-related topics (Pietilä & Lappalainen, 2023).

Thus, with regard to literacy teaching in VET, issues apply that are similar to those involved in integrating literacy and disciplinary content within general education. Vocation-specific literacy practices are analogous to disciplinary literacies, and the teaching of general literacy skills presents similar issues to those of content-area literacy. Regardless of the structures and aims of VET in each European country, it is essential that students develop the literacy skills they need in their studies, future work and in other domains in life. This

requires the development of literacy teaching that takes into consideration the vocation-specific and situated nature of literacy. In VET, as in disciplinary literacy, every teacher is a literacy teacher; however, there is still progress to be made in ensuring that every VET teacher incorporates this understanding into their practice.

5.1.3. Developing adult literacy

The primary focus of this report is to support the teachers of school students. However, if the literacy-related goals of any education system are to enhance the human capital of the country while at the same time increasing GDP, it would be wise not to neglect the importance of adult literacy. As Thomas Sticht reported to UNESCO (1994):

Governments can expect multiple returns on investments in adult literacy education in at least five areas:

1. *Improved productivity at work, at home, and in the community, leading to higher tax bases for communities, decreased violence at home and in the community, and greater participation in citizenship activities by a larger segment of the adult population.*
2. *Improved self-confidence and other psychological and physiological aspects of health of adults, including activities that will help the brain grow throughout adulthood and contribute to reduced medical costs for adults as they age.*
3. *Improved health of adults' children due to learning in adult education programmes leading to better prenatal and postnatal care, and better home medical care, thereby contributing to lowered medical costs for children and fewer learning problems in school.*
4. *Improved social justice from providing literacy education for marginalised populations to permit them to acquire skills and knowledge needed to take political action that allows them to achieve their civil rights and to overcome social exclusion, and join in the mainstream of society.*
5. *Improved productivity in the schools, by providing adults with the knowledge they need to better prepare their children to enter school, help them achieve in school, encourage them to stay in school and increase their opportunities to enrol in higher education.*

Item 5 in the list above is especially important, because it confirms the effects that educating adults can have on the educational opportunities and achievements of their children. Over a quarter-century later, in 2023, a UNESCO report confirmed the foregoing and stated, "Research evidence indicates a strong association between parents' education levels and their children's level of literacy acquisition. Different studies have therefore stressed the importance of intergenerational approaches to literacy learning. The desire to help their children with school readiness and schoolwork often motivates parents to (re)engage in learning themselves." (Hanemann, 2023, p.12).

The European Framework of Key Competencies for Lifelong Learning (European Commission, 2018) highlights that literacy is needed for learning all domains of life, throughout the course of life. Since the textual landscape is constantly changing, literacy needs to be defined as an object of lifelong learning, too. Adults need to maintain and

develop their literacy to meet their personal and employment needs. Also, the European Skills Agenda (European Commission, n.d.) recognises the need for adult upskilling and reskilling in the changing labour market, and includes measures related to lifelong learning. Several Recommendations on adult learning by the Council of the European Union, supporting the Skills Agenda, refer to literacy and other basic competencies as the foundation for upskilling and reskilling. These Recommendations include, for example, the "Upskilling Pathways – New Opportunities for Adults" initiative, based on a 2016 Council Recommendation (European Union, 2016) that highlights offering low-skilled adults opportunities to acquire a minimum level of literacy, numeracy and digital competencies, among other measures. Overall, adult literacy is a theme that has a significant role in Europe for individuals and their learning, as well as for the geopolitical and economic development of the European Union (European Commission, 2020).

It noteworthy noting that on average, the literacy levels of older adults are poorer than those of younger adults. This results in part from their being educated in a very different textual world from that of younger adults. Indeed, it is hardly possible for initial formal education to meet an individual's changing literacy needs throughout the course of their life, since for many adults, formal education was completed several decades ago. Studies do show that lifelong learning plays a role in literacy development, and complements initial education. Lifelong learning typically includes various types of adult education and training (AET), which can be formal (leading to formal qualifications), non-formal (institution-based, but not leading to formal qualifications), or informal. In its many forms, adult education can help adults to maintain and develop their skills (OECD, 2013).

In its report, the European Union's High Level Group of Experts on literacy emphasised the need for high-quality AET when it summarised the features of successful literacy programmes:

- meeting learners' individual and varied needs;
- well-trained and committed teachers;
- developing and choosing materials and methods linked to real-life and everyday experiences;
- courses balancing adults' time constraints with the need for courses of adequate length and intensity;
- gathering evidence on the longitudinal effectiveness of training; and
- recognising non-formal and informal learning (Brooks et al., 2012).

The Expert Group also underlined the need to prioritise the selection of teachers and their training as part of adult literacy policy, since the professionalisation of infrastructure and the development of human resources for adult literacy provision was not adequately resourced in most countries.

Participation rates in formal and non-formal AET vary by country, but a good deal of variation also exists within countries. For example, the PIAAC results (the OECD survey of adult skills) showed that the Nordic countries of Denmark, Finland, Norway and Sweden, along with Netherlands, were the only five countries in which the overall participation rates in adult education exceeded 60 % (OECD, 2013). In all countries participating in PIAAC, adults with higher levels of proficiency are more active participants in adult education than

those with lower levels of proficiency (ibid., pp. 208-209; Sulkunen & Malin, 2014). However, this is not a causal relationship, but an association that is probably explained by the educational level of participants, among other factors. For example, in the Nordic countries, the higher the educational level, the higher the participation rate in AET on average, and particularly in non-formal AET (Sulkunen & Malin, 2014). To invite and motivate those adults who most need to develop their skills, outreach activities are necessary.

Adults also maintain and develop their literacy informally, engaging with literacy practices in or outside work. These practices are positively associated with literacy proficiency and contribute to the development of literacy. For example, a study examining the effects of informal literacy learning on adults' proficiency in literacy in the Nordic countries found that adults' opportunities for informal literacy learning vary according to their social conditions and individual experiences. It was found that informal literacy learning, particularly outside of work during leisure time, complements the effect that initial education has on literacy proficiency, but does not outweigh the impact of formal education or that of language background, occupation and age. However, it should be noted that cross-sectional and correlational studies do not reveal the direction of causality: while it is likely that literacy practices in and outside of work maintain and develop proficiency, it is also likely that those with high literacy proficiency find reading easy and enjoyable, and thus read more. The relationship between engagement in reading and literacy proficiency also applies to adults (Afflerbach & Harrison, 2017). In any case, it is necessary to support both a literate environment and literacy skills.

The EU High Level Group of Experts on Literacy (Brooks et al., 2012) pointed out that many adults with low levels of literacy do not recognise that they have a literacy issue, and if they do, they tend to avoid reading as they do not find it enjoyable. However, many adults exhibit diverse literacy practices in their everyday life (Garbe, Mallows & Valtin, 2016a). They engage with written texts in print and on screen at work and at home, dealing with government services and children's schools, etc. Such uses of written texts should be considered when creating a positive literate environment for adults. Indeed, we need to examine literacy practices in a way that is sufficiently broad, looking beyond generalisations that may not be productive in understanding adult literacy. For example, adult literacy surveys have shown that the role of literacy is pronounced in expert occupations (e.g. senior officials and managers) and to some extent in white-collar occupations (e.g. clerks and sales professionals), in which employees engage frequently in diverse reading and writing tasks. In contrast, literacy plays a minor role in blue-collar occupations represented as manual labour: such workers read and write less frequently, encounter less diverse materials at work, and show lower levels of average literacy proficiency than experts or white-collar workers (OECD, 2013; Buddeberg et al., 2020; Sulkunen et al., 2021). However, qualitative studies provide a more nuanced understanding by studying literacy as a social practice (Barton 2007). These studies show that even practical tasks in blue-collar work are mediated by diverse texts that are utilised for various functions (Belfiore, 2004; Karlsson, 2009; Gaskill, 2015). Also, when examining literacy in broad terms – namely, by including multimodal and multilingual aspects of meaning making – the understanding of adult literacy becomes even more nuanced (Bezemer & Kress, 2016).

The ELINET expert group identified three sub-groups of adults as being particularly important, and having a relatively high need to develop their literacy in the changing literacy environment (Garbe, Mallows & Valtin, 2016a, p. 19). These include young adults aged 16-24 years who are likely to continue their post-secondary education; the adults of working age (25-64 years); and the "post-retirement" population. Moreover, there is a need for many European countries to improve support for the language and literacy needs of adult migrants to enable their full integration into society and the labour market (ibid., p. 52). As with all adult learners, these needs vary a great deal, and this is especially pronounced in the case of adult migrants. Some of these individuals already have literacy skills in one or more languages, and have different needs from those who have few or no literacy skills in any languages.

The European Skills Agenda (European Commission, 2019) and many Council Recommendations supporting its implementation could and should include adult literacy provisions in Member States. As mentioned above, the new Upskilling Pathways programme for adults recommends offering opportunities to low-skilled adults to acquire a minimum level of literacy, numeracy and digital competencies, among other measures. In addition, individual learning accounts would be one way to offer all adults opportunities for labour market-relevant training, while micro-credentials can be used to certify the outcomes of small units of learning. All European countries should ensure that literacy is integrated into policies and reforms for lifelong or continuous learning, as well as into literacy policies such as national literacy strategies.

5.2. Developing critical digital literacy – at secondary level and beyond

The OECD publication *21st-Century Readers: Developing Literacy Skills in a Digital World* (OECD, 2021) emphasises the learning challenges faced by all young people:

> *Globalisation and digitalisation have connected people, cities, countries and continents in ways that vastly increase our individual and collective potential. But the same forces have also made the world more volatile, more complex, more uncertain and more ambiguous. In this world, education is no longer just about teaching students something but about helping them develop a reliable compass and the tools to navigate ambiguity*. (OECD, 2021, p. 3)

We would argue that the key competence – the "reliable compass" – that students need is critical digital literacy.

The challenge facing students in relation to critical digital literacy has been described in a number of ways. García-Quismondo, Parra-Valero and Martínez-Cardama (2024) led an EU Erasmus+ project to develop a European perspective on critical digital literacy. This offered an information science perspective, informed by a Delphi study of the views of European experts, who adopted this definition by consensus:

> *Critical information literacy refutes the neutrality of traditional information literacy and asks library educators and students to engage with the social and political dimensions of information, including its production, dissemination, and reception*. (García-Quismondo, Parra-Valero & Martínez-Cardama, S., 2024, p. 7).

They also listed the skills necessary to put this definition into practice:

> *Digital Literacy encompasses the cultivation of skills necessary for navigating, accessing, organizing, integrating, evaluating, analyzing, and synthesizing information disseminated in digital formats*. (ibid., p. 3).

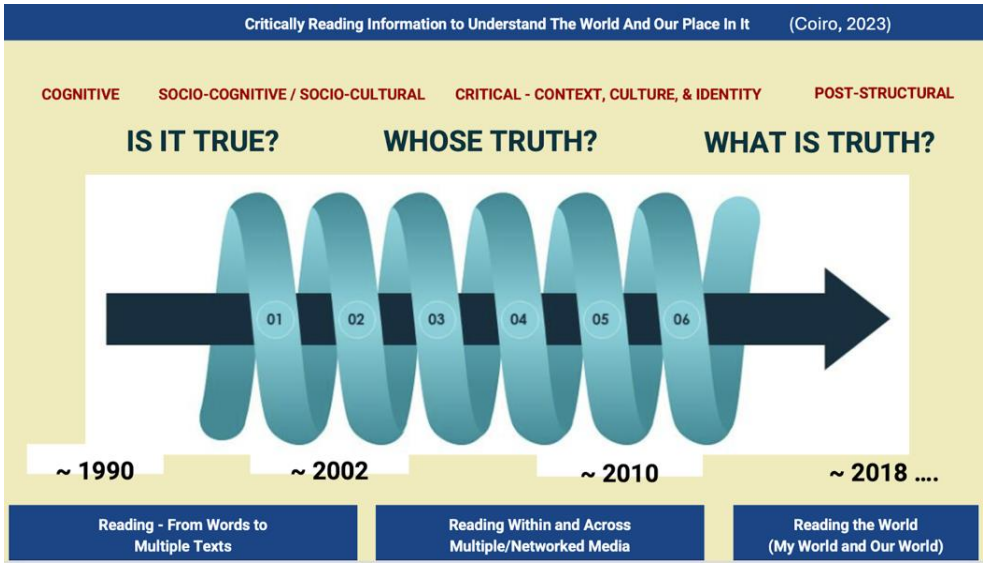
Lastly, a group of academics from Finland, the UK and Spain (Ilomäki et al., 2023) systematically reviewed the literature on critical digital literacy, and drew attention to its socio-political aspects:

> *In particular, the notion of critical literacy is seen to focus on how texts and the relationships they present and sustain, are shaped by power relationships, and how the production of new texts can constitute a means of generating oppositional discourses through repositioning misrepresented or under-represented social groups. This emphasises the adoption of a critical and questioning approach when engaging with texts, and advocates for a more nuanced understanding of the relationships between texts, representation, ideology and power*. (Ilomäki et al., 2023, p. 6).

Those advocating the importance of critical digital literacy argue that in important respects, education is about democracy: it is, in the broadest sense, a political activity. As García-Quismondo, Parra-Valero and Martínez-Cardama put it, information is not neutral. Inescapably, it appears within a context and with a purpose: to inform, or to misinform; to enlighten, or to mislead. On the internet, a site may claim impartiality, while in reality being sponsored by a hidden source – an advertiser, a political organisation, an unnamed country. Since the 19th century, teaching in Europe has been primarily didactic: the didactic teacher has clear learning objectives, and is the primary source of knowledge. He or she presents information, and is in charge of what and how the students learn. But this is changing, and the internet is a key driver of that change. Tim Berners-Lee set up the World Wide Web with the intention of creating a platform for the free and open worldwide exchange of information (Berners-Lee and Cailliau, 1990). He could hardly have predicted that it would become an ideological and political battleground, in which information provided by trustworthy sources had to compete for attention against social media that feed on dogmatism and amplify prejudice. Nearly 30 years after he invented the World Wide Web, Berners-Lee (2018) expressed alarm at three trends, all of which threaten not only the web, but humanity itself. These are the ubiquity of "fake news", the rise of personal surveillance over the internet, and cyber-warfare: attacks carried out by countries attempting to damage, corrupt or halt the internet activity of other countries.

As Figure 2 below from Julie Coiro (2023) shows, over the past 30 years, the internet has brought about a change in the epistemology of information, from being a source of "truth" to questioning the very nature of "truth". In the US, for example, more than half of adults now get their news from social media (Pew Research Center, 2024). They also choose the sources from which they get their news: if they are Republicans, 88 % get their news from Truth Social, a social media company set up by Donald Trump after he had been banned from Twitter and Facebook.

Figure 1. How the internet has rewritten the nature of "truth"



Source: Coiro, 2023.

In her review of research into how internet skills have been and should be evaluated in the future, Eden Litt (2013), who went on to become Director of Research at Meta (formerly Facebook), drew attention to a "second-level digital divide" between those who do or do not possess the "constantly redefined skill set" necessary to deal with the rapidly evolving interfaces and data structures that challenge the internet user. Harrison and Patterson (2023) are among many experts who have suggested that in these uncertain times, the way forward is to adopt a dialogic rather than a didactic strategy. Adapting the approach suggested by Dwyer (2013), they monitored the internet search skills of groups of 10 triads of ninth- and tenth-grade students, each of whom had a specific role (Manager, Navigator or Evaluator). The discourse responses of these students to research questions from science and the arts were classified into four groups:

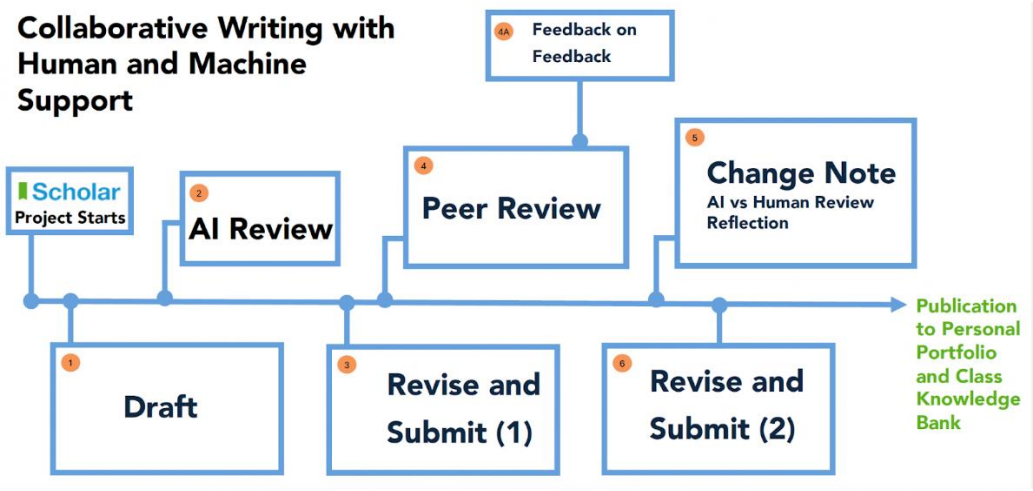
1. Ingenuous (naïve, unquestioning, point/click, selecting the first site offered)
2. Multimodal (recognising the need for information from additional sources/confirmatory information/fresh search terms/rechecking earlier results)
3. Circumspect (showing caution about a site, a source, or invited links)
4. Ambivalent (showing critical awareness of "truth", judging ideology, remaining doubtful when faced with conflicting results)

Their learning, and the search for an answer, was dialogic in the sense that the students collaborated to produce knowledge through talk: they not only critiqued the web sites that they visited in order to answer a research question, but they also used evidence and argument to challenge their classmates' views. In doing so, they modelled for their classmates how to engage in a deeper conversation with the texts they encountered. The Russian philosopher Bakhtin (1973; 1984) used the word "unfinalisable" to argue that in literature, "truth" is elusive; that there can never be a final answer to questions of meaning and interpretation. From a 21st-century dialogic perspective, the internet invites us to consider the possibility that the answer to a question is "unfinalisable". We do not wish to say that there are no certainties in the information universe; rather, that the internet

teaches us that we need to be aware that what we have hitherto regarded as "true" may be regarded by others as provisional.

Kalantzis and Cope (2020), in their book on multimodal online learning, identify a number of areas in which the notion of traditional teaching is replaced by a much more varied agenda. This includes collaborative intelligence, ubiquitous learning, differentiated learning and active knowledge making, rather than passive reception. The authors envisage artificial intelligence (AI) not as the enemy of education, but rather as a collaborator in the construction of knowledge. For example, Figure 3 below illustrates a much more collaborative and constructive model of writing than has been common in the past.

Figure 2. An AI-supported, peer-reviewed model of composition



Source: Kalantzis and Cope (2020).

What is particularly interesting about the model of composition in Figure 3 is the role of a student's (or scholar's) peers. The peer-review stage comes after the AI review. This gives the students' views greater status and emphasises the idea of knowledge creation being a collaborative process – one in which the voices of students are given significant weight. The teacher has created the context for learning, but the teacher's voice is only one among many (one could say "among billions") in the final production of knowledge.

Our understanding of how AI will transform education is still at an early stage. The instant AI feedback provided by programmes such as Microsoft's Reading Coach and Immersive Reader (Microsoft, 2024) have the potential to be extremely valuable for both the student and the teacher, especially since they provide instant translation for second-language learners. As Kalantzis and Cope (2020) point out, however, generative AI (at least at present) has a number of weaknesses:

- Sourcing: the machine buries its sources.
- Facts: the machine can have no notion of empirical truth.
- Theory: the machine can have no conception of a theoretical frame or disciplinary practice.
- Ethics: if the machine is socially well-mannered, it is not because it sources are well-mannered.

- Critical dialogue: to appear a good interlocutor, the machine is skewed towards being uncritically affirmative.

In fact, Kalantzis and Cope go further, pointing out that what we call "artificial intelligence" is not actually intelligence at all. Machines can "learn" in the sense of being able to copy and find patterns in language, but they cannot "understand". The brain is much more than a binary computer, and human understanding is based on a human being's social, emotional and contextual representations of the world. Critical digital literacy is something that computers do not have – and it is what enables the peer group to critique an essay that has been revised using AI.

After reviewing a number of studies that have shown that many students engage with multiple sources in a superficial and uncritical manner, and fail to see connections within and across different types of sources, Coiro et al. (2019) reported on a study in which 11 pairs of high-school students demonstrated (or failed to demonstrate) critical digital literacy skills, while engaging in collaborative enquiry based on a task involving the evaluation of multiple sources of information presented within a virtual world, culminating in a short oral presentation. Interestingly, the team had two treatment conditions: face-to-face and remote-online. One important outcome of this project was that the team identified 12 different sub-processes that exemplified collaborative enquiry. These included planning, evaluating sources, synthesising content, negotiating a joint understanding, and monitoring or repairing understanding. The report provided examples of weaker collaboration (a confident male dominates, asking no questions of his classmate, and essentially gives a monologic self-report of his thinking), and stronger collaboration (jointly searching for information, accepting the other's contributions, negotiating and then adding a new idea to their presentation). On the basis of these, the team formed some important conclusions:

- Most students have had little experience of collaborative enquiry, and may not understand how to carry it out successfully.
- Students in the remote-online version of the task found it even more difficult to collaborate.
- The team developed collaborative prompts to help the students work with each other (for example, "Talk with your partner about which of the search results would be most useful and why. Then, select one that you agree would be useful.") They felt that offering these would be valuable in future online enquiry projects.

Kiili and her colleagues have conducted a number of studies that addressed the important issue of how well students can evaluate multimodal texts. These texts involve the complex interweaving of visuals, sound, text and movement. For the present purposes, it is important to consider how students might be taught to evaluate multimodal texts, since evidence is emerging that for younger children, at least, videos can have a stronger influence on their beliefs than textual information (Salmerón et al., 2020). In one important study, Killi and her colleagues addressed the question of how we can evaluate the learning of students who are watching a video online. In this study (Kiili et al., 2021), 404 senior high-school students watched a video in Finnish with subtitles in English, and then answered questions on the topic of whether or not the vaccination of children should be obligatory. Interestingly, although the arguments in favour of obligatory vaccination were

all presented through speech, the students' evaluations focused on the visuals. Only a quarter of the students were able to provide clear reasons for their support for vaccination that were based on the two sets of arguments that were actually presented in the video. The researchers concluded that it would be very valuable to include into the curriculum instruction for students in relation to viewing, evaluating and creating their own videos, since interpreting videos is likely to be an important part of their future lives.

Kiili has worked with teachers on many online learning research projects, and has recently published a valuable paper on how we might support teachers who wish to increase the critical digital literacy skills of their students (Kiili & Kulju, 2024). This is presented below as a good practice example.

Box 18. Good practice example: empowering teachers to educate students in critical online reading

As a preamble, the paper sets out five key aims:

- To describe key features of critical online reading;
- To define teacher self-efficacy and its sources;
- To introduce design principles that support teachers' self-efficacy in educating students in critical online reading;
- To illustrate how these design principles were implemented in two teacher-education contexts; and
- To share teachers' experiences of courses that implement these design principles.

Kiili and Kulju make a number of very helpful points about critical online reading: it must involve provisionality – in other words, students must be prepared to search multiple sources, and to evaluate each for credibility and relevance. Readers must evaluate not only the sources, but also their provenance, and the reasons why this author published this page in this place, and at this time. Students must also be prepared to include mutually exclusive views in their summaries, if necessary. Evaluating the credibility of texts is a demanding and high-level comprehension skill, and Kiili and Kulju suggest that teachers, particularly in the case of younger learners, begin with simpler texts, and avoid making the children feel unsafe. They offer a four-tier set of approaches to assessing credibility:

i. Restricted tasks practising the evaluation of one aspect of credibility.
ii. Evaluating credibility using online texts designed for teaching purposes.
iii. Evaluating the credibility of authentic online texts selected by the teacher.
iv. Evaluating the credibility of self-selected online texts, and composing a synthesis based on multiple texts.

The authors' suggestions also include a very important observation concerning self-efficacy; namely that, while we often talk about improving the students' sense of self-efficacy, it is also necessary for the teacher to support their own self-efficacy – i.e. their feeling of confidence in being able to successfully manage their students' engagement and learning. This can be developed in a number of ways: watching another teacher; team-teaching with a colleague; discussing and collaborating on lesson planning; offering emotional support; and just having fun sometimes! These forms of support work best within a pedagogical framework that follows these design principles:

- ❖ Providing theoretical knowledge about critical online reading and why it should be taught;
- ❖ Modelling and sharing materials and practices;

- Supporting collaborative planning and experimentation in the classroom;
- Offering opportunities to provide and receive feedback; and
- Providing opportunities for systematic reflection on feedback.

Source: Kiili and Kulju, 2024.

In their paper, Kiili and Kulju share transcripts from both experienced teachers and pre-service teachers who had followed these principles. It is heartening to read how much the teachers' confidence, self-efficacy and lesson planning had improved. The researchers also wisely gave a pre-course and post-course self-efficacy questionnaire. This enabled the participants to see for themselves how much they had learned and how much their practice had changed. It was clear that applying these design principles was a promising practice to support teachers' self-efficacy.

Telling teachers to change is not a productive route to bringing about change in the classroom. But when change is introduced in a manner that supports collegial and collaborative approaches, underpinned by clear theorisation and organisation that enables deeper learning and engagement, change can be both deep and enduring.

5.3. Supporting the needs of struggling readers – at secondary level and beyond

The authors of the present report have all been primary or secondary teachers at earlier points in their careers. One of the authors recalled his first lesson in a new school with a class of 15-year-olds, many of whom were among the least able out of the 261 students in that year group. Gary was a fairly quiet boy, and a very slow writer. It was quite an achievement for him to write two lines in a 40-minute lesson, and he had a very clear opinion of his own ability. When the teacher went over to him, he was looking out of the window, but he turned his head round and faced his new teacher: "Don't try to teach us owt, sir. We're crap." Gary was not being intentionally rude or obstructive. But his words were a startling reminder to his teacher that Gary's view of himself as a reader, as a writer, and as a learner had been developed over nine years and were unlikely to change any time soon. We share this anecdote as a reminder to ourselves that to his teacher, Gary was not a "struggling reader"; he was a young person whose literacy experiences had been so negative and so damaging that he did not consider himself a reader at all. When we talk about "supporting the needs of struggling readers", the first question is not "Where did Gary go wrong?", but "Where did we go wrong?".

Because he was inexperienced, it was six months before Gary's teacher learned that Gary's dad was a blacksmith, and that Gary was a horse whisperer who was able to calm nearly any horse in the stable. Although Gary had a reading age of nine, he could read – and wanted to read – a book about blacksmithing that would have been challenging for someone with a reading age of 16. This book told of the arts of welding, tempering, forging and shoeing. Gary was also different from every other child in the class, each of whom had their own cocktail of abilities and needs. But once "Sir" tuned in to Gary's wavelength, a communication channel was opened: 18 months later, Gary managed to obtain a school-leaving qualification that matched at least a PISA level 2 in reading and writing.

The reason for sharing this anecdote is simple. It is to stress that supporting "struggling readers" who have already experienced nine years of failure is very different from helping a second-grade student who has not made a good start in learning to read, and whose major needs are greater phonological awareness and more contact with stories. The challenge that the young teacher faced with Gary is one that faces every teacher at secondary level. And although Gary was a unique individual, with his own personality and literacy history, his needs were not unique. His needs, and those of every "struggling reader" at secondary level, include the following:

- To build and increase self-esteem.
- To succeed, and to have that success celebrated.
- To have a teacher who believes that they can succeed.
- To engage in literacy tasks that are worthwhile and interesting.
- For the teacher to understand that no child lacks motivation – they just are not always motivated to do what the teacher asks them to do.
- Personalised learning, matched to the needs of the individual.
- To have short-term, achievable literacy goals, with rapid feedback.
- To feel that they are special.
- To have fun.

Hoover and Fabian's *Problem Solving: Struggling Readers* (2000) recounts a successful reading programme aimed at US students who had much in common with Gary. They lived in a district in which the students scored among the lowest in California on the state tests, and their programme was aimed specifically at older failing students, including many with disabilities. The key elements of their approach are presented below as a good practice example.

Box 19. Good practice example: Hoover and Fabian's *Problem Solving: Struggling Readers* (2000)

1. This programme aimed to provide reading materials that harmonised with the interests and culture of the students.

2. The teachers who would be working with these students were given special professional development to support this new challenge.

3. The school timetable was altered to give the students a full morning, five days a week, of literacy-related activities. The carefully structured programme included work on word recognition and phonics, primarily because the students' own language included many dialect forms that were in non-standard English, and they would ultimately be reading the much more formal and unfamiliar language of textbooks.

4. The focus was on themes and texts that included quotations from great writers, popular personalities, cultural history that was relevant to the lives and experience of the students, and songs and music that they valued.

5. There was an emphasis on reading and repetition, including songs, chants, rhymes and alliteration.

6. At the end of each session, there was usually a language or spelling game, often with students in small groups attempting to outperform their classmates.

7. There was an increasing shift in emphasis from the teacher to the class in reading aloud, to and with peers.

8. There was an emphasis on writing for a purpose. The students wrote letters to younger students two or more grades below their own, and in some cases visited those classes to help the youngsters learn to read.

Hoover and Fabian's project had many useful features, but did not provide any statistical evidence of impact. Another report that was also aimed at older students and which did provide such data was the evaluation of a programme called PHAST (Lovett et al., 2020). This had been adapted to be aimed specifically at adolescents with reading disabilities, and was delivered in schools in Toronto and Atlanta. Lovett and colleagues began their paper by making two very important points that echo many of those made already in this chapter:

- Any intervention aimed at older struggling readers needs to address the negative effects of earlier literacy-related experiences, and must target motivational change as well as cognitive change.
- Any intervention aimed at increasing reading fluency by targeting decoding and word recognition must simultaneously aim to improve text comprehension.

The PHAST programme contained some important student-focused elements that were explicitly aimed at increasing motivation: emphasising choice, enabling success, emphasising the importance of reading, and fostering collaboration among students. An important aspect of the intervention was the incorporation of elements of John Guthrie's CORI programme (Concept-Oriented Reading Instruction). This was a widely evaluated programme for developing both comprehension and engagement, which stressed building self-efficacy, motivation and comprehension (Guthrie, McRae, & Klauda, 2007). The PHAST programme included many lessons aimed at developing vocabulary, and the comprehension lessons also included reciprocal teaching. Classes were randomly assigned, with the control groups given the remedial support that the schools already had in place for weaker readers. The PHAST programme gave students between 100 and 125 hours of instruction, delivered by teachers who had received careful training in the programme. The researchers ensured that the students in the control group received the same amount of teacher time. Crucially, the PHAST teaching was given to small groups of no more than eight students, while the team also ensured the control group received similar amounts of small-group or individual teaching. The outcomes of the intervention were impressive: overall, the PHAST group (n = 433) significantly outperformed the control group (whose scores did improve over the testing period), with an effect size (Hedge's g) of 0.56 on word reading, 0.36 on comprehension, and 0.61 on the students' self-assessed sense of reading competence. Clearly, this was an expensive programme to implement – but the results were conclusive: intensive reading intervention in middle school can produce gains in multiple dimensions of reading skill and motivation, and can foster the continuing growth of higher-order reading skills.

Hundreds of studies have been carried out of small-scale interventions aimed at enhancing the sub-skills of reading at secondary level, such as fluency, word recognition, vocabulary

or metacognition. In this review, however, we have chosen to highlight more comprehensive programmes that have aimed to deliver improvements in literacy in relation to a number of areas simultaneously, the main ones being fluency, vocabulary, writing, comprehension, motivation, engagement, and self-efficacy. A very thorough review of international research into improving reading at secondary level was conducted by the Educational Endowment Foundation (EEF) in the UK, with support from researchers in the US and Belgium (Quigley & Coleman, 2019). The EEF is an independent organisation, funded by the government, with the explicit aim of improving the educational attainment of the poorest pupils.

The EEF review, *Improving Literacy in Secondary Schools: Guidance Report*, drew upon over 60 meta-analyses, and condensed these into a relatively brief but very detailed set of seven research-informed sets of literacy development practices. These are worth sharing as a good example of how to develop literacy at classroom, school and system level:

Box 20. Good practice example: *Improving Literacy in Secondary Schools*, Guidance Report

Each of the seven recommendations below is accompanied by four pointers towards implementation. Wherever these pointers use specialised language (such as vocabulary "tiers", these terms are fully explained, with classroom examples, in the online version).

1. Prioritise "disciplinary literacy" across the curriculum

• Literacy is key to learning across all subjects in secondary school, and is a strong predictor of outcomes in later life.
• Disciplinary literacy is an approach to improving literacy across the curriculum that emphasises the importance of subject-specific support.
• All teachers should be supported to understand how to teach students to read, write and communicate effectively in their subjects.
• School leaders can help teachers by ensuring that training in relation to literacy prioritises subject-specificity over general approaches.

2. Provide targeted vocabulary instruction in every subject

• Teachers in every subject should provide explicit vocabulary instruction to help students access and use academic language.
• Effective approaches, including those related to etymology and morphology, will help students to remember new words and to make connections between words.
• Teachers should prioritise teaching Tier 2 and 3 vocabulary, which students are unlikely to encounter in everyday speech.
• Teachers and subject leaders should consider which words and phrases to teach as part of curriculum planning.

3. Develop students' ability to read complex academic texts

• Training focused on teaching reading is likely to help secondary school teachers to teach their subject more effectively.
• To comprehend complex texts, students need to actively engage with what they are reading and to use their existing subject knowledge.

• Reading strategies, such as activating prior knowledge, prediction and questioning, can improve students' comprehension.
• Strategies can be introduced through modelling and group work, before support is gradually removed to promote independence.

4. Break down complex writing tasks

• Writing is challenging, and students in every subject will benefit from explicit instruction in how to improve.
• Teachers can break writing down into planning, monitoring and evaluation, and can support students by modelling each step.
• Targeted support should be provided to students who struggle to write fluently, as this may affect writing quality.
• Teachers can use a variety of approaches, including collaborative and paired writing, to motivate students to write.

5. Combine writing instruction with reading in every subject

• Combining reading activities with writing instruction is likely to improve students' skills in both, compared with a less balanced approach.
• Reading helps students to gain knowledge, which leads to better writing, while writing can deepen students' understanding of ideas.
• Students should be taught to recognise the features, aims and conventions of good writing within each subject.
• Teaching spelling, grammar and punctuation explicitly can improve students' writing, particularly when focused on meaning.

6. Provide opportunities for structured talk

• Talk matters: both in its own right, and because of its impact on other aspects of learning.
• High-quality talk is typically well structured and guided by teachers.
• Accountable talk is a useful framework to ensure talk is of high quality, and emphasises how talk can be subject-specific.
• Teachers can support students by modelling high-quality talk; for example, including key vocabulary and metacognitive reflection.

7. Provide high-quality literacy interventions for struggling students

• Schools should expect and proactively plan to support students with the weakest levels of literacy, particularly in Year 7 (i.e. those in their first year of secondary schooling in the UK).
• Developing a model of tiered support that increases in intensity in line with need is a promising approach.
• Assessment should be used to match students to appropriate types of intervention, and to monitor the impact of interventions.
• Creating a coordinated system of support is a significant challenge requiring both specialist input and whole-school leadership.

Source: Quigley & Coleman, 2019, pp. 4-5.

In later sections of the Guidance Report, advice is offered to senior school leaders, as are lesson plans and tips on how to implement these teaching strategies in the classroom. Specialist pedagogical vocabulary, such as "accountable talk" is clearly explained, and the

vocabulary of "tiers" is described, with examples. Although many of these examples are based on the English language, principles such as discussing the etymology or morphology of subject-specific vocabulary would be applicable to any language. Equally, nearly all of the comprehension strategies advocated, such as activating prior knowledge, prediction or generating questions, are not language-specific.

The Guidance Report also makes the important point that even the most promising intervention will fail if implementation is poor. Strong and supportive leadership and staff training are necessary to enable teachers in every subject to implement these approaches in every subject across the curriculum. The authors also mention that research has shown that, provided they have been well trained, teaching assistants can be as effective as teachers in supporting these initiatives. Lastly, Quigley and Coleman add that as well as putting in place appropriate and collegial professional development to train the staff involved, it is also necessary to monitor the delivery of the approach, and to consider how to sustain it over time.

In this section of the report, we have attempted to share a number of research-informed perspectives on how to best support struggling readers in the post-primary years. We have emphasised the role that every teacher must play in developing reading. We have also suggested that there are many strategies available that could help a frustrated subject specialist who leaves a classroom wanting to say, "How can I be expected to teach these children my subject? They can't even read!". The teacher might have had a happier experience if he or she had begun the lesson as follows: "I'm going to give each of you a sheet of paper with 20 words randomly arranged on it. These are all words you are going to meet this term. Put a ring round any word that you know and think you understand, and underline any word that you are pretty sure you don't yet understand, and we'll talk about them in a bit. When you've done that, discuss some of these words with your neighbour. By the way – don't worry: by the end of term, you will be ready to put a circle round every word."

The approaches outlined so far will give teachers many strategies for developing not just reading, but also engagement, motivation, oral language and writing. But researchers agree: in order to access the secondary curriculum, even hesitantly, a child needs to have a reading level that is at least that of the average 9-year-old. Any student beginning secondary education with a reading level below this requires specialist help, and this should be given without delay.

For those students that need this additional help, many of the interventions discussed in earlier sections, such as the PACT programme (Vaughn et al., 2017) or the York Reading for Meaning project (Clarke et al., 2014), could be adapted to suit an individual's needs. If it is clear that the student still has major problems with word recognition and decoding, then support involving the development of phonological awareness may still be relevant (see Section 4.3, Key Component 8), provided that the teacher makes sure to use activities involving rhyme, rhythm, listening and oral language that are culturally relevant and matched to the student's interests (for example, humorous limericks, raps, song lyrics, advertisements), rather than being borrowed from kindergarten materials.

In most cases, schools would expect such specialist help to be delivered by teacher who has received professional development in special needs. Commonly, such help might be given in 30-minute time slots, with the students withdrawn temporarily from the regular class, perhaps to be taught one-to-one or in a small group. Many schools have tried different options that avoid the disruption and possible stigma of leaving regular lessons, by providing extra sessions just before or immediately after school. As Quigley and Coleman (2019) point out, every underachieving student is different, and therefore careful assessment must be made, and a personalised catch-up programme tailored to the student's needs must be delivered – and delivered quickly – to avoid the risk of their falling further behind.

This chapter has challenged the notion that literacy in secondary school is solely the preserve of language teachers or literacy coordinators. The emphasis on disciplinary literacy makes clear that every teacher communicates their subject through academic language, and that reading, writing, speaking and listening are at the heart of every subject in secondary school.

Chapter 6. The cost-effectiveness of literacy development: what are the issues?

6.1. All estimates of the relationship between funding and literacy outcomes are subject to some degree of uncertainty

Research studies that evaluate the cost-effectiveness of literacy development fall into two broad categories. On the one hand, there are medium-scale, school- or classroom-level direct evaluations of the cost-effectiveness of literacy programmes or interventions. On the other hand, many large-scale, national- or international-level indirect analyses have attempted to look ahead and estimate the potential system-wide economic impact of literacy-related events or initiatives. In this chapter of the report, we review a number of important examples of both types of study.

Cost-effectiveness studies also vary in terms of the degree of confidence claimed by their authors. Hollands and her colleagues (2013, p. 13) adopted a cautious approach, and began what is in many ways an exemplary medium-scale direct evaluation report by comparing the cost effectiveness of seven literacy interventions with a caveat, noting that "few empirical studies have been conducted on the cost-effectiveness of literacy programs", and arguing that any meta-analysis of cost-effectiveness might be unsound for three reasons: first, because the populations studied will have been very different; second, because the literacy programmes under analysis may have had very different pedagogical goals; and third, because the outcome measures that are conflated in the meta-analysis may have been based on tests that measured very different aspects of literacy. At the more confident end of the cost-effectiveness continuum, the Europe-wide indirect study by Hanushek and Woessmann claimed that "an increase in student achievement of 25 PISA points across the EU would be expected to increase the present value of EU GDP by €71 trillion" (2020, p. 1). This is an extravagant claim, and one that is not easy for a non-specialist to evaluate in terms of its trustworthiness.

It is not relevant in this report to go into the statistical details of every study that is cited, but it is important for readers of this report to be aware that researchers who are calculating cost-effectiveness have to make dozens of decisions, every one of which is capable of altering the final outcome. As Simon's scholarly analysis of the many ways in which medium-level cost-effectiveness can be calculated makes clear (Simon, 2011), these decisions include the following:

- Was the cost of teacher time included, and if so, how?
- Was teacher training time costed?
- Were the costs of the educational facilities included?
- Were the costs of teaching materials included?
- Were computers used, and if so, were software costs included?
- If computers were used, were hardware costs included?
- Was class size data included in the calculation?
- Were assessment costs included in the calculation?
- How were the outcome measures across different studies standardised?
- How were effect sizes calculated?

- On what basis were any effect sizes that used different statistics conflated?

Many medium-level cost-effectiveness studies are based on meta-analyses that bring together data based on effect sizes, and these can be complex to evaluate. In single-case studies, an effect size in the range 0.2 is generally considered to be only "small", but an effect size of 0.2 may actually have been derived from reading test scores that have gone up from the 50th to the 75th percentile, which is quite substantial (Simon, 2011, p. 148). In this chapter, we cite only studies that in our view have provided a satisfactory and robust level of detail on how the data were gathered and analysed.

It is important to stress that system-level estimates of the cost-effectiveness of improved literacy make many assumptions about the factors that will ultimately determine their outcome. The equations that enabled Hanushek and Woessmann (2020) to claim that improved literacy, as measured by higher PISA scores, would bring EUR 71 trillion into the EU are calculated on the assumption that improved literacy will impact school attainment, which in turn will improve family well-being, which in turn will improve both the country's health and its workplace skills, and that these in turn will increase industrial productivity – all of which will ultimately contribute to a nation's GDP. There are no zero-sum gains here: the figure of EUR 71 trillion is based on the assumption that every country improves, and no country improves at the expense of another country.

If these dramatic claims appear a little speculative, Hanushek and Woessmann make three important points in defending their approach. First, they argue that their equations attempt to capture not just the impact of academic improvement: they aim higher, seeking to capture the increase in human and social capital that improvement in literacy brings. Second, they make it clear that their statistical and computational decisions have been overseen by senior PISA researchers. Third, they offer graduated assessments of the impact of literacy improvement; for example, including a more modest estimate of the benefit to the EU if every country were able to bring its students up to a Level 2 score in the PISA reading test. This third point is particularly relevant in the context of the present report, since PISA Level 2 is precisely the "baseline proficiency" level that the EU countries wish to set as a target for every student. Hanushek and Woessmann make two other interesting points: first, that any attempt to bring all students up to Level 2 would have spill-over effects that would improve the literacy achievement of many students who were already at Level 2 or higher; and second, that even if EU countries only achieved the much more modest goal of bringing all but the lowest 15 % of students up to Level 2, this would still yield a long-term economic gain of EUR 5 trillion to the EU's GDP.

In our view, estimating cost-effectiveness is an art as well as a science; in doing so, researchers must make many more decisions and assumptions than is the case with more simple "one-click" statistical methods. Inevitably, therefore, this results in less transparency and greater uncertainty in relation to exactly how a final outcome measure has been determined. Nevertheless, governments need data upon which to base difficult decisions, and many of those decisions are ultimately about the distribution of funds. What helps governments in making those decisions is not simply data on possible savings or benefits, but advice from experts on how confident one can be about the claims made. Thus, where possible, we try to provide such advice in the sections that follow.

6.2. What works - and can we afford it? Evaluation at programme level

Answering the question "What works?" is never straightforward. As Pellegrini and Vivanet (2021) pointed out in their review of how governments in Europe have implemented evidence-based policies, the answer to this question depends upon the context in which it is asked. A large proportion of cost-effectiveness evaluations are based on studies of schools in either the UK or the US, in which the language of instruction is English. Across Europe, however, there are 43 education systems – each of which has a unique organisational model, and there are 24 official languages. Pellegrini and Vivanet go on to cite a woeful series of evidence-based national policy decisions, from the introduction of new technology to reductions in class size, all of which seemed promising, but appeared to yield close to zero improvement after implementation. The key to using evidence of impact, they suggest, is therefore to better understand in what context(s) implementation was successful.

An example of a recent "What works?" research project that dealt successfully with some of the complexities highlighted by Pellegrini and Vivanet is the meta-analysis by Volodina et al. (2023). This looked at the relationship between a child's home learning environment and their subsequent language and social development. The study is exemplary in a number of respects. First, it brought together large data sets from three different countries (the UK, the US and Germany), involving a total of more than 32,000 infants. Second, great care was taken to ensure that the key variables, though complex (for example, children's socio-emotional skills), were measured using very similar items. Lastly, the study included many variables that are rarely captured, such as mother's age at childbirth, history of migration, maternal smoking during pregnancy, and maternal depressive feelings. These added important depth, and make this meta-analysis unique.

The results of the Volodina study are important in a number of respects, sometimes due to differences rather than similarities between countries. For example, we expect to find large differences between children's development when measured in relation to parental educational level: the children of highly educated parents are expected to score higher for both language and social development. In fact, this gap differs markedly in different countries: it was significantly higher in the US than in the UK or Germany. Equally, parental income was a much more significant factor in the US in predicting children's language and social development than was the case in the UK or Germany. One possible explanation for this is that in both the UK and Germany, ECEC initiatives in socially and economically disadvantaged areas have helped to mitigate some of the effects of social inequality. If this is indeed the explanation, it provides strong support for the expenditure that European governments have already made in providing pre-school opportunities in poorer areas.

One factor in the Volodina study that was found to contribute significantly to both children's language development and their social development in all three countries was parental engagement with their child in storybook reading, and in sharing songs, nursery rhymes and poems with them. This is an interesting and important finding: multiple research studies have demonstrated that pre-school storybook sharing is associated with more rapid literacy skill acquisition. Similarly, many studies have shown that poems, rhymes and songs develop phonological awareness, which also facilitates word-recognition processes. Meanwhile, Jerome Bruner (1986/2009) and many other psychologists with an interest in

child development have also argued that engaging with stories not only develops the creative imagination, it may also play a crucial role in helping children to understand emotions – their own, and those of others. The engagement of children with stories, and the shared conversations with their parents that follow, might well be an important factor in promoting their socio-emotional development. If this is the case, the cost-effectiveness of funding ECEC and pre-school initiatives becomes an even greater imperative. We would therefore argue that future evaluations of such programmes should not focus solely on literacy as an outcome, but should also focus on socialisation, ideally through carefully differentiated measures.

ECEC was a focus in the European Commission Expert Group's report on quality investment in education and training (EC, 2023). This was established with a mandate to identify education and training policies that have the strongest potential to boost education outcomes and inclusiveness, while increasing efficiency in public spending. The group's report focused on four areas: 1) teachers and trainers, 2) digital education, 3) management, infrastructure and learning environments, and 4) equity and inclusion. Within its section on equity and inclusion, the report evaluated research into the benefits of investment in ECEC. It concluded that the potential benefits were very large, since early investment in children increased not only cognitive skills but also socio-emotional skills, with additional "spillover" effects in relation to long-term outcomes such as earnings, health and lower crime rates. Echoing the findings of the Volodina et al. (2023) study, the experts also found evidence of spillover effects on society as a whole, suggesting greater stability within families, positive effects on parents' jobs and wages, and greater female participation in the labour force. The potential benefits for disadvantaged children were especially large, but the group also stressed that the quality of ECEC was crucial, as was addressing the issue of encouraging access to ECEC programmes by children from lower-SES populations. The report also noted that while there was clear evidence that attending ECEC was associated with higher scores on PISA, this relationship was much weaker when family background was taken into account, because the literacy level of children from higher-SES homes was already higher before they entered ECEC.

The European Commission Expert Group on investment in education reported on US literacy development programmes that targeted low-SES children, such as HeadStart and Abecedarian. These showed short-, medium- and long-term gains in cognition, social-emotional development, school progress, reduced antisocial behaviour, adult earnings, health (obesity or smoking behaviour) and even reduced crime (Fack et al., 2022, p. 105). The estimated returns on HeadStart programmes were between USD 7 and USD 12 for each USD 1 invested. The Abecedarian programme was more expensive, since it targeted infants from birth, but it nevertheless provided an estimated benefit of USD 2.5 for each dollar invested. The expert group expressed caution, however, noting that it is not easy to estimate the impact of scaling up a programme such as Acededarian, which was run with 120 families, to a nationwide offering. They also pointed out that the higher the SES of the child, the less impact the programme had on them. Overall, studies on universal ECEC have confirmed the strong benefits of providing access to ECEC to disadvantaged families. The group therefore concluded that more studies were needed on the cost-benefits of large-scale ECEC programmes in EU Member States.

Understandably, politicians want results from expenditure that show impact in the short term, or at least the medium term. However, the OECD is highly confident that putting significant funding into early childhood education is one of the most cost-effective tools for increasing literacy levels for all in the later stages of education. As *Education at a Glance 2024* emphasised:

> *Early childhood education is an important tool for reducing the impact of family background on educational opportunities, as it helps to close developmental gaps between children before they enter primary school. To ensure that all children attend pre-primary education, 10 out of 38 OECD countries have lowered the starting age of compulsory education within the last decade to include some or all pre-primary education, and it is now compulsory in 19 OECD countries. Moreover, governments are prioritising early childhood education in their budgets. Public expenditure on early childhood education measured as a share of gross domestic product (GDP) increased by 9% between 2015 and 2021, significantly more than for other levels of education.* (OECD, 2024, p. 20).

It is clear that there is strong empirical support for pre-school education as a concept. However, this still leaves open the question of how it should be delivered, and what approaches to pre-school provision are most cost-effective. This question was the focus of a detailed study in the US by Fillman (2020). Fillman gathered data on programme costs and student outcomes for four large-scale pre-school programmes: HeadStart, VPI (the state of Virginia's own pre-school programme), Title 1-Pre-K, and VPI-plus (the state of Virginia's pre-school programme explicitly targeting minorities). Evaluating these programmes was not a simple matter. Each programme contained elements of the following components:

- classroom-based or centre-based instructional programmes;
- home visiting programmes;
- extended day programmes in HeadStart or community-based childcare;
- professional development for early childhood professionals, including providers in non-school settings;
- support services, such as nutrition, vision, dental and counselling services;
- screening and diagnostic assessment;
- summer enrichment programmes for young children and their families;
- family literacy programmes; and
- parental involvement initiatives.

Fillman then collected data on the students' early pre-school performance at two points. His findings generated some interesting conclusions. First, all the programmes resulted in significant gains in pre-school literacy (alphabet knowledge, phonological awareness, etc.), but the differences between the four programmes were non-significant. However, there were differences in cost-effectiveness. The Title 1 programme was significantly less expensive per student than the other programmes (Title I Pre-K cost USD 12,543 per student; VPI+ cost USD 15,944). It is instructive to consider why the Title 1 programme appeared to be more efficient than the others. Examining the data in Fillman's study reveals that the other programmes required a higher level of certification from the teachers who delivered the programme, and this difference in salary cost will have been a

contributor to the "efficiency" of the Title 1 programme. Another of Fillman's tables indicates that the Title 1 pre-school programme in Virginia did not have a statutory limit on class size, whereas the other three programmes had a maximum class size of between 16 and 20. These figures add an interesting layer of detail to the notion of "cost-effectiveness". While the more expensive programme, VPI+, might initially appear to be less fiscally efficient, this programme explicitly targeted those students whose parents' annual income was low, and who were among the least likely to attend pre-school classes. Since all of the programmes demonstrated significant gains in the skills and knowledge needed for kindergarten, from the perspective of the population served, VPI+ might well be considered the most successful of the four.

Among the cost-effectiveness studies that focus on primary school rather than pre-school, research efforts have generally aimed to evaluate or compare programmes that target students who have been categorised in one way or another as "struggling readers". Hall and colleagues (2023), in a meta-analysis of 53 experimental studies, found overall a highly significant mean effect size of g=0.33:

- The effect size for interventions was greater for students aged 5-7 than for those aged 8-11 (i.e. it was more effective to deliver the intervention early).
- 'Dosage', i.e. the longer, more sustained interventions, increased effect size.
- Interventions (including those for older students) that included a component of teaching phonological awareness outperformed those that did not.
- One-on-one interventions did not differ in effect size from small-group interventions (i.e. it appeared more efficient to deliver interventions to small groups rather than to individuals).
- Multisensory interventions (such as writing in sand, or tracing letters in the air, which are explicitly mandated in some US states) had no additional impact on effect size.
- Teaching spelling in addition to teaching word reading added to an intervention's effect size.
- Teaching comprehension added to an intervention's effect size, but the effects were smaller than those for word-recognition instruction.

Hollands and her colleagues (2013) evaluated the published cost-effectiveness of what they termed seven "effective reading programmes". The study is an especially interesting one, in that the programmes evaluated range from kindergarten to third grade:

- Kindergarten: Kindergarten Peer-Assisted Learning Strategies (K-PALS), Stepping Stones to Literacy (Stepping Stones), and Sound Partners
- First grade: Fast ForWord Reading 1 (FFW1) and Reading Recovery
- Third grade: Corrective Reading and the Wilson Reading System

K-PALS is not a remedial programme, and the other six, while all aiming to help poor readers improve, have different pedagogical goals. Nevertheless, since all interventions may have unintended "spinoff" outcomes, a cost-effectiveness analysis of outcomes that included not only word-recognition, but also fluency and comprehension, offered a valuable perspective. The Hollands study was thorough, and found ways of including in its analysis the teacher cost per student, as well as the professional experience of the teachers, the

time needed to train the teachers who delivered a specific programme, the time devoted to teaching, and facilities costs. Furthermore, rather than simply looking at effect size as an outcome measure, the team produced a statistic that estimated the standardised cost of producing a fixed amount of effect size (thereby resulting in lower cost per student for programmes that showed larger gains in effect size). The following were some of the project's key findings:

- Evaluations that use measures of impact on literacy developed by the programme's authors tend to show far higher effect sizes than those obtained through independent tests; for this reason, the team were cautious about the gains claimed for K-PALS and Reading Recovery
- A detailed analysis of cost per unit increase in effect size on two programmes, Corrective Reading and Wilson Reading System, showed significantly higher gains in favour of the Wilson Reading System in relation to the teaching of "alphabetics" - i.e. word recognition, phonological awareness, letter identification, print awareness and phonics. Corrective Reading cost USD 35,000 per standard deviation, compared with Wilson's cost of USD 13,000 for the same amount of gain.
- Statistically, it is difficult to combine results across multiple domains (for example, alphabetics, fluency and comprehension) for the purposes of estimating a single summary of a programme's cost-effectiveness
- Different implementations of the same programme can use varying amounts of resources, which in turn results in varying costs. One programme, READ 180, which was intended to be implemented uniformly across sites, actually varied in terms of implementation costs from USD 285 to USD 1,514 per student, due to differences in group size and programme delivery hours.

There have been a number of cost-effectiveness studies of Reading Recovery (Clay, 2022). It is important to review these in the present report, firstly because it is one of the most widely used approaches to support struggling readers in primary schools in the English-speaking world, and secondly because the programme can be used in any language, and might therefore be a useful one to consider in many European countries. Briefly, Reading Recovery is a one-to-one programme of daily 30-minute lessons aimed at helping children to catch up when they have not made a good start in learning to read. The teacher delivering Reading Recovery matches her or his approach to the child's interests, combining reading and writing, building the child's confidence, and increasing familiarity with a range of books and stories, with the goal of putting the student back into regular grade-level lessons after 12-20 weeks. Reading Recovery teachers receive specialised training, and the costs of this are always included in any cost analysis.

Cost-effectiveness studies of Reading Recovery began to be published in the 1990s. Broadly speaking, they reported that the programme was effective, but questioned whether its one-to-one teaching was cost-effective. Allington and Walmsley evaluated the data available at that point and concluded that "the more expensive RR programme provides the best evidence of long-term success for the largest population of at-risk students served" (1995, p. 262). Shanahan and Barr (1995) disagreed. Although confirming that students in Reading Recovery programmes made greater than expected gains in reading, with effects comparable to those accomplished by the most effective educational interventions, they nevertheless suggested that the programme was less

effective and more costly than its proponents claimed. They pointed out that estimating the cost-effectiveness of Reading Recovery was not easy: to the teacher costs, it was also necessary to add the costs of the Teacher Leader who delivered the training.

It was also extremely difficult to estimate the long-term impact of programmes such as Reading Recovery, and the savings in educational costs if the child did not need additional instructional interventions at a later time. Even if the programme had been successful in helping a child to improve up to the average literacy level for his or her grade level, it is entirely possible that factors relating to the child's environment and parental support might have made it much more difficult to maintain grade-level achievement in the long term. Shanahan and Barr ended their report with some important conclusions:

- Reading Recovery does "work" – many children leave the programme with well-developed literacy skills and knowledge.
- Not every low-achieving Reading Recovery student succeeded, and supplementary services need to be in place to support these students.
- Reading Recovery does not work well with students in first grade: second grade (age 6 or 7) appears to be the optimal time for this approach.
- Carrying out Reading Recovery in small groups drastically improves its cost-effectiveness, and has been relatively successful, albeit not as successful as one-on-one teaching.

In the UK, the evaluation of the "Every Child a Reader" (ECaR) programme (Tanner et al., 2011) reported the impact and cost-effectiveness of a nationally-funded intervention that supported three phases or "waves" of activity: these were 1) a nationally-mandated programme of class teaching for every child entering school (in England, these would be children aged 4) that prioritised the teaching of word recognition and language comprehension, and included "systematic phonics"; 2) a small-group literacy support intervention for 5-year-old children who needed extra help to enable them to catch up with their peers; and 3) a more intensified 20-week programme based on Reading Recovery, aimed at the lowest-achieving 5 % of children aged 5 or 6. The evaluators reported that after two years of implementation, the number of children who achieved the expected level (Level 1) in reading and writing nationally had improved by between 2 and 6 percentage points, and the number of students in the Reading Recovery programme gaining Level 1 had increased by 26 percentage points. However, training Teacher Leaders who would then train Reading Recovery teachers was a massive logistical challenge, and the programme was most successful when local education officials, headteachers, senior managers and staff in individual schools were all aware of the nature and demands of Reading Recovery. The researchers concluded that the ECaR programme was very successful overall, and that it was also cost-effective.

Estimates of the cost-effectiveness of ECaR were calculated from data on actual expenditure under 19 separate headings from 414 schools. These estimates included the additional teacher training needed for Reading Recovery, as well as the one-on-one teacher time. The cost-benefit per pupil was estimated as being in the region of GBP 5.60 per GBP 1 in the short term, and GBP 6.70 per GBP 1 in the long term, with the benefits being based on estimated expenditure that would have been incurred in special needs provision had ECaR not been in place. The researchers made some estimates of life-long benefits

related to health and income. These gains were modest (for example, only GBP 6,000 over a lifetime), but the evaluators also made two other important points: first, that the impact of ECaR might "depreciate" over time, and second, that longer-term evaluations should be undertaken to gain accurate data on sustained impact.

The complex challenges that face researchers seeking to evaluate the cost-effectiveness of interventions to develop literacy are even greater when the focus moves to the area of digital support. In evaluating the impact of classroom- and teacher-based programmes, estimates can be made of the cost of any materials, of teacher contact time and student learning time. As technology has become more sophisticated, however, students in many schools may now have access to learning through a desktop computer in the classroom, or to a tablet computer that can be taken home and used at any time or co-used with another student or parent. Alternatively, they may have access to a learning system that is accessible through their smartphone, or to YouTube videos providing prompts and learning tips created by their teacher. Equally, the development costs of software that is used to support literacy development are difficult to estimate, or to include.

As we have already noted in this report, there is clear research evidence that children are spending less time reading books, and that they read less deeply on a device than from a printed book. However, new personalisable software, together with increased teacher awareness about how children can become the architects of their own learning environment, are starting to change the nature of education for many children. Many of these changes are happening so rapidly that we have yet to see peer-reviewed studies of their effects. In the UK, for example, following the Conservative government's strategy of giving groups of schools the autonomy to establish their own financial and pedagogical strategies, schools are forming clusters that conduct their own research, and publishing the results online with 5-minute professional-quality level video reports from teachers and students on how new technologies have transformed their classrooms. For schools that are aiming at technology innovation, online videos showing other teachers how new technologies have transformed their practice are much more important than peer-reviewed estimates of cost-effectiveness. Such dissemination practices might also influence governments more directly than journal articles.

One example of such a research cluster comes from the LEO Academy Trust, a group of nine primary schools in south London that brought in a 1:1 Chromebook approach for the 5,000 students, starting in 2020. What the schools' own evaluations attempt to demonstrate is that the Chromebooks, running two related suites of programmes, Read&Write and OrbitNote, have transformed learning by giving every child the opportunity to develop their own learning and literacy in ways that are powerful, inclusive and individualised. These programs enable the child to select and personalise their learning, in particular their literacy learning, drawing upon an array of possibilities that would have been impossible even five years ago. These include voice-to-text, text-to-speech, a built-in dictionary, a built-in picture dictionary, the ability to increase the size or change the colour or typeface of text, instant translation into any of Google's 200+ languages, a screen-masker that highlights a rectangle of the screen to facilitate the reading of dense texts that might otherwise intimidate the young reader, tools for annotation, and voice notes (for themselves, or to or from the teacher). If the child leaves their Chromebook at school, all of their work and all of the toolkit is available on a Mac or PC, and can be viewed

by them or their teacher any time, anywhere. The Chromebooks also support collaborative learning, and this enables collaborative composition with classmates or others in another school on text presentations, slide presentations or mixed-media productions. The Trust's original aim in buying Read&Write and OrbitNote software was to support students with special needs. However, now that the Chromebooks and software have been rolled out to every student, the schools' evaluations suggest that it is now impossible for any visitor to spot a child with special needs in the classroom, since every child is reading, writing and learning using the tools they require, as necessary. The Trust commissioned its own independent impact study (Aubrey-Smith, 2023), which reported on the impact of the initiative, and provided at least partial information on its cost-effectiveness.

First, Aubrey-Smith reported that there had been an increase in school attendance, compared with a decrease nationally in the UK following the COVID-19-related closures. Across the nine LEO schools, unauthorised absences fell in the year following the pandemic from 16 % to 9 %. The report attributed this to two factors. The first was the continuity of teaching during the pandemic, which enabled every child to continue learning using their Chromebook at home. The second was students' high level of engagement with their learning that the Chromebook provided. In focus groups and classroom observations, many children – particularly those with special needs – regularly said that they enjoyed learning and did not want to miss school. The report noted that a terminally ill child, and another child who had to travel to India for three weeks, were both able to continue to feel part of their class by joining in lessons through Google Meet. Literacy-related impact factors included several that one would not expect to see in primary school. For example, by the end of Year 6 (age 11 in the UK), the average child had a typing speed of 33 words per minute, which freed up more time for editing and revision.

The research team compared the children's activity during Chromebook lessons with the activity in paper-based lessons, which might include handwriting, cutting out and pasting, and calculated that in the digital lessons, 25 % more time was devoted cognitive and metacognitive tasks (such as planning, discussion), and there were hardly any disruptive behaviours. The evaluation reported that across the nine schools, 36 % of students had a home language that was not English. These children enormously valued the opportunity to access translations of unfamiliar concepts and vocabulary into their home languages, and to demonstrate their understanding in English. Those who might expect the youngest children (those aged 4 or 5) to find it difficult to manage lessons based on their Chromebook might be surprised to learn that 98 % of the Reception (age 4-5) and Key Stage 1 (age 5-7) children surveyed said that using Chromebooks meant they could manage their own learning independently. Instant feedback was also a much-valued feature, and included on-screen teacher video tips.

One aspect of the Read&Write software that all children made use of was the text-to-speech feature. The evaluating team were not reading specialists, and were unsure how to respond to the concerns of some teachers that the regular use of this tool might deskill some readers. In fact, the opposite is likely to be the case. As Rasinski has argued (Rasinski, Rupley, Paige & Young, 2021), reading while listening is a valuable tool for enhancing comprehension (because less of the cognitive capacity is devoted to word recognition), and it also contributes to building vocabulary and improving spelling. Furthermore, the research team timed the students' use of the dictionary tool, and found

that on average it took these primary school students only 8 seconds to look up a word that they wanted defined, compared with 51 seconds using a physical dictionary or thesaurus, even if this was on their desk.

In estimating the cost-effectiveness of the schools' approach, the research team shone attention on some variables that tend not to be addressed in evaluation studies. One of these was the number of exercise books used, which went from 17 per student each year to 6, saving GBP 24 per child over the duration of their time in primary school, and GBP 97,000 across the nine schools. Similarly, if the schools had continued to produce paper worksheets for students at the previous rate, this would have amounted to approximately 1,000 worksheets per student over the school year, with a photocopying cost of GBP 78 per student. This equates to 50 % of the cost of the Chromebooks, not to mention the environmental costs of the paper. Each Chromebook cost GBP 144 per year per student, which included a headset, charger and case (the evaluation does not make clear whether server and data storage costs are included in this figure). The team also calculated the staff time saved because teachers were not spending hours standing at the photocopier, and found it to be approximately GBP 30,000 per school. The costs also included savings related to the shared curriculum materials that were prepared by subject specialist teams but then shared between all nine schools at no cost, which had the additional benefit of spreading models of good practice among junior staff. Calculating teacher time at the average rate of primary school teachers' pay of GBP 18.21 per hour, if the lesson preparation time saved is one hour per day across the other eight schools, over the 190 days of the school year this saving would equate to GBP 28,000 in teacher time. Overall, the evaluation judged the implementation of digital support for learning to be both cost-effective and outstandingly successful in transforming learning and improving academic achievement, at levels far beyond national averages (Aubrey-Smith, 2023).

One reason for discussing the LEO report in depth is that many of the features evaluated are generic, and will be applicable to schools across Europe, with similar software products being available in many countries. The EU-funded ELINET project (Garbe, Mallows & Valtin, 2016) produced more than 150 reviews of literacy development initiatives from 20 countries, but most of these were single-language projects. More recently (ELINET, 2022), the group evaluated research on digital applications for developing literacy at pre-school and primary level, and shared links to 16 short reports from Croatia, Greece, the UK, the Netherlands, Austria, Finland, Portugal, Germany and Spain. Nearly all of the programmes evaluated worked only in the language of the country, though some also worked in English.

Overall, the cost-effectiveness studies reviewed in this section suggest three policy implications:

- Investment in pre-school education can bring highly significant cost-effectiveness gains.
- Investment in remedial programmes for those children who have not made a good start in literacy is also very cost-effective, and the earlier it is implemented, the greater the benefit.
- Investment in new technologies, particularly with 1:1 student-device ratios, can be remarkably cost-effective in enhancing both literacy and learning, but takes perhaps

two years to become fully embedded in a school or school system, since the professional role of the teacher needs to change dramatically.

6.3. The economics of literacy development at system level: from the cradle to the workplace.

Hanushek and Woessmann (2020) claimed that an increase in literacy scores of 25 on PISA reading tests in every European country would bring EUR 71 trillion into the EU's GDP, and that even if EU countries only achieved the much more modest goal of bringing all but the lowest 15 % of students up to Level 2, this would still yield a long-term economic gain of EUR 5 trillion for EU GDP.

As we consider the potential benefits to the economy that can be by-products of literacy initiatives, it is important to take stock of the negative economic impact that the COVID-19 outbreak has had, not only on the GDP of European countries, but on the tens of millions of young people whose schooling was significantly (and in some cases, irreversibly) damaged. In their telling analysis of the effect of COVID-19 on the EU economy, Koehler, Psacharopoulos and Van der Graaf (2022) point out that there have been well-documented analyses for decades demonstrating that school closures have been associated with a reduction in GDP, but also that the short- and long-term impacts on a student's performance are at least partially determined by his or her socio-economic background. School closures have effects on human capital over a lifetime, with a learning loss that becomes an earnings loss compared with higher-SES individuals, and this disparity continues to increase over the whole of an adult's life. The global losses associated with school closures are great. Using the calculations made by Hanushek and Woessmann (2020), the authors quote anticipated losses related to the COVID outbreak of between USD 4 trillion and USD 9 trillion for European countries, with losses in lifetime earnings of between USD 20,000 and USD 50,000 per person, and with vulnerable populations bearing disproportionately higher losses.

The damage to educational opportunity caused by the pandemic is also likely to affect the social mobility of disadvantaged children: their chances of social mobility will decline, which in turn may impact the educational and professional outcomes of their children, continuing the intergenerational cycle of low achievement. The inequality gap will surely increase, as the children of the better off will have suffered less as a result of learning disruptions. Koehler, Psacharopoulos and Van der Graaf argue that the damaging outcomes of the pandemic for millions of children, many of whom will not be leaving school until 2035, are too important to be ignored. They also point out the sobering fact that long-term effects are sometimes disregarded by politicians, who are more concerned with short-term expediency.

On a more positive note, Koehler, Psacharopoulos and Van der Graaf (2022) point to mitigation strategies that can be enacted to create a less unequal society, all of which require system-level action:

- Governments should enact policies designed to remove barriers that prevent migrants and other disadvantaged learners from achieving equal opportunities, both at the level of education and within society as a whole (as Portugal did in 2020).

- Structures must be created to enable access to online and distance learning for all learners, including migrants and refugees, and their parents (in Estonia, a nationwide system of e-learning platforms, as well as the development of e-learning materials and of teachers' digital skills, helped to enable a smooth transition to digital education during the pandemic).
- The application of individualised learning plans should be mainstreamed and expanded, and should cater to the needs of non-native speakers (Luxembourg has set up online and offline multi-language learning content, aimed at children of all ages).
- Parental support programmes should be extended, but with the understanding that low-SES or migrant parents do not lack willingness to support their children's education, but rather that their employment roles and lack of positive experiences with school are obstacles to be overcome.
- Governments should work to extend parent partnerships with health, education, community organisations and industry, exploring new approaches to communication and engagement.

Lastly, but no less importantly, Koehler, Psacharopoulos and Van der Graaf stress the importance for governments to review current lifelong learning and adult learning strategies. In particular, they should:

- Identify the main areas in which disadvantaged children are most likely to lag behind later in life as a result of their lower educational achievements. These areas may differ between countries.
- Strengthen lifelong learning and adult learning provision to address these gaps over the coming decades.
- Develop joint strategies with educators, businesses and vocational training providers to facilitate the transition to tertiary education for those young people who have been affected by interruptions in education due to school closures.

This review of research into the cost-effectiveness of interventions to enhance literacy levels at the school strongly supports such investments. Many of the estimates of cost effectiveness discussed above make the assumption that improving literacy at pre-school and in the early primary years will save what would have been a great deal of additional expenditure on remedial education at a later point. The emphasis on personalised learning is also important: if students are able to receive education that is matched more closely to their learning needs, this will result in more efficient use of teacher time. It seems likely that education across Europe is on the cusp of a significant transformation, since digitally supported learning may be an increasingly important mechanism for delivering such personalisation. If this is to happen, however, these new technologies and new pedagogies will need to be mediated by teachers who have been given a great deal of support as they navigate towards a new understanding of their roles. Plans for the future must therefore allow for significant costs related to their further professional development.

Chapter 7. Recommendations for success in literacy

7.1. Literacy development during a time of crisis: what have we learned?

The COVID-19 pandemic affected the learning of 1.6 billion children in 190 countries across the world. The abrupt and unplanned shift to online schooling had a negative impact on student learning and achievement, with the greatest challenges being experienced by the most vulnerable learners. In the 21 European countries to whom this report is primarily addressed, schools were fully closed for 14 weeks and partially closed for 21 weeks on average. It is widely acknowledged that the school closures induced by the pandemic led to considerable learning loss, which will have a negative impact on meeting the European Commission's target of decreasing the proportion of low-achieving 15-year-olds to 15 % by 2030. De Witte and François (2022) found that, while there was considerable variation across countries, European students on average lost more than 30 % of a year's worth of school progress due to physical school closures during the pandemic. The education systems of every European country will be dealing with the outcomes of these closures for the next two decades, because there are children not yet in school whose life-chances will have been diminished by COVID-19. Given this context, it is even more vital for governments to recognise that their education systems can make a massive contribution to reducing the negative impacts that will continue to affect their schools by implementing these recommendations, every one of which is the result of research-informed analysis.

Schools and school systems need to have infrastructures that are flexible and able to support distance learning in times of crisis, with resources and policies that ensure that that learners from immigrant and more disadvantaged communities do not fall further behind in learning.

Recommendation 1: Given the challenges to education systems of a volatile, uncertain, complex and ambiguous digital world, governments must stand ready to adapt their policies and practices to sudden and often drastic changes.

Recommendation 2: Governments must support educational institutions by upgrading their digital systems to better support both schools and their students, both in school and at home. Particular attention should be given to schools in economically and socially disadvantaged areas, since we know that during the pandemic, both students and schools in those areas were far less likely to have access to digital devices and broadband internet to support online learning.

Recommendation 3: Following the COVID-19 pandemic, many schools implemented laudable policies to compensate the learning of disadvantaged students. Such programmes (including summer schools and tutoring programmes) should be continued and extended up to the end of formal schooling, in order to help reduce inequities that might otherwise impact both higher education opportunities and lifetime human capital.

Recommendation 4: Personalisation of learning is increasing, and new technologies are supporting this augmentation of the pedagogic repertoire. Personalisation should be welcomed, planned for and extended, since it can lead to increased student engagement,

more efficient teaching, more rapid feedback for students, and enhanced learning outcomes, not least in the field of literacy development.

Recommendation 5: Schools that responded well to the challenges of school closure put in place measures that mitigated many of the negative effects of closure and the unanticipated switch to remote learning. Schools – and school systems – should therefore learn from these understandings and adapt them within their own contexts:

- Establishing a network for teachers to share good pedagogical practice can be invaluable – in a crisis, it can enable teachers to improve their knowledge, develop new skills and feel less alone.
- Schools that were able to communicate across a single digital environment or platform were better able to organise, share good practices and work across the curriculum.
- Face-to-face teaching can work with a large group, but online, digital learning appears to work better with small groups in which the teacher is better able to monitor attention, participation and student understanding.
- Some children may even work better with remote learning (for example, many introverts, those who are easily distracted, even some ADHD students), but nearly all students learn less if they do not receive feedback on their learning from either the teacher, one of their peers, or the computer.
- All teachers need help in setting up remote learning opportunities: producing and sharing content, encouraging motivation and enhancing students' self-efficacy, as well as managing their own time and the time of their students.
- The social and emotional aspects of online learning are vitally important, and these work differently online compared with the classroom; teachers require support in learning how to manage these.
- The computer can be a very valuable ally in managing student assessment and feedback, but again, teachers need support in learning how to make best use of the tools available.

7.2. Facing the challenge of a declining interest in reading

The gender gap in reading is decreasing (OECD, 2023), but this is hardly good news. Across the EU, the number of boys failing to gain a Level 2 in reading in 2022 was 31 % - an increase of 3 % since 2018. Meanwhile, the number of girls failing to gain a Level 2 in reading was 22 %, an increase of 4 % since 2018. Far from providing a boost to students' reading at home, the lockdown seems to have resulted in many students, including girls, reading hardly any books at all. This is potentially an extremely troubling state of affairs, since we know that reading books is a key element in a virtuous circle of learning: children who read books gain in vocabulary, world knowledge, academic attainment, and also very importantly, in socio-emotional learning. They also derive enjoyment from books, and this sends them back to read more. By contrast, those who do not read come to find that when they try to read, they experience it as a chore. Furthermore, while we know that many children now spend hours every day playing digital games or watching the infinitely scrollable set of videos on TikTok, and that often they do so in the company of online school friends, we also know from research that both young and older students read the same

content less deeply online than is the case when the content is presented in a printed book.

Again, we know from research that after the age of around 8 or 9, the major determinant of vocabulary development is not schooling, but children's free reading. Such reading, of course, also enhances children's writing, as they encounter new grammatical structures and text structures, and reading also improves their spelling. Teachers therefore face two great challenges: one is teaching children to read; the other is encouraging them to continue to read.

A number of our recommendations are relevant here, but especially Recommendations 2, 3, 4, 6, 7, 8, 9, 11 and 12.

7.3. Teaching children to read

The primary focus of this report has been on what teachers, and those who support them, need to know about how to teach reading, how to encourage lifetime reading, and how to help those who did not make a good start in learning to read. Fortunately, research has given us a great deal of valuable knowledge about how to deal with these challenges. This report is not a book on parenting, but given that what happens in a child's development during their first years of life massively impacts their subsequent ability to learn to read, it would be negligent not to point out the implications of this for governments, educational leaders and, of course, parents. Recommendations 6, 7, 8, 9 and 10 all concern early reading development, and relate particularly to the research findings from Chapters 4 and 5.

Recommendation 6: The development of children's literacy begins at birth, and all nations should encourage family literacy initiatives that support parents, health workers, libraries and literacy professionals to give children the best possible start in life, particularly during the crucial 0-3 years. This will involve:

- **Good health care**
- **Children's early language development** (in both their mother tongue and the language of instruction)
- **The role of families** in building a sustainable basis for the lifelong literacy skills of children, but also those of their parents
- **Early identification of any health-related difficulties** that might impair literacy development
- **Joining a library** is actively promoted and encouraged

Recommendation 7: Governments must prioritise support for early childhood education and care (ECEC). ECEC is a powerful tool for reducing social inequality in later years, since the life-chances of children in disadvantaged areas can be set on a different trajectory during these crucial years. ECEC helps to close developmental gaps between children before they enter primary school. The cost-effectiveness benefits of ECEC are significant and enduring: research has demonstrated short-, medium- and long-term gains in cognition, social-emotional development, school progress, reduced antisocial behaviour,

adult earnings, health (obesity or smoking behaviour) and even reduced crime in later life. These benefits are even more valuable for disadvantaged populations.

Recommendation 8: All ECEC centres and primary schools encourage parents to support the learning of their younger children. It would be helpful, therefore, for both parents and teachers to be made aware that sharing stories with children, and talking with the child about those stories, has been found to have significant benefits for overall pre-school language development, while the child's access to screen time should be monitored and managed. New research is now emerging on how parents can use digital devices productively with toddlers (Flewitt et al., 2024); however, the WHO recommendations on this are strongly worded (World Health Organization, 2019):

- For infants under 3: there should be storytelling and reading with a caregiver every day, but no exposure to screen time at all (no television, no phone or tablet, no laptop).
- For children aged 3 or 4: engaging in reading and storytelling with a caregiver every day is encouraged, but screen time should be no more than 60 minutes in one day.

Recommendation 9: It is important for every teacher to understand how enormously valuable it is for children who are learning to read to sing songs, to hear stories and poems read aloud, and to participate in discussions about what they have heard. First of all, stories introduce children to other worlds, other children and other cultures, and stories invite them to find a place for themselves in those worlds. Literature develops the imagination, but as the events in a story unfold, the cognitive side of reading is also being developed. In primary schools, therefore, as beginning reading is taught, all teachers should be encouraged to put in place a balanced approach: reading for meaning and understanding should not be taught separately from direct instruction about grapheme–phoneme relationships, and learning to read and write should be parallel and interactive activities.

Recommendation 10: While literacy instruction in the early years focuses more on code-based skills, it is nevertheless important not to delay teaching a wide range of comprehension strategies with all children. Research has shown that word recognition and comprehension need to be taught together. At this point, it is important to point out that learners benefit from explicit or formal instruction in the application of comprehension strategies. Explicit teaching of comprehension strategies has been shown to improve reading comprehension among readers with different levels of ability. In fact, it is the weakest readers who benefit most from explicit instruction in reading comprehension.

7.4. Building upon initial literacy in primary and secondary schools

Recommendation 11: Once initial literacy has been established, teachers and schools can make a significant difference to its continuing development by implementing a variety of practices that have been shown in research to impact individual and school-level literacy standards. Schools should be made aware of these, and encouraged to put all of these into practice:

- Reading spaces are created to make reading inviting and enjoyable. For this purpose, there are comfortable reading corners in classrooms and/or throughout the school, as well as a well-equipped school library.
- The school provides access to a wide variety of reading materials, including books, magazines, newspapers, and digital resources. Book recommendation walls are established.
- The school enables numerous engaging reading experiences. Dedicated reading time is incorporated into the school schedule (e.g. DEAR – Drop Everything And Read). In some schools in Germany, reading nights have been established, with which family members also engage. Reading is promoted as a social (and not just a solitary) activity.
- The school invites the exchange of ideas about what has been read by organising book clubs or reading circles for students to discuss books and create reading partnerships or buddy systems as well as hosting author visits or virtual author interactions.
- Reading activities and achievements are celebrated and recognised. Schools could participate in celebrating World Book Day (23 April) or International Literacy Day (8 September) or – as in Germany – a nationwide "reading aloud day" when, for example, celebrities read in schools.

Recommendation 12: Several sections of this report go into detail about how teachers might use a variety of strategies to teach comprehension. We recommend that all teachers be given support, if they need it, to extend their repertoire of pedagogies in this important area. We further recommend that teachers of every subject give serious consideration to including reciprocal teaching in their classrooms (for more on this, see the good practice example in Chapter 4).

Recommendation 13: There is now a growing body of literature on how teachers can develop their students' critical digital literacy skills, although conducting a meta-analysis of this is made more difficult by the fact that the evolving nature of both the internet and teachers' pedagogy makes comparisons increasingly complex. We argue that there is an urgent need for teachers to help students to develop not only digital literacy, but also critical digital literacy – an awareness that the internet can be a dangerous place, containing potentially intentionally misleading information. Critically evaluating sources of information can be difficult, but as research has found, students working together in groups of three to carry out internet searches can support and learn from one another, and we would endorse this approach.

Recommendation 14: As we argued in Chapter 5, it is important to include the teaching of literacy across curriculum as part of the state-level curricula and policies, and to ensure that these policies are acted upon at classroom level.

- The key is to view language and literacy practices as tools to enhance disciplinary knowledge and processes, and to provide explicit and continuous instruction and exposure – although shorter interventions can be successful, too.
- Developing and examining teaching interventions or pedagogical materials and their effectiveness helps to develop effective practices, as there are no "one size fits all" solutions.

- It is important that content-area teachers have the knowledge and expertise to teach disciplinary language and literacy practices. There is therefore a need for in-service specialist teachers, and for disciplinary pedagogy and language to be included in initial teacher education (ITE) and in the continuing professional development of all teachers.

7.5. Vocational education and adult literacy

Recommendation 15: In vocational education and training, it is necessary to develop the literacy skills that are needed, on the one hand, in the course of the practical tasks involved in work; and on the other, to support learners' personal development and active citizenship. Regardless of the type and level of occupation, work includes complex and often multimodal genres of work-context that vocational students need to learn. As we argue in Chapter 5, regardless of the structures and aims of VET in each European country, every country needs to ensure that vocational curricula include the development of the literacy skills students need in their studies, in future work and in other domains in life. In practical terms, this requires the development of literacy teaching that takes into consideration the vocation-specific and situated nature of literacy, and integrates the teaching and learning of vocational content and skills and literacy. In VET, as in disciplinary literacy, every teacher is a literacy teacher – but vocational teachers need and deserve training that provides them with an awareness of and skills to teach vocational language and literacy.

Recommendation 16: As suggested in Chapter 5, adult literacy has consequences not only for the lives of adults themselves, but also for their families and the larger community they are part of, as well as for the whole of society. In the constantly changing textual landscape, adults need to continuously maintain and develop their literacy skills. Thus, it is imperative that each European country places adult literacy at the centre of their literacy policy measures. European countries need to:

- identify those adults most in need of updating and developing their literacy skills;
- introduce outreach activities to attract and motivate those adults who most need to develop their skills to attend adult literacy courses and other adult education and training (AET) provisions;
- offer opportunities to low-skilled adults to update their literacy skills and to acquire a minimum level of literacy;
- offer high-quality literacy provision for adults that meets learners' individual and varied needs and life situations, is provided by well-trained teachers, connects with real-life and everyday experiences, is adequate in length and intensity, and which gathers longitudinal evidence on the long-term effectiveness of training; and
- develop the selection and training of adult literacy teachers as part of adult literacy policy.

7.6. Supporting struggling readers and multilingual learners

Recommendation 17: Research into the best ways to help struggling readers suggests that it is important for the teacher to have access to rich data on every student's literacy capabilities. Such data would mean that first, it is clear which students need help, and

second, progress can be monitored and celebrated. Struggling readers need help in developing not just reading, but also engagement, motivation, oral language and writing. Researchers agree, however, that in order to access the secondary curriculum, a child needs to have a reading level that is at least that of the average 9-year-old. Any student beginning secondary education with a reading level below this requires specialist help, and this should be given without delay. Research also shows that structured talk and small-group work can have a significant impact on the development of reading and comprehension. Every school should be supported with resources and professional development to put these insights into practice.

Recommendation 18: It is important for struggling readers to feel supported, and also that they have reading experiences that are enjoyable and that they look forward to. Two ways in which this can happen are through paired reading and peer-tutoring. Both of these activities involve interaction with another student (in the case of peer-tutoring, it works best if the "tutor" is two years older than the "tutee"). The emphasis here is on enjoying reading, and having a conversation about the book. We recommend that teachers consider using one or both of these approaches with struggling readers (from Grade 2 to Grade 4 is the most common approach). Further information on these approaches can be found in Chapter 4.

Recommendation 19: Research has shown that support aimed at helping multilingual and migrant students to become more fluent readers should begin as early as possible in the child's schooling. This is an area of concern in almost every school in Europe. Our recommendation is that teachers should consider putting some of the following measures into place to enable this to happen. When the following measures are put in place, the whole culture of the school is enriched (Bruggink et al., 2022):

- Integrating reading comprehension with other school subjects; in mathematics, including measurements in the units of different countries, based on recipes from the home countries of different students.
- Storytelling that draws upon books, tales and artefacts from different countries.
- Activating prior knowledge using multicultural perspectives (through drama, and by encouraging students to talk about their native country to the class); also, by encouraging the activation of prior knowledge in native languages.
- Allowing and encouraging the use of multiple languages in class; research evidence strongly supports this.
- Using many picture books as part of teaching, to enable more students to interact with the lesson content in their own language.
- Playing language games, inviting students to guess words from another language that are acted out by the students.
- Giving every teacher training in vocabulary development, with new words bring displayed and used in conversation every day.
- Accepting, celebrating and displaying dual-language books in the school library.
- Finding non-fiction books and biographies about topics and people from other countries that are represented in the class.
- Encouraging the use of computer programmes that offer translation and read-aloud tools.

- When introducing new vocabulary, also teaching grammar that is connected with the use of that vocabulary.
- Taking a whole-school approach to developing vocabulary, with shared knowledge of a "word of the day" across subjects and classes.
- Helping students to memorise new words by introducing them in semantically related families
- Giving small groups the task of producing a picture to illustrate their word, then each group making a presentation of their word with its picture.
- Organising parents' evenings in which different languages and cultures are represented.
- When teaching vocabulary, encouraging drawing, visualising and talk, as well as meaning.

7.7. Teacher education and professional development

Clearly, there are far-reaching implications for pre-service teacher education and in-service professional development in the many pedagogical imperatives that arise from the research presented in this report. These changes to the pedagogical and digital environments of education will make exceptional demands on teachers, and on their ability to adapt to new modes of learning and assessment.

Recommendation 20: We therefore recommend that policymakers give careful thought to the ways in which teachers, teaching assistants, head teachers and local network administrators will be guided and supported through the changes that will be demanded of them in the coming decade. Policymakers should also put in place stable and enduring support networks, both face-to-face and digital, to embed and make permanent the professional development frameworks that will be needed.

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