

DOKTORI DISSZERTÁCIÓ

ASSESSING THE “INVISIBLE” – CRITICAL  
DISCUSSION ABOUT THE OECD/PISA READING  
LITERACY SURVEYS

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## **DOCTORAL DISSERTATION**

### **Assessing the “Invisible”**

**Critical Discussion about the OECD/PISA Reading Literacy Surveys**

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## Abstract

This dissertation discusses the topic of reading literacy assessments, focusing on the Organisation of Economic Cooperation and Development (OECD)'s Programme for International Student Assessment (PISA)'s Reading Literacy Assessments (RLA). (OECD PISA, n.d.) These surveys gain enormous attention and trigger so many harsh debates all over the world that there is only one thing that seems to be certain: criticisms of the OECD/PISA RLA's research findings are reliable. If so, then is it possible that the problems are originated from the deficiencies of the conceptual, theoretical and methodological background of the assessments rather than its applications? To find the right answers, the dissertation analyses the OECD/PISA RLA analytical and framework documents from 2000 to 2018 (OECD, 1999; 2003; 2006; 2009; 2013; 2016a; 2016d; 2019a; 2019b), and compares them to contemporary theories and concepts of reading literacy assessments.

The research *hypotheses* to be (dis)confirmed are as follows:

- (1) The *conceptual* and *theoretical* background of the OECD/PISA RLA is un(der)determined or deficient in many cases.
- (2) The problems with the *conceptual* and *theoretical* background have a significant impact on the *methodological* background as well and cause misunderstandings.
- (3) Because of these problems (1 and 2), the assessments do not represent children's actual or real state of reading literacy competencies in many cases; thus, OECD/PISA RLA is not succeeded in achieving its original intention.
- (4) Since OECD/PISA RLA has a great impact on educational policies all over the world, the problems phrased in hypotheses 1-3 could not only contribute to innovative methodology development, but in some cases, they could also mislead educational improvement connected to reading literacy.

The narrow target group of the work is one of the researchers and teachers who are constantly working on the improvement of the OECD/PISA RLA system. In a broad sense, the dissertation addresses all researchers and teachers who are interested in the enhancement of teaching and assessing reading literacy skills among children.

**Keywords:** OECD/PISA, Reading Literacy Assessments, PISA-shock, Non-Digital and Digital Reading, Screen Reading, Text Comprehension Competencies, Educational Development

“Observing and understanding are two different things.”

Mary E. Pearson

## Introduction, Background, and Significance of the Research<sup>1</sup>

Imagine a child sitting with a book in her hands, staring at the pages, turning them, and following the lines on the paper with her eyes. Occasionally she smiles, nods, frowns, and cries – thus expresses some emotions. Otherwise, she is motionless – except for some frequent position changes, such as leaning forward, putting her head into her palms, sitting back, or changing legs from one side to the other. Now, let us imagine another child curled up in an armchair, who is not holding a book, but a technological device, a tablet that can display the story on its screen digitally. She is staring at the screen, touching it, clicking on icons, scrolling up and down with a sidebar, and following the lines on the screen with her eyes. Occasionally she nods, frowns, smiles, laughs, and changes sitting position similar to the other child. One can see that both children are doing *something* so intense that it provokes the actions and reactions mentioned above; however, we cannot see any explicit cause behind them. Thus, this *something* that they are doing is happening *inside* their heads. From these, two questions can emerge: (1) *what* are they doing, and (2) *how* are they doing what they are doing?

In the child-with-the-book case, our most straightforward answer could be that she is *reading*. More precisely, she is focusing mentally and physically on the actual passage of the book and doing a complex process of comprehending the story. In the other, child-with-the-tablet case, our answer could be a little bit more complicated, varying from using the tablet, surfing on the Internet, to as far as chatting with friends or watching a movie. Furthermore, we can think that, similarly to the other child, she is *reading* too. If we choose to call both activities

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<sup>1</sup> The statements of this dissertation are the results of my seven-year research at the Department of Philosophy and History of Science, Budapest University of Technology and Economics (BUTE). The dissertation was critically discussed by the Measures of Rationality Research Group at BUTE. Between 2017-18 the research was conducted in the framework of *Eötvös József Hungarian State Scholarship (Tempus Public Foundation)* at the Department of Education and Sport of the University of Bedfordshire, Bedford, United Kingdom. Even though none of the chapters is a direct republication of papers of mine appeared earlier on this topic, several insights published elsewhere are integrated into the dissertation (with appropriate acknowledgement in the *References*).

‘reading’<sup>2</sup>, stating that the first child is performing a print reading, while the second one is performing digital reading, then the question remains *how*. How do they read, how does the process of comprehension work? These are what are hidden, what we cannot see from the outside with direct observation; thus, we need to assess them in another way.

Reading is a fundamental form of communication that helps to transfer information, irrespective of time, space, and the number of receivers. An average adult spends enormous time reading via different platforms in her everyday life and reading, not only at the level of coding and decoding, but a level of complex comprehension is significant in achieving critical thinking and cooperation. So those who struggle with reading are at a great disadvantage in society as compared to others. The more skilled a reader is, the more opportunity and chance to become successful in the long run. Poor reading skills influence the quality and opportunity of individuals’ studies, work, emergence, social and financial status and welfare, and (in a wider sense) the destiny of the whole community the individual lives in. (Baron, 2015; OECD, 1999)

From these, we can easily understand the importance of training children to be good readers and improve their reading literacy skills. The first place to do this officially, in a well-organised framework and reasoned methodology, is school. Especially as reading abilities are directly connected to learning abilities as well. Those children who have poor literacy skills have difficulties with studying since they have problems with decoding, processing, selecting, understanding, and reflecting on written content. Dealing with learning material without comprehension is a waste of time and not a reasonable goal in the long run. (OECD, 1999; Nyíri, 2019; Szabó, 2016b)

Clarifying the reasons behind poor reading literacy skills has been in the focus of researchers for a long while. At present, reading literacy enters more and more levels of people’s lives, since it is firmly connected not just to books or printed reading material but to online texts, digital devices, and smart tools. Notions like digital and visual, online space, user experience, and user-friendliness are also involved. Thus, assessing reading literacy and understanding the “invisible” process of comprehension has become more complex and urgent than ever. Especially in the field of education, because “reading comprehension both its

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<sup>2</sup> The reasons why among others digital reading is considered as reading, therefore relevant in reading literacy assessments, are discussed in *Section 2.4*.

instructions and its assessment, is arguably the most important outcome of reform movements designed to improve reading curriculum and instruction.” (Pearson and Hamm, 2006, 76)

There are various kinds of literacy assessments (see *Chapter 3*), and several methods were developed to examine reading literacy and comprehension, including individual, small and large groups, country-specific, and world-widely extended assessments. (Harrison and Salinger, 2002) From the variety of measurements, one particular piece seems to emerge and dominate the discussion of children’s reading literacy skills: the Programme for International Student Assessment (PISA)’s series of Reading Literacy Assessments (RLA) by the Organisation of Economic Cooperation and Development (OECD). The surveys aim to measure 15-year-old students’ reading literacy skills every three years since 2000. The starting year 2000 and then 2009, and 2018 were especially important since these were the years when the assessment framework was updated. The theoretical, conceptual, and methodological considerations behind every RLA, the official analytical and framework documents, tasks, answer sheets, and the reports of the assessments are published and made available for everyone. (OECD PISA, n.d.)

Besides the RLA, the other two major pillars of the OECD/PISA assessments that concern 15-year-old children are *Mathematics and Science*, but *Financial Literacy*, *Cooperation*, *Decision Making*, and *Critical Thinking* are also measured. (OECD PISA, n.d.) All these periodically repeated surveys are of great interest among educational experts and policymakers. The surveys induce harsh debates all over the world, and the results are usually questioned and attacked from various sides and reasons. It seems that the tests lay huge stress upon students and teachers as well as on the actors of education, such as governments, researchers, and inventors, even in financial, business, and political senses. (Zhao, 2016a; Zhao, 2016b; Zhao, 2020)

From the lively discussion, the RLA seems to emerge; thus, it is an excellent material for my analysis. At present, the internationality of the RLA in the area of measuring children’s reading skills is unchallenged, and it presents the overall complexity of children reading literacy assessments at best. However, despite the intentions, invested energy, time, thoughtful design, enormous assessment apparatus, huge database, and expertise, it seems that the knowledge or their interpretation that OECD/PISA RLA presents about 15-year-old children’s reading

literacy skills are controversial, deficient or leads misunderstandings in many cases. (Zhao, 2016a; Zhao, 2016b; Zhao, 2020)

In my consideration, the roots of these criticisms against the RLA's results should be found in the conceptual, theoretical and methodological background of the RLA. Thus, this thesis focuses on the problem of assessing children's reading literacy skills by examining the analytical and framework documents of the OECD/PISA RLA series from 2000 to 2018. (OECD, 1999; 2003; 2006; 2009; 2013; 2016a; 2016d; 2019a; 2019b) These documents are essential because they (tend to) discuss the whole RLA system, the conceptual, theoretical, and methodological background of each survey and the improvement that PISA experts have made from one session to the other. Since PISA – despite the returning harsh criticisms and petitions against its practice – is very popular and governments tend to take its standards and analysis into account in their policymaking (OECD, 2016b), I consider the connected discussion, research, and the tenor of improvement as essential in the field of contemporary education.

## 1. Setting the Stage

The first chapter presents the guideline, undertakes, and disclaimers of the dissertation, as well as the research questions, hypotheses, methodology, and some considerations regarding the bibliographical background. It also aims to point out that discovering the issues the OECD/PISA RLA is particularly significant in the field of educational improvement in general.

### 1.1. Guideline. Undertakes and Disclaimers of the Dissertation

The first part of the dissertation (*Chapter 1*) aims to set the stage by introducing the guideline, undertakes, and disclaimers of the research, as well as presenting the questions, hypotheses, methodology, and some considerations of the bibliographical background. The second part (*Chapter 2*) discusses the epistemological grounding of the research and clarifies the key definitions and concepts of the domain. The third part (*Chapter 3*) aims to summarise the traditions, difficulties, and debates in reading assessments briefly and some assessing projects to put in context the OECD/PISA RLA. Besides, it provides an outlook on the Hungarian reading literacy assessments as well. The closure of this section presents the OECD/PISA RLA mission, aims, goals, and cycles from 2000 to 2018. The detailed critical discussion starts with the fourth part (*Chapter 4*), where the focus is entirely on the OECD/PISA RLA's conceptual background and its problems. In the fifth part of the dissertation (*Chapter 5*), the topic of the discussion is the RLA's theoretical background aiming to put it in contrast with the contemporary literature on the applied terms and reading components of reading literacy assessments. The sixth part (*Chapter 6*) of the dissertation aims to show the methodological background and incompleteness of the RLA, including some influential factors of reading. The seventh part (*Chapter 7*) discusses the findings in the context of the hypotheses and shows how that many problems of the RLA are originated from the un(der)determined or deficient conceptual, theoretical, and methodological background of the assessments that were analysed in the previous chapters. The *Conclusion* summarises the research and, based on the findings, gives suggestions to improve the OECD/PISA RLA that can also be possibly applicable to other reading surveys. Finally, the chapter closes with some ideas for possible further research as well.

The guideline specified above shows not just the structure of the work but also the undertakes that the dissertation intends to achieve. The primary aim, in short, is to examine the

analytical and framework documents of the OECD/PISA RLA and show the emerging conceptual, theoretical, and methodological deficits if there are any. Here the phrase ‘conceptual’ refers to the overall approach of the RLA, including the declared intentions, considerations, and framework structure. ‘Theoretical’ alludes to those principles, research findings, professional literature, and contemporary conceptions of reading literacy on what the RLA based or should have based its assessments. ‘Methodological’ means only and exclusively those issues that were connected to the task types, response formats, and reading material, and those factors that affect reading performance, such as writing skills, reading fluency, motivation, and reading platform.

The analysis is about the nine, already mentioned official OECD/PISA RLA analytical and framework documents, and the involved scientific literature, concepts, theories, and overall approach fitting to them. The decisive factors behind choosing the RLA to be analysed are the following:

(a) It is an assessment of children’s reading skills. The dissertation aims to focus on issues of reading literacy and text comprehension, and the first step is to discover the challenges of surveying them at school. The RLA examines 15-year-old children’s reading skills who are in the middle of their secondary school studies, relatively near to become adults, thus expectedly have already acquired the necessary knowledge and skills of reading and text comprehension available under educational circumstances.

(b) It is an international, regularly repeated assessment conducted worldwide. The RLA is repeated in every third year in the OECD countries, partner countries, and regions. (OECD PISA, n.d.) Thus, long-term internal and cross-country tendencies, improvements, and returning problems can be concluded, observed, and enhancements, and suggestions may be put in practice in a reasonable time. Hence, any research, discussion, and recommendation concerning the RLA are essential from a conceptual, theoretical, methodological, therefore practical perspective that can be built in the survey framework.

(c) It is still an unrivalled, widely accepted assessment that aims to help educational improvement; however, usually questioned by lively debates. Survey creators intend to enhance the quality and trustworthiness of the assessments and make their efforts meet the expectations of educational actors, as well as the common interest. These tenors trigger lively discussions and debates around the issue of reading literacy, the role of reading in the 21<sup>st</sup> century, and



assessment systems. (Sahlberg, 2019a; Sahlberg, 2019b) The OECD/PISA RLA has a massive impact on curriculum design, educational policymaking, and defining and selecting good practices in teaching and learning reading. (Meyer and Benavot, 2013; Zhao, 2016b; Zhao, 2020) Hence, examining the analytical and framework documents is a long-term, exciting, and useful task with as much practical as conceptual, theoretical, and methodological aspects.

In the dissertation, the focus is on the Latin alphabet, European and Anglo-Saxon language areas, and Western concepts and traditions of reading. There are OECD countries and partners which do not satisfy these requirements (such as Japan and China). However, it is beyond the limits of this dissertation to refer to their specific framework, reading and writing concepts, traditions. The way how OECD/PISA RLA managed the difficulties of translation that involves task and item characteristics or specific attributes of evaluation that is rooted in the various cultural backgrounds is also excluded. (Grisay, de Jong, Gebhardt, Berezner and Halleaux-Monseur, 2007)

The main interest of the research lies in children's reading literacy skills and problems in their mother-tongue; thus, assessing adults and second-language learners' reading skills are not discussed here. Since the OECD/PISA RLA is an international survey, there are considerations and debates about the translation equivalence across PISA, not just in the case of the RLA, but other PISA surveys as well. These, of course, also occur in other international tests, and not just reading literacy assessments. Although the relevance of translation is uncontroversial, involving the topic would far exceed the limits of this dissertation. PISA discusses these issues in its *Technical Reports and Survey Implementation Tools* documents that are not part of the analysis. (OECD PISA, n.d.)

The dissertation does not discuss the RLA's methodology in the sense of implementing worldwide empirical research, designing questionnaires and tasks, translating tasks and answer sheets, sampling, data gathering, database building, research result analysis, or report compilation. Likewise, the sociological, psychological, political, or economic considerations, perspectives, debates, and criticisms that are regular parts of the RLA discussion are beyond the limitations of the dissertation. As I have already mentioned in the *Introduction*, I am aware of the fact that the OECD/PISA surveys, so as the RLA, are surrounded by harsh debates and criticisms from various aspects and for various reasons. PISA's original aim is not to rank or compare countries to create an artificial and unhealthy competition between them but to find

the best educational systems and share their practices with the not so lucky nations. Despite these, the debates include topics such as reliability, trustworthiness, political pressure, blaming, cheating, and manipulating the results, expectations and reality, comparison, competition, and stress, as well as methodological issues connected to the RLA. (Sahlberg, 2019a; Sahlberg, 2019b; Zhao, 2016b; Zhao, 2020) A brief discussion of those debates is presented in *Section 3.1. and 3.2.* The function and intention of this discussion are not to take a side or phrase judgements, but to show those aspects of the debate where the present research can be relevant and may serve new viewpoints to enrich the discussion.

I believe that the research can help to identify the roots of the conceptual, theoretical, and methodological disunity of reading literacy assessments; and offer an alternative view improving the OECD/PISA RLA system to get closer to the accomplishment of the highly ambitious challenge of assessing the “Invisible”.

## **1.2. Research Questions and Hypotheses**

According to its mission, OECD/PISA RLA aims to assess children’s reading literacy competencies to help educational improvement and policymaking (besides other aims). It is a matter of question whether it achieves these goals or not. The research intends to decide on this question by examining the relevant OECD/PISA RLA analytical and framework documents, aiming to (dis)confirm the following hypotheses:

- (1) The *conceptual* and *theoretical* backgrounds of the OECD/PISA RLA are un(der)determined or deficient in many cases.

The first hypothesis refers to those parts of the research that aim to examine both the conceptual and theoretical backgrounds of the RLA presented and discussed in its analytical and framework documents. Questions connected to the conceptual background involve the overall approach of the RLA, such as the declared intentions and considerations of the assessments that guided the process of creating the framework structure; the selection of background literature; the decisions on competencies, factors and relevant elements of reading to measure; etc. Besides, to discover and understand the theoretical fundamentals of the RLA (i.e., the central notions, terms, literature, and theories that the assessments are based on) are also significant parts of the analysis. Moreover, it is a question whether the theoretical background is in harmony with the contemporary scientific literature on reading, literacy,

comprehension, text, digitalism, and the visual – to mention some critical notions from the field of reading literacy assessments. According to the first hypothesis, the analytical and framework documents do not give answers to these questions, or if they do, deficiencies and anomalies occur in many cases. *Chapter 4* aims to discuss the conceptual, while *Chapter 5* the theoretical issues in detail.

- (2) The problems of the *conceptual* and *theoretical* background have a significant impact on the *methodological* background as well and cause misunderstandings.

The second hypothesis is based on the assumption that PISA fits its methodological framework to the conceptual and theoretical frameworks. If it is true (and the analysis aims to decide on this as well), the applied conceptions and theories have a determining force on the methodological background of the measurements. Thus, if there is any problem with the conceptual and theoretical background, for instance, they are un(der)determined or deficient in many cases – as the first hypothesis states – then the methodology supposedly also suffers from these problems. Subsequently, misunderstandings can quickly occur from conducting examinations based on inconsistent considerations, outdated literature, or already exploded notions, because the results supposedly also will be explained according to this problematic framework. If it is false, and the methodology is not in harmony with the conceptual and theoretical background of the RLA, then their problems do not affect it. If the methodology is autonomous from the conceptual and theoretical approach, it is crucial to discover the reasons why. However, it does not seem to be probable or sensible at first sight – unless the second hypothesis will be proved to be false. It is the task of *Chapter 6* to examine these issues.

- (3) If hypotheses 1 and 2 are correct, then the OECD/PISA RLA does not represent children's actual or real state of reading literacy competencies in many cases; thus, the assessments do not succeed in achieving their original purpose.

This third hypothesis points out that if the assessments are based on un(der)determined or deficient conceptual, theoretical, and accordingly methodological background in many cases, and hence they lead to misunderstandings, then the assessments also lead to wrong results and conclusions. Moreover, the collected data and the interpretation of the results do not fulfil the requirements that the RLA explicitly undertakes. In this case, we have firm ground to query what the reports represent about the assessed children's reading literacy competencies. Starting from questions whether the collected data are adequate, the examined factors of reading

competencies are relevant, or the interpretation of the results possesses substantive information, gives useful knowledge, and on what level or extent. The aim of *Chapter 7* is to present a discussion on these issues.

- (4) Since OECD/PISA RLA has a great impact on educational policies all over the world, the problems phrased in hypotheses 1-3 could not only contribute to innovative methodology development, but in some cases, they could also mislead educational improvement connected to reading literacy.

The fourth hypothesis expresses that, due to the determining force of the RLA, the conceptual, theoretical, and the connected methodological issues are significant not just from the perspective of researchers but because of the consequences on educational improvements. This latter includes curriculum design, teaching and learning reading, marking aims, and goals in enhancing reading literacy skills or policymaking. Many countries – primarily the OECD countries, secondarily those that take part in the assessments, thirdly others that would like to close up – align with the trends that the RLA reports and analysis designate. Thus, it seems essential to handle the above-phrased issues with proper thoughtfulness and try to discover their roots. *Chapter 7* discusses these issues in detail, too.

My hope is that the research can help to understand the origin of resistance against OECD/PISA RLA surveys, the reasons behind some criticisms that question the reliability of the RLA, and describe the aspects that provoke researchers, teachers, and the expression of harsh criticism from those who are involved in teaching reading. Besides, the dissertation aims to point at some parts of the assessments that need updates, explanations, or improvement in the long run. The methodology of the research to analyse the suggested hypotheses is presented in the next section.

### **1.3. Methodology and Bibliographical Background**

Studying reading literacy assessments is not an isolated, but an interdisciplinary research topic, involving various scientific fields, methods, and questions that can be analysed and discussed on its behalf. The following list gives a selection of the possibly relevant areas, perspectives, and questions of reading literacy and text comprehension research:

- A. Teaching Reading and Writing (*e.g., How to teach reading, writing and comprehension in the 21<sup>st</sup> century? What are the consequences of screen reading and digital writing concerning literacy skills?*);

- B. Education and Information and Communications Technology – ICT (*e.g., How to improve up to date educational reading material in a digital environment? How to read, comprehend and study from digital learning content?*);
- C. Linguistics (*e.g., What are the linguistic consequences of digital reading and writing?*);
- D. Communication Studies (*e.g., How to create reading contents in a screen-guided world? What are the necessary skills that required to be literate and assert oneself?*);
- E. Philosophy (*e.g., What epistemological changes and tendencies can be discovered in reading, comprehension, and education due to digitalism?*);
- F. Psychology, Neurology and Cognitive Sciences (*e.g., What are the effects of digitalism and screen on reading motivation, cognitive processes, motoric skills, and representations?*);
- G. Sociology, Cultural Studies and Cultural History (*e.g., What are the consequences of digital culture on reading, writing, and learning?*).

The above-listed areas and questions give a possible framework and circle of the relevant scientific literature for this research in a broad sense. However, to keep the dissertation between reasonable boundaries, the selected background literature is from the fields of *A. Teaching Reading and Writing*, *B. ICT*, and *F. Psychology, Neurology, and Cognitive Sciences*. It involves those considerations that can help to analyse and evaluate the conceptual, theoretical, and connected methodological background of the RLA. Thus, the research is moving within those contemporary reading literacy paradigms, which involve printed and digital reading, text comprehension, the nature of the text and the role of the visual, reading assessments designed for children, and some consequences on education.

The secondary resources of the research consist of printed and online papers, books, research reports and frameworks, articles, and blog notes from the three areas mentioned above. The selected authors discuss the topics of printed and digital reading, text comprehension, the nature of the text, the role of the visual, reading assessments designed for children, reading literacy assessments and education, and the OECD/PISA.

The primary resources of the research are the nine OECD/PISA RLA analytical and framework documents from years 2000, 2003, 2006, 2009, 2012, 2015, and most recently, 2018 (see *Chart 1*). The research aims to analyse them, focusing on the conceptual, theoretical, and methodological background of the surveys.

1.	Measuring Student Knowledge and Skills: A New Framework for Assessment. (OECD, 1999)
2.	The PISA 2003 Assessment Framework: Mathematics, Reading, Science and Problem Solving, Knowledge and Skills. (OECD, 2003)
3.	Assessing Scientific, Reading and Mathematical Literacy: A Framework for PISA 2006. (OECD, 2006)
4.	PISA 2009 Assessment Framework: Key competencies in reading, mathematics and science. (OECD, 2009)
5.	PISA 2012 Assessment and Analytical Framework: Mathematics, Reading, Science, Problem Solving and Financial Literacy. (OECD, 2013)
6.	PISA 2015 Assessment and Analytical Framework: Science, Reading, Mathematic [sic], Financial Literacy and Collaborative Problem Solving (Revised edition). (OECD, 2016a)
7.	PISA 2018 Draft Analytical Frameworks May 2016. (OECD, 2016d)
8.	PISA 2018 Assessment and Analytical Framework. (OECD, 2019a)
9.	PISA 2018 Released Field Trial and Main Survey New Reading Items. (OECD, 2019b) <sup>3</sup>

**Chart 1: The OECD/PISA RLA’s Analytical and Framework Documents Examined in the Dissertation**

The structure of the RLA documents listed on *Chart 1* is reasonably similar to each other. After a short overview of the domain, and the actual mission, aims and the latest improvements, there follows the definition of the domain (e.g., epistemological background, major terms), organisation of the domain and task characteristics (such as item types and influencer factors), assessment structure (e.g., building tasks, response formats, coding, and scoring), reporting scales (meaning scaling, interpreting, reporting) and other issues (such as reading examples, supplement information and notes). Naturally, in those years, when reading was the primary domain, such as the starting year of 2000, then 2009 and 2018, the documents are more detailed, involve more aspects of reading, and present a deeper discussion than the other years.

The method of the analysis is a close critical reading of the conceptual, theoretical, and relating methodological background declared in the analytical and framework documents. Besides, the analysis includes a comparison of these backgrounds, focusing on the

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<sup>3</sup> The last assessment’s final analytical and framework document was released during my research in 2019. Until then the dissertation had leaned on the PISA2018’s draft analytical and framework document, published in 2016. A selection of PISA2018’s reading items and task examples were published in an individual document in 2019 as well. For the sake of completeness, the dissertation involved all the three documents in the discussion.

improvements and their inner consistency, session by session. Beyond that, the highlighted conceptual, theoretical, and related methodological considerations of the background documents are set against contemporary scientific literature to examine their grounding, adequacy, actuality, and relevance. The occurrence of fundamental notions of reading literacy assessments, such as *reading, literacy, text, and the visual, reading strategies, and comprehension in the digital age*, and the RLA's considerations about them due to the analytical and framework documents are also significant parts of the dissertation.

After setting the stage, *Chapter 2* offers a summary of the epistemological background of the research and discusses the main terms of reading literacy assessments applied in the dissertation.

## 2. Epistemological Background: Definitions of the Domain

This chapter of the dissertation aims to present the main terms and definitions that are applied in the research and considered essential in the discussion of the OECD/PISA RLA. Defining or clarifying notions such as *reading literacy*, *text*, *visual*, *reading strategies*, and *comprehension in the digital age* is required to establish a common epistemological background. Not just for the sake of this dissertation, but also to present the broad and exciting scientific area of literacy assessment discussions and point to the conceptual, theoretical, and methodological problems emerging directly from them.

In the digital age, our previous knowledge about reading – e.g., its process, function, and strategy – is continuously shifting or being conceptually challenged. Different researchers phrase different, often contradictory claims about literacy or the nature of reading, and stick to disputes about “old school” and “new” reading, printed vs. online materials, linear vs. non-linear reading, etc. Thus, assessments, such as the OECD/PISA RLA, necessarily become a kind of ‘battlefield’. Conceptual and theoretical disunity concerning digital reading hinders the primary purpose of reading assessments: the intention of improving children’s reading skills.

Since the dissertation aims to analyse the conceptual, theoretical, and connected methodological background of the OECD/PISA RLA, there is great emphasis on presenting the epistemological grounding of the RLA in contrast with the contemporary definitions and theories of literacy. Since *literacy* is the subject, and *comprehension* is the action that PISA aims to understand with the help of *texts*, to get a better understanding of (*digital*) *reading*, it is inevitable to make these notions clear. They are complex concepts, even in the case of print reading. Still, with the arrival of digitalism, the well-known definitions have turned upside down. This chapter aims to give a summary of these notions, starting with the most important and most controversial one: the term of *literacy*.

### 2.1. Multiple Meanings of Literacy

This section aims to present four understandings of literacy: (1) reading literacy, (2) digital literacy, (3) web literacy, and (4) visual literacy.

#### 2.1.1. Reading Literacy

“At first glance, ‘literacy’ would seem to be a term that everyone understands. Nevertheless, at the same time, literacy as a concept has proved to be both complex and dynamic, and continuing



to be interpreted and defined in a multiplicity of ways. People's notions of what it means to be literate or illiterate are influenced by academic research, institutional agendas, national context, cultural values and personal experiences. In the academic community, theories of literacy have evolved from those focused solely on changes in individuals to more complex views encompassing the broader social contexts (the 'literate environment' and the 'literate society') that encourage and enable literacy activities and practices to occur." (UNESCO, 2005, 147)

This statement is from the *Education for All Global Monitoring Report 2006* that summarises and discusses the continually changing meaning of literacy in a whole chapter (*Chapter 6*) under the title *Understandings of Literacy* (UNESCO, 2005, 147). The report demonstrates that there is a lack of a unified definition of the term 'literacy' that applies both to common sense and the academic field. The complexity, multiple interpretations, concepts, various understandings, and influencing factors of the term make it complicated to conduct every kind of assessment which tends to measure literacy. Especially if we talk about wide-scale assessments, such as cross-country or worldwide surveys, when reliable, commonly accepted, precise terminology, theoretical background, and framework are essential.

Because of the previously mentioned reasons, there is a strong effort in the academic sphere to find or create a universal definition of literacy. Without a unified, consensual definition, it is hard to launch interdisciplinary or multidisciplinary discussions about literacy. The problem is that the researchers involved from various fields try to fit and apply 'literacy' to their specific scientific purposes, methodology, and aims. The picture is even more complicated if we take into account the problem of unifying the international terminology and the issue of translating scientific terms. For example, there is no precise translation of the term 'literacy' in Hungarian, just a paraphrase with the meaning of text comprehension, understanding, reading and writing skills, reading and writing ability, etc. (D. Molnár, Molnár, Józsa, 2012, 18)

In the simplest sense, literacy – as an ability – means encoding and decoding written texts. In an extended sense, literacy involves other aspects of communication, too, such as social, socio-psychological, linguistic, cognitive, economic, technological, etc. based on the questions what it means to be literate and what kind of skills are needed to understand media contents. "Furthermore, it is commonplace to speak of other kinds of literacy, such as »musical literacy«, »computer literacy«, »mathematical literacy« and so on. This metaphorical expansion of the

term has been criticized to conflate too many various areas of human conduct, to the point of rendering the term »literacy« meaningless.” (Kress, 2003, 23–24) Thus, it seems that ‘literacy’ is an umbrella term for issues involving various kinds of understanding, abilities, skills, and activities. The existing definitions of literacy emerged as the result of several conceptual debates that considered literacy, such as:

- *an autonomous set of skills*: “a set of tangible skills – particularly the cognitive skills of reading and writing [...] for example ‘information literacy’, ‘visual literacy’, ‘media literacy’ and ‘scientific literacy’ [...] The meaning of these concepts tends to be diverse and shifting, ranging from the view of literacy as a set of largely technical skills (the OECD perspective) to the idea that these skills should be applied in critical ways to examine one’s surroundings (e.g. the workplace and the media) and push for social change (Hull, 2003).” (UNESCO, 2005, 149-150). Originally, this is the concept that OECD/PISA RLA follows – as they interpreted in their documents. However, as we will see in *Chapter 6*, they took into account only reading skills and did not involve writing skills or visuality as essential and influencing factors in literacy. “Some scholars have suggested that a more useful concept would be that of multiple literacies – that is, ways of ‘reading the world’ in specific contexts: technological, health, information, media, visual, scientific, and so on [...] This concept has recently been adopted in the francophone world (most prominently, in Quebec) through the term *littératies* and has been used to understand the multiple forms of literacy among minority communities with shifting cultural identities [...]” (UNESCO, 2005, 150)
- *applied, practised and situated*: “the *application* of these [above mentioned] skills in ‘relevant’ ways [...] Among key concepts in this view of literacy are *literacy events* (‘any occasion in which a piece of writing is integral to the nature of the participants’ interactions and their interpretative processes’) and *literacy practices* (‘the social practices and conceptions of reading and writing’).” (UNESCO, 2005, 151) This approach “questions the validity of designations of individuals as ‘literate’ or ‘illiterate’, as many who are labelled illiterate are found to make significant use of literacy practices for specific purposes in their everyday lives”. (UNESCO, 2005, 151) OECD/PISA RLA has emphasised several times that their interest lies in the useful practice of literacy, thus how children can cope with their set of knowledge outside the school. Thus, their aim is

not to check whether children learned well the materials that should be acquired according to curriculums, but to assess how they apply their knowledge in everyday life. (OECD PISA, n.d.)

- *a learning process*: it “views literacy as an active and broad-based learning process, rather than as a product of a more limited and focused educational intervention. Building on the scholarship of Dewey and Piaget, constructivist educators focus on ways in which individual learners, especially children, make sense of their learning experiences. In the field of adult education, some scholars see personal experience as a central resource for learning.”. (UNESCO, 2005, 151) Since reading assessment is a part of education – and an essential one –, this literacy concept should necessarily be taken into account in our discussion. Teaching literacy skills are fundamental to education. Without doing so, the complete modern education system would be fundamentally mistaken. Literacy is the way of learning, discovering, and understanding the contemporary world, and in this sense, we can consider reading as learning, exploring, and understanding as well. Moreover, we should not regard literacy as a new concept but a quite old one that is necessary to get a better understanding of human activities. “Every reading of the word is preceded by a reading of the world. Starting from the reading of the world that the reader brings to literacy programs (a social- and class-determined reading), the reading of the word sends the reader back to the previous reading of the world, which is, in fact, a rereading”. (Fransman, 2005, 16) If we put these ideas in contrast to illiteracy, we can see that the issue is not about being able to *live* without literacy skills or not, but to being able to *live and cope effectively in modern societies*. And here comes “the notion of ‘critical literacy’, a goal to be attained in part through engaging with books and other written texts, but, more profoundly, through ‘reading’ (i.e. interpreting, reflecting on, interrogating, theorizing, investigating, exploring, probing and questioning) and ‘writing’ (acting on and dialogically transforming) the social world.”. (UNESCO, 2005, 152) There are other important factors here, namely ‘personal experience’ and ‘engagement’ that are essential elements of motivation, thus of reading motivation as well.
- *as text*: “in terms of the ‘subject matter’ (Bhola, 1994) and the nature of the texts that are produced and consumed by literate individuals. Texts vary by subject and genre (e.g. textbooks, technical/professional publications and fiction), by complexity of the language

used and by ideological content (explicit or hidden). This approach pays particular attention to the analysis of discrete passages of text, referred to by socio-linguists as ‘discourse’. Influenced by broader social theories (e.g. those of Michel Foucault), it locates literacy within wider communicative and socio-political practices that construct, legitimate and reproduce existing power structures [...] Language represents one of several modes through which communication is conducted [...]”. (UNESCO, 2005, 152) This linguistic approach, which considers literacy in a narrow sense, can be relevant from the perspective of reading assessments if we talk about texts to be read as tasks in a reading test. At first sight, we could think that text types and genres are clear and well-defined elements in assessments; however, the case is just the opposite. Different assessments apply different text-categorisations, and this diversity becomes more problematic when we involve digital texts as well.

This above-discussed improvement that shows how the notion of literacy has emerged and changed from acquiring basic cognitive skills to applying them in a complex socio-economic context to social awareness, critical thinking for personal and social purposes, is constant, and especially important in the field of education. According to the UNESCO, literacy is “both a right in itself and an instrument for achieving other rights. [...] Since literacy is a key outcome of education, it is difficult to separate the right to literacy from the right to education”. (UNESCO, 2005, 135) UNESCO considers reading, writing, and calculating skills as the elements of “fundamental education” (UNESCO, 2005, 136) – where reading and writing have particularly important roles.

While literacy has essential benefits beyond questions such as human, political, cultural, social, and economic benefits, it is “not defined consistently across studies and literacy data are frequently flawed”. (UNESCO, 2005, 138) The question of whether we will have a global consensus on literacy someday or not is still open and a matter of future research. “As text becomes an integral part of basic social, political and economic institutions – for example, in offices, law courts, libraries, banks and training centres – then the notion of ‘literate societies’ becomes pertinent [...] Literate societies are more than locales offering access to printed matter, written records, visual materials and advanced technologies; ideally, they enable the free exchange of text-based information and provide an array of opportunities for lifelong learning. These broader understandings of literacy provide fertile ground for further research, innovation

and progress toward the development of effective literacy programmes for all”. (UNESCO, 2005, 159) However, this inability to find a universal interpretation of literacy means that every culture has its literacy concept and its own literacy assessment concept as well. At present, we can choose to accept all of them as legit and equal or choose one or two that rule the others. As a third way, we have the opportunity to create a new one that will fit all frameworks, countries, cultures, and traditions – but it would go beyond the limitation of this dissertation.

Thus, at this very first step of discussing reading literacy assessments, it seems that the most crucial notion of the field is fuzzy – and the consequences of this conceptual diversity question the comparability of comprehensive assessments. Notwithstanding, in this work, literacy is applied in a narrow sense, namely *reading literacy*, meaning a set of skills including reading, writing, comprehending, and using various reading materials, whether they are offline or online, printed/non-digital, or electronic/digital. In this understanding, literacy also includes the ability to apply physical devices and platforms as interfaces of these reading materials. This claim may be controversial but well-supported by the everyday experience of how today’s reading is done on various devices and platforms, in contrast with traditionally one-mediated reading.

### 2.1.2. Digital Literacy

If we invite digital reading to the picture, defining literacy becomes immediately more complicated since it is necessary to distinguish between literacy and digital literacy. This latter term “is so broad that some experts even stay away from it, preferring to speak more specifically about particular skills at the intersection of technology and literacy.” (Heitin, 2016) However, it is instructive to compare some existing definitions of digital literacy in order to understand the complexity of the issue. For instance, according to Ola Knutsson, Mona Blåsjö, Stina Hållsten, and Petter Karlström, digital literacy is “one of the problematic literacies because it could include any conceivable computer skill or any activity that takes place with a digital tool.” (Knutsson, Blåsjö, Hållsten and Karlström, 2012, 238) This definition does not say anything about reading; it just refers to activities via computer or a digital tool that need some special skills.

Originally, the term ‘digital literacy’ was created by Paul Gilster in 1997 and “proposed that it is about mastering »ideas, not keystrokes«. [...] A well-established definition is that used

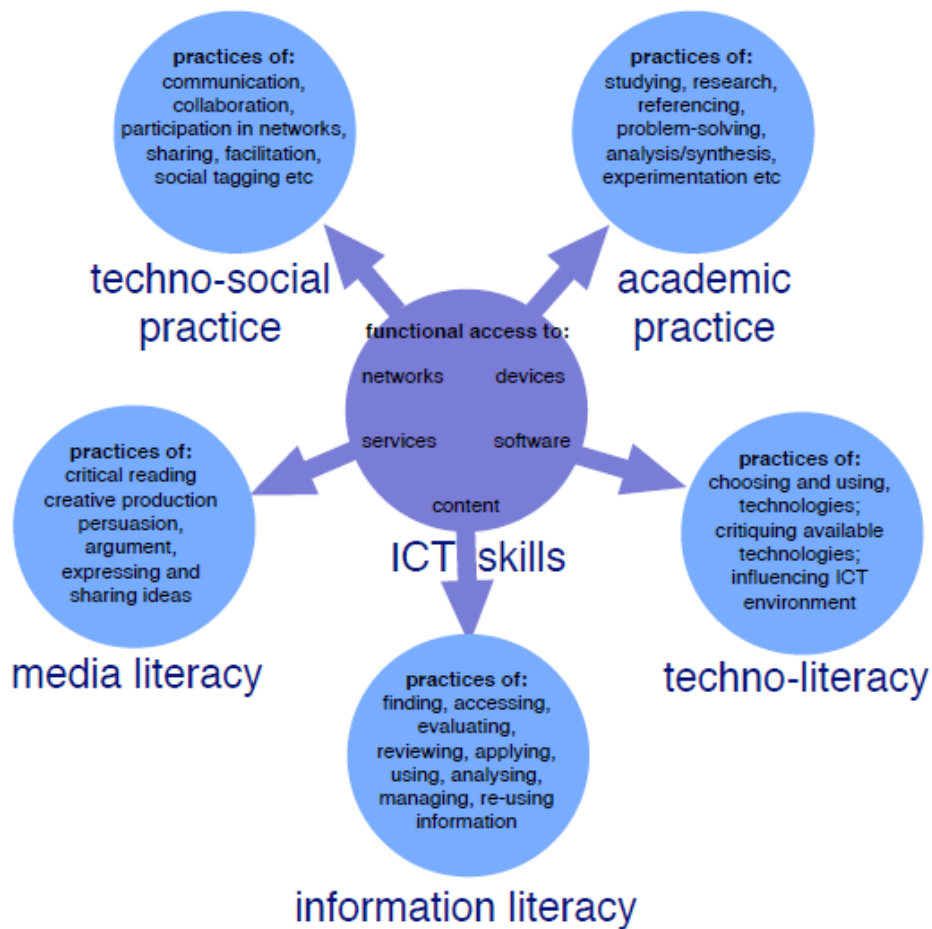
by the European Commission: »Digital Literacy is defined as the confident and critical use of ICT for work, leisure, learning and communication«”. (Huvila, 2012, n.p.) Thus, again, this is not about reading or literacy in a narrow sense but using digital devices. The notion of ‘learning’ appears that could suggest reading as well; however, at this point it is not yet clear why literacy and not ‘digital skills’ is the applied term.

The European Commission gave us a more complex definition: “the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process.” (Dowdall, 2009,50) Behind the activities, there is the process of reading. Without it, there is no evaluation, analysis, synthesis, constructing new knowledge, communication via digital devices, etc.; however, it does not mention reading and comprehending digital materials.

The next definition worth to cite is Martin (2006)’s, who defines the notion of digital literacy according to three levels/stages. “The first stage concerns the user’s digital competence necessary for carrying out tasks in her digital life context. This is the fundament for all of the user’s digital activities. The second stage consists of a number of digital usages, which are necessary tasks and processes in order to belong to a community and consists both of digital competence and knowledge belonging to the specific domain. The third and most advanced stage, involves what Martin (2006) calls digital transformation, and takes place when the digital usages have been developed and includes innovation and creativity. Martin further claims that there is no straight progression between the stages, and that digital literacy is an ongoing process advanced by technological development.” (Knutsson, Blåsjö, Hållsten and Karlström, 2012, 238)

According to the above-mentioned definitions, digital literacy is an activity that people do to achieve purposes, connect to social life, cooperate, live their creativity, gather experiences, progress, thus live together in a digitalised life. It is about being a useful link in the chain of social life and work. Those who are gifted with digital literacy can easily manage their life, while those who are not, have difficulties both in their personal and professional life. In this sense, digital literacy has nothing to do with reading (the latter understood in a narrow sense); however, reading is the fundament of every action in the digital sphere. So, digital

literacy can be seen as a varied set of access, skills, and practices, as Beetham (2011) summarised (see *Figure 1* and *2* below):



**Figure 1: Digital Literacy Anatomised: Access, Skills, and Practices (Beetham, 2011, n.p.)**

In this summarising figure of Beetham, we can find reading in the circle of media literacy (explicitly) and information literacy (implicitly). In this sense, skills of digital literacy are about sorting, managing, applying, and organising data or information, and the process of digital reading is collecting and selecting mechanism. It involves comprehension and critical thinking but excludes the process of cognition, personal engagement, experience, and emotion – to highlight some factors of reading. Interestingly, these factors are difficult to be measured in reading literacy assessments; nonetheless, they seem to be essential.



**Figure 2: Digital Literacy Anatomised: Practices in Context (Beetham, 2011, n.p.)**

In the second figure of Beetham (*Figure 2*), one can find self-expression and fluency that could be easily connected to reading and writing; however, taking part in society, democratic citizenship, and personal management are in focus. Thus, it seems that digital literacy is an ability that 21<sup>st</sup> century people need to improve in order to be valuable and capable members of society. Besides, since we are talking about skills, we have to talk about *learning* these abilities.

However, digital literacy “for learning is not a loose collection of separate skills, but their integration into specific education contexts”. (Beetham, 2011, n.p.) It is a matter of question how to integrate something so sophisticated into education, as digital literacy is “one of many phrases/concepts/terms that higher education embraces and uses in a wide range of ways.” (Walton, 2016, 1) Just one example from the Open University’s Digital and Information Literacy Framework: “Digital literacy includes the ability to find and use information



(otherwise known as information literacy) but goes beyond this to encompass communication, collaboration and teamwork, social awareness in the digital environment, understanding of e-safety and creation of new information. Both digital and information literacy are underpinned by critical thinking and evaluation.” (“Digital and Information Literacy Framework”, n.d.)

Information literacy as a synonym for digital literacy? It seems that in the process of digitalism, the notion of literacy is extended, and goes beyond reading, writing, and text, and goes towards some new types of social cooperation and activity even in the field of education. (Vass, 2010; Vass, 2019) As Walton (2016) puts it: “It is no coincidence that universities have developed their own DL [=digital literacy] definitions [...] While the academic library is working on establishing its DL boundaries and partnerships, opportunities to contribute toward their own university’s DL definition should be actively sought.” (Walton, 2016, 3)

In this dissertation, after having examined the definitions mentioned above, it seems wiser to apply the definition of digital literacy in a narrower sense, focusing primarily on reading on a digital device, including the competencies that are necessary to do it effectively. Those definitions that do not consider the process of reading, but focusing entirely on applying ICT skills, information literacy, and techno-social practices would shift the focus beyond the limitation of the dissertation. Thus, in this analysis, digital literacy means using, reading, and comprehending digital/electronic texts and applying their connected platforms. It means the way how we read in a digital environment but also our methods of how we navigate in this space, how we use the given electronic tools and specific guiders, how we understand the processes of the digital world, and how many of them we can exploit. These skills can be acquired and improved by observation, practice, and education, and not an original, inherent talent that we were born with.

This approach contradicts Mark Prensky’s (2001) theory about digital natives that says: “Our students today are all »native speakers« of the digital language of computers, video games and the Internet.” (Prensky, 2001, 1) I claim (and attempt to demonstrate some reasons for this claim via analysing the results of PISA-tests) that children of 21<sup>st</sup> century have no genuine digital literacy skills. They can handle digital tools easier (because they have got used to them), but they should also have to learn how to use them properly. I agree with Teo (2013), who states in his criticism on Prensky that there are “four attributes of digital natives as people who grow up with technology, are comfortable with multitasking, are reliant on graphics for

communication, and thrive on instant gratifications and rewards.” (Teo, 2013, 57) There is no research result which says without a doubt that those children who usually use digital tools have better digital reading literacy skills and have a better comprehension of these texts. Thus, having excellent digital literacy skills does not depend on the reader’s age, but on her relationship with technology. And this is one of the exciting parts of assessing reading literacy skills.

### 2.1.3. Web Literacy

Wendy Sutherland-Smith (2002) invites the notion of *web literacy* to the discussion of digital literacy as a term “for finding, scanning, digesting, and storing Internet information”. (Sutherland-Smith, 2002, 663) She cites Sorapure et al. (1998), claiming that the Web is a “vast, open, and uncatalogued library, and one in which reference librarians are nowhere to be found”. (Sorapure et al., 1998, 410). Because of these characteristics, web literacy requires skills such as reading, navigation, information accessing and analysing, and processing activities with texts. It also means the application of critical thinking and logic. From these, the difference between digital literacy and web literacy – if there is any relevant difference at all – is that every instance of web literacy is digital. Still, not every instance of digital literacy is web literacy. It is the same analogy as in the case of online reading/online text, and digital reading/digital text: every piece of online reading/text is digital, but not every piece of digital reading/text is online.

### 2.1.4. Visual Literacy

Finally, yet importantly, there is the concept of *visual literacy*. According to the relevant literature, visual literacy as a fundamental and controversial notion, has been used for over a hundred and fifty years in various fields (e.g., art history; iconology and visual culture); both in the singular (‘literacy’) and plural (‘literacies’) forms. (Elkins, 2009, 1-11) The phrase ‘controversial notion’ refers to the fact that it is a “fluid term which can change depending on its contexts.” (Stafford, 2011, 6) All the following disciplines tried to give their own theoretical and practical definitions of visual literacy, as follows (Avgerinou and Ericson, 1997, 283):

- aesthetics/art, philosophy, linguistics/psycholinguistics, cognitive/gestalt psychology, visual perception and perceptual development, the anatomy of the eye, mental imagery, neuropsychology, research on hemispheric processes, sociology, cultural anthropology,

educational technology, instructional design, screen education, communication theory, and semiotics.

As Barbara Maria Stafford puts it: “Visual literacy is a temporal construct, rising and falling with the cultural and scientific assumptions and values of a given period.” (Stafford, 2009, 32) John Debes creates the concept of visual literacy in 1969 with the following meaning: “Visual Literacy refers to a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects, symbols, natural or man-made, that he encounters in his environment. Through the creative use of these competencies, he is able to communicate with others. Through the appreciative use of these competencies, he is able to comprehend and enjoy the masterworks of visual communication”. (Debes, 1969, 27)

As Maria Avgerinou and John Ericson (1997) write in their summarising paper, this definition has been criticised by many researchers, because it does not determine the concept itself. Still, it gives the attributes of a visually competent agent. The solution could lay in the distinction of verbal and visual symbols, “which of them falls within the scope of verbal, and which fall within the scope of visual literacy”. (Avgerinou and Ericson, 1997, 281) Nevertheless, it seems that making this distinction is beyond the universal agreement since new and new definitions came up as time went by. Here are some examples:

- “Visual literacy can be defined as a group of skills which enable an individual to understand and use visuals for intentionally communicating with others.” (Ausburn and Ausburn, 1978, 291)
- “Visual literacy is the ability to understand (read) and use (write) images and to think and learn in terms of images, i.e., to think visually.” (Hortin, 1983, 99)
- “Visual literacy is the ability to understand the communication of a visual statement in any medium and the ability to express oneself with at least one visual discipline. It entails the ability to: understand the subject matter and meaning within the context of the culture that produced the work, analyse the syntax – compositional and stylistic principles of the work, evaluate the disciplinary and aesthetic merits of the work, and

grasp intuitively the Gestalt, the interactive and synergistic quality of the work.” (Curtiss, 1987, 3)

- “Visual literacy itself is defined as the active reconstruction of past experiences with incoming visual information to obtain meaning.” (Sinatra, 1986, 5)
- Visual literacy is the “ability to decode, interpret, create, question, challenge and evaluate texts that communicate with visual images as well as, or rather than, words. Visually literate people can read, interpret the purpose and the intended meaning, and evaluate the form, structure and features of the text. They can also use picture and word images in a creative and appropriate way to express meaning”. (Carry, n. d., 13)

According to Avgerinou and Ericson’s (1997) summary, there have been gathered 62 definitions of visual literacy in a media leadership conference that can be categorised as follows: human abilities, teaching strategies, and the promotion of ideas. (Avgerinou and Ericson, 1997, 283)

Modern research discusses the notion of visual literacy in the context of educational assessment, connecting visual skills and competencies to various situations. This latter, i.e. examining visual skills (thinking methods, working methods, work tools and real-life activities) through live situations is a significant improvement in the field of visual literacy. “Being competent only makes sense when there is a problem at hand that demands for action. What to do and how to act is always dependent on a situation, or, more specifically, on the interpretation of a situation. A situation is an environment that is considered from a specific angle or with a specific purpose. By interpreting a situation, one can arrive at an action that makes sense, not only in a factual way, but also with regard to the meaning of that situation for the person(s) involved. This connection to personal, social or practical relevance can help to arrive at assignments and learning situations that make sense for the learner and supports the development of the culturally educated citizen of the future.” (Schönau and Kárpáti, 2019, 6)

The European Network for Visual Literacy (ENViL) founded in 2011, renamed to Common European Framework of Reference for Visual Competency (CEFR-VC) in 2018, and working with 68 researchers from 19 countries at present, undertook the arrangement of the fundamental visual skills and abilities into a framework. The model of the European Visual Literacy Framework (Wagner and Schönau, 2016), created between 2013 and 2016, defines visual literacy in three levels: educational purposes, specific competencies, and situations of

their application. The model is not about aesthetical education or teaching drawing but modernising the way how visual literacy is taught. Thus, competencies such as creativity, critical thinking, sensitivity in inclusion, proficiency in visual phrasing, intercultural consciousness, civic commitment, capability, and consciousness are also included to the framework. Connecting and assessing visual literacy elements to situations and context, and organise them according to genres, purposes, places, individuals, sources, methods etc. helps diagnostic evaluation and discover pedagogical issues connected to visual literacy. (Kárpáti and Pataky, 2016) In the special issue of the International Journal of Education Through Art (Schönau and Kárpáti, 2019), visual literacy „is primarily used as a generic term that covers all school subjects that concentrate on learning in the visual domain.” (Schönau and Kárpáti, 2019, 5)

In this dissertation, visual literacy means applying, reading, and comprehending the visual attributes and elements of non-digital/non-electronic and digital/electronic texts. This approach does not exclude the definitions mentioned above but helps to focus on the visual aspects of reading and comprehension. The connection between text and visual is so strong that in some cases – e.g., in online reading – text is subordinated to the visual. Thus, the task is to understand how images and texts connect through writing. See more about the role of visuality in the reading process in *Section 2.3*.

The definitions above incorporate several scientific approaches and areas from Linguistics, Literature, Communication, Info Communication Technology (ICT), Sociology, Cultural Studies, Cognitive Science, Education, etc., and show that defining literacy is an evolving field. Since the main subject is quite fuzzy, it is a difficult task for researchers to conduct an assessment that aims to survey literacy. This dissertation refers to literacy in connection with the issues of reading, excluding other types of literacies, such as science or financial literacy.

## **2.2. The Complex Definition of Text**

The notions of literacy and reading are strongly connected to that of texts. Their form is written, created according to specific intentions, and aiming to (re)present something to be read and understood by readers. One can expect that texts do not need more sophisticated definitions;

their boundaries are clear and trivial; however, according to Bolter (1998), there are difficulties in defining them.

“The term text has not been easy to define since 1960s. It was first made difficult by the poststructuralist writers, such as Derrida, Barthes, and Foucault, but their notion of the text and their own texts had relatively little impact on the educational community. Now the computer, which is indeed having a great impact on educational theory and practice, has presented further complications.” (Bolter, 1998, 3) In the discussion of the nature of texts, it is necessary to make a distinction between texts that we read on paper and texts that we read on screen. The former can be called e.g. *off-screen/printed/non-digital/non-electronic/written/paper* etc. texts. The latter are the *on-screen/non-printed/digital/electronic/typed/online* etc. texts. All these names aim to grab differences between off-screen and on-screen texts and show a categorisation according to their major medium: the surface that texts are presented on. Thus, defining these texts causes controversies among researchers, and the debates are rooted in two well-demarcated questions. The first is about whether we can regard and treat off-screen texts similar to on-screen texts. If the answer is yes, then reading from a screen is just a simple platform-shift, a necessary but natural technology change that does not touch upon the nature of the text itself deeply. In this case, the classic frameworks of reading literacy and text comprehension should work mainly unaltered and they do not need major revision. In contrast, if the answer is no, and reading from screen means a significant and essential text nature change, then we should revise our literacy theories, including reading strategies and comprehending mechanisms, too. The second problematic question rises directly from the claim that before describing the features of reading off-screen and on-screen texts, we should agree in the definition of these kinds of texts.

“Although nearly all text linguists are in agreement that the notion ‘text’ is the natural domain of language, they vary in their views on what constitutes a text.” (Al-Amri 2007) According to linguists, off-screen text as a linguistic unit can be determined as communicative occurrence which meets with the following standards: cohesion, coherence, intentionality, acceptability, informativity, contextuality and intertextuality, and “text cannot be considered a text unless it meets these seven standards”. (De Beaugrande and Dressler, 1981) For a detailed summary of these seven standards, see *Chart 2*.

<b>Cohesion</b>	The network of lexical, grammatical, and other relations, a kind of „sticky tape” which provides links between various parts of a text, thus linking ideas one another with semantic markers.
<b>Coherence</b>	The network of conceptual relations, which underlies the surface text throughout descriptions and sequences of situations, and marks the causality and time in the construction of the text.
<b>Intentionality</b>	The author’s purposes and goals of influence or rhetorical devices such as persuasion, instruction, request, information, commands, questions, and suggestions based on a given plan.
<b>Acceptability</b>	The receiver’s attitude and recognition are that a text is cohesive and coherent regarding also the supplement information, and the social activity of the text is fulfilling.
<b>Informativity</b>	New information for the benefit of the reader, including information transfer and revealing new information.
<b>Contextuality</b>	A particular social or pragmatic context where the text is relevant in a given time or in a context that influences readers’ interpretation.
<b>Intertextuality</b>	This refers to the fact that all texts contain traces of other texts, and they are connected by a linking system that lies among text and other texts.

**Chart 2: The Seven Standards of Textuality (Original Chart Based on De Beaugrande, 1981; De Beaugrande and Dressler, 1995; Carstens, 1999)**

Notwithstanding of the various text definitions, there is a fundamental consensus that text is ‘what is written’. However, if one claims that digitalism changed the way of reading, then she cannot disregard that her claim also involves that reading material also changed and turned the valid concept of ‘written’ as well. Since on-screen, we read special texts that are not *hand-written* but *hand-typed*, their inner organiser force, their structure, even their features are different: they bear some characteristics of off-screen texts, but they are also more individual and peculiar. (Szabó, 2016b) Thus, as *literacy* and *digital literacy* forms a pair together, text (=off-screen/printed/non-digital/non-electronic/written/paper) also has its digital tally: digital (=on-screen/non-printed /electronic/typed/online) text.

Chart 3 below shows three definitions of digital text – one of them is the official definition of PISA2018:

<b>digital text</b>	“Digital Text or eText is an electronic version of a written text. Digital Text can be found on the internet or on your computer or on a variety of hand-held electronic devices. With digital text, changing or customizing the information to meet the needs of students is easy. By nature, digital text is more flexible. It can be searched, rearranged, condensed, annotated or read aloud by a computer. And because digital text is so flexible, it's often a perfect alternative for students with different learning needs.” (Redefining Literacy, n.d.)
	“Digital text is delivered on a computer or another device to meet the needs of students with sensory, physical, or learning and reading disabilities. Digital text is malleable and, depending on the technology and/or the software that is used, various features that control how the content is presented to the user can be manipulated such as size, fonts, colors, and contrast to accommodate the needs of the learner. Supported reading software with text-to-speech can provide audio and visual components either separately or simultaneously as well as other scaffolded supports like highlighting, dictionaries, and thesauruses.” (Maine-AEM, n.d.)
	“Just like printed texts, some digital texts are “static” in that they come with a minimal set of tools for interaction (scrolling, paging, and a find function). For instance, this is the case of

<b>PISA2018's definition for digital text</b>	documents intended for printing but displayed on a computer screen (e.g. word processing documents or pdf files). However, many digital texts come with innovative features that increase the possibilities for the reader to interact with the materials, hence the phrase “dynamic text”, which is sometimes used to characterize these texts. Dynamic text features include embedded hyperlinks that take the reader to other sections, pages or web sites; advanced search functions that provide ad hoc indexes of the searched keyword and/or the highlighting of these words in the text; and social interaction like in interactive textbased communication media such as email, forums and instant messaging services.” (OECD 2016, 22)
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**Chart 3: Definitions for Digital Text**

Here it is necessary to narrow the focus and make a distinction between digital texts and *online* texts. It is an important step because, in this research, the digital text is referred to in a wider sense, which includes every kind of on-screen/digitalised texts (i.e., E-books and simple digital copies of off-screen texts as well). At the same time, online texts are considered as texts which are to be accessed and read on the World Wide Web. They are dynamic and changeable texts; hence, it is easy to change their content, add or delete sections, edit their outlook and characteristics by the author or the readers. Besides, online texts are much more than something *written* or *typed*. Rather they are something written *and* drawn, visually designed and edited, linked, and embedded into the online space. Online texts include sidebars, graphic organisers, pictures, gifs, animations, pictograms, and linked references, even embedded videos and interactive panels. Thus, online texts are *hypertexts* (Bolter, 1991; Bolter, 2001; Pullen, 2006; Cull, 2011): always ‘vivid’ and multifunctional and be able to change according to readers’ intentions.<sup>4</sup> “The Web is designed to be hypertextual [...] is a global network of pages and links. [...] Both writing and reading on the Web are defined by the expectation of interaction. [...] Today, the Web is itself one gigantic, interconnected text.” (Bolter, 1998, 4)

The antecedent of hypertext is *memex* by Vannevar Bush, originally meaning an interactive encyclopaedia on microfilm. Theodor H. Nelson was the one who created the name hypertext in 1960. The notion of hypertext can be defined as follows: “text composed of block of words (or images) linked electronically by multiple paths, chains, or trails in an open-ended, perpetually unfinished textuality” (Landow, 1997, 3) Hypertext is a kind of fluid text, built up by verbal and graphic elements (pages) that are linked to each other. It has two building

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<sup>4</sup> This dissertation handles the term hypertext as a synonym for online text. However, there are digital documents, that are offline, but have hyperlinks, that connects sections within the text, creates inner references, or even external references to other offline documents on the same digital device. Nevertheless, if these links do not lead out the reader to the online space, they are not concerned to be hypertexts here.



elements: links and lexias, the latter means a reading unit or a section of a text. Since the decision of the reader defines the order of the pages, a “rich hypertext can and probably will be different for each reader and with each act of reading. [...] A hypertext is radically unstable and unpredictable in a way that the printed text is not.” (Bolter, 1998, 5) Thus, hypertexts are non-linear as readers create them during the process of reading. “Hypertext is said to bring freedom to readers, creating new terms such as *wreader* and *secondary author* [...] Each reader can then create a unique text according to the links followed.” (Nowak, 2008, 2) Some scholars are questioning this “unique” freedom of hypertext claiming that print texts can also be as free as hypertexts, since “there can also be many paths through a printed text, to be formed by the reader during the process of understanding the text”. (Nowak, 2008, 2) Another debate concerning hypertext is about the cognitive process of reading a hypertext. Some claim that hypertext involves better the associativeness of cognition (White, 2007), while others (Dillon, cited by White, 2007) argue, “there is no evidence within cognitive psychology that hypertext supports associative thought processes”.

The “multimedia nature and computer interface of the Web enables it to offer the reader more assistance in finding the information they need than print documents can”. (Bastek, 1994-2012) Including but not limited to, here are some important peculiarities of online texts (Bastek, 1994-2012): URL’s –Web addresses, Site Maps, Search, Frames, Functional Areas: Headers, Footers, Side Bars, Menu bars, Toolbars, and Forms.

Regarding text linguist De Beaugrande’s (1995) above-mentioned seven principles, it is questionable whether they could provide a valid and sensible framework in the case of online texts as well. Text cohesion, coherence, contextuality, and intertextuality should be reconsidered in the first place, because visual elements and text extension have strong influential force in the process of constructing meaning on a semantic level. As many researchers have already concluded (Adler et al., 1998; Hocks, 2003; Mangen, Walgermo, Brønnick, 2013; Baron, 2015, etc.), the nature of online texts requires constant activity from readers, meaning jumping between text sections, shifting from one site to another, zooming in and out and surfing with the help and guidance of links. It follows from this non-linear or multilinear, fragmental way of reading (Aarseth, 2004; Bearne et al., 2007; Bolter, 1998; Hillesund, 2010) that it is much harder at first to define and describe text itself and at second the pursuit, their inner conceptual arc, thus comprehend their meaning. Concerning the other

three principles: intentionality, acceptability, and informativity, they should be revised, because the online nature of the text and the required constant activity of readers significantly involve and modify them.

This urgent need for reconsidering the conceptual framework of classic text linguistic and reading literacy regarding the uncertainties and hitherto unknown features of online texts will be significant if we like to put theory into practice and do surveys for reading literacy to improve reading skills, text comprehension, and educational materials. It follows from the above that reading and text comprehension are not only decoding and summarising anymore but much more complicated mechanisms. (Szabó, 2015) Even so, as reading researchers, Mark Sadoski and Allan Paivio put it: in reading, the term decoding is “theoretically imprecise. The term recoding is often preferred because it indicates concerting the printed form to the spoken form without necessarily comprehending, as the general definition of decoding implies (i. e., to decode a message)”. (Sadoski, 2004, 16)

Having surveyed various definitions of texts, such as digital and online texts, it is clear that the question: “What does text mean in the digital age?” is quite complicated. That is one reason why it is a difficult task to create a literacy assessment where a massive percent of the results depends on the texts of the test tasks. Even more so, because these texts, apart from the above-discussed characteristics, carry a considerable amount of visual and graphic elements that have an essential impact on reading. Thus, the next section (*Section 2.3.*) focuses on the role of the visual in the reading process.

### **2.3. The Role of the Visual**

The topic of visuality has already been involved in the previous chapters, where the multiple meanings of literacy, including visual literacy (*Section 2.1.*) and the notion of hypertext (*Section 2.2.*), were discussed. This chapter aims to go deeper and present the complicated role of the visual, thus the connection between reading the world and seeing the world.

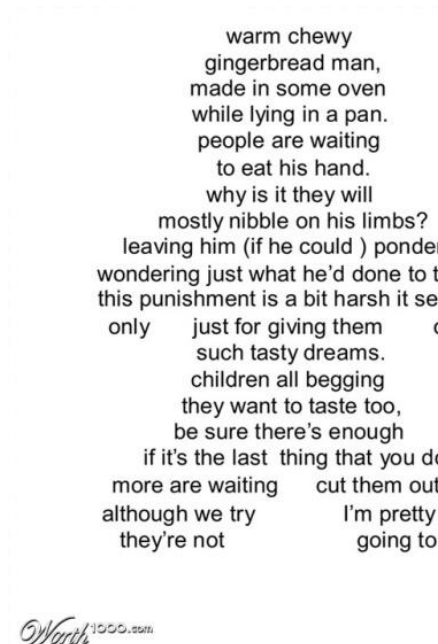
“Seeing, it suggests, is something like reading. But how exactly?” (Mitchell, 2009, 11) asks art historian William John Thomas Mitchell and continues: “If seeing is like reading, it is so only at the most rudimentary and literal levels [...] If the writing system is phonetic, one will have to have to [sic!] learned the alphabet that coordinates the spoken with the written word [...] the skill of reading is already a visual skill. [...] If the writing system is not phonetic, but

ideographic or pictographic, then the demands on the visual system are even more profound.” (Mitchell, 2009, 11-12) He also adds that seeing at a basic level is a naturally acquired but also learned skill, and – as another art historian, Barbara Maria Stafford suggests – a kind of visual competence as necessary but not sufficient component is in need to be competent in visual literacy. (Mitchell, 2009, 13) Thus, the importance of visual literacy lies in the fact that “[o]ne has to possess visual competence in order to read a text (unless it is written in Braille).” (Mitchell, 2009, 14)

These remarks will be important, especially in the literacy discussion of the last forty decades. “Since 1980s the rhetoric of images has become far more pervasive, so that it is now commonplace in the media to hear that we live in a visual culture, and get our information through images.” (Elkins, 2009, 4) Because of these reasons, “[i]t is time to consider the possibility that literacy can be achieved through images as well as texts and numbers”. (Elkins, 2009, 4-5) Thus, visual literacy has been discussed in many senses (such as conceptualisation; images outside the arts; politics; pedagogy, etc.) with various definitions, such as “understanding how people perceive objects, interpret what they see, and what they learn from them”. (Elkins, 2009, 2)

The involvement of the visual is not a new topic in the field of reading and not the innovation of digitalism. (Kondor, 2008; Kárpáti and Nagy, 2019; Kárpáti and Schönau, 2019) At a basic level, texts originally have a sort of visuality, as the “[...] name for a group of signs is text – a collection of signs which organized in a particular way to make meaning. The meanings made will depend on which signs are brought together, and how they are arranged in relation to one another”. (Schirato and Webb, 2004, 8) It is enough to think about Egyptian hieroglyphs or the initials of codices, where texts carry strong visual elements. (Kondor, 2008) Thus, reading is to comprehend signs – which are visual elements with special characteristics such as font style, size, and arrangement – and means that the whole reading process is subordinated to the visual (*Figure 3 and 4*).





**Figure 4: Example of Font-Arrangement (W2, n.d.)**

“The world told is a different world to the world shown.” (Kress, 2003, 1) Writing is for »to tell« while visual elements (for instance, images) are for »to show«. (Kress, 2003) The main difference is that “writing [...] is governed by the logic of time and by the logic of sequence and its elements in time, in temporally governed arrangements”. (Kress, 2003, 1) Contrarily, “the organization of image is governed by the logic of space and by the logic of simultaneity of its visual/depicted elements in spatially organized arrangements”. (Kress, 2003, 1) However, I must disagree – especially in the special case of printed picture books, workbooks, and comics. Take this latter as an example: in comic books, pictures are governed by time and by the logic of space. The same phenomenon could be easily noticed vice versa, as well as in the case of the online version of picture books, workbooks, and comic books. (Youngs and Serafini, 2011) In these cases, we deal with multimodal texts, thus a kind of triple signal system: written language/text, picture/visual elements, and a “third quality”. (Youngs and Serafini, 2011; Szabó, 2015, Kondor, 2008) The latter connects texts to the additional visual elements and makes their meanings a common, united whole. Visual elements give meaning and drive the reader’s attention, so there is an interplay between texts and visual elements. (Szabó, 2015)

According to information mapping expert Robert E. Horn, this *visual language*<sup>5</sup> is “the tight coupling of words, images, and shapes into a unified communication unit. »Tight coupling« means that you cannot remove the words or the images or the shapes from a piece of visual language without destroying or radically diminishing the meaning a reader can obtain from it.” (Horn, 1999, 27)

In order to get a better understanding of the visual, it is worth having a look at the so-called “image science”. According to Mitchell (2009), there have been four major turns in image science:

- (1) *The pictorial turn*: a turn from words to images. “[I]t is not unique to our time. This is not to say, however, that pictorial turns are all alike: each involves a specific picture that emerges in a particular history situation.” (Mitchell, 2009, 15)
- (2) *The image-picture distinction*: The easiest way to grab the difference is that “»you can hang a picture, but you can’t hang an image«. The picture is the material object, a thing that you can burn or break. An image is what appears in a picture, and what survives its destruction – in memory, in narrative, and in copies and traces in other media.” (Mitchell, 2009, 16)<sup>6</sup>
- (3) *The metapicture*: “They appear whenever an image appears inside another image [...] one medium maybe nested inside another, as when the golden calf appears inside an oil painting, or a shadow is cast in a drawing.” (Mitchell, 2009, 19)
- (4) *The biopicture*: a new version of the pictorial turn, to *clone* something living, to create artificial life according to “our own image”. (Mitchell, 2009, 21)

Following this string, the question emerges: “[m]ight it be possible that in future there may be a textual turn: people may go back to reading books, so to speak – they might realize the importance of verbal literacy?” (Mitchell, 2009, 25) Especially that, at present, we are at the counter-stage where texts are turning into pictures. (Benedek and Veszelszki, 2016) As an art research professor, Lilly Koltun writes: “Google is in the process of scanning millions of

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<sup>5</sup> Bishop Berkeley’s term: „He called this »universal language of nature«, to contrast the *spoken* and *written* »natural languages«, which are, as we say, cultural constructions based in arbitrary, symbolic conventions.” (Mitchell, 2009, 13)

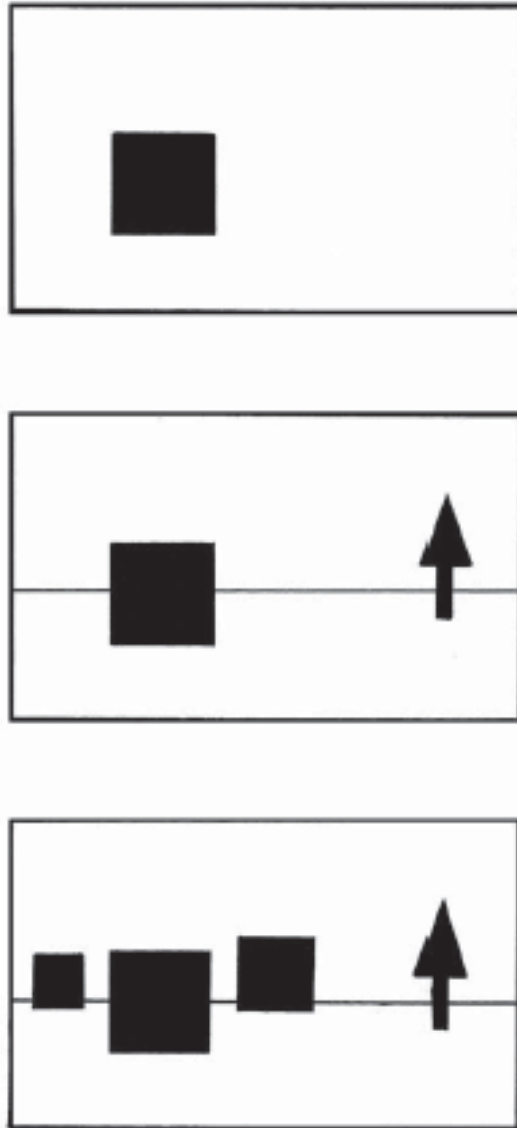
<sup>6</sup> Despite of Mitchells’ theory, this dissertation does not stick to this distinction of image and picture, as most of the literature.

books in the libraries of Michigan University, Harvard, Stanford, the New York Public Library, and the Bodleian in Oxford, and turning them into images, which would then be available on the Internet.” (Mitchell, 2009, 27)

At this point, the clear distinction between text and context, text and visual elements falls, and the problem of reading literacy – and its surveys – becomes more complicated. Thus, the question and the answer concerning reading visually complemented texts is the following: “[t]o what extent [...] does verbal literacy involve, and perhaps depend on, some sort of visual competence or even visual literacy? [...] One has to possess visual competence in order to read a text”. (Mitchell, 2009, 14) It is especially so in the case of contemporary reading, where the shift from print to digital and online is not just a change of instruments or data media, but also text comprehension. The line between textuality and visuality seems to slur, their traditional hierarchical order is gradually disappearing, and the problem of surveying reading literacy become more complicated.

Hence, it seems obvious that the enormous number of visual elements, which turn up in lots of offline and digital, and almost every online text has a significant role in reading processes. But what is this “significant role”? (Szabó, 2016a) Mitchell suggests the *vehicle metaphor* as a help to understand the fuzzy issue of contemporary reading as follows: “reading as the »tenor« – the thing to be explained – and vision as the vehicle that might help explain it”. (Mitchell, 2009, 11)

English and Literature teacher and researcher Tim Stafford (2011) shows us another perspective, namely, the *narrative*. According to him, we should connect the visual – hence visual literacy – to the act of telling a story. The question is, “at which point does an image stop being »just« an image and take on a narrative dimension?”. (Stafford, 2011, 7) For a better understanding of the issue, he gives us the following (visual) example (*Figure 5*):



**Figure 5: Three Boxes (Stafford, 2011, 8)**

In this example, we can pursue the small changes that give each box from 1 to 3 a more complex meaning step by step. By adding a simple element, such a line and a rectangle, the drawer immediately creates a possible perspective and a narrative. *Possible*, because “images, like written texts, should not always be limited to a single unequivocal meaning, especially abstract ones”. (Stafford, 2011, 7) Stafford applies the term ‘reading’ for the process of looking at an image *and* understanding its meaning. With this notion, he connects the topic of understanding images to literacy as well. He also refers to the image – icon – symbol triad, claiming that ‘image’ is a general, cross-media umbrella term, but the other two reflect on more



sophisticated visual elements. Thus, an icon is a two-dimensional representation, usually with a conventionally fixed meaning, whilst the symbol is a specific type of icon where “we can turn into literacy studies to aid our understanding” (Stafford, 2011, 10), such as poetry and visual metaphors. However, he also warns us to “beware of over-reading and try to avoid looking for a coded, deeper significance in every simple aspect of it”. (Stafford, 2011, 10)

Inserting visual elements into texts to make them more exciting or colourful is not equal to inserting visual elements as explanatory illustrations. The latter aims to make content, message, and their inner communicative intentions comprehensible. As Joel R. Levin and Richard E. Mayer phrased, “illustrations can have powerful positive effects on students’ learning” (Levin and Mayer, 1993, 95), as they make text information more concentrated, compact/concise, concrete, coherent, comprehensible, correspondent, codable, and collective. With these attributes, illustrations can decorate, represent, organise, interpret, and transform the meaning of the text. “Illustrations are the basic of visual learning and include photographs, drawings, diagrams, charts, graphs, figures and tables.” (Mayer, 1993, 257)

Here it is worth to mention infographic, which is an illustration that aims to translate an information to the language of the visual in order to help its inclusion. Infographic highlights, groups, arranges, simplifies, and selects the essence of data, and provides well-prepared, easily understandable information to the reader. Infographic can be considered as functional art, aiming to be beautiful and precise at the same time. There are four types of infographics: data visualisation, continuous or explanatory diagram, map, and poster-type complex infographics. (Bubik, 2013)

Recent research claims that there are “10 tenets for teachers” for applying illustrations in texts in order to enhance children’s learning<sup>7</sup>, which is also a warrant for the significant role of the visual, and the strong connection of text comprehension and illustrations. (Carney and Levin, 2002)

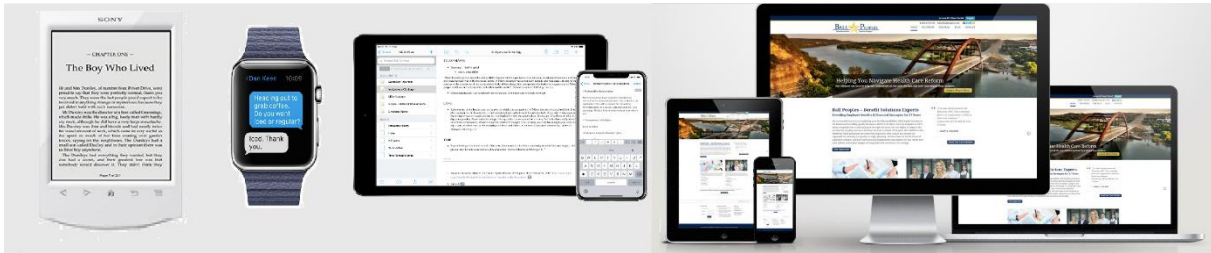
In the case of picture books and comics – as genres where the visual is an essential part of the content – readers require specific kinds of literacy skills. At this point, in a certain sense, they extend their attention and comprehension and observe texts in another level, where visual elements are not in the background anymore but serve as context *and* content during an exciting,

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<sup>7</sup> For more, see: Carney and Levin (2002).

dynamic interplay. An “understanding of [this] dynamics is an essential part of being visually literate”. (Stafford, 2011, 11)

Shifting towards digital texts, the visual becomes even more highlighted, as the electronic interface opens a set of clever solutions of making visual elements inherent parts of texts. Since a huge amount of digital texts are just copies of offline texts (thus just *digitalised* texts), one could expect that their visual elements are not *that* different, complicated, or unique (see *Figure 6*).

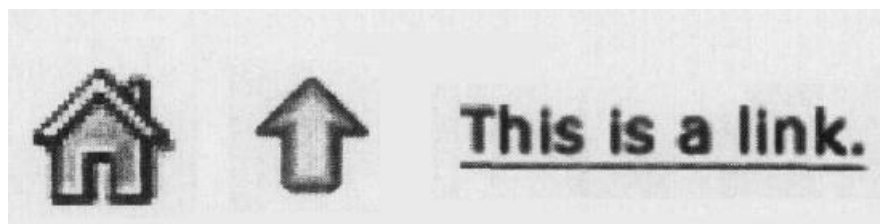


**Figure 6: Electronic/Digital Texts (Original Picture Based on W., n.d.)**

On the one hand, it is true. Electronic/digital texts mostly the copy of the original visual elements of the offline text, without any significant modification. Illustrations remain illustrations, as visual explications and design elements also stay as they are. On the other hand, electronic/digital texts have additional visual elements that are required because of the specific *surface* because of the *screen*. These are not illustrations but guiders – scroll bars, sidebars, menus, icons of navigation, etc. – that help readers to “find their way” in texts. They have an essential role in digital reading because without them, even “turning a page” could be difficult – or simply impossible. These visual elements are *on* screen, next *to* or even *in* text, and their function is not just *to mark* something but also *to lead* readers into, out of, backward and forwards, in and between texts. Thus, it would not be wise to regard them as simply illustrations or design elements. According to Claire Harrison, expert of writing, rhetoric, social semiotics, and systemic functional linguistics, “those of us who communicate primarily as writers face three significant challenges in this new multi-modal communication environment. To ensure that our documents are most effective for readers/users, we must

1. Understand how text and still images work together to make meaning together for readers/users.
2. Know when still images enhance or detract from text, and vice versa.
3. Be able to effectively discuss the issues of multi-modal communications with other members of the document’s production team.” (Harrison, 2003, 47)

To fulfil these requirements, Harrison suggests turning our attention towards *visual social semiotics* as an appropriate tool for understanding the dualism of text and visual. Carey Jewitt and Rumiko Oyama, social semiotics researchers, define this notion as follows: “the description of semiotics resources, what can be said and done with images (and other visual means of communication) and how the things people say and do with images can be interpreted”. (Jewitt-Oyama, 2001, 136) The field of *Semiotics* discusses the triad of *icon-index-symbol*, as the three categories of images. This triad serves an essential part of the discussion about the visual, whether we talk about offline, digital, or online content. Harrison shows us three examples from the online sphere for each element of the triad (*Figure 7*):



**Figure 7: The Three Categories of Images (Harrison, 2003, 50)**

The image of the *house* on the left side of the above picture is an icon since it shows similarities with a real house or a cognitive concept of a real house in one’s mind. This icon could be more sophisticated and also simpler – the point is to have enough characteristics to stay recognisable and show resemblance. The *arrow* on the middle of the picture is an *index*: it is most recognisable not because of any similarities with a real object, but the hidden, latent meaning it bears. If we understand an index, we understand the concept behind it. For instance, if we see this arrow on a web page, we know that it means something like ‘Top of the page’, or ‘Scroll up’. From this example, it is also clear that an index can be easily misunderstood if we do not know or understand the intended meaning of it. That is why the arrow mentioned above sometimes accompanied by an explanatory label such as “Scroll to the top”. To put it in contrast, a *symbol* – the third element of the triad – does not need any visual resemblance to the entity or to the concept intended to represent. The meaning of a symbol is socially constructed, built on consensus and convention.<sup>8</sup> One good example is on the right side of the picture above: “This is a link.” We know the meaning of it because we recognise its commonly agreed form and

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<sup>8</sup> According to Nelson Goodman (1968), the meaning of every visual representation is the result of social construction, while Kristóf Nyíri (2001) argues that a certain level of resemblance is required to construct meaning.

characteristic. (Harrison, 2003, 50) Thus, visual elements illustrate, complete, and explain the main text – on a first level. Furthermore, they give meaning to the texts and drive the reader’s attention during the reading process. In short, there is an interplay among the text and visual elements.

One can discuss these three examples mentioned above in the context of printed texts; however, they can be typical examples of the digital and the online world, since digitalism led to the rediscovery of the visual: the “prehistoric” communication forms of image, picture, icon, index and symbol that once dominated human communication. (Nyíri, 2016) In the case of mobile communication, for instance, the following requirements should be fulfilled in order to fit visual elements to the digital environment: “(1) ease in producing special symbols, and (2) fast recognizability of the symbols employed; (3) pictoriality (icons, as far as possible, should resemble real-world objects); (4) conventions enabling (a) the combinations of icons, and of parts of icons, (b) the generation of complex symbols out of simple ones, (c) the use of symbols standing for abstract concepts, and (d) adding text (written and voiced) to icons; (5) multi-cultural span and historical continuity, as well as (6) dynamic capabilities (allowing for animations).” (Nyíri, 2003, 179-180)

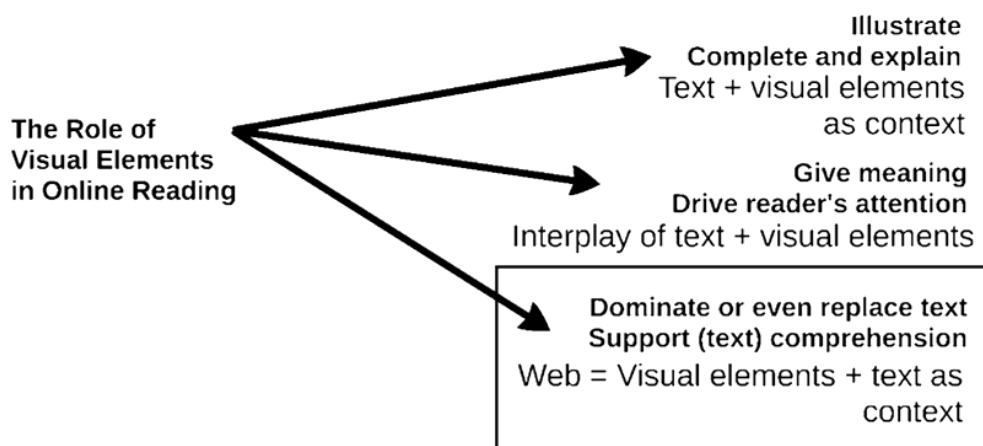
In modern pedagogy, applying illustrations in teaching, especially in e-learning is crucial, and the priority of the visual – as a new paradigm – seems unquestionable. (Benedek, 2019; Benedek and Nyíri, 2019) “One of the special dimensions of the transformation going on in education and pedagogy these days, which is perceivable by ICT applications becoming more and more commonly used, is that we strive to apply images more explicitly than ever before. In fact a new type of multi-modality, offering effective methodological utilization in current teaching and learning, is taking form. We can and must use consciously this new possibility which has info-communication potentials and is available by the students practically anytime and anywhere.” (Benedek, 2019, 949)

Returning to the previous issue and example of the icon-index-symbol triad, the house is more an index than an icon since its hidden meaning becomes primary: homepage. The arrow retains its indexical features as well as the link. All three examples are interactives in the context of digital and online space: we need to click on them if we would like to follow the path they offer. In the case of the link, we do not need any additional, explanatory instructions to guide us. The underline and the colour of the link (it is usually blue) is enough to understand the

meaning of it. Online texts are full of these kinds of interactive visual elements; thus, we can claim that the online self itself is visual, while digital texts – regarding their visual and interactive complexity – are between printed and online. An online text is built up by characters (aka signs) and “multiple communication modes” (alias visual elements), for instance, image, audio, and video. They “are governed by distinct logics [which] change not only the deeper meaning of textual forms but also the structure of ideas, of conceptual arrangements, and of the structures of our knowledge”. (Kress, 2003, 16 in Weasenforth, 2006, 1)

Thus, visual elements have at least an equal or even a dominating role over text in online reading processes. They do not only support comprehension but dominate or replace online texts indeed. (Szabó, 2016a) “[R]eaders imagination is a matter of ordering elements in contrast to filling traditional text with meaning. [...] readers do fill images with meaning also.” (Weasenforth, 2006, 27) Moreover, “images are plain full of meaning, whereas words wait to be filled”. (Kress, 2003, 3) Thus, “the conceptualization of textuality is changing as images seem to dominate text and as screen overtake paper [...] [and] writing becoming subordinated to the logic of the visual”. (Kress, 2003, 5) It is a cardinal change in comparison to traditional theories about printed texts that claim the dominance of texts over visual elements. In this sense, we could talk about the rediscovery of the visual.<sup>9</sup>

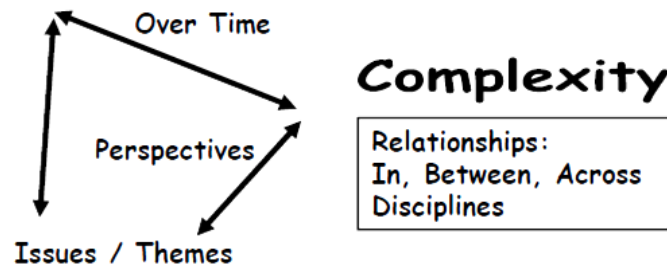
There is continuity in the printed – digital – online reading triad, and visuality has its own crucial, variant, and intensifying role in every step of this path. Focusing on online reading, the unique role of visual elements could be the following (*Figure 8*):



**Figure 8: The Role of Visual Elements in Online Reading (Szabó, 2016a, 109)**

<sup>9</sup> See also the decade-long conference series of the BUTE Visual Learning Lab: <http://vll.mpt.bme.hu/>.

Now, we returned to the already discussed topic of what it means to be a “text” (see *Section 2.2.*). With the involvement of the notion of visual text, we get an even more complex picture, where we should consider the following features as well (*Figure 9*):



**Figure 9: The Complexity of Visual Texts (Carry, n. d., 8)**

According to the above, the web is constructed by online texts. It is a sort of content composed of the text (characters, words, sentences) and visual elements (pictures, images, graphics, etc.). The shift in the hierarchy of texts and visual elements is so significant that it modifies and influences reading and text comprehension – especially in the case of digital and online reading.

This vagueness is rooted exactly in the nature of visuality that interweaves the online content. An online text is more than a digitalised version of an offline text because the online nature of it substantially modifies its reading, meaning, and comprehension. They are hypertexts, i.e., texts “linked to each other with hyperlinks so we can easily switch and jump between them, like in an eternal, never-ending and always refreshed text.” (Szabó, 2015, 171) Hypertexts, also because of the online space, are inherently combined with visual elements. This connection could be so complex that sometimes it is challenging to decide what is related to the main text, and what is just an additional illustrative or design element or a supporting icon of the digital device. This could be a problem, for instance, in online literacy surveys. If we do not have exact notions about the texts what to read, then we will quickly conclude to inappropriate results about readers’ skills and reading process as well. This issue will be discussed in *Sections 5.4.* and *6.4.*

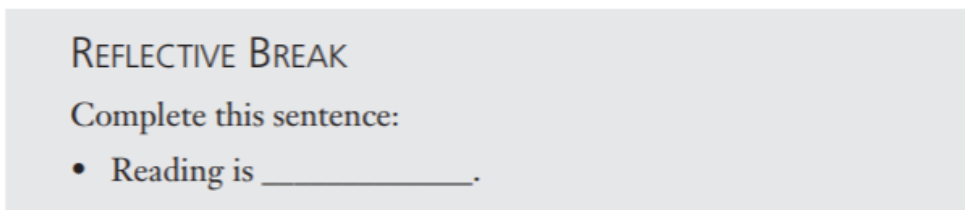
However, this should not be too surprising: if the connection between an offline text and the visual is so strong and complicated, then it should be at least the same in the case of online texts, too. The aim of the next chapter (*Section 2.4.*) is to present this complexity of reading in the digital world.

## 2.4. The Concept of Reading in a Digital World

There are several beliefs concerning how reading should be defined; it is enough to think about the many ways in which the term of reading is applied in common sense and the academic field as well. Thus, in the case of reading, there are as many parallel definitions as in the case of literacy. (See *Section 2.1.*)

According to literary scholar Wolfgang Iser (1978)'s phenomenological approach, reading is a constructive act during which there is a dynamic interplay between the text and the reader that results in a constructed meaning. Thus, reading can be defined according to the *act* of it: it is an action, an active *cognitive* process or procedure that readers do when they look at a text and aim to understand its content. Reading is also a *physical* process, i.e., readers are physically engaged with the medium (e.g., book, paper, parchment, or electronic device) by holding it, turning its pages, feeling the shape of it, touching, and even smelling it. These cognitive and physical connections work together, create, or give the *experience* of reading. "The phenomenology of reading is most often used to describe the process of reading traditional, linear text, but it can also be a challenge to hypertext theory on describing digital readings. Its goal is to describe the experience of reading". (Nowak, 2008)

One way to find a proper definition of reading is to ask readers what they think about reading as an activity while they are doing it. For instance, advise them to read the sentence below and fill the gap (*Figure 10*):



REFLECTIVE BREAK  
Complete this sentence:  
• Reading is \_\_\_\_\_.

**Figure 10: Reflective Break (“What is Reading?”, n.d.)**

Typical answers probably include the following versions. Reading “had something to do with comprehension, meaning, or understanding [...] This view of reading as comprehension is generally thought of as a cognitive or mental view of reading – of what takes place in the brain.” (“What is Reading?”, n.d., n.p.) According to this, reading is “a number of interactive processes between the reader and the text, in which readers use their knowledge to build, to

create, and to construct meaning.” (“What is Reading?”, n.d., n.p.) In another sense, reading “is a process undertaken to reduce uncertainty about meanings a text conveys. The process results from a negotiation of meaning between the text and its reader. The knowledge, expectations, and strategies a reader uses to uncover textual meaning all play decisive roles way the reader negotiates with the text’s meaning.” (Definitions of Reading”, n.d.) Besides, “reading is a temporal activity, and one that is not linear. (Mambrol, 2018)

As one can see from the sample definitions above, there are several keywords concerning reading, according to which we can pursue deeper meanings of reading. These keywords are (1) *interactive*, (2) *processes*, and (3) *knowledge*. The first refers to two conceptions; one is the interactivity between readers and texts, the other is the interplay between those components skills that work parallel during reading and result in what we call comprehension. (“What is Reading?”, n.d.) As reading researcher William Grabe (1991) puts it: the interactive reading processes include “both an array of low-level rapid, automatic identification skills and an array of higher-level comprehension/interpretation skills”. (Grabe, 1991, 383)

Concerning process, there are several kinds of activities that readers do while reading, from lower-level processes to higher-level processes. The former is about recognising letters and words, decoding, or finding the syntactical connections in a paragraph, whilst the latter means understanding and interpreting texts, guiding our attention, interference, and applying different reading strategies. (Steklács, 2013; “What is Reading?”, n.d.)

The third keyword was the *knowledge* that includes the language and its features (alphabet, grammatical rules, and vocabulary), topic, author, genre, aim, and cultural background of texts. Besides, there include the author and the reader as well. (“What is Reading?”, n.d.) Here digitalism must be mentioned since it can be an essential part of knowledge as required knowledge, set of skills and abilities, or cultural dimension. (“What is Reading?”, n.d.) However, there is a disagreement concerning whether we should consider digital reading as reading *at all*. For instance, according to the *National Endowment for the Arts* study (NEA, 2007) that discusses the issue of reading of American children in 2008, reading digital contents or learning online is “not reading”, but „activities that distract one from reading” (Coyle, 2008, 3-4). Moreover, in the newest 2018 study (NEA, 2018), NEA still holds to this statement. In line with this, a 2016 study states that digitalism will give us a new experience, “which is not exactly »reading«”. (Badulescu, 2016, 148) Thus, ‘digital reading’



intrinsically refers to a distracting activity or new experience, and these are in contrast with reading. However, if children who are consuming digital content are doing something that is “not exactly” reading, then what are they *exactly* doing?

There are those – including me – who claim that digital reading *is* reading as well, and we should handle it accordingly in research, surveys, improvements, and educational practice. The supporters of this opinion do not claim that digital reading is entirely similar to print reading, they are aware of the significant specifics of digital reading, but they claim that the total exclusion and separation of digital reading from traditional reading is not a viable consideration. (Coiro and Dobler, 2007; Bolter, 2001; Cull, 2011; Dougherty, 2011; Dyson and Kipping, 1998; OECD, 1999; Rich, 2008; Gatward, 2017) Here I will not present the whole argument; however, I consider digital reading definitely *as reading*, just as written and print reading.<sup>10</sup>

The dimension of *culture* has several aspects as well since there are reader and non-reader cultures, and variant levels of literacies, which occur through time and space. The aim of reading varies according to cultures, levels of education, and literacy concepts. Besides, certainly there is an *affective* dimension of reading. It means the reading-experience that gives joy, pleasure, excitement, or even Flow to readers. (“What is Reading?”, n.d.) For more, see *Section 6.5*.

Reading can be defined as a dynamic and complex process that requires specific skills, strategies, and prior knowledge from the reader. The latter needs to run cognitive components such as word recognition, decoding, text comprehension, etc. in order to constitute a proper reading. Thus, reading by nature is a constant mental improvement that requires a certain level of motivation, self-efficacy, and prior reading experiences. (Afflerbach, 2007)

According to the Literacy Dictionary: The Vocabulary of Reading and Writing, there are twenty different definitions of reading. One is that reading is a socially situated “perceptual act” when readers construct meaning by applying variant strategies and skills according to their personal and social purposes. (Afflerbach, 2007, n. p.)

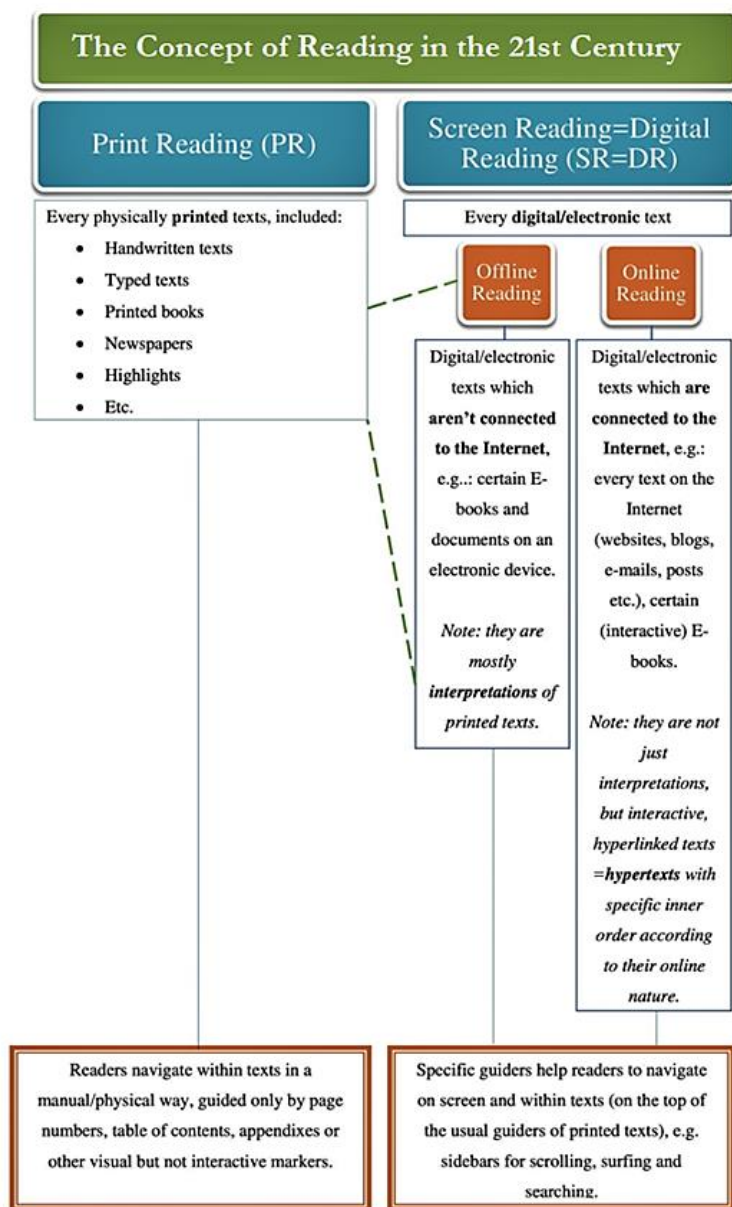
The Reading Framework for the 2015 National Assessment of Educational Progress (NAEP) defines reading as an active, dynamic, goal-oriented and complex process, that includes understanding written texts, developing and interpreting the meaning and using this

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<sup>10</sup> For the whole argument, see Szabó, 2020.

latter as appropriate to type of texts, purposes, and situations. It also involves essential aspects as readers' reading strategies, skills, purposes, and prior knowledge. (Afflerbach, 2007, n.p.) Reading assessment researcher Peter Afflerbach (2007) defines reading as follows: "Reading is the act of constructing meaning from text. We use skills, strategies, and prior knowledge, all of which are developmental in nature, to understand what we read. The act of reading is supported by reader motivation and positive reader affect. We read to help us achieve our goals, within and outside of school." (Afflerbach, 2007, n. p.) (See *Section 6.5.*)

The present dissertation, with regards to the above-discussed definitions, considers *reading* as a complex mental process and activity. It is a specific communication between readers and authors through reading materials (offline and online; printed/non-digital and digital/electronic), and reading platforms (non-digital such as books and newspapers and digital/electronic such as e-books, computers, and smartphones). Reading aims to share information, knowledge, instructions, stories, thoughts, emotions, and everything that could be communicated in written form. Reading could be silent and loud, individual and social, offline and online, and its purposes are nearly endless. The terms of *digital/electronic reading* mean reading *on-screen offline* reading material (e.g., e-books) and *on-screen online* reading material (e.g., texts on the Internet). The following figure (*Figure 11*), gives a summary of the differences of the two terms.



**Figure 11: The Nature of Reading in the XXI. Century (Original Picture)**

According to the above, print reading (PR) means reading every kind of printed text<sup>11</sup> that has a touchable physical form. During the process of print reading, readers handle the text according to its physical characteristics, e.g., the shape, weight, size, length of the book or the newspaper, and the extension of the text on one page. A printed text affects the senses, i.e., how it feels to touch or smell it. According to Umberto Eco, “reading is a tactile experience in which

<sup>11</sup> Here, the literature usually mentions handwritten texts as well; however, they have specific characteristics that printed text do not have, such as individual tracing and personality traits of the writer.

bodies suggest ideas, and the sensation of our fingers touching the book strips deep emotion in us”. Calligraphy researcher Denis Brown takes the smell of manuscripts as “pungently exuding sweet aromas of leather dressing”. (Badulescu, 2016, 142)

In contrast, Screen Reading (SR) or Digital Reading (DR) means reading a digital or electronic text via screen where the carrier of the text is a digital/electronic device. Here it is necessary to make a distinction between offline reading and online reading. Offline reading involves texts that are not connected to the internet actively. These are mostly digital copies of printed texts, scans, or digitalised interpretations of the sources. The main difference between print texts and their offline but digital/electronic variants is the medium, i.e., the device that carries the texts. Every other difference comes directly from the electronic medium, such as shape, size, calligraphy and typography, visibility and extension, navigation between and within texts. Thus “the digital text is less material than text on page, but can act in different ways than print text”. (Nowak, 2008, 2)

There are two kinds of offline digital texts/books: (1) books that contain digital texts and (2) scans, digital photographs, and copies of print books. Concerning the *first one*, texts are formatted and modified according to the electronic device. Thus, they can be fitted to the actual screen size and orientation, rotated, or having their font size and type changed. Readers can zoom in and out of the text, do searches within the text, or turn on/off the illustrations of the text.

The *second one* is a reproduction of a book, a digital image of the original, printed pages. “The photographically digitalized book is poorly suited, however, to being rendered on a screen for reading [...] there is no re-flowing of the text to accommodate the differences in viewing areas between different devices.” (Coyle, 2008, 6) This latter can be a problem since printed books typically have *portrait* orientation, while traditional screens generally designed in *landscape* mode. Thus, when one reads a digitalised book, one cannot see the page as a whole, but infractions, only a part of a page. This problem can be solved with an e-book reader or a tablet PC, where screen orientation is set to portrait by default, or at least it can be changed into that mode.

However, there are aspects of offline reading that seem to be so important that readers do not want to give up just for the sake of using an electronic device. One is the definition of where they are in the text. Holding and reading a print book, one can quickly identify how much of

the text is left for further reading, or how far she went in the book. Readers can mark their progression physically, such as creating dog-ear pages and can easily make notes and underlines. Some devices and programs try to solve the problems and allow the readers to use specific navigation tools and make digital bookmarks, comments, and highlights within the texts. (Kalmane, 2012; Biancarosa and Griffiths, 2012; Smit, n.d.; DA Author, 2016; “Best Digital Library...”, n.d.)

Another aspect is portability. Since electronic devices contain hundreds of texts according to their memory built-in, thus it seems that they have an advantage that cannot be achieved by print books. However, digital devices have some characteristics that make their appliance less comfortable, such as heaviness, noise, wires, overheating, sensitive and flickering screen, background light, or slow page-turning. Moreover, these devices can be easily damaged by scratching or dropping them accidentally. Nevertheless, due to technological innovation, digital devices and digital texts have features that can make reading more comfortable than printed reading, e.g., built-in interactive elements, toolbars for easy navigation and searching, etc. (see “Into the Book”, n.d.).

Thus, a digital version of a book has advantages and disadvantages compared to a printed book, and printed books have their pros and cons as well. (Jabr, 2013; Baron, 2009; Gomez, 2008; Goodwyn, 2013a; Goodwyn, 2013b; Goodwyn, 2014; Goodwyn, 2015). Due to the opportunities of technological innovations, the expectations concerning the quality of digital reading platforms are high. As library technology expert Karen Coyle argues: “Being book-like is not enough [...] Most e-books today do not, however, go beyond being a simple electronic version of the printed book. That just may not be enough.” (Coyle, 2008, 9) Moreover, as Coyle puts it in her critics: “What the paper book cannot do is interact dynamically with other texts. Unfortunately, the digitalized books that libraries are creating are no more interactive than their paper counterparts, and also have poor usability compared to the paper book.” (Coyle, 2008, 10)

Concerning digital and online texts/books, it is “not yet clear whether hyperlinked words are read in the same way as print-based words [...]. The non-linearity of hypertext may also affect the reading process”. (Nowak, 2008, 2) However, hypertext theory “has emerged as the most prominent theory of digital reading today. The phenomenology of reading can also be used to model digital reading [...] digital reading theory is still an emerging area of study that

continues to seek a theoretical framework and accepted body of knowledge”. (Nowak, 2008, 1) Those who praise hypertext, claim that its format gives broader freedom to readers because they offer such reading and navigation paths that printed books will never. However, it is a questionable claim, because “there can also be many path [sic!] through a printed text, to be formed by the reader during the process of understanding the text. Hypertext itself is made up of prearranged lexias and link choices that may limit reading choices”. (Nowak, 2008, 2) As literary theory and educational technology experts, David Miall and Teresa Dobson (2001) put it in their critics: “the embrace of hypertext for literature is possible only for those who have paid little attention to the nature of reading”. (Miall, 2000, n. p.) Hypertext theorists such as Landow, Moulthrop and Bolton claim that “textual medium determines the nature of response” (Miall, 2000, n. p.), thus besides the physical form of the ‘book’ the features of hypertext is also determining, as much as “the mechanisms of hypertext determines reading, rather than the content.” (Miall, 2000, n. p.)

One consequence of these characteristics of hypertexts is that the classic *hierarchical model of reading* (i.e., linear reading path in a pre-ordered way) changed to a *topographical model*. As Jay David Bolter, researcher of media, educational technology, and the role of computers in the writing process claims: “In place of hierarchy, we have a writing that is not only topical: we might also call it ‘topographic’... Electronic writing is both a visual and verbal description. It is not the writing of a place, but rather a writing *with* places, spatially realized topics.” (Miall, 2000, n. p.) Thus, hypertext prefers visual representation to verbal and the role of the visual is so determining that “hypertext advocates are drawn to promote the visual over the verbal or abstract order of the book”. (Miall, 2000, n. p.)

What seems to be a significant difference between reading offline and online texts is the latter’s dynamic connections *within* and *between* texts through the hyperlinks. Readers must learn how to manoeuvre using the tools of electronic devices connected to the internet to comprehend what they read. Some researchers claim that hypertext “has been put forward as a better reflection of the associativeness of cognition and the reading process [...] this associativeness can also be carried out through print-based reading, that it is not exclusively the domain of hypertext [...] there is no evidence within cognitive psychology that hypertext supports associative thought process”. (Nowak, 2008, 2)

The dissertation does not intend to decide which researcher's opinion stands closer to the truth but to present some existing reading strategies for offline and online reading and text comprehension in order to support the analysis of the OECD/PISA RLA. The concept of reading in the digital world and the connected theories what the RLA applies have determining force on its methodological background as well and gain importance in text choice, task design, response formats, and digital testing (see *Chapters 5 and 6*). The two following subchapters (*Section 2.4.1. and 2.4.2.*) aim to describe offline and online reading strategies, as well as present the concept of comprehension according to contemporary scientific literature.

### **2.4.1. Offline Reading Strategies**

Reading strategies determine the reading path, i.e., the order of reading parts of a text chosen by the reader. This order has a significant impact on reading comprehension, since "it can influence the process of relating text ideas". (Salmerón, Kintsch, Cañas, 2006, 1159) According to a universal concept, print reading is somewhat pre-ordered: readers typically follow the linear path of a text, and pursue the author's intention. Since most of the digital but offline texts are just plain interpretations of the original printed texts, their reading order is quite similar. Naturally, there are some specific characteristics of a digital but offline text, such as sidebars and navigation tools built in the electronic device or in the "page" itself. E.g. some reading material provide opportunity for searching within the text according to keywords, similarly to the index of print reading books, but easier and faster. But these additional features do not disturb much the order of the reading path. (Usó-Juan and Ruiz-Madrid, 2009.)

However, some texts do not fit this concept of the linear, such as comics, catalogues, and maps, no matter whether they are printed or digitalised. The more visual elements are in a text, the more opportunity to differ from the straight reading order. This can be the consequence of the text itself (i.e., the story) or the editing. Apart from the intention of the author, the way of the editing or any other inner guider in the text, readers have the freedom to turn back and forward, reread some parts of a text, jump onto the footnotes, table of content, abstract or summary, etc. as they wish. If a text, printed or digitalised, has boxes or highlighted parts, the reading order automatically follows the highlights in accordance with the author's intention. Hence, the author can define the order of reading and guide readers from one box to another through written instructions or visual elements. Reading order also depend on the reader's

decision (e.g., she skip boxes, read them parallel with the main text, or save them for later). Thus, in the case of offline reading (printed or digitalised), the concept of linear reading seems to be not as adequate as we usually think. (Steklács, 2013)

Another issue here is the size of a specific page. This is variant even in the case of printed texts since there are several types of page sizes; it is enough to think about the unique stamp-like printed books, brochures, standard books, dictionaries, and newspapers, or the enormous albums, maps or codices. However, the international standard printed page size is the A/4 or A/5 in the case of books and A/3 in the case of newspapers, and the orientation of pages is usually vertical. These two factors – page size and orientation – are the ones that can be quite different in the case of online reading and can influence reading order as well. In the case of page size, it depends on the screen size of the electronic device (E-book reader, notebook, laptop, PC, Smartphone). Orientation also depends on the device: E-book readers and Smartphones are usually vertical, while most of the other devices are horizontal, or designed rotatable. Most of these electronic devices have view-change functions; thus, readers can set them as they like, but this function is not available or comfortable in the case of PC-s or those notebooks and laptops that have fixed keyboards. It follows that those who read on PC, notebook, or laptop must deal with a horizontal screen-orientation. In this case, the page size is very different from the standard printed page sizes; thus, texts are small-sized (if we reserve the vertical orientation) or comfortably big, but wide. However, they can be modified, while in the case of print, we cannot change page or font size, or other physical features. In the case of digital, we have various opportunities to modify page size or orientation with using the sidebars or the keyboard to zoom in and out, to roll up and down, navigate left to right, back and forward. These processes require different manual skills and competencies than in the case of printed texts. The way of navigation inside and between texts influences the reading path, according to prevalence, speed, difficulty, and unambiguousness. If a device has a touchpad, the process of this navigation becomes either more comfortable or more difficult – according to the reader’s competencies and skills.

These characteristics of reading have a massive effect on reading strategies and reading comprehension. It is beyond the limit of this dissertation to give a detailed and sophisticated selection of all the existing theories of reading strategies. Still, let me present a summary of the commonly accepted “mini-theories,” which “may account for complementary and even



mutually supportive aspects of reading comprehension” (Rapp and van den Broek, 2005, 276). *Chart 4* below gives a summary of some reading strategies which try to capture the essence of reading methods:

AN OVERVIEW OF READING STRATEGIES	
Memory-based perspective	“Each word, phrase, or concept that a reader processes triggers an automatic spread of activation to other, related words and concepts in memory for the text read so far and background knowledge. In this account, the reader has little or no control over the information that is activated at any point during reading.” (Rapp and van den Broek 2005, 276-277).
Constructivist Reading Theory	Readers make their meanings about the text during an active, constructive process quasi independently from the intention of the author.
Process-driven Reading Theory	Concentrates only on reading and contents separately. “describe how cognitive activity fluctuates during reading, how working-memory limitations or textual features influences such cognitive activity, and so on” (Rapp and van den Broek 2005, 277).
Product-driven Reading Theory	The product-driven research which is about the notion of text representation in the memory, while a relatively shallow process of reading concentrates on reading information, summarizing paragraphs and identifying the main idea of a text (Murnane, Sawhill and Snow 2012, 6-7).
The Simple View of Reading	“Reading comprehension depends on accuracy and speed of word reading and oral understanding of the words to be read” (Murnane, Sawhill and Snow 2012, 7).
Schema Theories	Reading is a process when a reader’s knowledge is updated by “integrating information encountered in text with information already stored” (Murnane, Sawhill and Snow 2012, 7).
Dynamic Text Comprehension (DTC) Theory	Tries to mix the best parts of the “mini-theories”. DTC is complex, complementary, flexible and open. Its central model called “Landscape model of reading”, which replicates mental text comprehension processes of hypertextual, complex and fluidly connected digital reading. It indicates that during the reading process we understand a text first with the help of the latter content we read. Then we connect these items of information to the next reading section and we make a mental representation based on the newly read text. After that readers give their previous information and knowledge to the new mental representation to get the full meaning of that part of the text. And then this whole process goes on from the beginning (Rapp and van den Broek 2005, 277).

**Chart 4: An Overview of Reading Strategies (Szabó, 2016b, 79)**

As one can see from *Chart 4*, the last reading theory is Dynamic Text Comprehension, which is a digital reading theory, that tries to incorporate some part of the print reading “mini-theories”. Since every act of reading consists of three parts: manipulation, comprehension, and interpretation, (Nowak, 2008, 3) every text should be suitable for manipulation by readers, because this is a necessary process in reading comprehension and for creating readers’ interpretation. Gervais (2007) However, there is a difference between the manipulation of printed text and the manipulation of online text, and readers should learn them both. The next section aims to focus on these differences.

### 2.4.2. Online Reading Strategies

Now, what are the main similarities and differences as compared to the “old” offline version of reading? “Different reading strategies induce readers to focus on different aspects of the text, which could be critical in determining the kind of interconnections established within the information read. This relation between reading strategies and text comprehension has been

reported extensively in the literature. [...] There is no reason to argue that this relation, found in the literature of linear text comprehension, does not hold for hypertext comprehension as well.” (Salmerón, Kintsch, Cañas, 2006, 1158-1159)

Definitional and conceptual questions around online/electronic text induce hot debates about the nature of online/electronic reading and text comprehension itself. According to Murnane, Sawhill, and Snow (2012) “a new definition of literacy is required” (Murnane, Sawhill, Snow 2012, 6), and there is an urgent need for updating, reconsidering, and arranging theories of reading strategies.

In their research, information technology and neuroscience experts Jose L. Salmerón, W. Kintsch, and J.J. Cañas (2006) applied two main approaches to describe online (i.e., hypertext) reading strategies: (1) the analysis of the *navigation path* and (2) the description of the *criteria* followed in the selection of reading order. (Salmerón, Kintsch, Cañas, 2006, 1157) Relayed on the second one, they chose the *C(onstruktion)-I(ntegration) model* (van Dijk and Kintsch, 1983), that handles comprehension “as a process of relating the ideas of a text in a coherent representation”. (Salmerón, Kintsch, Cañas, 2006, 1158) According to this model, there are two variants of mental representation: (1) *textbase* and (2) *situation model*. The first refers to the hierarchical order of information within the actual text. The second is the integration and connection of text information and readers’ prior knowledge. Thus, based on the above, text coherence and prior knowledge are two essential factors in reading and comprehending a text. (Salmerón, Kintsch, Cañas, 2006, 1158)

As the Colorado State University phrases in its guide titled *Reading the World Wide Web*: “When reading the Web you have strong Critical Reading skills. When reading online we use clues from the text to decode messages just as we do when reading print. Web documents use many of the same clues you’ll find when reading print and a few new ones. Knowing what these new clues are and how to Web readers use them can make your online reading experience more enjoyable and more productive” (Bastek, 1994-2012). This latter seems to strengthen that for online reading, getting used to handling the World Wide Web (i.e., getting to be ‘Digital Natives’ in Mark Prensky’s (2001) terminology) is not sufficient, but more important is to know how to use it properly in order to comprehend its contents.

Literacy and education researcher, Debbie Abilock shows a great example of the online reading strategy in an animated video/slideshow titled: *A “think aloud” to model reading*

*online* (Abilock, n. d.). In her video, she presents how she reads and comprehends a selected content of a website, step by step. She claims, “reading online is a dynamic interplay between reading comprehension and information literacy strategies” (Abilock, n. d.). *Figure 12* shows how Abilock summarises the main points of reading online.

- + Skim
- + Snatch and grab
- + Use prior knowledge of content and medium
- + Summarize
- + Question
- + Infer
- + Hypothesize
- + Synthesize
- + Identify purpose
- + Analyze point of view
- + Gather and organize data
- + Assess accuracy

**Figure 12: The Main Points of Online Reading Strategy (Szabó, 2016b, 80, Based on Abilock, n. d.)**

In their study, visual learning experts Pei-Hsuan Hsieh and Francis M. Dwyer (2009) summarise the following three online reading strategies, which are worth to mention here:

- 1) **Rereading strategy:** it is a pedagogical tool, which helps students in the meaning acquisition and obtaining their favourite reading sections. The rereading strategy could be time-consuming, but it also improves comprehension and retention of ill-structured information.
- 2) **Keyword strategy:** it means using keywords to comprehend the whole text. Research shows that students obtain higher scores in comprehension if they discussed keywords before reading.
- 3) **Question and answer (QA) or question-answer relationship (QAR) strategy:** it can develop meta-cognition awareness of readers and help to increase comprehension by answering questions related to the chosen text.

Reading researcher Anette Adler et al. (1998) found that reading online covers a “broad spectrum of activity” (Adler et al. 1998, 243), which consists of glances to identify documents; skimming; reading to remind; reading to learn; reading to edit text; reading to search or answer questions; reading to self-inform, and reading to support listening or discussion. *Chart 5* below

shows how education expert Lisa Wen Chun Chen (2015) summarised the top ten frequently used online reading strategies based on her conducted research.

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**The top ten frequently used online reading strategies**

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I use reference materials (e.g. an on-line dictionary) to help me understand what I read on-line. (*Support strategy*)

I use context clues to help me better understand what I am reading on-line. (*Global strategy*)

I try to get back on track when I lose concentration. (*Problem solving strategy*)

When I read on-line, I guess the meaning of unknown words or phrases. (*Problem solving strategy*)

I use tables, figures, and pictures in the on-line text to increase my understanding. (*Global strategy*)

I try to guess what the content of the on-line text is about when I read. (*Global strategy*)

I paraphrase (restate ideas in my own words) to better understand what I read on-line. (*Support strategy*)

When on-line text becomes difficult, I re-read it to increase my understanding. (*Problem solving strategy*)

I think about what I know to help me understand what I read on-line. (*Global strategy*)

I scan the on-line text to get a basic idea of whether it will serve my purposes before choosing to read it. (*Global strategy*)

---

**Chart 5: The Top Ten Frequently Used Online Reading Strategies (Chen 2015, 74)**

To sum up, “until now, there has been no agreement in the literature regarding the strategies that the hypertext readers follow when their main purpose is to comprehend a text”. (Salmerón, Kintsch, Cañas, 2006, 1157) Thus “sketching out this range of reading activities has

a general message for designers of digital reading devices which is that it is vital to understand precisely what is meant by supporting »reading«” (Adler et al. 1998, 243).

Here it is indispensable to express that this dissertation handles reading as an activity, which can, moreover: *should be* taught both in the case of non-digital and digital reading. In this consideration, there are no native readers either in a non-digital, or a digital sense and children have no genuine but only acquired literacy skills. This is the reason why it is so important to talk about issues of reading, comprehension, literacy, and their assessments.

Having discussed the terms of literacy, text, visuality, and the concept of reading in the digital age, the next subchapter (*Section 2.5.*) focuses on the various understandings of comprehension.

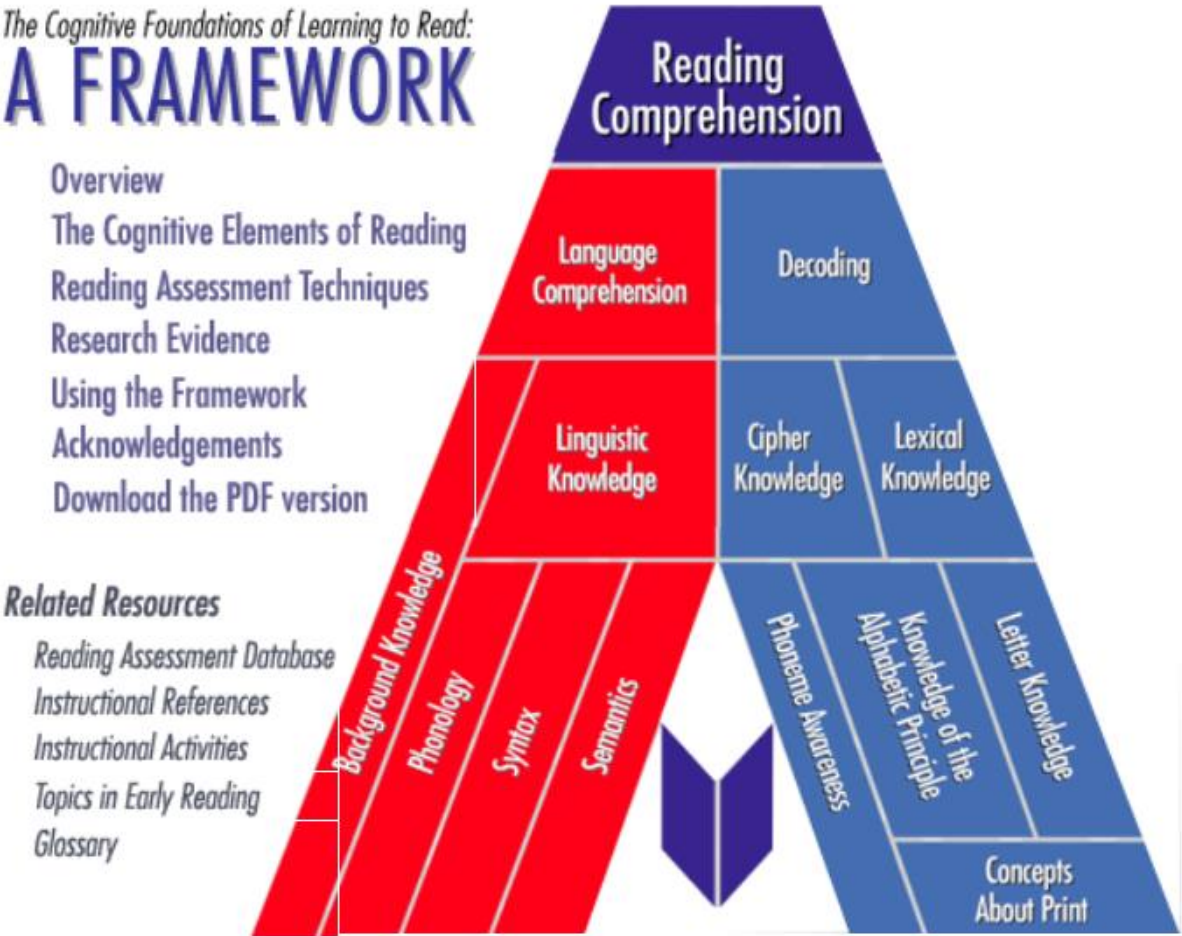
## 2.5. Understanding Comprehension

*Reading comprehension* – both in the cases of non-digital and digital reading – is a skill or competency which enables to understand the given reading material’s meaning and communicative message (*semantics*), as well as its linguistics, grammatical, structural and visual elements, and inner relations (e.g., *syntactic, cohesion and coherence*). However, some researchers claim that defining comprehension is not that univocal since there is no such thing as comprehension at all. “We often use the term ‘reading comprehension’ as if it refers to a dichotomous knowledge state: a student either does, or does not, understand a certain passage or text. This is far from the case. It might be more helpful to begin from the much more radical position of suggesting that there is no such thing as ‘reading comprehension’.” (Harrison, Bailey, and Dewar, 2002, 17) Moreover, as literacy history researchers P. David Pearson and Diane N. Hamm put it: “we see little more of comprehension than Plato saw of the shadows in the cave of reality”. (Pearson and Hamm, 2006, 77) The reason behind these radical claims is that text comprehension or the process of understanding written content is a phenomenon that we cannot assess directly but indirectly, relying on “only indirect symptoms or artifacts of its occurrence. [...] we quiz them on ‘the text’ in some way requiring them to recall its gist or its major details, asking specific questions about its content and purpose, or insisting on an interpretation and critique of its message.” (Pearson and Hamm, 2006, 76)

For instance, according to cognitive scientists Wesley A. Hoover and Philip B. Gough (2019a), reading comprehension is “the ability to construct linguistic meaning from written



representations of language.” (Hoover and Gough, 2019a) Two aspects build it up: language comprehension and decoding. The former is about being able to understand spoken language and creating meaning from it, while the latter is about the recognition of words as written representations. Both aspects have several sub-aspects and sub-abilities. Language comprehension involves linguistic knowledge, background knowledge, phonology, syntax, and semantics. Decoding consists of the abilities of cipher knowledge, lexical knowledge, letter knowledge, knowledge of the alphabetic principles, phoneme awareness, and concepts about print. (Hoover and Gough, 2019a.) *Figure 13* by Wesley A. Hoover and Philip B. Gough below shows these components of reading comprehension.



**Figure 13: A Framework for Reading Comprehension (Hoover and Gough, 2019b)**

Both language comprehension and decoding are required for successful reading comprehension. Without the ability of language comprehension, there is no proper decoding and vice versa; thus, they are equally important. There are three primary reading disorders

concerning language comprehension and decoding: (1) dyslexia, (2) hyperlexia, and (3) garden-variety reading disorder. The first is when someone understands spoken language but cannot decode written texts. The second is when the reader can decode rapidly without understanding the text, while the third is about having disabilities in both cases. (Hoover and Gough, 2019a) It depends on the actual assessment's purpose, whether they are surveyed and considered or not in the test process.

There are typically five components (K12 Reader, 2016b) what reading literacy assessments measure; these are as follows:

1. **Phonological Awareness:** the skill to combine sounds to letters, letters to letters, and form words from letters. Besides, the level of how children understand this process and apply their skills to do it properly.
2. **Phonics Decoding:** it means to “sound-out” words by using sounds and acquired letters. It does not necessarily mean comprehension but the ability to read aloud the written content. Reading aloud a rarely used or foreign word can be difficult even for adults, but those children who are advanced in decoding will have fewer problems with new or foreign words later.
3. **Vocabulary:** this is the skill to connect words to background knowledge and representations in our world, according to culture and language. Educational psychologist Richard C. Anderson and literacy education expert Peter Freebody distinguished three hypotheses concerning vocabulary:
  - i. The instrumentalist h.: is that it is word knowledge per se that promotes comprehension. People with larger vocabularies understand the text better because they have larger vocabularies.
  - ii. The aptitude h.: is that verbal ability underlies both vocabulary growth and reading comprehension. Those who are good at learning words are also good at understanding texts.
  - iii. The knowledge h.: suggests that one's ability to understand a text depends on conceptual knowledge – of which vocabulary knowledge is a highly visible but relatively small part. (Nagy and Scott, 2006, 219)
4. **Reading Fluency:** the readers' ability to read at a steady pace without stalling, rereading, or struggling with letters or words. It does not necessarily mean good text-

comprehension or accurate decoding but setting a good reading speed in silent and aloud reading as well. It can include reading accuracy and prosody as well. “For example, reading accuracy is often tested using lists of words or non-words. Assessors record the number of words/non-words that are read accurately within a given time period [...] Similarly, reading fluency tests are very popular, but assessors tend to focus only on accuracy and speed. In the field of applied linguistics, fluency refers to ‘prosody’ as well as accuracy and speed. What is prosody? It’s the intonation, stress, tone and rhythm, which mirrors the reader’s understanding of what they are reading. You cannot read with expression if you do not understand what you have read. Including prosody in fluency tests therefore reflects the importance of reading with meaning.” (Hill, 2017)

5. **Comprehension:** refers to the ability to acquire the meaning of a text and understand its content. This is the final purpose of reading – without comprehension, there is no rationality in the whole process and the previous four are involved in the process in order to help access the fifth.

Apart from these above-discussed factors of text comprehension, motivation is also an essential part of reading because for comprehension children should be engaged with the text. If they are not interested, they will not ask questions about the content or try to understand it.

Having discussed the epistemological background of the research, the next chapter (*Chapter 3*) focuses on the trends, traditions, and debates in reading literacy assessments to put OECD/PISA RLA in context. Besides, it gives an overview of the OECD/PISA RLA’s mission, aims, methods, and cycles through the years.



### 3. Trends, Traditions, and Debates in Reading Literacy Assessments

This chapter aims to present (1) some issues of testing in education, (2) difficulties of reading literacy assessments, (3) the origin of reading literacy research, including an outlook on the Hungarian reading literacy assessments as well, (4) some previous assessments that OECD/PISA RLA considers as antecedents, and (5) an overview of the OECD/PISA RLA's mission, aims, methods, and cycles through the years from 2000 to 2018.

#### 3.1. Educational Assessments: To Test or Not to Test

Supposedly, every teacher would like to achieve goals with her students, and one of the best ways to decide on what to improve is to assess students' knowledge and skills. Besides, not just teachers but parents, schools, community leaders, and governments need to know these data to get a clear picture of their students' abilities and the possible ways of improving teaching techniques if required. Thus, there "is good reason for the educational community to be concerned about assessment in general. Assessments have assumed a larger and more central role in almost every aspect of schooling than ever before. Protagonists of testing claim that the whole process of conducting assessments is pointless or even harmful. According to assessment expert Grant Wiggins, this sharp opinion rooted in a misunderstanding concerning 'testing' and 'assessment'. He claims that it is necessary to make a distinction between the two and apply them accordingly because both have their rightful place. "Many people who are anti-testing end up sounding anti-evaluation and anti-measurement. A good test has a role to play. The language that we like to use is, it's an audit. It's a snapshot. You don't run your business for the audit. You want more than a snapshot, you want a whole family album. But the audit and the snapshot have a place in the larger picture. What can the test do that more complex, performance-based, project-based things can't do? Look for discrete knowledge and skill for the individual student." (Wiggins, 2002)

To design an assessment, researchers need well-defined purposes, audiences, and assessment subjects. They also must decide on the right method and questions to ask in order to create suitable surveys, get valid, valued, and useful data, and satisfy the chosen audience's expectations. *Chart 6* below shows a framework that lists helpful questions to determine the suitability of an assessment in general.

**CURRV = Consequences, Usefulness, Roles and responsibilities, Reliability, and Validity**

- What are the positive consequences of the use of this assessment?
- What are the negative consequences of the use of this assessment?
- What is the usefulness of this assessment to teachers, students, administrators, and others?
- What are the specific roles and responsibilities for the teachers, students, and administrators associated with this assessment?
- What are the reliability issues related to this assessment?
- What are the validity issues related to this assessment?

**Chart 6: Questions to Help Determine the Suitability of an Assessment (Afflerbach, 2007, 18)**

“When we use the word assessment in education, we’re talking about a method used to determine students’ understanding of a skill or concept. They’re sometimes also referred to as tests.” (Linde, n.d.) There are several types of tests according to the purpose of measuring, audiences, age levels, school systems, curricula, countries, and educational policies. There are tests for adults and children at multiple levels based on various approaches. There are holistic assessments that aim to get data about complex processes (e.g., reading in general), while the purpose of other measurements is to gather information at a micro-level, focusing on a particular segment/aspect of an issue (e.g., reading fluency). In the discussion of assessments’ method, we also face with a colourful practice from simple questionnaires to sophisticated tests, from individual interviews to small focus group interviews or large-scaled tests. Concerning the latter, the main idea is to gather wide-range comparable information. What we have after a carefully conducted large-scaled assessment, is a well-built database from that we can gain data concerning individuals. The question is how we evaluate, interpret, and apply these results and what we learn from them. In this process, technology can serve an essential part by making tracking, sharing, and comparing data possible over time and all over the world. As Wiggins claims about applying an electronic technology in an assessment project, “the student is bringing together visual, three-dimensional, and paper-and-pencil work.” (Wiggins, 2002) However, he adds, “sometimes technology is overused and we don’t think carefully enough about the evidence we need to give the grade, put something on the transcript, and track that information over time.” (Wiggins, 2002)

Concerning standardised tests, Wiggins says that they “have a very narrow focus and purpose as audits. They’re just trying to find out if you really learned the stuff you learned in school.” (Wiggins, 2002) This is one major counterargument against testing, particularly large-scaled tests: they just check whether children can give back information that is acquired in school rather than show how they can *apply* them. Thus, these standardised tests cannot predict children’s future performance or success in adult life, so we need to be “very careful about what we’re making claims about, what these assessment results do and don’t mean. Most state and national tests are predicting very, very narrow results about certain types of school performance.” (Wiggins, 2002) Wiggins suggests to conduct ‘authentic’ assessments, i.e., realistic performance assessments that try to capture and simulate the challenges and tasks that one can face in a real-life working place, instead of paper-and-pencil, fill-in-the-blanks, multiple-choice, etc. tests. Since at the workplace, we usually do not spend our time doing tests but solving problems, this seems to be a better way to assess knowledge and skills. “So far, there is no test that has been proven to capture all the qualities that lead to the success and prosperity of a person, group, or nation, despite some of the outlandish claims of proponents of certain tests at the time. History has disproved most of the claims made about certain tests, even though some of them were once believed to be valid or extremely reliable.” (Zhao, 2016a, 14) However, there are situations when we just cannot conduct performance assessments, so standardised, large-scale, international tests have their place as well. These cases seem to be filled with difficulties due to different cultural, political, socio-economic, and linguistic contexts. One of the challenges is to fit the core analytical framework to the many selected countries, educational systems and policies, different cultural backgrounds, languages, and age levels.

Another challenge is the triggered stress rooted in the assessment situation. The background attitude is that politicians “generally hope to find evidence of changes over time, either (if there are improvements) to demonstrate the effectiveness of their policies or (if there is a decline) to demonstrate that teachers are failing and that new policies are necessary.” (Harrison, Bailey, and Dewar, 2002, 2-3) Thus, creating practical, useful measurements and reach high scores in different kinds of surveys in the various fields of education puts heavy stress on schools, teachers, and students. Even though neither teachers nor students enjoy being subjects of assessment and measured up and tested by researchers. We can easily observe a

tendency of “teaching for testing”: educators train their students to be better test writers and reach higher scores in leader boards. (Zhao, 2014; Zhao, 2016a; Zhao, 2020) Intuition says that this is a bad practice and does not serve the purpose of training better students but training stressful “survey fillers”. Regardless, this is a real phenomenon that accompanies almost every assessment. “Understanding the influence of assessments for children of different abilities is important, particularly due to the weight assessments often play in measuring a child’s ability level.” (Logan, Medford and Hughes, 2011, 127) What we talk about here is a competition between students, schools, regions, and countries: competing with each other and with standards, which were created according to several but typically not entirely clear and easily questionable factors. (Zhao, 2014)

The process is quite simple: an actor from the field of education wants to get information about students’ skills; thus, she creates surveys to measure them. She gets some results, which she is usually not satisfied with, and immediately starts to compare them to others’ results. As soon as the actor begins to handle the whole situation as a competition (and this is a usual reaction), she falls into the *Catch-22*: she wants to make students reach good scores and get rid of the “shame” of being at the bottom of the leader boards. Thus, she starts to prepare students for the next survey. She makes them practice and practice all the time, not reading *but* writing tests. Filling surveys became a regular activity in schools, and reaching better scores is the primary goal. When the next official testing period arrives, she hopes for better results without noticing that the measurement is not about *knowledge-related skills* but *test writing skills*. Then, when she gets the new findings, the whole process starts from the beginning. It is the same, even if her students perform better than others do. In this case, she feels privileged, thinks that other students/schools/countries underachieve with their poor results, and wants to defend her leading status on the next test period as well. This circle of competition has been going around and around since ages, stresses out students, teachers, schools, and governments, and triggers harsh political debates from time to time. During these competitions, the original aim seems to have been forgotten, namely, to help to improve teaching and children’s skills. (Coughlan, 2013)

This *Catch-22* phenomenon of assessments can be observed in the case of the OECD/PISA tests, that worth to be mentioned here before the major topics: the problems of the RLA will be discussed. Despite the criticisms that will be mentioned against PISA, one cannot

deny that its testing system is far the best in present educational assessments. Focusing on skills and abilities rather than curriculum-based knowledge allows to demonstrate differences

- (1) between countries regarding students' level factors (e.g., gender, socio-economic background, etc.) and their test results,
- (2) across countries regarding school-level factors and test results; in the relation of results' variation between schools across countries,
- (3) between countries (i.e., observing the extent of moderating and increasing the effects of individual-level student factors and student results), and
- (4) in educational systems and national contexts. (OECD, 2009)

Besides, PISA applies a new sampling method, focusing on the same age group, rather than on the same school year; thus, the results can be put in contrast with the different school systems. The cyclical periodically repeated data gathering is also a PISA achievement that makes it possible to examine skill improvements in every three years. (Csapó, 2007; Csapó, 2010)

However, after every new publication of the PISA-reports, lively debates arise mostly about the method of data gathering, task types, the interpretation of results, and even about the usefulness of the whole assessment system. ("OECD and PISA tests...", n.d.; Niyozov and Hughes, 2019) Especially in those countries which do not perform well or even underachieve according to the surveys, the debates can be very harsh, and a kind of panic starts. This whole vexed phenomenon called the "PISA-shock" (Xhiha, 2016), i.e., the usual hysterical reaction after the release of PISA reports all over the world, when politicians, educators, researcher, and even the public are faced to the results, start to explain the poor performance, search for the persons that can be blamed for underachievement, and demand educational reforms. (Sahlberg, 2019a; Sahlberg, 2019b; Zhao, 2014; Zhao, 2016a; Zhao, 2019) The PISA-shock reached the leading countries such as the United States of America, China, the United Kingdom, Germany, Norway, Australia as well as Spain, Latvia, Russia, Luxembourg, Austria, Hungary, Italy, Iceland and Kosovo (Paceni in Grammar Schools, 2013a; 2013b; 2013c; 2016a; 2016b; Steinbock, 2013; Elstad, 2012; O'Carroll, 2017).

As we can shortly see, there is a constant accusation against the whole survey system claiming that PISA follows straightforwardly counter-productive mechanisms. Moreover, the assessment itself – and other similar assessments as well – are pointless because the participant

countries are so different in an educational, socio-cultural, political, and economic sense that comparing students' results may lead to wrong consequences ("OECD and PISA tests...", n.d.). Some opinions claim that PISA would like to gain a voice in education and politics without the right to do so. "Unlike United Nations (UN) organisations such as UNESCO or UNICEF that have clear and legitimate mandates to improve education and the lives of children around the world, OECD has no such mandate. Nor are there, at present, mechanisms of effective democratic participation in its education decision-making process" (OECD and PISA tests...", n.d.).

The argument went so far that a group of academics from around the world wrote a letter to Andreas Schleicher, director of the OECD's Programme for International Student Assessment to "express deep concern about the impact of Pisa [sic] tests and call for a halt to the next round of testing". ("OECD and PISA tests...", n.d.) They summarised their critics in several points, stating that PISA "with its continuous cycle of global testing, harms our children and impoverishes our classrooms, as it inevitably involves more and longer batteries of multiple-choice testing, more scripted »vendor«-made lessons, and less autonomy for teachers. In this way Pisa [sic] has further increased the already high stress level in schools, which endangers the wellbeing of students and teachers." ("OECD and PISA tests...", n.d.)

These claims are held even though PISA attempts to manage the differences between the participant countries. As they declared: „Students also answer a background questionnaire, providing information about themselves, their attitudes to learning and their homes. In addition, school principals are given a 20-minute questionnaire about their schools. Countries and economies can also choose to administer several optional PISA questionnaires: the computer familiarity questionnaire, the educational career questionnaire and the parent background questionnaire. In addition, many countries and economies choose to gather further information through national questionnaires. The information collected helps countries and economies to explore connections between how students perform in PISA and factors such as migration, gender and students' socio-economic background, as well as students' attitudes about school and their approaches to learning". (OECD PISA FAQ, 2017)

Another cardinal point here is the problem of sampling schools and students. If PISA tests the skills and abilities of carefully selected students in carefully selected schools that meet particular quality demands and levels, then the complete assessment is fundamentally

manipulated. What if these subjects of the survey in the chosen “elite schools” are specially trained to solve the tests to gain a higher ranking in the final comparison? It is not a plain viciousness or a conspiracy theory, but a considerable argument against the assessment system that accuses PISA with manipulating the results and creating stressful competition between students, schools, teachers, educational policies, and countries. “China is cheating the world student rankings system [...] Enough is enough [...] Beijing must supply national data to assessors and not simply the results of a small minority of elite students.” (Steinbock, 2013) Questioning countries for their outstanding performances and claiming that the top places on the ranking do not tell anything about children’s skill in reading, mathematics, science, etc., but their capability of filling answer sheets become a strong tendency.

Other usual criticism against PISA concerns the paradox of its popularity and force to shape education: PISA has huge effects on educational policies; therefore it is highly represented in the media and educational politics; and because it is highly represented in the media and educational politics, it has huge effects on educational policies. Before political elections, reception and criticisms of PISA results are usually sharp-edged depending on whether they are favourable for the actual government or not. (Lannert, 2015)

Concerning methodological issues, there are criticisms about sampling; competencies of involved experts to evaluate and interpret the outcomes properly; conducting context-independent measurement; applying one-dimensional measuring scales and Rasch-model; issues of differences rooted in the translation of reading texts, tasks and answer sheets; differences of test books; and the methodological validity of rankings. (Lannert, 2015; Kreiner and Christensen, 2014, 210-231) The validity problem of the PISA surveys seems to be the harshest in the debate, with a high number of publications on this topic.<sup>12</sup> According to educational testing experts, Therese Nerheim Hopfenbeck and Andrew Maul, “test validity requires a unitary, logical argument linking item responses to the latent object of measurement, for which multiple kinds of evidence can and should be examined; in particular, the Standards refer to five »strands« of evidence relevant to the evaluation of validity: evidence based on test content, response processes, internal structure, relations to other variables, and the consequences of testing.” (Hopfenbeck and Maul, 2011, 98) As they phrased in their criticisms, the problem with the PISA scores is that countries do not get a guide on how to use or interpret

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<sup>12</sup> Approximately 56.800 findings for the key word: „PISA survey validity problem”.

data as feedback, “thus the specific uses of the test may vary by location (but will rarely have stakes at the individual student level)” (Hopfenbeck and Maul, 2011, 98). Moreover, there are problems with students’ willingness to give a valid response in the testing situation:

- a non-trivial portion of students may not give valid answers to items,
- poorly performing students are less likely to give valid answers to the questionnaire items, and
- the possibility to identify students who may not give valid answers is difficult and limited. (Hopfenbeck and Maul, 2011)

Having analysed what does PISA really assess, Antoine Bodin phrased that “some precaution have [sic!] to be taken, but also, in the whole, [...] the PISA studies are worth been taken seriously. They can bring new questions and new ideas to teachers which can help them to go ahead with a way of teaching that fits the needs of our societies as well as preserving the values of which they are depositaries.” (Bodin, 2005, 14) Hungarian pedagogy expert, Csapó Benő also expressed his positive opinion towards PISA, claiming that, in general, “PISA, without doubts, renewed educational research in many fields. It raised interdisciplinary cooperation into a new level, renewed the culture of data gathering and data analysis, and launched pedagogy into the era of Big Data. It attracted and prepared thousands of young researchers for the pedagogical researcher career in dozens of countries.” (Csapó, 2015, 37)

Now, after discussing some issues of educational assessments in general, the next subsection focuses entirely on reading literacy assessment and presents a few difficulties in measuring the “invisible” process of reading.

### **3.2. Difficulties in Reading Literacy Assessments**

One of the main problems of reading literacy assessments is that their whole concept can be misunderstood. Reading literacy is not an exact, obvious, or easily understandable and measurable set of skills. There are several methods to comprehend texts, but we do not have one accurate result that we can accept without doubts. Of course, there are some guides and standards, but since reading is a form of communication, misunderstandings are naturally coded inside. Thus, “[...] it is extraordinary difficult to get at what happens when a person is reading” (Harrison, Bailey, and Dewar, 2002, 17), because “[...] reading is an interactive process, as a result of which the knowledge state of the reader changes perhaps four times a second (one for



each fixation). [...] understanding is dynamic, fluid, socially and culturally located, and it acquires temporary stability only in goal-related and purposive contexts, which may have little to do with the understandings which are generated in other contexts.” (Harrison, Bailey, and Dewar, 2002, 17) Thus, the challenge is to capture and understand something hidden, invisible, individual, and very complex.

There are some, of course, who are disagree, and claim that it is unnecessary to think of assessing reading as an impossible, vigorous, or mystified task. “Anyone can tell whether or not a child can read, in five minutes” – stated the politician Kenneth Clarke, Secretary of State of Education in the UK in 1991, and continued: “What we need are quick pencil-and-paper tests, not tests that drag on over a month.” (Harrison, Bailey, and Dewar, 2002, 2) This was a directly phrased doubt concerning complex, wide-scale reading assessments, and also the expression of an urgent need for reporting data and draw consequences quickly. The latter has hardly changed over time, since those who have responsibilities in making educational policies need clear, direct, and fast results to solve out the problems of children’s reading competencies, especially in an era in which technological changes strongly influence reading processes and educational practices. The fact is that “assessment of reading tends to be conservative, and the more centralized the assessment arrangements, the more conservative those arrangements tend to be. States and governments often regard national performance in reading as an indicator of the effectiveness of the educational system, and take the view that assessment is too important a matter to be left in the hands of teachers”. (Harrison, Bailey, and Dewar, 2002, 2) As Education Consultant Peter-Sam Hill from the Oxford Policy Management claimed in 2017: “Great things are expected of literacy: if more people become literate they will learn more, be healthier and participate more productively in civic life. Governance will improve, economies will grow, nations will be better off. [...] Clearly, literacy skills matter. However, how you measure them also matters.” (Hill, 2017) If literacy will be able to fulfil theses expectations, what children need to know in this field is more than “make the correct noises indicated by written symbols”. (Hill, 2017) They must create meaning, interpret texts, and construct their own opinion by writing – in offline and in an online form as well. The ability and skills required for these processes do not improve in a linear sequence. They have a significant impact on each other and influenced by many internal (i.e., motivation, cognitive abilities, interests, etc.) and external (i.e., socio-economic, cultural-linguistic, etc.) factors. Thus, “understanding the

meaning of text and knowing the sounds associated with different letter combinations are mutually reinforcing”. (Hill, 2017)

One cardinal point here is assessing the factor of reading motivation since it is a hidden part of comprehension. Besides, motivation means different things to different people. In the case of children, most texts what they read are obligatory readings that must be read. Children may happen to like the actual reading material, and the external motivation became internal; however, the label “obligatory” have a huge negative influence on improving any kind of motivation, and not just in the field of reading. And this is the same in the case of a planned and organised assessment when children must read something in a given time interval, and it is clear that the whole process is measured, inducing motivation seems to be complicated. Researchers need to choose exciting reading content and various topics to make children motivated at the lowest level, at least. However, it must not be forgotten that this is a testing situation, a kind of competition with a huge factor of stress. We cannot expect children to be motivated to read and present a good reading performance under test circumstances, by default. Naturally, there are opportunities to measure reading motivation in the case of a large-scale assessment to get a view about what triggers children’s motivation to read. However, these are mostly just questionnaires about children’s reading habits and attitudes towards reading in general, hence complementary elements of reading literacy assessments, and we cannot expect much from them. (For more, see *Section 6.5*.)

Another issue is the influence of vocabulary knowledge. “The strong correlation relationship between vocabulary knowledge and reading comprehension had already been thoroughly documented, there was still little known about what type of cause-and-effect relationships might underline this correlation.” (Nagy and Scott, 2006, 219) This seems to be a problem since there is a popular fundamental statement concerning comprehension, namely that background knowledge and language competence – thus vocabulary knowledge as well – are essential factors to understand written contents. It seems evident that those who have a broader and deeper knowledge of a language can read better. Fluent readers understand texts without the necessity of stopping, trying to figure out whether they just cannot read the actual word properly or do not know the meaning of it. They also do not have to use a dictionary or ask for help during reading.

Then, there is reading fluency, which is “the neglected goal” of the reading curriculum. (Rasinski and Hoffman, 169) Assessing fluency via large-scaled tests that require written answers, and do not tell anything about reading aloud, seems impossible. Time can be a telling factor; however, the ability to read fast does not show much about the quality of comprehension. So, someone can read rapidly without understanding a word, while a slow reader can be excellent in reading comprehension, even though she can hardly keep the given time limit of the task. (For more, see *Section 6.3.*)

Being aware of the difficulties of assessing reading literacy skills, one cannot emphasise enough the significance of testing this field. If trends of completely rejecting reading surveys won, spread all over the world, and qualitative pedagogical methods of attendance evaluation and attributes of cultural anthropology took over, we would revert to the already transcended ages of educational policies based on anecdotal, incomparable and hardly justifiable evidence that cannot help educational improvement and policymaking in a modern, topical and relevant way.

After having discussed some problems of assessing reading literacy, one can see that finding the right items fitting to the actual research goal is especially important. They determine the whole concept of what we think about reading and what we should teach to children. Hence, “the diverse goals of reading instruction are adequately reflected in the regimen of assessments that is [sic!] intended to measure progress toward those goals. Or the answer may indicate that, whereas school district standards and the curriculum conceptualize reading development broadly, reading assessment measures it narrowly. We should plan to assess what we plan to teach”. (Afflerbach, 2007, n. p.) *Section 3.3.* aims to show some solutions on how actors of reading research faced the challenge of assessing the “Invisible” in the history of reading literacy assessments.

### **3.3. Reading Literacy Assessments Through the Years**

The question of reading literacy assessments is never about whether a child can read or not, but *how* a child can read and *what* a child can comprehend when reading. The ability to recognise words and reading them in silence or aloud is just a part of the reading process. No matter how fundamental part it is, it does not tell us anything about comprehension. Assessing reading is complicated because it involves more hidden than apparent aspects. Furthermore, it takes more

time and money but brings less precise results than other assessments (e.g., Mathematics and Science). Preceding from these facts, the question arises: what can be the rational and sensible purpose of conducting reading assessments?

One probable answer is that the primary purpose of conducting reading literacy assessments is to show teachers what to teach to children; what children already know and on what level; where the gaps are in their knowledge and how deep the gaps are; what the difficulties and misunderstandings are in the process of learning to read; and what the repetitive mistakes are that usually occur in a certain age/level/teaching method/school/educational system/country. All “research on reading, including psychological, educational, and socio-political research, is situated in particular contexts that influence the design of studies and the interpretation of data.” (Dougherty Stahl and McKenna, 2006, 363) Thus, reading researchers should design and address their findings to different audiences and should connect scientific research to classroom problems in order to get reciprocal benefits for both. (Dougherty Stahl – McKenna, 2006, 363) *Chart 7* below shows a summary about the possible representative audiences beside teachers and some purposes of conducting reading literacy assessments:

<b>Assessment Audience</b>	<b>Assessment Purpose</b>
Students	To report on learning and communicate progress To motivate and encourage To learn about assessment and how to self-assess To build independence in reading
Teachers	To determine the nature of student learning To inform instruction To evaluate students and construct grades To diagnose students' strengths and weaknesses in reading
School administrators	To determine reading program effectiveness To prove school and teacher accountability To determine resource allocation To support teachers' professional development
Parents	To be informed about children's achievements To help connect home efforts with school efforts to support children's reading development
Politicians	To establish accountability of schools To inform the public of school progress
Taxpayers	To demonstrate that tax dollars are well spent

**Chart 7: Representative Audiences and Purposes for Reading Assessment  
(Afflerbach, 2007, 6)**

As *Chart 7* clearly shows, reading assessments do not exist in an isolated environment but a context influenced by certain social and political forces. It means that the method to conduct research could be selected by political will and favours, and “practiced locally, supported broadly, or questioned widely.” (Afflerbach, 2007, n. p.) All groups of audiences listed above are supposed to get “useful information” on reading according to their interests and purposes, and ideally, “one group’s need for particular reading assessment information should not displace another group’s need.” (Afflerbach, 2007, n. p.)

There have already been several approaches to creating and conducting reading assessments. The tendency to invest more and more energy in reading research is not a new one. (Kamil, Mosenthal, Pearson, Barr, 2000) However, the history of reading assessments is short, probably because of two reasons. The first is the dominance of oral tradition during the 17<sup>th</sup>-19<sup>th</sup> century, focusing on accuracy and fluency. The second is about the privileged skill of memorising text, rather than comprehending written contents. (Pearson and Hamm, 2006) The first glimpse of assessing reading is connected to Binet (1895); however, he did not aim to measure reading comprehension but intelligence: he applied reading comprehension items as a part of his IQ test. The first published reading assessment was an oral reading assessment in 1914, created by William S. Gray. Two years later, Kelly (1916) conducted the *Kansas Silent Reading Test*. He made a significant contribution to an understanding of the process of recall, namely that it is not the same process as creating meaning because the former is about memory in work and not about immediate comprehension during reading. However, the recall testing method was applied again in the 1970s as ‘retelling’. (Pearson and Hamm, 2006)

The next step in reading assessment history was Thorndike’s classic from 1918, titled *Reading as Reasoning*, and it is commonly considered as the first “real” reading literacy test because it was the first measurement that connected the mental processes of comprehension with assessment methods. It aimed to discover the inner, hidden process of reading that takes place in readers’ minds. “Understanding a paragraph is like solving a problem in mathematics. It consists in selecting the right elements in the situation and putting them together in the right relations and also with the right amount of weight or influence or force of each.” (Thorndike, 1917, 329) According to Touton and Berry’s (1931) categorisation, there are various types of mistakes that readers could make during this process and that are needs to be understand. These are the followings (*Chart 8*):

1.	failure to understand the question
2.	failure to isolate elements of 'an involved statement' read in context
3.	failure to associate related elements in a context
4.	failure to grasp and retain ideas essential to understand concepts
5.	failure to see setting of the context as a whole
6.	other irrelevant answers

**Chart 8: Errors Readers Make During Decoding or Understanding (Pearson and Hamm, 2006, 81)**

Gates (1937) also took his attention to reading errors and examined the 'error of hesitation'. These influence the quality of fluent reading; therefore, they can indicate the quality of comprehension as well. Durrell (1937) and Betts (1946) were also interested in this part of reading assessments, trying to find and describe the connection between misreading and understanding. However, it was Goodman in the 1960s who focused on 'miscues' as a critical element in discovering reading comprehension. (Pearson and Hamm, 2006) According to Thorndike's point of view, "reading was an active and complex cognitive process" (Pearson and Hamm, 2006, 80) – and this approach became dominant in the 1970s when the cognitive revolution was on the agenda.

The first reading assessments involved test tasks such as short answers, incomplete sentences to fill in, essays, and oral responses in a discussion, as well as some cognitive tasks such as marking, writing, speaking, and reflecting. In the 1970s, three types of assessment came into the picture: (a) standardised, multiple-choice tests, (b) criterion-referenced assessments of specific skills, and (c) informal classroom assessments of comprehension. Let us discuss these types in details.

(a) *Standardised, multiple-choice assessments* were conceptually formed according to behaviourist psychology since it was the dominant trend in education from the 1930s to 1960s. It means that the purpose of these tests was to measure students' achievements comparing to national standards. These kinds of tests could be conducted due to the technical development of assessment methods, such as the IBM 805 scanner that could reduce the cost of scoring and evaluating. (Pearson and Hamm, 2006, 81) In 1944, Frederick Davis' dissertation about factor analysis was published, and researchers, at last, became able to answer the question, whether comprehension is a unitary or a multivariate construct. During his research, Davis found

hundreds of skills mentioned in the connected literature about reading literacy assessments, and he categorised them as follows (*Chart 9*):

1.	word meanings
2.	word meanings in context
3.	follow passage organisation
4.	main thought
5.	answer specific text-based questions
6.	text-based questions with paraphrase
7.	draw inferences about content
8.	literary devices
9.	author's purpose

**Chart 9: Frederick Davis's Nine Categories of Testable Skills (Davis, 1944)**

Due to his method, Davis “was able to conclude that reading comprehension consisted of two major factors, word knowledge and ‘reasoning about reading’”. (Pearson and Hamm, 2006, 82) Later, he complemented his list with three other factors: comprehension of explicitly stated ideas, understanding passage organisation, and detecting literary devices.

Wilson Taylor developed a new alternative for standardised tests in the 1950s, called the ‘cloze procedure’. (Taylor, 1953) He claimed that the evaluation of multiple-choice items was subjective in standardised tests because of the high level of text correction errors. Thus, human judgements in the evaluation process are needed to be replaced by mechanical evaluation systems. “Cloze was touted as the scientific alternative to multiple-choice tests of reading comprehension.” (Pearson and Hamm, 2006, 83) The method of the cloze test is the following: every ninth or fifth word arise deleted from the texts, and the readers’ task is to fill the gaps. The main question concerning cloze tests is what it accurately measures: linguistic predictability or individual differences in comprehension. (Pearson and Hamm, 2006, 83) In the 1960s, the following problem occurred: many of the standardised test task questions could be answered by logic, by prior knowledge, or by fantasy and without reading the actual passage.

(b) *Criterion-referenced assessments* was a new and exciting method of assessing reading literacy since it put the connection of reading and learning into focus in order to get more precise information about the process of learning and help students to develop. This method was so popular between the 1970s and 1980s that they started to apply them in parallel with workbook units as practising test tasks.



(c) *Informal assessment of reading comprehension* probably gained attention because of the shift from oral reading to silent reading in classrooms. It involves retelling or answering questions concerning the actual passages but searching for miscues was also a form of assessment in this method. The latter shifted the focus of reading assessments, not defining but explicating reading comprehension, and the process of decoding gained extra attention. (Sarroub, 1998, 98-99)

From the 1960s to 1980s, a new, cognitivist paradigm was overthrowing behaviourism, and by “the mid-1980s, reading research had gained prominence in the field of educational research as a discipline in which linguistic, psychological, sociological, and computer technology converged. The rise of cognitive science in the late 1960s and early 1970s had displaced the behaviourist tradition with information-processing theory”. (Alexander and Fox, 2004 cite Nagy and Scott, 2006, 217.) The reinvented *schema theory*, the new concept of *metacognition* theories about the influence of *text structure* and the *influence of grammar* clearly showed that some development started concerning reading research. “The cognitive revolution has also made possible a focus on comprehension in reading research. This was evident in particular in the establishment in 1976 of the Center for Study of Reading, the first federally funded centre focused on reading, whose initial charge was to examine reading comprehension, not decoding (Gaffney and Anderson, 2000, cite Nagy and Scott, 2006, 218)

The main step was Walter Kintsch’s (1978) improvement of comprehensive models of text comprehension. (Dougherty Stahl – McKenna, 2006, 275) He claimed: “both top-down and bottom-up processes are integral parts of perception, problem solving, and comprehension. Without sensory input (bottom-up) we could neither perceive, nor comprehend, nor think. However, perception, comprehension, and thought would be equally impossible without a memory or knowledge component (top-down). It makes no sense to ask whether one is more important than the other: Nothing happens without both. So, the question for the theorist is not top-down or bottom-up, but how do these processes interact to produce fluent comprehension?” (Kintsch, 2005, 126 cited in Dougherty Stahl – McKenna, 2006, 275)

According to Anderson, Wang and Gaffney (Dougherty, Stahl and McKenna, 2006, 275) the period between 1970-2000 was the period in which the focus was on “top-down” reading processes, and also “a period of exceptional vigour in research on »bottom-up« processes.” (Dougherty, Stahl and McKenna, 2006, 275) Word decoding theories, such as

*automatic processing, phonological awareness, and decoding by analogy* were popular approaches to getting a better understanding on reading.

By the late 1980s, constructivism has already gained attention and started to involve issues such as prior knowledge, environmental clues, the text itself, and other essential factors of the reading process. These changes brought a focus shift again since understanding readers' applied reading strategies – and the ability to apply reading strategies at all, according to various kinds of reading materials – came to the focus of research instead of the level of one's reading skills. However, because of many influencers, such as education stakeholders and politicians, teachers, and schools, etc., they still wanted to guard the reputation of their students, teachers, and institutes, thus teaching for testing remained in practice as well. The result of this tendency was an inappropriate application of reading tests, a questionable interpretation and evaluation of assessments' data, and unsuitable reading instruction models. "Score pollution" – as Haladyna, Nolan, and Hass (1991) phrased it, meaning getting better scores without becoming better readers. Researchers reacted to this phenomenon with another development of assessment tasks and started to apply longer text passages, complex questions, various question types, and responses to literature formats. (Sarroub, 1998, 100-101)

There was another step towards the social nature theories of reading and the construction of meaning. These changes occurred not just in the case of standardised, multiple-choice questions tests, but in the case of classroom comprehension assessments as well. Retelling and think-aloud, as two newly discovered testing methods, had become as popular and widely accepted testing methods (thanks to Ericsson and Simon's (1980) work on self-reports) as they were used both in assessment and instructional practices. (Sarroub, 1998, 101). In his research, Louise Rosenblatt (1978) suggested a new consideration of meaning, claiming that it is a kind of transaction between readers and texts, thus meaning "is therefore neither subject nor object nor the interaction of the two. Instead it is transaction, something new and different from any of its inputs and influences." (Pearson and Hamm, 2006, 90)

The next significant step in the history of reading literacy assessments was in the 1990s when researchers realised that no matter how many changes had occurred since the beginning of reading assessments, the core of research practice did not change. The so-called "acceleration of accountability mentality" (Sarroub, 1998, 99) showed that assessment reports gained great attention not just in the narrow circle of experts, but in the public domain as well. Thus, schools

and teachers “spent inordinate amounts of time and energy getting students ready to take those tests, just so their schools would look good – or at least so they would not look too bad.” (Sarroub, 1998, 99) The demand for accountability and comparison was so high that teachers and schools had to make compromises to serve political pressures. A greater amount of multiple-choice questions vs. open-ended questions and medium-length passages to read represented these tenors. The *National Voluntary Reading Test*, the *National Assessment of Educational Progress (NAEP)*, and the *New Standards Reference Exams* were good examples for compromises – and retreat as well. Thus, as Sarroub concluded: the new formats of testing did not take root, and a “hundred years later, we are still learning the steps to the same dance.” (Sarroub, 1998, 102-103)

Thus, by the time Millennium arrived, it seemed that the tendencies of teaching for testing and serving political pressure would become more and more dominant and sharpened the debates concerning the genre of reading literacy assessments. As Steven Stahl put it: “The politicization of recent years interferes with effective instruction because it hardens viewpoints and forces educators to adopt unreasonable tenets concerning instruction. One result of the movement is that teachers have a great many beliefs about reading instruction, some of which are tenable and some of which are not. As we approach the millennium, we need to step back, look at the evidence, and evaluate all our beliefs.” (Stahl, 1998, 6, cited Stanovich and Stanovich, 2006, 42)

From the 2000s to nowadays, there have been two main types of measuring reading comprehension that is worth discussing (Grabe and Jiang, 2014). They are standardised assessments such as the OECD/PISA and classroom-based assessments; both focusing on the construct of reading. They agreed that reading comprehension involves various kinds of factors such as background knowledge, cognitive abilities, language skills, etc., and the level of reading proficiency, reading purposes, and the given reading tasks vary according to these factors. There are 12 of these distinct components (see *Chart 10*) that have a huge influence on text comprehension and show the differences between individual readers.

1.	efficient word recognition processes (phonological, orthographic, morphological, and semantic processing);
2.	a large recognition of vocabulary (vocabulary knowledge);
3.	efficient grammatical parsing skills (grammar knowledge under time constraints);

4.	the ability to formulate the main ideas of a text (formulate and combine appropriate semantic propositions);
5.	the ability to engage in a range of strategic processes while reading more challenging texts (including goal setting, academic inferencing, monitoring);
6.	the ability to recognize discourse structuring and genre patterns, and use this knowledge to support comprehension;
7.	the ability to use background knowledge appropriately;
8.	the ability to interpret text meaning critically in line with reading purposes;
9.	the efficient use of working memory abilities;
10.	the efficient use of reading fluency skills;
11.	extensive amounts of exposure to L2 print (massive experience with 12 reading);
12.	the ability to engage in reading, to expend effort, to persist in reading without distraction, and achieve some level of success with reading (reading motivation).

**Chart 10: Twelve Factors That Strongly Impact Reading Abilities (Grabe and Jiang, 2014, 4)**

Assessing these factors in various combinations could give us information about readers' level of reading purposes and the connected reading proficiency. However, it triggers questions concerning the interpretation and explanation of data, the methodology of measurement, and a creation of large-scaled assessment task that could give us a more in-depth picture about reading comprehension in general.

Concerning *standardised reading assessment programmes*, they consider reading as a process of the construct in multiple ways according to (a) purpose, (b) reading task, and (c) cognitive process.

(a) The purpose of reading is typically getting informed, acquiring knowledge, understanding, and evaluating new data, etc. A “depiction of reading abilities, developed in the past two decades, has also led to a reconsideration of how to assess reading abilities within well recognized assessment constraints.” (Grabe and Jiang, 2014, 5) With this reconsideration, new measuring trends were developed in the field of standardised tests, such as (1) the *Cambridge ESOL suite of exams*, (2) the *IELTS*, and (3) the *iBT TOEFL*. In the first case, the most important changes concerning the concept of reading literacy assessments, for instance, are the elevated level of recognition of texts' discourse structure, the requirement of recognising main text ideas, “careful” reading abilities, reading multiple text genres, moreover the greater amount of texts to read. These changes naturally influenced the given tasks; thus, new kinds of task got

involved, such as multiple choice and short response items, complex matching tasks, and summary writing. (Grabe and Jiang, 2014, 5)

(b) In the case of the *International English Language Testing System (IELTS)*, the purpose of reading involves reading for specific information, main ideas, to evaluate and identify a topic or a theme both in general and academic fields. The latter includes reading with diagrams and figures and contains fill-in summary tasks as well. (Grabe and Jiang, 2014, 5)

(c) The last example is the *iBT TOEFL* that listed information finding, general comprehension as a base, reading to learn, and integrate. (Grabe and Jiang, 2014, 5) It assesses and evaluates readers' academic reading proficiency as well, focusing on the following factors: basic comprehension items, inferencing items, and reading to learn items. Because of the latter, *iBT TOEFL* applies two new task types: prose summary and schematic table.

As we can see, there were several promising changes and improvements in all three above-discussed assessments. However, there are factors that were not measured, such as passage reading fluency and reading rate; automaticity and rapid word recognition; search processes; morphological processes; text structure processes and discourse organisation; strategic processing abilities; summarisation abilities (and paraphrasing); synthesis skills; and complex evaluation and critical reading. (Grabe and Jiang, 2014, 6)

Another popular research method is the *classroom-based reading assessment*. It applies the test task from the standardised reading assessment programmes; however, it is a day-to-day observation with regular and rapid feedback. According to Grabe, there are six classroom-based assessment practices and 25 specific informal assessment activities (i.e., read aloud in class; record-keeping of students' responses to questions after a reading; and pursuing the amount of time spent by individual and silent reading), that could be applied in research. Among these factors, we can find observing students reading with an audiotape, having a student read aloud for the teacher, or keeping charts of students' reading rate growth. (Grabe and Jiang, 2014, 8) The primary purpose of this kind of assessment is "to provide immediate feedback on tasks and to teach students to engage in more effective learning instead of evaluation of their performance". (Grabe and Jiang, 2014, 8)

In their research, Grabe and Jiang (2014) searched through two significant journals from the last ten years of reading assessments: *Language Testing* and *Language Assessment Quarterly* to map the current trends of reading literacy assessments. They found that the latest

reading and text comprehension measurements concentrated mostly on issues such as test tasks, reading texts, and reading strategies. (Grabe and Jiang, 2014, 9) They concluded their findings as follows: “One of the most important challenges for reading assessments stems from the complexity of the construct of reading ability itself. [...] The question remains how such an array of component abilities can best be captured within the operational constraints of standardized testing, what new assessment tasks might be developed, and what component abilities might best be assessed indirectly”. (Grabe and Jiang, 2014, 11) Another issue is testing itself because it seems that the fact of being tested during reading has a significant effect on reading comprehension performances. Thus, what we can measure and what we would like to measure are two different processes. “One outcome is that it is probably not reasonable to demand that the reading done in reading assessments exactly replicate »real world« reading experiences.” (Grabe and Jiang, 2014, 12) In the case of assessing reading strategies, the problem is the same: research shows that the strategy applied during reading in testing contexts is different from real-world reading strategies. If this is true, then “how should we view the validity of reading assessments (assuming strategy use is a part of the reading construct)? (Grabe and Jiang, 2014, 12) According to Grabe and Jiang, 2014, different levels of reading proficiency require various assessment tasks, and this is another moot point in the already sophisticated methodology of large-scale standardised tests that needs reconsideration. What is extremely surprising is that the issue of testing digital or online reading and text comprehension is not discussed *at all* but mentioned as a future problem and challenge to face. However, this paper of Grabe and Jiang was published in 2014, when digitalism, screen reading, and online texts should not have been considered as a new phenomenon at all.

The last assessment to mention here is the *National Assessment of Educational Progress (NAEP)*. With its mixed model, NAEP carries the legacy of previous reading literacy assessments, such as wide-scale assessments; however, “there is still much more to learn about how to measure a phenomenon that is elusive as it is important”. (Pearson and Hamm, 2006, 92)

The next section (*Section 3.3.1.*) aims to present a brief overview of the Hungarian reading literacy practices, because Hungary, as an OECD country, regularly takes part in the RLA.

### 3.3.1. Reading Assessments in Hungary

In Hungary, the tradition of assessing reading does not have a long history: the first large-scale measurement was in 1979 by the OPI-MM (Országos Pedagógiai Intézet – Művelődési Minisztérium = National Institute for Pedagogy – Ministry of Culture and Public Education). (D. Molnár, Molnár, Józsa, 2012, 28) The concept of the assessment was created by Judit Kádárné Fülöp, in accordance with the already conducted international assessments, such as the IEA in 1970 (About IEA, n.d.), but also following (then) contemporary trends in methodology and theoretical background. The OPI-MM assessment aimed to survey children aged 13-15 (thus the grade eight of the Hungarian primary school system). In the measurement, they applied three types of text: belles-lettres, science literature, and documents. Children had to work out two task types: identifying information in the texts and concluding information from the texts. The results were rated in three levels: completely understood, partially understood, and not understood. (D. Molnár, Molnár, Józsa, 2012, 28)

The second large-scaled observation, titled TOF (Országos Pedagógiai Intézet Tantervelméleti Osztály Felmérése = Assessment by the Division of Curriculum Theory of the National Institute for Pedagogy), was conducted in 1980. In this survey, they applied several types of text according to the following characteristics: text length, text cohesion, thematic variance, ethical rules, and the Maxims of Grice (quantity, quality, relation, and manner). During the assessment, two types of reading process were identified: text *comprehension* (understanding the information, attendance, and reading without mistakes) and text *interpretation* (understanding the hidden meanings of the texts). (D. Molnár, Molnár, Józsa, 2012, 28-29)

Then the Monitor Assessments by the Centre of Evaluation of the National Institute for Pedagogy were created in order to recognise trends and the effectiveness of the Hungarian public educational system. (D. Molnár, Molnár, Józsa, 2012, 31) The first Monitor Assessment was in 1986, but it became a regular, biannual survey only from the 1990s. In the Monitor Assessments, they surveyed four-grade, eight-grade, ten-grade, and twelve-grade students – thus the stepping-stones of the Hungarian primary and secondary school system. The tasks were chosen according to the required background information, motivational force, structural and thematic coherence, and the image of the reality of the text. The last Monitor Assessment was published in 1999. After that, its function was taken over by the National Competency

Assessments (OKM=Országos Kompetenciamérés) in 2001. This survey aims to observe the complete population of Hungary. From 2003 the OKM became a regular one, repeated every year, and supplemented by a survey of Mathematical skills and questionnaires of social and institutional background. Then, since 2000, PISA Assessments and the RLA got to the map of surveys in Hungary as well. (D. Molnár, Molnár, Józsa, 2012, 31-36) The most prominent Hungarian PISA researcher and expert is Benő Csapó, member and former vice-president of the PISA Governing Board, whose works represent a breakthrough in the Hungarian educational research and policy making. His research field includes educational development, assessments and evaluation, children's learning skills and competencies, teaching and learning models and systems, and educational policy-making. His works relevant to my research are applied and cited in the dissertation, and in the Bibliography.<sup>13</sup>

This brief overview of the history of reading assessments intended to describe the complexity and the most relevant tenors of reading literacy surveys in order to put the OECD/PISA RLA in context. The next subsection (*Section 3.4.*) of the dissertation aims to discuss the antecedents of the OECD/PISA RLA.

### **3.4. Antecedents of OECD/PISA Reading Literacy Assessments**

The aim of the following subsections (*Section 3.4.1.* and *3.4.2.*) is to discuss two forerunners of the OECD/PISA RLA. First, the *International Association for the Evaluation of Educational Achievement (IEA)* (About IEA., n.d.), second, the *International Adult Literacy Survey (IALS)* (IALS, n.d.) are discussed. These parts of the dissertation intend to show the RLA's background and context with a specific focus on our home country as an illustration of the general stance.

#### **3.4.1. The IEA's Reading Literacy Study (RLS)**

The International Association for the Evaluation of Educational Achievement (IEA) (About IEA, n.d.) is a non-profit international scientific organisation licensed in Belgium and based on cooperation between research institutes, governments, and various actors of education. It aims to assess, evaluate, and understand educational systems, policies, and practices to improve education since 1958. IEA conducts regular measurement and comparative studies in the subjects of reading, mathematics, science, civics and citizenship, computer and information

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<sup>13</sup> For more, see his works: <http://www.edu.u-szeged.hu/~csapo/publ/PublCsB.htm>.



literacy, early childhood and teacher education.<sup>14</sup> The organisation includes more than sixty countries and involves over one hundred countries in its global studies. (About IEA, n.d.) On the official IEA website, there is a data repository where many completed studies are available for further analysis. Besides these studies, all IEA's publications (assessment frameworks, reports, summaries, reviews, etc.)<sup>15</sup> also can be found.<sup>16</sup>

The first IEA assessment was conducted in 1960 with the participation of 12 countries. This assessment measured 13-year-old students' skills in the following fields: mathematics, reading comprehension, geography, science, and non-verbal ability. With this research, IEA's principal aim was to demonstrate the sense and feasibility of large-scale cross-national surveys. This first research project of the IEA is called *Pilot Twelve-Country Study*<sup>17</sup> and examined the following countries' educational systems: Belgium, England, Finland, France, West-Germany (FRG), Israel, Poland, Scotland, Sweden, Switzerland, United States, and Yugoslavia. The success of the *Pilot Twelve Country Study* triggered the *First International Mathematics Study* (FIMS) in 1962. Then, *The Six Subject Survey* in 1970-1971 was the one that, besides other topics, involved reading comprehension with the following focuses: "out-of-school environment (including home environment, language in home, and exposure to mass media); availability of reading materials; educational practices and school background (including instructional practices, resources and procedures for individualization of instruction, and size and type of school); interests and attitudes of students; acquired study and reading habits; presence of eye, hearing, and speech deficits." (Early IEA Studies, n.d.)

For my research, two IEA assessments are relevant: (a) the *Progress in International Reading Literacy Study (PIRLS)* (IEA PIRLS, n.d.) and (b) the *Literacy and Numeracy Assessment for Developing Countries (LaNA)*. (IEA LaNA, n.d.)

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<sup>14</sup>For the detailed mission of IEA see the IEA's official *Strategy Diagrams* at [https://www.iea.nl/sites/default/files/fileadmin/user\\_upload/IEA\\_Documents/IEA%20Strategy%20Diagrams%20October%202018.pdf](https://www.iea.nl/sites/default/files/fileadmin/user_upload/IEA_Documents/IEA%20Strategy%20Diagrams%20October%202018.pdf).

<sup>15</sup> See the complete list of the IEA publications via this link: [http://pub.iea.nl/publication\\_list.html?&no\\_cache=1](http://pub.iea.nl/publication_list.html?&no_cache=1).

<sup>16</sup> All the IEA's assessments can be reached via the following link: <https://www.iea.nl/iea-studies>.

<sup>17</sup> Reference of the study: See Foshay, A.W., Thorndike, R.L., Hotyat, F., Pidgeon, D.A., Walker, D.A. 1962. Educational achievements of thirteen-year-olds in twelve countries: Results of an international research project, 1959–1961. Hamburg: UNESCO Institute for Education.

(a) The antecedent of PIRLS was the *Reading Literacy Study* (RLS) in 1990-91 that gathered information on students' reading habits and activities in 32 countries. This measurement aimed to examine students' performance and educational practices. It was a stepping-stone for PIRLS, which was first conducted in 2001, and then it became a five-year-period regular assessment (2006, 2011 and 2016).<sup>18</sup> PIRLS aims to measure fourth-grade (9-10-year-old) children's reading performance and their reading skills improvement through the years, including their first reading experiences when they started to learn to read. 2016 was the year when PIRLS extended its focus and involved online reading literacy skills in the measurement (ePIRLS). The next PIRLS assessment will be in 2021 that will include offline and online tests according to the following<sup>19</sup>: "(1) A new fully-digital ePIRLS assessment, which integrates all aspects of PIRLS Informational, PIRLS Literary, and the ePIRLS Online Informational assessments. (2) The paper-only version of the PIRLS assessment, which is equivalent to the original pen-and-paper PIRLS standard assessment." (About IEA, n.d.)

(b) The LaNA collects data and measures strengths and weaknesses from those countries where PIRLS would be too difficult to conduct at present. The literacy results of LaNA are linked to the outcomes of PIRLS Literacy assessments; thus, they are comparable. (IEA LaNA, n.d.) The LaNA assessments "include vocabulary and reading comprehension where the students read passages and answer questions about them." (LaNA Flyer, n.d.) These are adapted from the IEA PIRLS 2016 and fit for the purposes of "reading for literary experience (stories), and reading to acquire and use information". (LaNA Flyer, n.d.)

### 3.4.2. The International Adult Literacy Survey (IALS)

The *International Adult Literacy Survey* (IALS) (IALS, n.d.) was the first large-scale assessment that aimed to examine adults' literacy skills all over the world. This international measurement was conducted between 1994-1998 in 22 countries and regions. The target group was 16-65-year-old adults. The methodology of IALS based on the National Adult Literacy Survey (NALS) was conducted in 1992.<sup>20</sup>

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<sup>18</sup> See all previous PIRLS cycles via this link: <https://www.iea.nl/pirls-past-cycles#pirls-2001>.

<sup>19</sup> For more information, see the official PIRLS 2021 leaflet via this link:

[https://www.iea.nl/sites/default/files/publications/Electronic\\_versions/PIRLS%202021%20Brochure.pdf](https://www.iea.nl/sites/default/files/publications/Electronic_versions/PIRLS%202021%20Brochure.pdf).

<sup>20</sup> See more: [https://nces.ed.gov/naal/nals\\_products.asp](https://nces.ed.gov/naal/nals_products.asp).

IALS defined literacy as follows: “using printed and written information to function in society, to achieve one’s goals, and to develop one’s knowledge and potential”. (“What does IALS measure?”, n.d.) IALS aimed to assess three domains of literacy: (1) Prose Literacy, (2) Document Literacy, and (3) Quantitative Literacy. The first was about the background knowledge and skills that are necessary to apply and comprehend various kinds of texts, such as editorials, news stories, poems, and fiction. The second focused on document formats and skills that are important to collect and apply information from different documents (e.g., job applications, charts, maps, schedules, etc.). The last one assessed the skills and the level of knowledge that are required to apply and comprehend arithmetic operations. (W54) The results of this comparative cross-cultures and cross-countries measurement were published and made publicly available.

After having discussed the antecedents of OECD/PISA RLA, let us examine the OECD/PISA RLA, starting with its missions, aims, and methods, and summarising its cycles from 2000 to 2018.

### 3.5. The OECD/PISA Reading Literacy Assessments

This section focuses entirely on the OECD/PISA Reading Literacy Assessment (RLA) series, starting from an overview of the OECD, then presenting all the RLA surveys from 2000 to 2018, and highlighting gradual improvements of the RLA framework from time to time.

The Organisation for Economics and Cooperation Development (OECD) has a mission to improve the social, economic, and environmental well-being of people with the help of creating a forum for exchanging good-working practices, policies, and experience all around the world. OECD implements measurements, data-analyses, and comparisons based on their own, worldwide assessments, and works together with governments, business (the Business and Industry Advisory Committee to the OECD – BIAC (Business at OECD, 2016)), labour (the Trade Union Advisory Committee – TUAC (Trade Union Advisory Committee to the OECD, 2007)) and civil society organisations. They aim to restore “confidence in markets and the institutions that make them function. [...] Ensure that people of all ages can develop the skills to work productively and satisfyingly in the jobs of tomorrow”. (About the OECD, 2017) OECD summarises its core values as follows:

- **“Objective:** Our analyses and recommendations are independent and evidence-based.

- **Open:** We encourage debate and a shared understanding of critical global issues.
- **Bold:** We dare to challenge conventional wisdom starting with our own.
- **Pioneering:** We identify and address emerging and long term challenges.
- **Ethical:** Our credibility is built on trust, integrity and transparency.” (About the OECD, 2017)

The OECD/PISA is a series of standardised international surveys, created and improved by the OECD countries and economies, developed for 15-year-old students in educational programmes, and tested on 4.500-10.000 students each year. The Program gathers data from various countries to find good and effective educational policies, show and distribute their methods, trigger educational development, and help those counties that are at the bottom of international educational rankings. They primarily survey reading, mathematics, scientific literacy, and recently problem-solving as well, focusing on skills, applied knowledge, and “the mastery of processes, the understanding of concepts and the ability to function in various situations within each domain” (OECD 2003, 11), but it does also not exclude curriculum-based knowledge. According to OECD, the outcomes of the surveys are as follows:

- “A basic profile of knowledge and skills among 15-year-old students.
- Contextual indicators relating results to students and school characteristics.
- Trend indicators showing how results change over time.
- A valuable knowledge base for policy analysis and research.” (OECD 2003, 11)

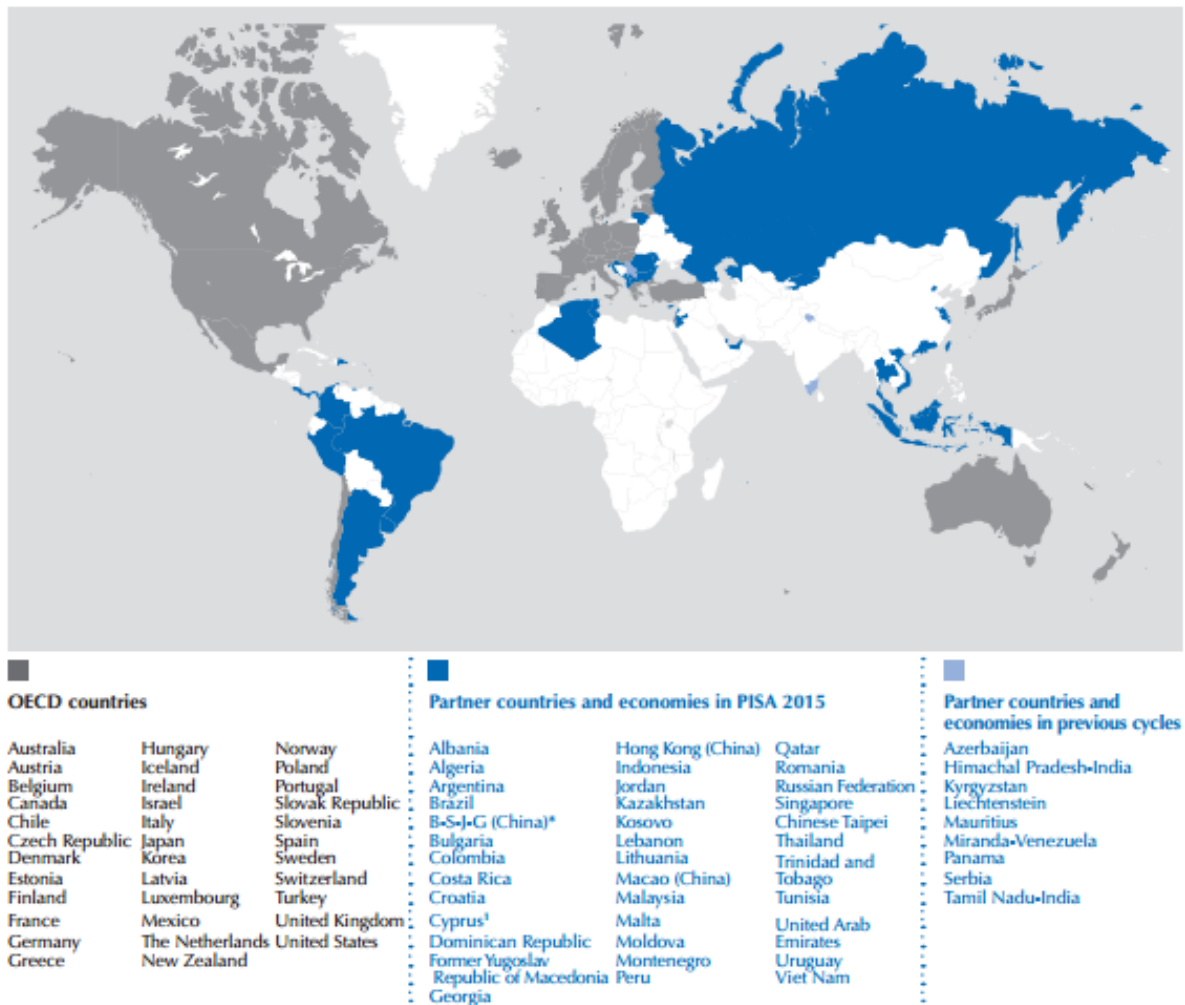
OECD’s PISA is the most accepted; however, the most controversial assessment aiming “to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students” (OECD PISA, n.d.). The Program started in 2000 with a triad of Reading, Mathematics, and Science surveys, and since then, it is repeated every three years. Besides, PISA gathers information on the following: attitudes, motivation, collaborative problem-solving, and other essential competencies. (OECD PISA FAQ, 2017) There have already been seven surveys: PISA2000, PISA2003, PISA2006, PISA2009, PISA2012, PISA2015, and PISA2018. All assessments and analytical frameworks, technical reports, and data are publicly available. (OECD PISA, n.d.)

Each turn of the survey has its focus field that is examined more deeply, so in 2000 and 2009, and 2018, emphasis was put on reading literacy, while in the other years, mathematics and science were the main topics in turns.

All surveys are created by researchers, experts, academics, and scientists from various fields of education. The test questions usually focus on skills and competencies, and they are not about asking lexical knowledge (e.g., names and dates), but to assess the practical ones, such as comprehending and evaluating text and information, finding correspondence, making reflections and critical thinking, etc. In short, PISA surveys tend to draw a picture on how 15-year-old students can apply their knowledge gained at schools and how they will stand their ground in life, e.g., at their future workplaces (OECD, 1999).

Methodologically, PISA works with paper-and-pencil and digital tests with a total of two hours and a mixture of multiple-choice and constructed response items, in favour of the previous type. PISA applies “[...] multiple-choice testing as the primary feature of its assessments because it is reliable, efficient, and supports robust and scientific analyses.” (OECD PISA FAQ, 2017) Different students take different combinations of test items and fill a 30-minute long background questionnaire about themselves and their homes as well. School principals also get a background questionnaire about their school. All PISA countries and economies have the opportunity to create and submit questions to the surveys, referred and improved by international experts and contractors of the OECD, with particular awareness of cultural bias. The final test questions are unanimously approved, and a trial survey ensures that they are appropriate and applicable to all PISA countries and economies. (OECD PISA FAQ, 2017)

Taking part in the PISA surveys is based on the given country’s will, and there is an opportunity for applying not just by OECD countries, but external participants as well. Moreover, participation is also possible for regions (instead of countries). (See *Figure 14*) PISA selects the participant schools according to “strict technical standards including for the sampling of schools and students within schools. The sampling procedures are quality assured, and the achieved samples and corresponding response rates are subject to an adjudication process that verifies that they have complied with the standards set”. (OECD PISA FAQ, 2017)



\* B-S-J-G (China) refers to the four PISA participating China provinces: Beijing, Shanghai, Jiangsu, Guangdong.  
 1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".  
 Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

**Figure 14: Map of PISA Countries and Economies (Map of PISA Countries, n. d.)**

With these surveys and reports, PISA’s intention is not to rank countries and create unhealthy competition between them or put stress on experts, teachers, and children, forcing harsh debates between policymakers, regions, or countries. On the contrary, PISA aims to find the bests educational practices and systems and spread their methods all over the world to help other countries to close up to the most developed. In short, the Program aims to offer a way of shaping educational reforms by sharing and transferring international educational experience.

What is unrivalled in the OECD’s PISA assessments can be summarised in the following way:

- origin: governments were the ones who did initiative the assessment to get a better view of their educational practices, and PISA aims to serve this purpose;
- regularity: in every three years making it possible to monitor progression and draw tendencies;
- age-group coverage: students near the end of their compulsory schooling that can present the effectiveness of the given educational system and practices; and
- the knowledge and skill tested: not data, names, curricula or plain information, but skills which children will need during their future studies, work and everyday life. (OECD, 1999)

This last one is outstanding in PISA assessments because it shows the link, the bridge, and the distance between the knowledge needed in school and needed in life. „For the first time an international assessment of school students aims to determine not just whether they have acquired the knowledge specified in the school curriculum, but whether the knowledge and skills that they have acquired in childhood have prepared them well for adult life.” (OECD, 1999, 16) Hence, PISA does not have the intention to exclude curriculum-based knowledge, but the focus is on their intelligent application. (OECD, 1999, 11)

2000 was the starting year of PISA surveys, and in this very first assessment, reading literacy was in focus out of the three domains. In the official document titled *Measuring Student Knowledge and Skills – A New Framework for Assessment* (OECD 1999), a summary was published about the central aspect of the reading literacy survey. The following session of assessments was in 2003 when Mathematics was in focus. Still, PISA did the Science and Reading Literacy surveys as well. The official background document titled *The PISA 2003 Assessment Framework – Mathematics, Reading, Science and Problem Solving, Knowledge and Skills* (OECD, 2003) was published in the same year. Then, the following assessment was in 2006, its background material was titled *Assessing Scientific, Reading and Mathematical Literacy – A Framework for PISA 2006*, and the primary domain was Science. (OECD, 2006) At that time, it has already been seven years gone by since PISA had published the first document of reading literacy assessment (PISA2000 was published in 1999), and three years have passed since they had managed to come out with the second survey (PISA2003, published in 2003). However, we had to wait for the updates of the RLA framework until the next cycle in 2009, when measuring reading literacy skills was the primary domain again.

In the foreword of the official document titled *PISA2009 – Assessment Framework – Key competencies in reading, mathematics and science* (OECD, 2009), it is stated that “the reading framework has been updated and now also includes the assessment of reading of electronic texts [...] thus reflecting the importance of information and computer technologies in modern societies” (OECD 2009, 3; 10) PISA2009 has a significant role in the history of assessments because it was the first assessment that measured digital reading on large-scale. It was entirely the participating countries’ individual decision whether they intended to take part in the electronic assessment or just in the print version. Thus, it was a kind of pilot measurement, and PISA added that the “assessment of electronic reading will be reviewed and refined over successive cycles to keep pace with developing technologies, assessment tools and conceptual understanding of the electronic medium’s impact”. (OECD 2009, 20)

The official document of the next reading literacy assessment is titled *PISA 2012 Assessment and Analytical Framework: Mathematics, Reading, Science, Problem Solving and Financial Literacy*. (OECD, 2013) In this fifth PISA cycle, reading was a minor domain, and the RLA’s framework had not changed since the previous period of PISA2009. (OECD, 2009) The following assessment was in 2015, when the focus was on scientific literacy skills. The official document was released in 2016 and titled: *PISA 2015 Assessment and Analytical Framework: Science, Reading, Mathematic [sic], Financial Literacy and Collaborative Problem Solving (Revised edition)*. (OECD, 2016a) Thus reading had a minor role again; however, this assessment was an outstanding one, because for “[...] the first time, PISA 2015 delivers the assessments of all subjects – science, reading, mathematics, financial literacy, and the additional domain, collaborative problem solving – via computer. However, a paper-based assessment instrument, consisting only of trend items, is provided for countries/economies that choose not to test their students on computer”. (OECD, 2016a, 3)

The assessment next in line, and the last one so far, was PISA2018. The first draft of the official framework document was published with the title *PISA 2018 Draft Analytical Frameworks May 2016*. (OECD, 2016d) Then, the final document was released in 2019, titled: *PISA 2018 Assessment and Analytical Framework*. (OECD, 2019) It was the third time when the complete reading literacy framework was updated, and it was promised to do so according to the contemporary and comprehensive theories of reading literacy. (OECD, 2016d, 5) The aim of the assessment stayed the same: “to measure students’ mastery of reading literacy



processes through manipulating task and text factors. The questionnaire further serves to assay some of the reader factors, such as motivation, disposition and experience”. (OECD, 2016d, 15)

The next assessment cycle will be in 2021, with a focus on the domain of Mathematics. The Assessment and Analytical Framework documents are available on the official OECD/PISA website, except for the Reading Literacy framework document. We have every reason to expect significant changes from this test period since the assessment’s domains of investigation are extended with *Creative Thinking* and *ICT*. (OECD PISA, n. d.)

As it has already been discussed in *Section 3.1.*, PISA’s periodically repeated reading literacy surveys and reports became the ignition keys of many debates and criticisms among researchers, teachers, educational experts, politicians, and the public as well. A significant part of these debates and criticisms focuses on the trustworthiness and interpretation of the test results, complemented by topics such as relevance, methodology, theoretical background, technological improvement, and influencing factors of reading. (Baron, 2016; Myrberg and Wiberg, 2015; Salter, 2015; Paceni in Grammar Schools, 2013c; Paceni in Grammar Schools, 2016a) This dissertation intends to answer the question whether the criticisms that question the trustworthiness and interpretation of the OECD/PISA Reading Literacy Assessments’ research findings are right, and if so, then is it possible that the problems are originated from the deficiencies of the theoretical and methodological background of the assessments.

Nevertheless, at present, regarding the efforts invested in the survey, the OECD/PISA RLA is far the best-organised, widespread, and sophisticated assessment in the field of surveying reading literacy. Hence, despite the criticisms, its conceptual, theoretical, and methodological background has rightly kept a tally on the standard. While the RLA leans on the trends and practices discussed in this chapter, it proceeds from them in cases when its mission, aims, and tenors of improvement require. However, because of these reasons, the RLA needs to take the criticisms seriously against its surveys, and fix the problems, be they conceptual, theoretical, or methodological.

Now, after presenting the OECD/PISA RLA and its improvements, the following chapters (*Chapter 4-7*) aim to discuss the problems of the RLA in detail throughout the years, focusing on three pillars: A. *Conceptual background*, B. *Theoretical background*, and C. *Methodological background* of the assessments.

## 4. Discussing the Conceptual Background of the RLA

This chapter discusses the conceptual background of the RLA. Here the phrase ‘conceptual’ refers to the overall approach of the RLA, including the considerations, declared intentions, emphases, and framework structure, rather than the fundamental notions and theories in the analytical and framework documents of RLA and their possible interpretations (as the latter have been mainly in the focus of *Chapter 5* to some extent).

### 4.1. Intentions, Emphases, and Considerations by Assessment Cycles

In general, and in contrast with its antecedents discussed before, the RLA focuses entirely on 15-year-old students (vs. IALS’ adult assessments) reading literacy skills in developed countries (vs. IEA/LaNA concentrating on developing countries). As phrased in the analytical and framework document of the first RLA in 2000, the assessment aims to examine reading literacy as follows:

“In OECD/PISA, the term reading literacy is understood in a broad sense. Since comparatively few young adults in our societies have no literacy skills, the framework does not call for a measure of whether or not 15-year-old students can read in a technical sense. It does reflect, however, contemporary views about reading. These views hold that students, upon leaving secondary school, should be able to construct, extend, and reflect on the meaning of what they have read across a wide range of continuous and non-continuous texts commonly associated with a variety of situations both within and beyond the school doors.” (OECD, 1999, 19) Thus, the RLA presupposes that every child assessed in the program are *literate* and *can* read and write, they *have* some reading experience and declares that the assessment leans on contemporary literature and theories of reading. The reading components to be assessed are as follows:

“Reading different kinds of *text*: continuous prose sub-classified by type (*e.g.* description, narration) and documents sub-classified by structure. Performing different kinds of reading *tasks*, such as retrieving specific information, developing an interpretation or reflecting on the content or form of the text. Reading texts written for different *situations*, *e.g.* for personal interest, or to meet work requirements.” (OECD 1999, 12) Thus, text, task, and situation are the three pillars that mark the domain of the assessment. Their detailed discussion will be presented in *Section 6.1*.

The RLA mixes the definitions of the IED/RLS and IALS about reading literacy and follows their concept of assessing skills, with minor changes. Their focus is on written texts (vs. printed and written information and language forms), and one’s ability to function successfully in society and improve personal knowledge (See *Chart 11* below).

<b>IEA/RLS:</b> “The ability to understand and use those written language forms required by society and/or valued by the individual”.
<b>IALS:</b> “Using printed and written information, to function in society, to achieve one’s goals, and to develop one’s knowledge and potential.”
<b>PISA2000:</b> “Understanding, using, and reflecting on written texts, in order to achieve one’s goals, to develop one’s knowledge and potential, and to participate in society.”

**Chart 11: Reading Literacy Definitions (OECD, 1999, 19-20)**

From 2009, the RLA includes digital tests, thus digital contents similar to the ePIRLS. It shows an awareness of advancing technology and continually changing nature of reading that involve the concept, theory, and the related methodology of the survey. Further conceptual considerations such as the ‘organisation of the domain and task characteristics’ (e.g., item types and influencer factors) and ‘assessment structure’ (e.g., building tasks, response formats, coding, and scoring) are discussed in the analytical and framework documents.

PISA2000 is based on two reading assessments: the IEA/RLS and the IALS. They follow the cognitive view of reading literacy, and theories of lifelong learning. In the chapter titled *Definition of the domain* (OECD 1999, 19), the RLA explains the definition of reading literacy in details. They refer to:

- *reading literacy* as a whole: “the intention of the survey is to measure something broader and deeper” (OECD 1999, 20) than reading. “The focus is on the application of reading in a range of situations for various purposes.” (OECD 1999, 20)
- *understanding, using and reflecting on*, i.e., reading is an interactive engagement with texts.
- *written texts*: printed, handwritten, and displayed electronically, including hypertext.<sup>21</sup>
- *achieve one’s goals, to develop one’s knowledge and potential, and to participate in society*: capturing “the full scope of situations in which reading literacy plays a role” (OECD 1999, 20), and the individuals contribute to society.

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<sup>21</sup> The RLA handles the notion of hypertext in an extended sense, including both offline and online digital texts.

By applying and explaining this definition above, the RLA considers its conceptual background to be properly given and described. “Having defined the domain of reading literacy and having laid out the set of assumptions that were made in constructing this definition, it is important to set out a framework of how to organise this domain.” (OECD 1999, 21)

According to the PISA2003 analytical and framework document, neither the *Conceptual*, nor the *Theoretical* background of the RLA was updated. The RLA worked with the same approach, literature, definitions, terms, and categories as in 2000. The notion of hypertext is mentioned, but comments on computers and new reading tools or the involvement of digital reading (despite of the previous promise, see OECD, 1999, 20) are missing. The only progression is the creation of reading literacy levels maps (OECD 2003, 126-127) in which the RLA gives us requirements for proficiency of reading according to five levels in forms of charts. Since these are parts of the evaluation system, they can be considered as improvements of the *Methodological* background.

The analytical and framework document of PISA2006 does not tell any progression or update concerning the *Conceptual*, *Theoretical*, or *Methodological* background of the assessment. The only improvement is that the document shows three task examples with brief explanations concerning their aim, function, and method of evaluation. (OECD, 2006, 64-69) As to the possible substantive improvement, the RLA phrased the following promise: “[r]eading was the main domain of the first cycle of PISA and will be again in 2009, at which time the assessment framework will undergo a review to consider developments that have occurred in that time.” (OECD, 2006, 69)

The declared aim of PISA2009 is to “focus on reading literacy skills that include finding, selecting, interpreting and evaluating information from the full range of texts associated with situations that reach beyond the classroom.”(OECD, 2009, 21) To achieve these goals, the two major improvements of the 2009 RLA framework are the involvement of *electronic reading* and *reading engagement and metacognition*. Concerning *electronic reading*, the document phrases that despite the many similarities between print and electronic reading, the latter “demands that new emphases and strategies be added to the repertoires of readers.” (OECD, 2009, 22) And this also means the (re)evaluation of critical thinking. *Engagement and metacognition* refer to “an awareness and understanding of how one thinks and uses thinking strategies”. (OECD, 2009, 20)

According to the PISA2012's analytical and framework documents, the definition of the domain remained unchanged, except two new elements, namely reading and understanding digital texts. "It describes how PISA assesses and analyses digital reading tasks, and the way in which students navigate through texts and respond to the format of tasks." (OECD, 2013, 60) However, one can discover two slight changes in the conceptual and theoretical background: (1) The RLA applies the notion of digital reading instead of electronic reading – and it can be a conceptual as well as a theoretical change. Unfortunately, the explanation of this change is nowhere to be found. (2) This time the assessment does not gather data about reading engagement or metacognition because reading is a minor domain. (OECD, 2013, 60)

In 2015, PISA's shift from paper to screen was a significant step that made the whole assessment more comfortable and practical. However, it did not affect the assessment framework: the 2015 RLA worked with the same conceptual, theoretical, and methodological background as in the previous cycles. The reason behind this decision was that reading literacy was just a minor domain in 2015; hence creators did not feel the necessity to improve this part of the assessment, even though the complete assessment, including the other fields, was delivered on-screen. "This framework uses the same description and illustrations of the PISA reading assessment as included in the 2009 framework, when reading was re-examined and updated for use as the major domain in that cycle. The framework does not, however, cover digital reading (also referred to as electronic reading in 2009). [...] Since reading is a minor domain in PISA 2015, and since digital reading was not assessed in all participating countries in 2009 or in 2012, there are no separate data on digital reading, nor was digital reading included as part of the overall concept of reading literacy." (OECD, 2016a, 48)

Thus, PISA2015 applied on-screen texts during its whole assessment; however, it was claimed that digital texts were not included, and no data was collected from these kinds of texts. As it is phrased in the analytical and framework document: "There is research evidence that a computer-based testing environment can influence students' performance in reading. Some early studies indicated that reading speed was slower in a computer-based environment [...], although these studies were conducted on proofreading tasks, not in an assessment situation". (OECD, 2016a, 50) In addition: "There is a large body of more recent literature on paper- and computer-based tests' equivalency [...]; however these still reveal conflicting findings. A meta-analysis of studies looking at K-12 students' mathematics and reading achievement [...]"

indicated that, overall, administration mode has no statistically significant effect on scores.” (OECD, 2016a, 50)

The seventh, and so far, the last, reading literacy assessment of PISA was in 2018. This year reading was the central domain again. Hence, the whole RLA was updated by intention. This time the “PISA 2018 reading framework acknowledges the goal-driven, critical and intertextual nature of reading literacy” (OECD, 2016d, 16) as it is declared in the document. In addition, the “framework fully integrates reading in a traditional sense together with the new forms of reading that have emerged over the past decades and continue to emerge due to the spread of digital devices and digital texts”. (OECD, 2016d, 8) It means that the assessment comprises the measurement of basic reading skills (such as fluency, literal interpretation, inter-sentence integration, etc.), and complex text processing as well. It also involves the previous cycles’ factors such as evaluating, information seeking, reading from multiple sources, and integrating or synthesising cross-text information. Moreover, there are tenors to apply the most up-to-date digital technology in the whole assessment process. (OECD, 2016d, 8)

#### 4.2. The RLA’s Analytical and Framework Structure

The OECD/PISA RLA’s concept is to conduct worldwide large-scaled assessments on the domain of reading, repeated in every third year. It is also an aim to make the individual test cycles and their results comparable with each other. In order to satisfy this intention, the analytical and framework structure of each assessment year follows the same structure. Let us examine how.

All RLA documents from 2000 to 2018 start with a ‘Foreword’ that declares the primary goal of the reading literacy assessments, i.e., to measure 15-year-old student’s literacy skills. Then follows the part of ‘Definition of the domain’ that presents the *Theoretical background* of the reading survey. The connected ‘References’ are generally given a place at the end of the whole document or as a closure of the RLA’s section (for more see *Section 5.1.*). The applied literacy definition and its explanation is also part of the section of definitions (see *Section 5.2.*). It also comprises a discussion of the macro-aspects of the survey, meaning the ‘Organisation of the domain’ (Text, Task, and Situation) and ‘Task characteristics’ (the five aspects of reading). They are discussed in *Section 6.1.* Then follows the ‘Assessment structure’; thus, the micro-aspect of the survey about the information to be gathered, response formats, marking. The

following section is usually about the 'Reporting scales'. At last, there are the 'Other [complementary] issues' of the RLA. These micro- and macro-aspects of the RLA are discussed here mostly under the label of *Methodological background (Chapter 6)*.

The above-described framework structure was of PISA2000, but with slight modification, the other analytical and framework documents are built up the same way. The small changes by cycles mean an emphasised part of 'Text format', 'Reporting outcomes', 'Assessing reading literacy' that presents task building in print and electronic medium, 'Reading proficiency in print and digital reading', and a section of task examples (PISA2006, PISA2009, PISA2012, PISA2018).

All the RLA analytical and framework documents are parts of the overall, complete framework document that includes the conceptual, theoretical, and methodological background of the other assessed fields. Hence, they are not individual, separated documents. By conceptual intention, this linked interweaved editing style of the framework documents probably represents the integral nature of the surveyed areas in the level of assessing skills and shows how comprehensive and sophisticated the program of PISA assessments is. Compared to the antecedents of the RLA discussed in *Section 3.4.*, the OECD/PISA RLA, at a conceptual level, is unchallenged indeed so far.

## 5. Discussing the Theoretical Background of the RLA

This chapter aims to discuss the theoretical background of the RLA, namely (1) the applied reading theories and professional literature grounding on what the RLA based its assessments. The analysis also includes the relevant definitions of the domain, such as (2) reading literacy, (3) text and hypertext, (4) the visual, (5) reading strategies, and finally (6) the role of digitalism in the reading assessment according to the RLA.

Theoretically, the RLA aims to follow contemporary views of reading and organise its concept, method, evaluation, and report in agreement with them. (OECD, 1999) All the examined analytical and framework documents present a list of references that consist of the literature the RLA leaned on during the work. The documents also discuss the ‘definition of the domain’, meaning the epistemological background and the major terms they applied. These terms have already been referred to in *Chapter 1* and highlighted to be significant both from the perspective of the RLA and of reading literacy studies in general. Now let us examine the background theories and terms of the RLA year by year, comparing them to each other and also to the literature.

### 5.1. Applied Reading Theories and Literature Grounding of the RLA

In the first PISA RLA, **PISA2000**, there is no individual, synthetic, or easily separable section about the theoretical background of the measurement; the focus seems to be on the methodological considerations. Moreover, and this is a general attribute of every RLA documents, the referred theories and research studies are not integrated into the framework documents. They are cited in mid-text sometimes, but most of them are just listed as bibliographical items. Thus, their function is not clear, and it seems that they are mostly “obligatory elements” of the documents, items that must be referred to, but without much reflecting on them, or presenting their affection on survey design. The bibliographies include “old school” items, before 1990, but also recent, up to date and relevant sources, that are in inherent parts of the contemporary literacy discussions. From this perspective, their neglected integration does not seem to be reasonable. Taking into account that the analytical and framework documents function is to present the background of the RLA, this is a severe problem, even though they are not academic studies. Especially that the RLA gives some



definitions and statements of reading literacy and text comprehension and based its whole assessment system onto them.

Despite of the above, in the first paragraph of the section that discusses the RLA, PISA2000 claimed that the framework “does reflect [...] contemporary views about reading”. (OECD, 1999, 19) According to these ‘contemporary views’, reading literacy is understood as a progressive set of knowledge, which requires skills and strategies that support the activity of lifelong learning. The RLA mentions the ‘cognitive views’ of reading literacy, with some references as follows: “[c]ognitive views of reading literacy emphasise the interactive nature of reading and the constructive nature of comprehension (Bruner, 1990; Dole et al., 1991; Binkley and Linnakylä, 1997). The reader generates meaning in response to text by using previous knowledge and a range of textual and situational cues that are often socially and culturally shared. While constructing meaning, the reader uses various processes, skills, and strategies to foster, monitor and maintain understanding. These processes and strategies are expected to vary along with the situation and the purpose as readers interact with a variety of continuous and non-continuous texts.” (OECD, 1999, 19)

The other apparent theoretical consideration of the RLA is connected to the term ‘reading literacy’. There are languages in which an exact phrase or translation for ‘reading literacy’ does not exist. Hence “translations of this section have been developed and are available from the OECD/PISA web site: <http://www.pisa.oecd.org>.” (OECD, 1999, 19) Although these, the RLA did not give any information about what concrete ‘contemporary views’ were built into the framework. There is a list of references at the end of the complete PISA2000 document, with nearly 30 items connected obviously to reading research. The items can be divided into two scientific areas: (1) *Meaning, Comprehension, and Literacy* (see Figure 15 in Attachment 1); (2) *Teaching and Assessing Reading* (see Figure 16 in Attachment 1). Some of them seem outdated even at that time (references from 1975, 1978, and 1987), but the majority of them were not older than ten years.

The following two assessment cycles were in the years 2003 and 2006 when reading was a secondary domain. Hence, no theoretical updates can be discovered in the analytical and framework documents of **PISA2003** and **PISA2006**. These years, less than ten reference items were listed that could directly be connected to the topic of reading literacy from the same

scientific fields. Half of them were before 1991. *Figure 17 in Attachment 1* shows the list of references inserted to the documents.

Compared to the previous assessments, **PISA2009** was a huge step forward. That was the year when reading became the central topic again; thus, significant improvement of the analytical and framework documents can be discovered. The references were inserted separately to the document and comprised nearly 100 items, among those 20 sources are dated before 1990. As it was claimed, the RLA “was also influenced by contemporary – and still current – theories of reading, which emphasise reading’s interactive nature (Dechant, 1991; McCormick, 1988; Rumelhart, 1985), models of discourse comprehension (Graesser, Millis, & Zwaan, 1997; Kintsch, 1998), and theories of performance in solving reading tasks (Kirsch, 2001; Kirsch & Mosenthal, 1990).” (OECD, 2009, 20) Despite this, it is a matter of question whether a reference from, e.g., 1985, belongs to “contemporary” theories of reading in 2009 or not. Especially in a year when digital reading was surveyed the first time in the framework of a large-scale assessment.

The two main improvements of the framework were the incorporation of electronic reading and the factor of motivation and engagement. The RLA considered reading literacy as a foundational skill, in an agreement with those who think that reading is more about information seeking, connecting and constructing meaning by specific purposes, and for successful participation, both in public and personal life.

Concerning electronic reading, it was phrased that “electronic reading demands that new emphases and strategies be added to the repertoires of readers. Gathering information on the Internet requires skimming and scanning through large amounts of material and immediately evaluating its credibility. Critical thinking, therefore, has become more important than ever in reading literacy (Halpern, 1989; Shetzer & Warschauer, 2000; Warschauer, 1999). Warschauer concludes that overcoming the “digital divide” is not only a matter of achieving online access, but also of enhancing people’s abilities to integrate, evaluate and communicate information.” (OECD, 2009, 22) Later, the RLA mentioned ‘cognitively-based’ theories of literacy and the ‘interactive’ and ‘constructive’ nature of reading with some references, but that was all. It did not explain, summarise or interpret these theories, or show how they were built into the framework, and how they influenced the design of the assessment.

Concerning motivation, among others, Guthrie and Wigfield (2000), Campbell, Voelkl, and Donahue (1997); and Lens and Deci 2006), etc. were referred, highlighting self-determination, and the link between reading practices, engagement, and achievement. (OECD, 2009, 69-72) For the complete list of references, see *Figure 18-20 in Attachment 1*.

The next assessment was **PISA2012**. This time, reading literacy was in a minor role. Approximately 30 items were referred to in the analytical and framework document (see *Figure 21 in Attachment 1*). The theoretical background did not improve, as it was claimed: “[t]he PISA 2012 reading framework has not changed from the PISA 2009 framework. The notion of reading literacy in PISA goes beyond the simple measurement of a student’s capacity to decode and understand literal information. Reading literacy in PISA also involves understanding, using, reflecting on and engaging with written texts, both to achieve personal goals and to participate actively in society.” (OECD, 2013, 80)

2015 was the year when the complete assessment was conducted digitally. However, the analytical and framework document of **PISA2015** does not include significantly more references than PISA2012. 31 items were referred altogether, mostly those that were applied in the previous cycle. Because of the electronic delivery mode, the terminology was rethought, focusing on mode, text display space, and digital reading, which will be discussed in *Section 5.3*. Apart from these, there was nothing about electronic surveying and its consequences on reading performance. *Figure 22 in Attachment 1* shows the list of PISA2015’s references.

The last RLA assessment so far is **PISA2018**. The RLA intended to collect all the previous assessment cycles’ theoretical considerations into the analytical and framework document, and this tenor resulted in a reference list that includes nearly 140 items (see *Figure 23-25 in Attachment 1*).

The selected literature discusses the topics of reading and comprehension theories, reading assessments, teaching and learning reading, motivation, engagement, metacognition, digitalism, and ICT. The majority of the literature is from after the Millennium, and the list includes references to the OECD/PISA RLA’s own research results as well.

The analytical and framework document of PISA2018 follows the tradition of discussing its theoretical background under the label of conceptual background, mix the two notions or leave out either of them; thus, it is hard to distinguish the two. However, what is clearly presented is that the RLA’s primary focus remained on understating, interpreting, and reflecting

on texts, but this time it took digitalism with greater awareness into account. The RLA fitted its reading literacy definition to this extended concept and aimed to examine both printed and digital basic and higher-level reading skills. PISA2018 did not throw away the previous assessments' theoretical background, especially the ones of 2009 and 2015, just updated and completed it. It integrated traditional and new reading, reading fluency, literal interpretation, inter-sentence integration, main topics extraction, and forming conclusions. Besides, evaluation, credibility, the ability of information seeking, managing and synchronising multiple sources, print and digital texts, and new technology also gained attention. As it was phrased: “[i]f students fail at performing higher-level text processing functions, it is critical to know whether the failure was due to difficulties in these basic skills in order to provide appropriate support to these students.” (OECD, 2019, 24) Although motivation and engagement are critical factors in reading literacy, PISA2018 still assessed them by separate questionnaires, and not integrated into the main survey, task design, or the process of evaluation. (OECD, 2019, 26)

PISA2018 referred to the same authors that in the previous cycles concerning cognitively based reading theories and the constructive nature of reading and comprehension, but it did not explain or systematically discuss them. (OECD, 2019, 27) The newly incorporated literature was about the topics of the already changed social and occupational role and purposes of reading in private and social life, and hence the specific cognitive skills (e.g., goal setting, decision making, and critical thinking) required to prevail. (OECD, 2019, 32)

In conclusion, all the OECD/PISA RLA documents present their theoretical background in their lists of references and mention some essential reading topics with references to relevant research and authors. However, they are not integral part of the framework, and there is no more in-depth discussion of these topics and theories at all. Having in mind that the analytical and framework documents are not scientific papers of studies, but descriptions or summaries of the assessments' groundings, it can be claimed, that the exposition of the theoretical background remained superficial. It is not clear that precisely what reading theories were built into the assessment and how, or what their significance is in the assessment design, or the evaluation process. This lack of knowledge or unclarity presents itself supremely on a definitional level when the RLA describes its main terms. The following sections aim to discuss these issues in detail.

## 5.2. Defining Reading Literacy

As it has already been discussed in *Section 2.1.*, defining reading literacy is a complex issue, and the term ‘literacy’ is fuzzy and changing according to various purposes. Thus, interpreting assessments’ results based on this ambiguous notion, and especially comparing its various interpretations, drawing tendencies, making forecasts, and shaping educational policies and reforms according to them are big challenges. From this perspective, it can be understood that every assessment on reading seeks to find the “right” definition or undertakes the challenge to create their literacy definition as good as they can, so that it best serves their purposes. The OECD/PISA RLA followed both processes: phrased its own literacy term based on its antecedent’s definitions and has been improving it through the years. Let us see how.

At first, **PISA2000** considered reading literacy – based on two previous assessment systems and practices, namely on the International Association for the Evaluation of Educational Achievement’s Reading Literacy Study (IEA/RLS) and the International Adult Literacy Survey (IALS) – as “understanding, using, and reflecting on written texts, in order to achieve one’s goals, to develop one’s knowledge and potential, and to participate in society”. (OECD 1999, 20) Here the RLA felt necessary to unfold the definition more profoundly and give some explanatory support for readers to get a better understanding of the notion. “»Reading« is often understood as simply decoding, or reading aloud, whereas the intention of this survey is to measure something broader and deeper. The focus is on the application of reading in a range of situations for various purposes.” (OECD, 1999, 20) Using the term ‘application of reading’ implies that there are other methods besides reading for acquiring the meaning of a text or a reading material. Thus, in a strict sense, the RLA did not examine text *comprehension* but text *application* – and for this latter, it is essential to take into consideration the tool, device, or display used in the reading process.

In this case, it is necessary to be careful during the understanding and evaluation of the survey results, because it is a question of *what* the PISA reports’ statements are about. Are they about text *comprehension*, text *application*, or *reading literacy* (which includes comprehension, application, and many other processes)? The difference between *understanding* a text and *using* a text or a reading device (book, newspaper or e-book, computer, Smartphone, etc.) properly is significant. The former means that one has the cognitive ability to *comprehend* written reading material, while the latter is about being able to *use* texts (e.g., present them, give them, post

them, copy them, etc. to someone), or tools (e. g. searching in a book, scrolling on the computer, switching on the Smartphone, etc.) for some purpose. Concerning the clause of “something broader and deeper” than *simple reading* is a direct reference to the complicated notion of *reading literacy*.

According to the analytical and framework documents of **PISA2003** and **PISA2006**, there was no change in the definition of literacy. The reason behind this is that these years reading was a secondary domain in the assessment.

Reading literacy became central again in 2009. In the document of **PISA2009**, it is pinned down that the RLA „must focus on reading literacy skills that include finding, selecting, interpreting and evaluating information from the full range of texts associated with situations that reach beyond the classroom”. (OECD, 2009, 21) The involvement of digital reading meant that the RLA had had to rephrase its definition of reading literacy used in the previous test cycles, because “while many of the skills required for print and electronic reading are similar, electronic reading demands that new emphases and strategies be added to the repertoires of readers. Gathering information on the Internet requires skimming and scanning through large amounts of material and immediately evaluating its credibility” (OECD, 2009, 22). According to these, PISA2009’s new definition for reading literacy became the following: “Reading literacy is understanding, using, reflecting on and engaging with written texts, in order to achieve one’s goals, to develop one’s knowledge and potential, and to participate in society”. (OECD, 2009, 23) This updated definition is equal to the ones in the previous cycles except from one thing: it involves the notion of engagement as an integral part of reading literacy. According to the document, engagement is “the motivation to read and is comprised of a cluster of affective and behavioural characteristics that include an interest in and enjoyment of reading, a sense of control over what one reads, involvement in the social dimension of reading, and diverse and frequent reading practices”. (OECD, 2009, 24) The discussion of involving the factor of motivation in the RLA will be presented in *Section 6.5*.

The PISA2009 framework document also clarified that reading literacy refers to a broad scale of cognitive competencies “from basic decoding, to knowledge of words, grammar and larger linguistic and textual structures and features, to knowledge about the world. It also includes metacognitive competencies: the awareness of and ability to use a variety of appropriate strategies when processing texts. Metacognitive competencies are activated when

readers think about, monitor and adjust their reading activity for a particular goal.” (OECD, 2009, 23) Strangely, the RLA did not involve electronic text in the definition at all, just used the notion of ‘written’; however, this was the first time when the survey measured electronic reading material as well.

Reading was a minor domain in 2012 and 2015; thus, the analytical and framework documents of **PISA2012** and **PISA2015** were not updated in terms of theoretical background. The following assessment cycle in line was in 2018, when reading literacy was a central topic, again. In **PISA2018** one of the major changes in the definitional extension of reading literacy was “encompassing both the basic reading processes and higher-level digital reading skills while recognising that literacy will continue to change due to the influence of new technologies and changing social contexts [...] Although the ability to comprehend and interpret extended pieces of continuous texts – including literary texts – remains a valuable one” (OECD, 2016d, 6) According to these considerations, PISA2018’s definition for reading literacy becomes 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.” (OECD, 2019, 28) Here there were two changes in the reading literacy definition compared to the previous ones: adding the process of ‘evaluation’, and changing the notion of ‘written’ to ‘texts’ as a reference to the application of both print and digital reading materials.

*Chart 12* below summarises how today’s PISA RLA definitions of reading literacy emerged according to the improvements of the assessment framework.

<b>PISA2000</b> <b>(continued for 2003 and 2006)</b>	“Understanding, using and reflecting on written texts, in order to achieve one’s goals, to develop one’s knowledge and potential, and to participate in society.” (OECD, 1999, 19)
<b>PISA2009</b> <b>(continued for 2012 and 2015)</b>	“An individual’s capacity to: understand, use, reflect on and engage with written texts, in order to achieve one’s goals, to develop one’s knowledge and potential, and to participate in society.” (OECD, 2009, 14)
<b>PISA2018</b> <b>(published in 2019)</b>	“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.” (OECD, 2019, 28)

**Chart 12: PISA Definitions of Reading Literacy**

This summary of the RLA’s literacy definitions shows that the experts of the assessment improved the definitions and involved new and new factors – suggesting that due to some reason, the previous ones did not fit perfectly to the aims and purposes of the assessment. For instance, adding the process of ‘engaging’ and ‘evaluating’ shows a necessity of assessing *more*, something that goes beyond reading, understanding, and applying, including emotions and motivation connected to the reading materials, as well as phrasing criticisms towards them. Deleting ‘written’ before text also suggests that the reading material *itself* has changed. These seemingly minor differences from one assessing period to another become major if they go together with conceptual changes as well.

If we put the various interpretations of reading literacy discussed in *Section 2.1.* into contrast with the RLA’s, we can realise that they are quite similar in the sense that they grab the nature of literacy according to the following factors: reading material, skills, application, learning process, and critical thinking. What is unique in the RLA is putting a great emphasis on the issue of comprehension, reflection, evaluation, and goal setting. Interestingly, the RLA did not give us any definition of digital literacy, not even of web literacy; thus, a proper comparison with these definitions cannot be presented. Considering that PISA 2000’s, PISA2009’s and PISA2018’s primary focus was entirely on reading literacy and that PISA2015 applied the method of online/screen assessment, it is a matter of question why the RLA did not give any definition or guide to reveal their understanding of digital literacy.



### 5.3. Text and Hypertext Given to Read in the RLA

The next significant part of the analysis is about the RLA's concept of the term text. What kind of texts are relevant in the assessment? How does the RLA keep up with digitalism and the changing notion of text? How did the so-called platform shift affect the assessment's task texts so far when the surveys became digital and moved to the screen? This section aims to answer these questions based on the RLA's analytical and framework documents.

According to the theoretical background of **PISA2000**, the RLA did not make a distinction between print and digital/electronic/online reading. However, in the discussion of the notion of text, the RLA referred to electronic texts when it unfolded the term 'written text'. According to the explanation, written texts are printed, hand-written, or *electronically displayed texts*, including "visual displays such as diagrams, pictures, maps, and tables or graphs, but do not include film, TV, animated visuals, or pictures without words". (OECD 1999, 20) Despite this reference, at that time, the RLA did not apply electronic texts in the survey, due to "considerations of time and access". (OECD 1999, 20) As it was claimed, "the availability of electronic texts and their use to obtain and exchange information will become more and more important in students' lives in coming years. To prepare for a greater involvement of technology in future cycles, the OECD/PISA survey will include a short questionnaire to gather information about students' access to a computer either at home, at school, at work, or in their community; attitudes towards using a computer; frequency of computer use in various settings; and types of activities they engage in with computers". (OECD 1999, 38) Thus, in 2000, the RLA's aim was to gather data on electronic reading, supposedly in order to gain enough information to improve their framework for the next survey cycle. However, with the awareness of the fact that the first framework was published in 1999, it would have been useful trying to refer with more profound attention to the electronic texts and their devices – even though it took time for these texts and devices to become widely accessible. Since the first home PCs started to spread in the 1970s ("History of personal computers", n.d.; "Personal computer", n.d.; "History of computing hardware...", n.d.) the first e-books in the 1980s ("Ebook timeline", 2002), and the first Smartphones in 1996 ("Ebook timeline", 2002), a constant reference to digitalism seems more than justifiable. Anyway, the following comment was promising in this very first RLA: „some of those [electronic texts] may be different from written texts in structure and format and may require different reading strategies". (OECD 1999, 20) Hence, the RLA expressed the intention

to assess electronic text reading in future surveys, even if they did not follow up extensively on this line in the first survey.

**PISA2000** gave students two major formats of texts: continuous (requires linear reading) and non-continuous (requires non-linear reading) texts. “Continuous texts are typically composed of sentences that are, in turn, arranged in paragraphs. These may fit into even larger structures such as sections, chapters, and books. Non-continuous texts are most frequently organised in matrix format, based on combinations of lists.” (OECD, 1999, 24) Concerning text types, the RLA emphasised that there is no such thing as ideal text type categorisation, just “different proposals as to the appropriate categories, many of them created for practical rather than theoretical purposes. All of them share the fact that no particular physical text seems to fit easily into only one category”. (OECD, 1999, 23) In these theoretical parts of the reading assessment framework, PISA2000 based on the model of Kirsch and Mosenthal (OECD, 1999, 24) and the Werlich scheme for defining continuous text types (OECD, 1999, 25) *Chart 13* below shows a summary of text types and formats that were used in PISA2000.

	CHARACTERISTICS	TEXT TYPES
CONTINUOUS TEXTS	<ul style="list-style-type: none"> <li>Typically composed of sentences that are arranged in paragraphs and may fit into even larger structures such as sections, chapters, and books.</li> <li>Organisation is evident in paragraphing, indentation, and the breakdown of text into a hierarchy signalled by headings. These markers also provide clues to text boundaries (marking section completion, for example).</li> <li>The finding of information is often facilitated by the use of different font sizes, font types such as italic or bold, and borders or shading.</li> <li>The use of format clues is an essential sub-skill of effective reading.</li> <li>Organisational information is also signalled by discourse markers. Sequence markers (first, second, third, etc.), e.g. signal the relationships between the units which they introduce and indicate how the units relate to the larger surrounding text.</li> <li>The primary classification of continuous texts is by rhetorical purpose, or text type.</li> </ul>	<ol style="list-style-type: none"> <li><b>Description:</b> the information refers to physical, <i>spatial</i> properties of objects or characteristics of people. Typically provide an answer to "what" questions. <ul style="list-style-type: none"> <li><b>Impressionistic descriptions:</b> present information from the point of view of subjective impressions of relationships, qualities, and spatial directions.</li> <li><b>Technical descriptions:</b> present information from the point of view of objective spatial observation. Frequently, technical descriptions use non-continuous text formats such as diagrams and illustrations.</li> </ul> </li> <li><b>Narration:</b> the information refers to <i>temporal</i> properties of objects. Typically provide answers to <i>when, or in what sequence</i> questions. <ul style="list-style-type: none"> <li><b>Narratives:</b> present changes from the point of view of subjective selection and emphasis, recording actions and events from the point of view of subjective impressions in time.</li> <li><b>Reports:</b> present changes from the point of view of an objective situational frame, recording actions and events which can be verified by others.</li> <li><b>News stories:</b> purport to enable the readers to form their own independent opinion of facts and events without being influenced by the reporter's own views.</li> </ul> </li> <li><b>Exposition:</b> the information is presented as composite concepts or mental constructs, or those elements into which concepts or mental constructs can be analysed. The text provides an explanation of how the component elements interrelate in a meaningful whole and often answers <i>how</i> questions. <ul style="list-style-type: none"> <li><b>Expository essays:</b> provide a simple explanation of concepts, mental constructs, or conceptions from a subjective point of view.</li> <li><b>Definitions:</b> explain how terms or names are interrelated with mental concepts. In showing these interrelations, the definition explains the meaning of "words".</li> <li><b>Explications:</b> are forms of analytic exposition used to explain how a mental concept can be linked with words or terms. The concept is treated as a composite whole which can be understood if decomposed into constituent elements and if the interrelations between these are each given a name.</li> <li><b>Summaries:</b> are forms of synthetic exposition used to explain and communicate about "texts" in a shorter form than in the original text.</li> <li><b>Minutes:</b> a more or less official record of the results of meetings or presentations.</li> <li><b>Text interpretations:</b> are forms of both analytic and synthetic exposition used to explain the abstract concepts which are present in a particular (fictional or non-fictional) text or group of texts.</li> </ul> </li> <li><b>Argumentation:</b> is the type of text that presents propositions as to the relationships between concepts, or other propositions. Argument texts often answer <i>why</i> questions. Another important sub-category of argument texts is persuasive texts. <ul style="list-style-type: none"> <li><b>Comment:</b> relates the concepts of events, objects, and ideas to a private system of thought, values, and beliefs.</li> <li><b>Scientific argumentation:</b> relates concepts of events, objects, and ideas to systems of thought and knowledge so that the resulting propositions can be verified.</li> </ul> </li> <li><b>Instruction</b> (sometimes referred to as <i>injunctive</i>): is the type of text that provides directions on what to do. <ul style="list-style-type: none"> <li><b>Instructions:</b> present directions for certain behaviours in order to complete a task.</li> <li><b>Rules, regulations, and statutes:</b> specify requirements for certain behaviours based on impersonal authority, such as public authority.</li> </ul> </li> <li><b>Hypertext:</b> is a set of text slots linked together in such a way that the units can be read in different sequences. These texts frequently have visual supports and may invite non-linear strategies on the part of readers.</li> </ol>
NON-CONTINUOUS TEXTS	<ul style="list-style-type: none"> <li>Most frequently organised in matrix format, based on combinations of lists. All non-continuous texts can be shown to be composed of a number of lists. Some are just simple lists, but most are comprised of combinations of several lists.</li> <li>They can be categorised in two ways: the formal <i>structure approach</i> used in the work of Kirsch and Mosenthal. Their work classifies the texts by the way in which the underlying lists are put together to construct the various non-continuous text types. The first looks at the principles by which the elements of the text are arranged. This text <i>structure</i> variable identifies the features of non-continuous texts that have the same function as the sentence and paragraph features of continuous text.</li> <li>The second approach identifies some common <i>formats</i> for these texts. Recognising the format is important because texts with the same structure may be laid out on the page quite differently. For example, a table of contents for a book and a form are usually combined lists.</li> </ul>	<p><b>BY STRUCTURE</b></p> <ol style="list-style-type: none"> <li><b>Simple lists:</b> contain only a single collection of elements. The elements in the list may be ordered, or unordered. If the unordered list is long, it may be difficult to determine whether an item is listed or not. This should easily be possible on the ordered list, provided that one knows the ordering principle.</li> <li><b>Combined lists:</b> are made up of two or more simple lists in which each element in one list is paired with an element in another list. One of the lists may be taken as the primary list (indexing list); this primary list is ordered to make it easier to find items in it, so that the parallel information in the other lists can also be found. Items may occur more than once in one of the lists, though this seldom happens with the primary list. A combined list may have many component lists. Searches of the non-indexing list are more difficult, and it may be difficult to know whether all relevant information has been obtained.</li> <li><b>Intersecting lists:</b> consist of three lists which are not parallel, but intersecting, and form a row and column matrix. The typical intersecting list is a television schedule that consists of a list of times, a list of channels, and a list of programmes. Many statistical tables are intersecting lists.</li> <li><b>Nested lists:</b> consist of a set of combined lists. For example, in some intersecting lists the column categories, such as days of the week, intersect not only with the row categories (times) but also with a fourth list, such as departments in a university. For a true nested list, the same type of category must be used in each of the intersecting lists.</li> <li><b>Combination lists:</b> are those in which several types of lists, or several lists of the same type, are joined into one list.</li> </ol> <p><b>BY FORMAT</b></p> <ol style="list-style-type: none"> <li><b>Forms:</b> are structured and formatted texts which request the reader to respond to specific questions in specified ways. Forms are used by many organisations to collect data. They often contain structured or pre-coded answer formats. Typical examples are tax forms, immigration forms, visa forms, application forms, statistical questionnaires, etc.</li> <li><b>Information sheets:</b> as opposed to forms, provide rather than solicit information. They summarise information in a structured way and in such a format that the reader can easily and quickly find specific pieces of information. Information sheets may contain various text forms, together with lists, tables, figures, and sophisticated text graphics (headings, fonts, indentation, borders, etc.) which summarise and highlight information for the eye. Timetables, price lists, catalogues and programmes are examples of this form of document.</li> <li><b>Vouchers:</b> testify that their owner is entitled to certain services. The information which they contain must be sufficient to show whether the voucher is valid or not. Typical examples are tickets, invoices, etc.</li> <li><b>Certificates:</b> are written acknowledgements of the validity of an agreement or a contract. They are formalised in content rather than format. They usually require the signature of one or more persons authorised and competent to give testimony of the truth of the given statement. Warranties, school certificates, diplomas, contracts, etc., are documents that have these properties.</li> <li><b>Calls and advertisements:</b> are documents designed to invite the reader to do something, e.g. to buy goods or services, attend gatherings or meetings, elect a person to a public office, etc. The purpose of these documents is to persuade the reader. They offer something and request both attention and action. Advertisements, invitations, summonses, warnings and notices are examples of this format.</li> <li><b>Charts and graphs:</b> are iconic representations of data. They are used for the purposes of scientific argumentation, and also in journals and newspapers to display numerical and tabular public information in a visual format.</li> <li><b>Diagrams:</b> often accompany technical descriptions (e.g. demonstrating parts of a household appliance), expository texts, and instructive texts (e.g. illustrating how to assemble a household appliance). It is often useful to distinguish procedural (how to) from process (how something works) diagrams.</li> <li><b>Tables and matrices:</b> Tables are row and column matrices. Typically, all the entries in each column and each row share properties, and thus the column and row labels are part of the information structure of the text. Common tables include timetables, spreadsheets, order forms, and indexes.</li> <li><b>Lists:</b> are the most elementary non-continuous texts. They consist of a number of entries that share some property(ies), which may be used as a label or title for the list. Lists may have their entries ordered (e.g. the alphabetically arranged names of students in a class) or unordered (e.g. a list of goods to be bought in a shop).</li> <li><b>Maps:</b> are non-continuous texts that indicate the geographical relationships between places. There is a variety of types of maps.</li> </ol>

Chart 13: Continuous and Non-Continuous Text Types According to PISA2000  
(Original Chart Based on OECD, 1999, 24-28)

**PISA2003** and **PISA2006** worked with the same text definition and categorisation as the RLA in 2000. It means that despite the promising reference to the electronic reading, the next two cycles stepped ahead in order to involve digitalism in the assessment neither in a theoretical nor in a practical way. However, those years reading was a minor domain, so significant framework updates did not happen in the RLA.

In the third assessment cycle, reading became the central topic again. **PISA2009** used the phrase ‘written texts’ again, but it involved electronic texts and their features as well. Written texts were explained as “all those coherent texts in which language is used in its graphic form: hand-written, printed and electronic. These texts do not include aural language artefacts such as voice recordings; nor do they include film, TV, animated visuals, or pictures without words. They do include visual displays such as diagrams, pictures, maps, tables, graphs and comic strips, which include some written language (for example, captions). These visual texts can exist either independently or they can be embedded in larger texts.” (OECD, 2009, 24)

**PISA2009** considered print medium text as a text that “usually appears on paper in forms such as single sheets, brochures, magazines and books. The physical status of the printed text encourages (though it may not compel) the reader to approach the content of the text in a particular sequence. In essence, printed texts have a fixed or static existence. Moreover, in real life and in the assessment context, the extent or amount of the text is immediately visible to the reader. *Electronic-medium text* may be defined as the display of text through Liquid Crystal Display (LCD), plasma, Thin Film Transistor (TFT) and other electronic devices”. (OECD, 2009, 27)

But this time the document explained electronic text compared to print text in details as follows: “Electronic texts [...] are distinguished from printed texts in a number of respects, including physical readability; the amount of text visible to the reader at any one time; the way different parts of a text and different texts are connected with one another through hypertext links; and consequent upon all these text characteristics, the way that readers typically engage with electronic texts. To a much greater extent than with printed or hand-written texts readers need to construct their own pathways to complete any reading activity associated with an electronic text.” (OECD, 2009, 24)

**PISA2009** classified texts according to medium (print and electronic – see above); environment (authored and message-based); text format (continuous and non-continuous, fixed

and dynamic, mixed and multiple) and text type (description, narration, exposition, argumentation, instruction, and transaction). (OECD 2009, 27) The environment comprises authored texts, meaning that there is a well-defined author of the text, while message-based refers to texts that are written by several different authors, even with the contributions of readers.

Concerning text format, *fixed*, *dynamic*, *mixed*, and *multiple* texts were new in the framework. Fixed texts are texts in the print medium with defined boundaries, while dynamic texts are text with blurred boundaries in the electronic medium. (OECD, 2009, 27-28) The RLA defined mixed texts in the following way: “In well-constructed mixed texts the components (for example, a prose explanation including a graph or table) are mutually supportive through coherence and cohesion links at the local and global level. Mixed text in the print medium is a common format in magazines, reference books and reports, where authors employ a variety of presentations to communicate information. In the electronic medium authored web pages are typically mixed texts, with combinations of lists, paragraphs of prose and often graphics. Message-based texts such as online forms, e-mail messages and forums also combine texts that are continuous and noncontinuous [sic!] in format.” (OECD 2009, 31)

About multiple texts, they wrote the following: “For the purposes of the PISA reading framework multiple texts are defined as those which have been generated independently, and make sense independently; they are juxtaposed for a particular occasion or may be loosely linked together for the purposes of the assessment. The relationship between the texts may not be obvious; they may be complementary or may contradict one another. For example, a set of websites from different companies providing travel advice may or may not provide similar directions to tourists. Multiple texts may have a single »pure« format (for example, continuous), or may include both continuous and non-continuous texts.” (OECD, 2009, 31)

Regarding text types, however, PISA2009 used precisely the same categorisation, claiming that it is equally true for print and electronic texts. “In previous versions of the reading framework, [...] text types were located as subcategories of the continuous text format. In this new version it is acknowledged that non-continuous texts (and the elements of mixed and multiple texts) also have a descriptive, narrative, expository, argumentative or instructional purpose.” (OECD, 2009, 31)

Chart 14 shows how PISA2009 considers the similarities and differences between print and electronic reading, involving the classification of the text mentioned above and the main characteristics of its framework.

	Print reading	Electronic reading
Situations	Personal Public Occupational Educational	Personal Public Occupational Educational
Texts: Environments	not applicable	Authored Message based
Texts: Formats	Continuous Non-continuous [Mixed] [Multiple]	[Continuous] [Non-continuous] [Mixed] Multiple
Texts: Text type	Argumentation Description Exposition Narration Instruction Transaction	Argumentation Description Exposition Narration Instruction Transaction
Aspects (1)	Access and retrieve Search  Orient and navigate in concrete information space e.g. <i>Go to library, search in a catalogue, find a book</i>  Use navigation tools and structures e.g. <i>Table of contents; page numbers; glossary</i>  Select and sequence information - low reader control - one sequence of linear reading	Access and retrieve Search  Orient and navigate in abstract information space e.g. <i>Enter URL; user search engines</i>  Use navigation tools and structures e.g. <i>Menus; embedded hyperlinks</i>  Select and sequence information - high reader control - multiple sequences of linear reading
Aspects (2)	Integrate and interpret Integrate at a lower level of demand: larger portions of text are simultaneously visible (one or two pages) Develop an interpretation Form a broad understanding	Integrate and interpret Integrate at a higher level of demand: limited parts of text are simultaneously visible (limited by screen size) Develop an interpretation Form a broad understanding
Aspects (3)	Reflect and evaluate  Pre-evaluate information e.g. <i>use table of contents; skim passages, checking for credibility and usefulness</i>  [Evaluate credibility of source - usually less important due to filtering and preselection in the publishing process]  Evaluate plausibility of content Evaluate coherence and consistency Hypothesise Reflect in relation to personal experience	Reflect and evaluate  Pre-evaluate information e.g. <i>use menus; skim web pages, checking for credibility and usefulness</i>  Evaluate credibility of source - usually more important due to lack of filtering and preselection in open environment  Evaluate plausibility of content Evaluate coherence and consistency Hypothesise Reflect in relation to personal experience
Aspects (4)	Complex The range of sources to be consulted is relatively undefined. The sequence of steps within the task is undirected. e.g. <i>finding, evaluating and integrating information from multiple printed texts</i>	Complex The range of sources to be consulted is relatively undefined. The sequence of steps within the task is undirected. e.g. <i>finding, evaluating and integrating information from multiple electronic texts</i>

**Chart 14: Similarities and Differences Between Print and Electronic Reading, by Main Framework Characteristics (OECD, 2009, 44)**

The PISA2009 framework also applied some additional terms to describe print and electronic texts as well. These terms are (1) text object (referring names given to text), (2) text features (characteristics of the text-based information), and (3) navigation tools and features (guiders which help readers orientate within texts). (OECD, 2009, 27) About the latter, the RLA



stated that they “play a particularly important role in the electronic medium, for at least two reasons. Firstly, due to the reduced display size, electronic texts come with devices that let the reader move the reading window over the text page: scroll bars, buttons, index tabs and so forth. Skilled readers of electronic text must be familiar with the use of these devices. They must also be able to mentally represent the movement of the window over the text page, and the shifting from one window to another. Secondly, typical electronic reading activities involve the use of multiple texts, sometimes selecting from a virtually infinite pool. Readers must be familiar with the use of retrieval, indexing and navigation tools for linking between texts”. (OECD, 2009, 28)

The framework document also described *hypertext* and their *links*, claiming that (1) *hypertext* is synonymous with *electronic text*, and its special feature is the requirement of *non-sequential* reading. “In the electronic medium, typically only a fraction of the available text can be seen at any one time, and often the extent of text available is unknown” (OECD, 2009, 27); thus, (2) *hypertext* has a network structure that is created by *hyperlinks*, which build a kind of relationship through pages. (OECD, 2009, 28) Thus, according to the RLA’s understanding, hypertext is a digital/electronic text that can be offline and online as well.

Thus, according to the above, it can easily be seen that this assessment of reading literacy was much more complex than in the previous times, and the cardinal point was to apply a proper and updated theoretical background (e.g., definitions and distinctions) of contemporary reading.

**PISA2015** was the first PISA assessment that was conducted via computer. Hence, in 2015, the RLA worked with *digital texts*. However, in some points the survey did not seem to be aware of this fact. The switch from print to digital assessment involved the terminology of digital literacy, but in a very confusing way. Using the distinction of print and digital text became pointless; thus, the RLA started to apply the notions of fixed and dynamic texts “regardless of whether it is printed or on screen”. (OECD, 2017, 49) In this assessment, the survey used only fixed texts delivered primarily on a computer. *Figure 26* below shows the summary of PISA2015’s reading literacy terminology.

### 2015 reading literacy terminology

**Mode:** refers only to the delivery channel. The following distinctions are made:

**Paper-based:** items delivered on paper

**Computer-based:** items delivered on computer

**Text display space:** In 2009, a broad classification, “medium”, was used to describe the features of print and digital texts. For 2015, the classification remains, but is renamed “text display space”.

**Fixed text:** what was previously called “print-medium text”. As this type of text is presented on a screen in PISA 2015, the term “print” no longer applies.

**Dynamic text:** what was previously called “digital-medium text”. As “print-medium” texts are also presented on a screen in PISA 2015, the term “digital” applies to both text display spaces.

**Digital reading:** The term “digital reading assessment” is retained for historical purposes to refer specifically to the 2009/2012 optional domain.

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**Note:** This new terminology is intended to be provisional, for use only in 2015 when items previously delivered on paper and classified as “print” are delivered on a screen. The purpose is to make a clearer distinction between the mode of delivery and the features of the classification previously known as “medium”. In 2018, when reading literacy will once again become the major domain, both the framework and these terms will be revisited and updated.

### Figure 26: PISA2015 Reading Literacy Terminology (OECD, 2016d, 50)

In **PISA2018**, the most important change was that the notion ‘written’ was removed, and the updated RLA texts “include all language as used in its graphic form: handwritten, printed or screen-based”. (OECD, 2016d, 13) Thus, the term text equally included handwritten, printed, on-screen, and visual texts (this latter meant texts with pictures, diagrams, graphs, maps, and comic strips), but excluded aural language artefacts. In the document, several pieces of research were quoted that showed the strong presence of electronic devices and the fast speed of their dissemination not just at workplaces and schools, but in everyday life as well. The results presented the shift from print-based text reading to screen-based text reading. This phenomenon was attached to the reduction of display size, messy and distractive screens, and the hyperlinked pages of the World Wide Web. New text types were raised, such as posts, e-mails, short messages, etc., and the communication became so intense that “people need to be selective in what they read while they must also read more, more often and for a broader range of purposes. Reading and writing are even replacing speech in some essential communication acts, such as telephoning and help desks. A consequence is that readers have to understand these new text-based genres and social-cultural practices”. (OECD, 2016d, 9) Naturally, reading new text types needs new reading skills, thus reading literacy is strongly connected to ICT (Info Communication Technologies) skills and visual literacy skills; therefore these skills should be involved in reading literacy assessments as well.



Chart 15 below shows the definitions what PISA applied to (written) texts during the years, from 2000 to 2018:

<p><b>PISA2000</b> <b>(continued for 2003 and 2006)</b></p>	<p>„The words written texts« are meant to include those texts – printed, hand-written, or displayed electronically – in which language is used. These include visual displays such as diagrams, pictures, maps, and tables or graphs, but do not include film, TV, animated visuals, or pictures without words. These visual texts can occur either independently or be embedded in continuous texts. Written texts also include those in electronic format, even though some of those may be different from written texts in structure and format and may require different reading strategies. [...] The term »texts« was chosen in preference to the word “information” used in the IALS definition because it was thought that the latter term did not adequately incorporate literature.” (OECD, 1999, 20)</p>
<p><b>PISA2009</b> <b>(continued for 2012 and 2015)</b></p>	<p>„The phrase »written texts« is meant to include all those coherent texts in which language is used in its graphic form: hand-written, printed and electronic. These texts do not include aural language artefacts such as voice recordings; nor do they include film, TV, animated visuals, or pictures without words. They do include visual displays such as diagrams, pictures, maps, tables, graphs and comic strips, which include some written language (for example, captions). These visual texts can exist either independently or they can be embedded in larger texts. »Hand-written texts« are mentioned for completeness: although they are clearly part of the universe of written texts, they are not very different from printed texts in structure or in terms of the processes and reading strategies they require. Electronic texts, on the other hand, are distinguished from printed texts in a number of respects, including physical readability; the amount of text visible to the reader at any one time; the way different parts of a text and different texts are connected with one another through hypertext links; and consequent upon all these text characteristics, the way that readers typically engage with electronic texts. To a much greater extent than with printed or hand-written texts readers need to construct their own pathways to complete any reading activity associated with an electronic text. Instead of the word »information«, which is used in some other definitions of reading, the term »texts« was chosen because of its association with written language and because it more readily connotes literary as well as information-focused reading.” (OECD, 2009, 24)</p>

<p><b>PISA2018</b> <b>(published in</b> <b>2019)</b></p>	<p>„The phrase »texts« is meant to include all language as used in its graphic form: handwritten, printed or screen-based. In this definition, we exclude as texts purely aural language artefacts such as voice recordings, film, TV, animated visuals and pictures without words. Texts do include visual displays such as diagrams, pictures, maps, tables, graphs and comic strips, which include some written language (for example, captions). These visual texts can exist either independently or they can be embedded within larger texts. Dynamic texts, which give the reader some level of decision-making power as to how to read them, differ from fixed texts in a number of respects, including the lack of physical clues allowing readers to estimate the length and quantity of text (e.g. the dimensions of paper-based documents are hidden in virtual space); the way different parts of a piece of text and different texts are connected with one another through hypertext links; whether multiple summarised texts are shown as the result of a search. As a result of these differences, readers also typically engage differently with dynamic texts. To a much greater extent than with text that is printed, readers need to construct their own pathways to complete any reading activity associated with dynamic texts. The term »texts« was chosen instead of the term »information« because of its association with written language and because it more readily connotes literary as well as information focused reading.” (OECD, 2019, 29)</p>
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**Chart 15: PISA Definitions of Written Texts**

The text types, which **PISA2018** applied in the next assessment cycle, were selected according to four dimensions: source (single, multiple); organisation and navigation (static, dynamic); format (continuous, non-continuous, mixed); and type (description, narration, exposition, argument, instruction, interaction, transaction). (OECD, 2016d, 22)

**PISA2018**, in order to put its the main theoretical novums in contrast with the previous cycle’s practice, summarised the changes from 2000 to 2015 in the following way (*Chart 16*):

	2000	2009	2015
TEXT			
Format	Continuous, Non-continuous, Mixed	Same as 2000, plus Multiple	Same as 2009
Type	Argumentation, Description, Exposition, Narration, Instruction	Same as 2000, plus "Transactional"	Same as 2009
Environment	N/A	Authored, Message-based	N/A
Medium	N/A	Print, Electronic	N/A
Space	N/A	N/A	Fixed, Dynamic
SITUATIONS	Educational, Personal, Professional, Public	Same as 2000	Same as 2000
ASPECT	Access and retrieve Integrate and interpret Reflect and evaluate	Same as 2000, plus "complex"	Same as 2000

**Chart 16: Main Changes in the Reading Framework, 2000-2015 (OECD, 2016d, 40)**

As one can see from this section, the RLA worked with various text types, fitted to several situations and aspects. From the very beginning of the surveys, the RLA's definition of text included references to the visual. But with the application of digital text to the assessments, this attribute should be more important. Let us see whether the RLA agreed with this or not.

#### 5.4. The Ignored Role of the Visual

As it has already been discussed in *Section 2.3.*, the role of the Visual in the process of reading and text comprehension is not negligible, especially. Especially in the case of digital reading, when various, mostly visual guiders aim to help readers to navigate within and between texts and manage the digital device on which the reading material is displayed. This section seeks to investigate how the RLA took into consideration visibility in the assessments, especially in forming reading tasks and evaluating reading performance.

Starting with **PISA2000**, the RLA referred to the visual in the section when it defined the notion of written text. It claimed that there are visually displayed texts, such as diagrams, pictures, maps, tables, and graphs. The RLA called them visual texts that can occur independently, or embedded in, continuous text types. These visual texts are distinguished from films, tv, animated visuals, or pictures not accompanied by written words. (OECD 1999, 20) These attributes, as intended, marked the circle of possible texts that could be applied in the reading test. However, there was not any other sign that there is an essential influencing factor in the process of reading that could influence text comprehension, and that is visual at the same time.


**PISA2003** and **PISA2006** did not step forward in this sense: there was nothing more in the analytical and framework documents about the **visual**. Then the year 2009 brought a change in the RLA theoretical background, and this involved the factor of visual as well. **PISA2009**, due to the involvement of electronic texts, considered visually displayed text as an essential part of the assessment. The RLA referred to them as diagrams, pictures, maps, tables, and graphs again, and claimed that they could appear independently or embedded in continuous texts. (OECD, 2009, 24) Thus, despite the declared significance of the visual, the RLA did not discuss the visual more deeply. It did not give any additional explanation, either of the importance of visibility in the reading process or about the application and involvement of this knowledge in the survey.

**PISA2012** and **PISA2015**, when reading literacy was secondary domain, left untouched the discussion of the **visual**. Then, **PISA2018** continued this tradition, and despite the updates, involvement of digital reading and digital texts, the RLA still referred to the visual in connection with text ('visual text') in the same way as in the previous cycles. (OECD, 2016d, 13)

However, let us examine two task examples (*Figure 27* and *Figure 28*) from PISA2006; both are print tasks, where the factor of the visual should have been considered. The first one (*Figure 27*) is a text arranged mostly in columns, typed with a non-usual font, and the majority of it is coloured with grey. There are some words bolded and a picture covering one-third of the page. The text is edited itemwise but not justified.

**Feel good in your runners**

For 14 years the Sports Medicine Centre of Lyon (France) has been studying the injuries of young sports players and sports professionals. The study has established that the best course is prevention ... and good shoes.



**Knocks, falls, wear and tear...**

Eighteen per cent of sports players aged 8 to 12 already have heel injuries. The cartilage of a footballer's ankle does not respond well to shocks, and 25% of professionals have discovered for themselves that it is an especially weak point. The cartilage of the delicate knee joint can also be irreparably damaged and if care is not taken right from childhood (10–12 years of age), this can cause premature osteoarthritis. The hip does not escape damage either and, particularly when tired, players run the risk of fractures as a result of falls or collisions.

According to the study, footballers who have been playing for more than ten years have bony

outgrowths either on the tibia or on the heel. This is what is known as "footballer's foot", a deformity caused by shoes with soles and ankle parts that are too flexible.

Protect, support, stabilise, absorb

If a shoe is too rigid, it restricts movement. If it is too flexible, it increases the risk of injuries and sprains. A good sports shoe should meet four criteria:

Firstly, it must **provide exterior protection**: resisting knocks from the ball or another player, coping with unevenness in the ground, and keeping the foot warm and dry even when it is freezing cold and raining.

It must **support the foot**, and in particular the ankle joint, to avoid sprains, swelling and other

problems, which may even affect the knee.

It must also provide players with good **stability** so that they do not slip on a wet ground or skid on a surface that is too dry.

Finally, it must **absorb shocks**, especially those suffered by volleyball and basketball players who are constantly jumping.

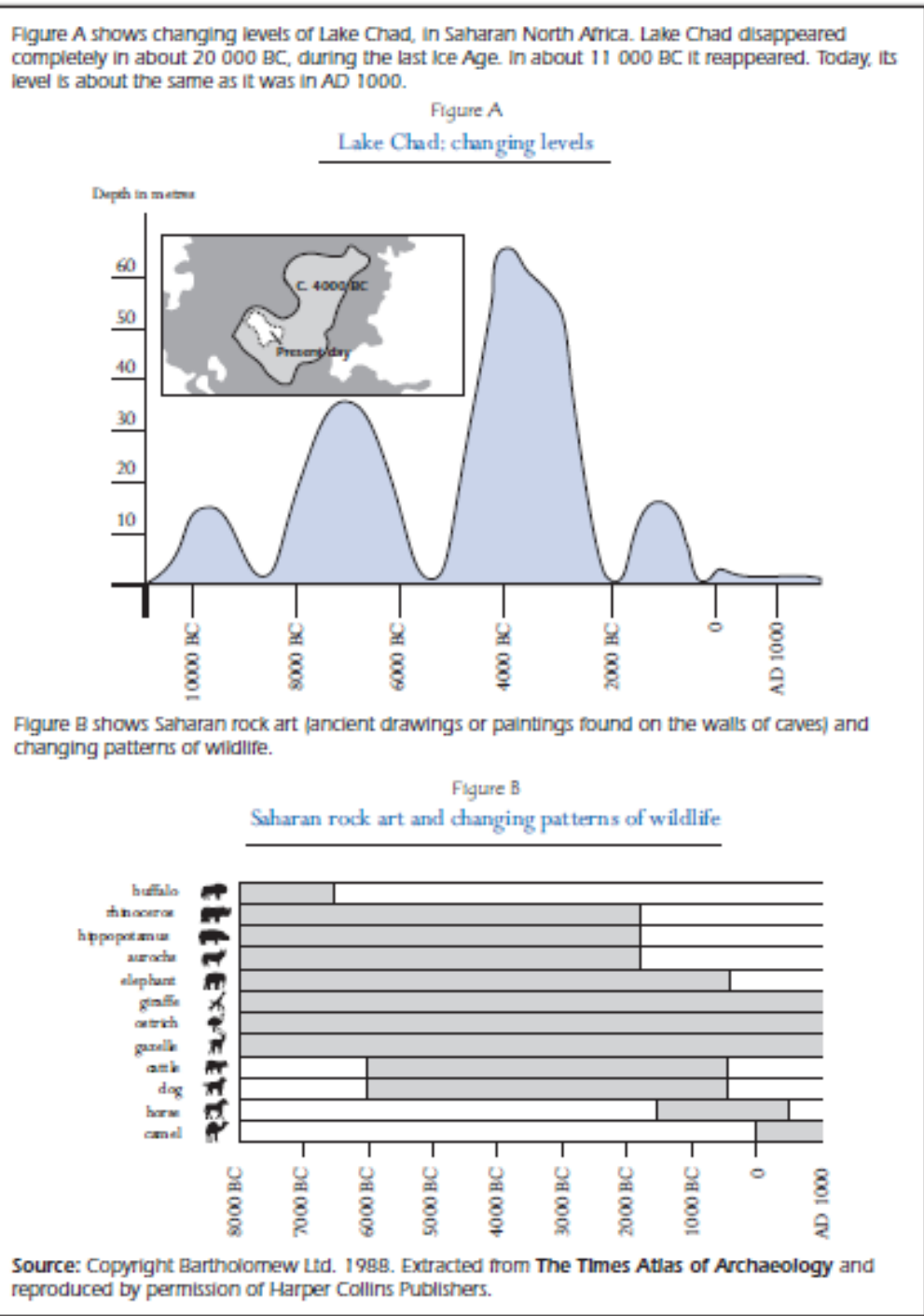
**Dry feet**

To avoid minor but painful conditions such as blisters or even splits or athlete's foot (fungal infections), the shoe must allow evaporation of perspiration and must prevent outside dampness from getting in. The ideal material for this is leather, which can be water-proofed to prevent the shoe from getting soaked the first time it rains.

**Source:** Revue ID (16) 1-15 June 1997.

**Figure 27: Print Reading Example from PISA2006 (OECD, 2006, 64)**

The second example (*Figure 28*) is mainly a picture: two diagrams with additional illustrative and explicative elements (animals and written sentences). Here the task was to understand the represented information and data, arranged in various directions (vertical, horizontal, and diagonal). The typography is the same as in the previous case, but the font size varies, and two colours were applied (grey and blue). Concerning this latter, saturation and shade have meaning to explore.



**Figure 28: Print Reading Example from PISA2006 (OECD, 2006, 66)**

While in *Figure 27*, the visual element is just an illustration, and it does not modify the meaning of the written text, in the case of *Figure 28*, the written text cannot stand without the additional visual elements; otherwise, it would lose its meaning. *Figure 29* below shows how these two examples would look without the extra visual elements:

**Feel good in your runners**

For 14 years the Sports Medicine Centre of Lyon (France) has been studying the injuries of young sports players and sports professionals. The study has established that the best course is prevention ... and good shoes.

Knocks, falls, wear and tear...

Eighteen per cent of sports players aged 8 to 12 already have heel injuries. The cartilage of a footballer's ankle does not respond well to shocks, and 25% of professionals have discovered for themselves that it is an especially weak point. The cartilage of the delicate knee joint can also be irreparably damaged and if care is not taken right from childhood (10–12 years of age), this can cause premature osteoarthritis. The hip does not escape damage either and, particularly when tired, players run the risk of fractures as a result of falls or collisions.

According to the study, footballers who have been playing for more than ten years have bony

outgrowths either on the tibia or on the heel. This is what is known as 'footballer's foot', a deformity caused by shoes with soles and ankle parts that are too flexible.

Protect, support, stabilise, absorb

If a shoe is too rigid, it restricts movement. If it is too flexible, it increases the risk of injuries and sprains. A good sports shoe should meet four criteria:

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It must **support the foot**, and in particular the ankle joint, to avoid sprains, swelling and other

problems, which may even affect the knee.

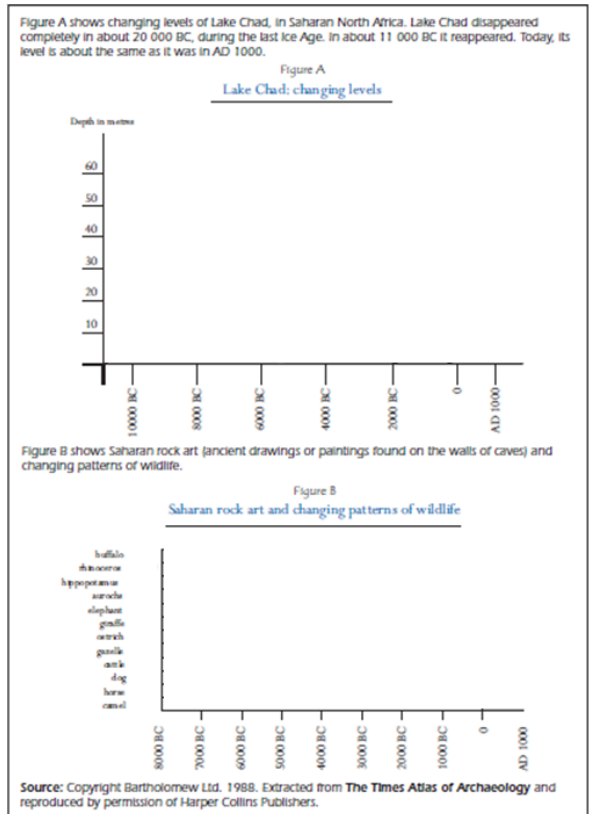
It must also provide players with good **stability** so that they do not slip on a wet ground or skid on a surface that is too dry.

Finally, it must **absorb shocks**, especially those suffered by volleyball and basketball players who are constantly jumping.

Dry feet

To avoid minor but painful conditions such as blisters or even splits or athlete's foot (fungal infections), the shoe must allow evaporation of perspiration and must prevent outside dampness from getting in. The ideal material for this is leather, which can be water-proofed to prevent the shoe from getting soaked the first time it rains.

Source: Revue ID (16) 1-15 June 1997.



**Figure 29: Figure 27 and Figure 28 Print Reading Examples without Additional Visual Elements**

The text on the left would remain the same, while the text on the right would significantly be different when one starts to seek its meaning. One cannot comprehend it, since, without the visual, the substance of the meaning is missing.

Now, let us see another task example, a digital one (*Figure 30*). It is from PISA2009, the year when digital reading was first assessed.





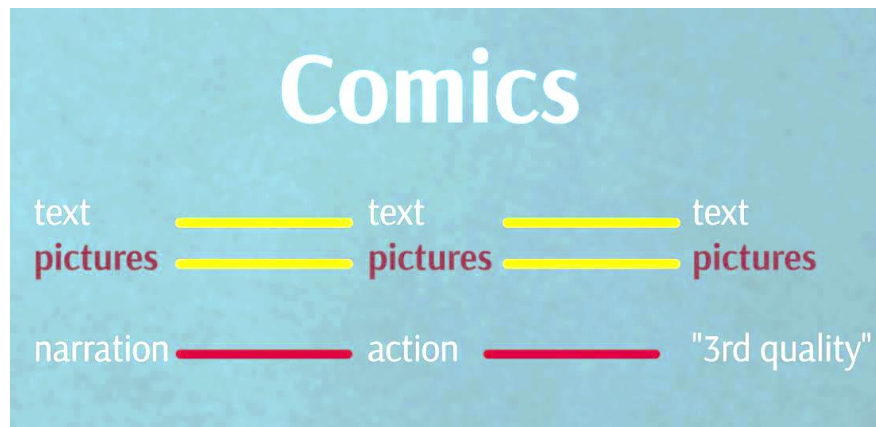
**Figure 30: Electronic Reading Sample Tasks from PISA2009 (OECD, 2009, 236)**

In the case of *Figure 30*, the text itself is comic-book-like: there are individual text bubbles inserted in pictures, and the latter are arranged in a grid format. The images are not just illustrative elements, but they have an explicative force as well. The order of images possesses individual meaning, which is more than the meaning of each image alone. (Nyíri, 2016) As Kristóf Nyíri phrases in his work, “[...] pictures might sometimes succeed where texts fail. Pictures, especially animated pictures – by themselves, or in combination with words – can quite effectively convey practical knowledge. Also, pictures can summarize, in a way that can be grasped in a single glance, complex information that may be unintelligible when propositionally expressed.” (Nyíri, 2003, 58)

There are various kinds of comics types according to languages, cultures, traditions etc., but they have some general characteristics which are almost the same, regardless of the comic type. (Comics Research, 2010) First of all, comics consist of text and visual elements, more precisely, pictures. They together make a mixture of letters and visual, that is why we can call them hybrid pictures. According to Gulanowski (2015), text and pictures create a complex meaning, a unique third quality (see *Figure 31*), which one can sort out during the reading



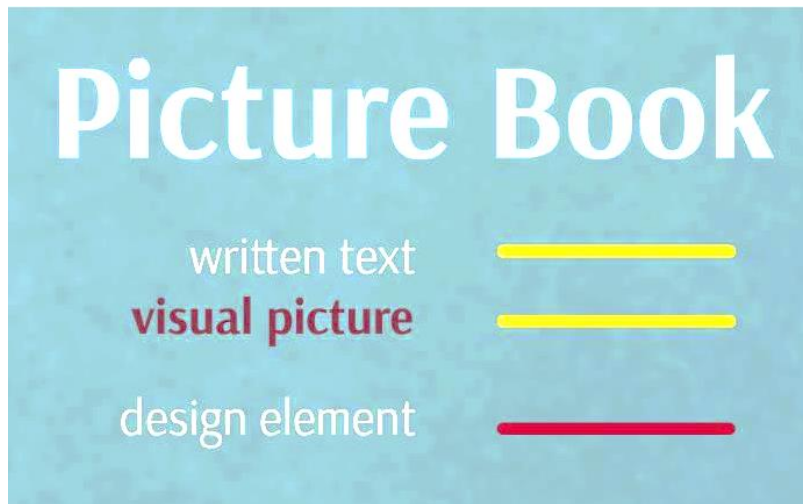
process. These three levels are also being called text, pictures, and narration, as well as text, picture, and action.



**Figure 31: The Three Levels of Comics (Szabó, 2015, 173)**

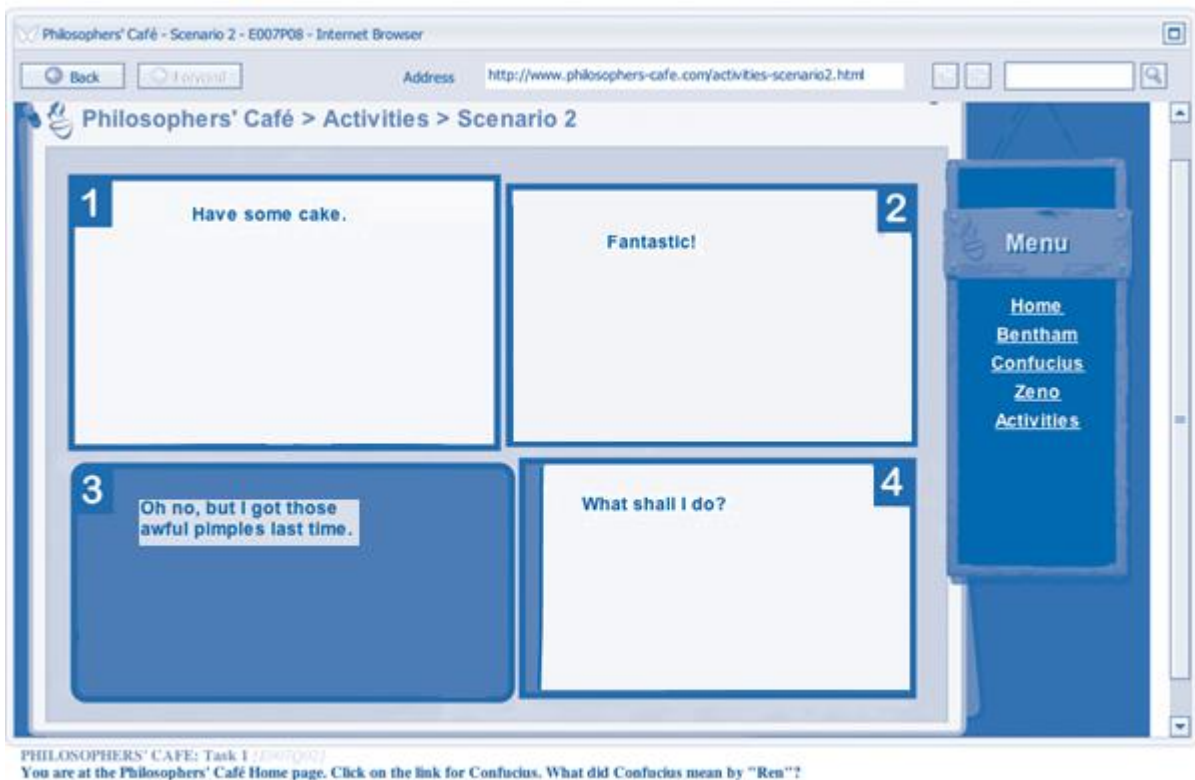
The reading process conforms to the duality of text and pictures, and because of the unique third quality, reading becomes fragmental and non-linear. Readers usually switch hectically from one panel of the comic to another, depending on completely their own method of interpretation. (Comics Research, 2010) Thus, reading comics is a fragmental, non-linear reading and needs a kind of visual comprehending skill, an active user activity to understand this whole complex system of text, pictures, and the third quality of meaning. If one reads comics digitally, this process could become even more difficult because those comics work with the help of a hyperlink system, so pictures are “hyper-pictures”, too. These webcomics nowadays are on a rising branch precisely because of internet penetration.

From the above discussion, a question arises: what is primary, text, or pictures? One can say that in order to comprehend digital texts and comics, at first, we need to become readers. This claim suggests that text is the primary quality in the process of reading comprehension. But then what is the role of the picture? Does it help to understand texts? Has it got a secondary role? Are texts able to stand alone without pictures? Or, on the contrary: are pictures indispensable in the process of comprehension? Are texts the secondary qualities which help to understand visual elements? In order to answer these questions, it is worth turning to the theory of picture books. According to Suzette Youngs and Frank Serafini (2011), picture books consist of three sorts of element (See Figure 32). They are the following: written language, visual picture, and design element. This latter comes from the other two parts, so it is the third quality – just like in the case of comics.



**Figure 32: The Three Sorts of Element of Picture Books (Szabó, 2015, 174)**

The comic-book-like task of PISA2009 can be observed the same way, as the previous tasks above: with the elimination of images. *Figure 33* below shows how the text would look like without the images:



**Figure 33: Figure 30 Without the Original Images**

Without the images, the text does not seem to be a coherent story, but four individual sentences separated in different text boxes. The numbers in the corners of the text boxes suggest the right reading order; however, it is still questionable whether it is a discussion between some people or a monologue of one person. The text boxes with the light grey background can even suggest that they are connected to one person only, who says three sentences to another one. Thus, the text could be reconstructed as a discussion between some people, like this:

- A. Have some cake.
- B. Fantastic!
- C. Oh, no, but I got those awful pimples last time.
- D. What shall I do?

Or a discussion between two people, like this:

- A. Have some cake. Fantastic!
- B. Oh, no, but I got those awful pimples last time.
- A. What shall I do?

Or a monologue, such as:

- A. Have some cake. Fantastic! Oh, no, but I got those awful pimples last time. What shall I do?

Of course, there can be other solutions, as well. But what we can see from these examples is that there are tasks with such visual elements that have the force to change the meaning or reconstruction of a text. And we did not even talk about the other visual features of the text, namely the digital environment, e.g., the sidebars, icons, header, etc., that help the reader to navigate on the screen. Distinguishing the main task text from the background texts, and the main word boxes from the toolbar and the menu strip could cause difficulties for children who are not practiced in a digital environment. In some instances, the visual attributes of a digital screen could be distracting for children and make it hard to concentrate on the text.

Based on the above, one can see that pictures have got an essential role in comprehension, thus, in test tasks. They can drive readers' attention, provide frame and pattern, clarify, explain, complete, and give meaning to the contents. However, one can raise doubts against texts with pictures on the basis that this path would lead us back to picture reading, which is an already outworn style of reading. According to these, too much ready-made content, more pictures, and less text harm our mental processes and comprehension because they do not encourage us to

think deeply and, what is more, they can easily confuse the reader. However, in my view, the rediscovery of pictures and visual elements serve the process of deep comprehension. As Youngs puts it: “When readers progress from noticing the visual, textual, and design elements in picture books to interpreting and analyzing these texts, they construct an interpretive trajectory” (Youngs, 2010 in Youngs and Serafini, 2011, 117).

In conclusion, in the assessment cycles, the OECD/PISA RLA did not give any definition of visual literacy or refer to other’s relevant definitions or concepts. They did not even involve the topic at a conceptual or theoretical level. Thus, here the comparison with the literature on the subject, unfortunately, has to remain void.

### 5.5. Reading Strategies and Comprehension

This section aims to discuss how the RLA managed and built theories of reading strategies and comprehension into the analytical and framework documents during the years. It is hard to find those parts of the documents where the RLA discussed these topics. Firstly, because they were mixed with task design and evaluation processes, secondly, because they were mostly mentioned under the labels of literacy definition and metacognition. Let us see how.

Starting with **PISA2000**, as it has already been referred to in *Section 5.1.*, reading literacy is understood according to cognitive views, and means “understanding, using, and reflecting on written texts” (OECD, 1999, 20). Besides, reading literacy is attributed to an interactive nature, i.e. “[t]he reader generates meaning in response to text by using previous knowledge and a range of textual and situational cues that are often socially and culturally shared. While constructing meaning, the reader uses various processes, skills, and strategies to foster, monitor and maintain understanding. These processes and strategies are expected to vary along with the situation and the purpose as readers interact with a variety of continuous and non-continuous texts.” (OECD, 1999, 19)

The question emerges: what these “various strategies” are. Having examined the PISA2000 document, it can be claimed that apart from mentioning the term ‘linear and non-linear strategies’, there is no explanation of the topic. There is nothing about the types of reading strategies, their attributes, or how the RLA intended to lean on them. There is a section where the RLA discussed metacognition, mentioning readers’ comprehension strategies and the individual differences in them rooted in knowledge about cognition and regulation of cognition.

“The first component concerns the ability to reflect on our own cognitive processes, and includes knowledge about when, how, and why to engage in various cognitive activities. The second, regulation, concerns the use of strategies that enable us to control our cognitive efforts [...].“ (OECD, 1999, 38) As it was phrased in the document, the RLA did not measure metacognition, since at that time there was no proper tool for doing it. (OECD, 1999, 38)

In the next assessment cycle in 2003, reading was a minor domain. The analytical and framework document of **PISA2003** slightly mentioned comprehension as an activity when “[r]eaders respond to a given text in a variety of ways as they seek to use and understand what they are reading. This dynamic process involves many factors, some of which can be manipulated in large-scale assessments such as OECD/PISA.” (OECD, 2003, 108) Under the phrase “many factors”, the RLA meant reading situation, text structure, and test rubric (i.e., the question asked about the text). And that was all that one could learn about reading comprehension strategies from PISA2003. And so was the case in the next assessment, **PISA2006**, since there was not any change compared to the previous RLA.

In 2009, when reading became the major domain again, the RLA returned with an updated theoretical background. **PISA2009** incorporated digital reading into the framework and phrased that despite the many similarities among print and digital reading, the latter requires new reading strategies, such as “skimming and scanning through large amounts of material and immediately evaluating its credibility” (OECD, 2009, 24). The RLA mentioned the proficiency in ICT skills claiming that the ability “the ability to navigate within the electronic medium [...] [is] conceived of as integral to proficiency in electronic reading.” (OECD, 2009, 60) However, the document did not say more about, e.g., the strategies of skimming and scanning, or other connected issues of comprehension.

In the section where the RLA discussed the topic of metacognition, there was more about comprehension strategies. As it was claimed, “[m]etacognition in reading refers to the awareness of and ability to use a variety of appropriate strategies when processing texts in a goal oriented [sic!] manner. Learning from texts requires the reader to take an active role in their reading by making inferences, filling in gaps, and generating macrostructures (conceptualisations of the largescale structure of a text) and elaborations.” (OECD, 2009, 72)

Thus, reading strategy in the understanding of PISA2009 was connected to doing actions with texts. In this process, as it was phrased later, language, text, and topics knowledge have

significant benefits. These are mental or behavioural cognitive activities that support reaching one's purposes via reading. "For example, a reader may be taught to generate questions about a text as it is read. These questions are of the why, what, how, when, or where variety. By generating such questions and trying to answer them, the reader processes the text more actively. Other strategies relevant to different purposes of reading are various forms of highlighting and summing up important text information (identifying main ideas); frequent comprehension monitoring and self-checking; and a repertoire of approaches for dealing with text difficulties (clarifying)." (OECD, 2009, 72)

*Figure 34* below shows how PISA2009 collected information about children's applied reading strategies.

Q Reading task: You want to help a 12-year-old student to understand a three-page text about animals and plants of the forest.

How do you rate the usefulness of the following strategies for helping the 12-year old student to understand the three-page text?

Possible strategy		Score					
		Not useful at all				Very useful	
		(1)	(2)	(3)	(4)	(5)	(6)
a)	First the 12-year-old student writes a summary of the text. After that we check together whether the summary covers the most important points	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>	<input type="checkbox"/> <sub>6</sub>
b)	I ask the 12-year-old student to read the text out loud twice, and then to copy it out	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>	<input type="checkbox"/> <sub>6</sub>
c)	After the 12-year-old student has read the text aloud, we discuss difficult words that he did not understand	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>	<input type="checkbox"/> <sub>6</sub>
d)	I provide a second text about the same topic which we read together immediately after reading the first one.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>	<input type="checkbox"/> <sub>6</sub>
e)	I read the text aloud while the 12-year-old student underlines words he doesn't understand. I then try to help him clear up what he doesn't understand. Then he writes a summary.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>	<input type="checkbox"/> <sub>6</sub>
f)	The 12-year-old student reads the text aloud and I correct him whenever he makes a mistake. Then I explain the meaning of the words that he did not read correctly.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>	<input type="checkbox"/> <sub>6</sub>

**Figure 34: An Example of a Metacognition Task that was Administered in the Field Trial for PISA 2009 (OECD, 2009, 74)**

As one can see from *Figure 34*, this was a task in the assessment, where the RLA measured up what children thought about useful or effective reading strategies. The survey evaluated the responses and stated that “students who achieved a high score on this metacognition item tended to do well overall on the PISA reading assessment.” (OECD, 2009, 74) However, this was not about the real strategies that children use during reading but their theories and knowing what should be good to use. Being aware of these pieces of information is useful; however, it does not tell us much about theories of reading comprehension strategies that PISA2009 applied in its assessment.

**PISA2012** did not say much about reading comprehension strategies, just the following: “[i]n light of recent research, reading engagement and metacognition were featured more prominently in the PISA 2009 reading framework as elements that can make an important contribution to policy makers’ understanding of factors that can be developed, shaped and fostered as components of reading literacy. However, in PISA 2012, reading is a minor domain and no data on engagement or metacognition in reading were collected.” (OECD, 2013, 60) Since in 2003 reading was a minor domain, there was no extension in regard to explaining reading comprehension strategies.

This was the case in the year 2015. Even though **PISA2015** was the first assessment in the history of the RLA when the complete survey was conducted via digital devices, there was nothing more about reading comprehension strategies than in the previous analytical and framework documents. It was phrased, “[w]hile constructing meaning, the reader uses various processes, skills and strategies to foster, monitor and maintain understanding. These processes and strategies are expected to vary with context and purpose as readers interact with a variety of continuous and non-continuous texts in the print medium and (typically) with multiple texts in the digital medium.” (OECD, 2016a, 49) However, there is no information about the mentioned “various reading strategies.” Metacognition was also left out of the picture, on that principle that reading was a minor domain in 2015. (OECD, 2016a, 48)

Most references to reading comprehension strategies and metacognition can be found in the last and most elaborated analytical and framework document of the RLAs: **PISA2018**. In the document, the notion of comprehension was mostly referred to and discussed under the label of understanding. As it was claimed, understanding is the process of constructing mental representation about the text by the reader. It requires memory in work and an integration of



literal meaning and new information into the reader's background knowledge. These two abilities cannot work without understanding words, sentences, and paragraphs, or with a lack of ranking, prioritising, and arranging information. Finding or constructing inferences and main messages within and among texts and connect them to tasks questions is the fundament of the RLA. (OECD, 2019)

PISA2018 discussed and handled metacognition as an integral part of the assessment. As it was claimed, “[t]he prominent metacognitive reading strategies include setting reading goals, adapting one's reading strategies depending on these goals, knowing how to summarise a piece of text or remember essential information, monitoring comprehension and knowing how to repair comprehension problems”. (OECD, 2019, 229) It was also claimed that digitalism in reading literacy called to live new reading strategies, such as information selection choosing new reading pathways, and managing distraction. These activities depend on individual abilities and decisions and serve effective interaction with texts, turning reading into “a problem-solving task that requires the use of strategic thinking to accomplish reading comprehension”. (OECD, 2019, 229) Thus, the focus was on task solving strategies, where time and test filling abilities are essential and not on strategies that, e.g., drive reading path, influence, or support constructing meaning. Accordingly, PISA2018 gathered information about reading strategies connected to information, quality, and credibility evaluation of texts. (OECD, 2019, 52)

In conclusion, reading and comprehension strategies were discussed in the OECD/PISA RLA from the perspective of assessment and evaluation, and mainly as data collected from children by complementing questionnaires. However, according to the literature discussed in *Sections 2.4. and 2.5.*, there are several theories of reading comprehension and strategies according to medium types, and they should be integral parts of reading research by giving theoretical grounding and support in order to establish a reading literacy assessment framework. Without referring or applying them, the complete theoretical background remains empty.

## 5.6. Reading in the Digital Age

Digitalism, as it has been already discussed in *Section 2.4.* in details, has changed our theories and concepts about reading. It seems evident that the shift from paper to screen, print to **digital**

affects the whole process of reading, therefore comprehension as well. As the last part of the discussion of the theoretical background of the OECD/PISA RLA, this section intends to examine the way how the assessment handled and involved digitalism in its framework through the years. Let us start with the first reading literacy assessment of PISA again.

The analytical and framework document of **PISA2000** presented its theoretical considerations about the involvement of digitalism in the reading comprehension assessment in a simple statement: “It is expected that electronic texts will be used in future survey cycles but will not be included in this cycle because of considerations of time and access.” (OECD 1999, 20) And basically that was all. No further explanation, possible theories or trends mentioned concerning the topic of digital. On the one hand, it was 1999 when the framework document was released, and 2000 when PISA conducted the survey. Moreover, it was the very first reading literacy assessment in its kind. It was a challenging task in itself to design, create and conduct a large-scaled worldwide assessment – and not just in one domain, but in three areas at the same time. Thus, understandably, digitalism was not in the game at that time.

The next two RLAs, **PISA2003** and **PISA2006**, due to the much-repeated reasons that left their framework untouched, did not show any progression in this topic, but repeated the above cited remark.

As one can expect, the next test period in 2009 was the cardinal year when involving digitalism could be a reasonable expectation. **PISA2009** did a huge step forward, and involved electronic reading to the assessment, as a reaction and answer to the technological changes and challenges of the 21<sup>st</sup> century. The RLA recognised that a proper reading literacy assessment cannot go without making allowance for digitalism. As it was phrased: “Proficiency in reading literacy is a key not only to unlocking the world of printed text, but also electronic texts, which are becoming an increasingly important part of students’ and adults’ reading. As of 2007, almost 1.5 billion people – one-fifth of the world’s population – were reading on line [...] The rate of growth in online use has been staggering, with much of it having occurred during the past five years – though the rate varies widely according to location [...] The variation is not only geographical, but also social and economic.” (OECD, 2009, 22)

Accordingly, as it has already been discussed in the previous sections, the RLA updated its theoretical framework, its applied terms and definitions, and rethought the text formats, types and genres that were given to children as a task to read. As it was phrased, “reading is massively

shifting from print to digital texts [...] children and teenagers prefer to read digital than printed texts [...] two thirds of users of a phone-based reader across five developing countries indicated that their interest in reading and time spent reading increased once it was possible to read on their phones [...] This shift has important consequences for the definition of reading as a skill.” (OECD, 2016d, 8-9)

It seems that the area of reading assessment extended, new gates opened for observation and evaluation; hence surveying reading comprehension in the digital age covers much more than at the beginning of the RLA. The assessment realised the significance and inevitable role of digitalism in reading literacy and tried to fit the theoretical framework to it, with the awareness of the literature, and according to the expectation of the various actors who are interested in reading. However, as one can see from this analysis, it failed to meet the challenge entirely. Despite the theoretical improvements and updates that accompanied the RLA cycles so far, some critical factors remained neglected or superficial. The next chapter of the dissertation (*Chapter 6*) shows how the OECD/PISA RLA took the obstacles in a methodological sense, and whether the lack of the previously discussed conceptual and theoretical deficiencies of the framework had affected the methodological background or not.

## 6. Discussing the Methodological Background of the RLA

This chapter discusses the methodological background of the RLA, focusing on (1) writing skills and response formats, (2) reading fluency, (3) the effects and difficulties of the screen in solving reading literacy tests, finally (4) motivation and engagement on comprehension and reading performance under assessment circumstances.

*Methodologically*, the RLA, besides the test questions, gathers data from students about their background, environment, home, and school. It is also in harmony with the practice of its antecedents, considering many already mentioned trends of reading literacy assessments, and trying to organise its surveys with maximum awareness. “Research suggests that reading is not a single, one-dimensional skill, and that reading literacy therefore cannot be represented adequately by a single scale or single score along that scale. Determining how many and which scales should be used for reporting reading literacy scores is crucial for ensuring that sufficient numbers of tasks are developed to define and interpret these scales adequately.” (OECD, 1999, 21) For the evaluation, PISA defined:

1. the content or structure of knowledge (that students need to acquire in each domain);
2. a range of processes (that need to be performed);
3. the situation or context (in which knowledge and skills are applied). (OECD 1999, 12)

The methodological issues concerning the framework can be found in the analytical and framework documents’ related sections as ‘reporting scales’ (e.g., scaling, interpreting, reporting) and other issues (e.g., reading examples, supplement information, and notes).

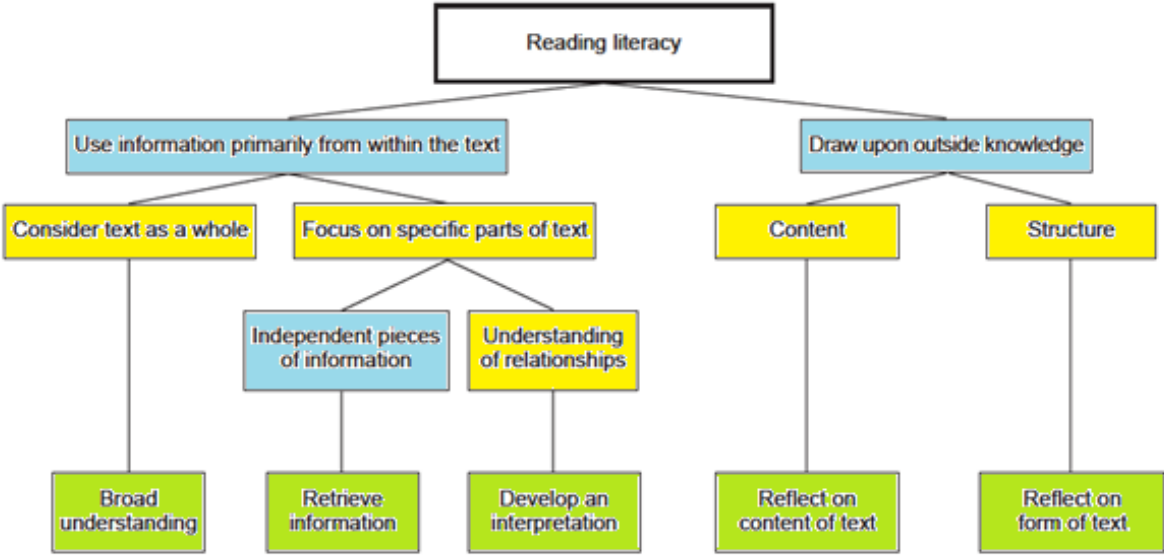
### 6.1. Three Pillars of Observation: Text, Task, and Situation

The RLA marked three categories to examine the domain of reading literacy: (1) the *form of reading material, or text*, (2) the *reading task*, and (3) the *situation or context the text was constructed in*. This analysis considers these categories as parts of the methodological background of the assessment since they refer to and highlight the type, form, and defined purpose of the reading material given in a reading task to solve. Thus, they present the circle of possible tasks in general, that comprise the fundamental of the evaluation as well. Let us examine how.

Concerning the first category, the *form of reading material, or text*, **PISA2000** distinguished two subcategories: text type and prose form. The former comprises continuous

and non-continuous texts, while the latter refers to narration, exposition, and argumentation. The second category was the *reading task*, more accurately, the aim of the observation, or the expected reading activities that children required to do, and according to which their level of comprehension was classified. These expected activities were the following: retrieving information; forming a broad general understanding of the text; developing interpretation; reflecting on text contents; and reflecting on the form of text.

Figure 35 below shows these five reading tasks and their relationships according to the RLA’s measurement of reading literacy.



**Figure 35: The Five Reading Tasks and Their Relationships (Coloured by the Author) (OECD, 1999, 29)**

The relations represented on *Figure 35* can be considered as a matrix of skills that the RLA aims to assess. Rectangles coloured with green refers to the reading skills, yellow rectangles highlight the cognitive tasks with the texts (the intended focus-direction of reading), and rectangles coloured with blue show the knowledge and information students need to use to solve the tasks. In the field of collaborative problem solving, PISA provides a review of skills, that shows the assessed skills with their purposes and functions in a complex matrix in the framework document of 2015. Bill Lucas and Ellen Spencer (2017, 19-20) discuss the topic emphasising how important is to identify and describe the skills assessed in educational research. In contrast, the RLA PISA did not provide such matrix of skills, or just in portions, as e.g. *Figure 35* showed above, or *Chart 20* and *Chart 21* will show below. However, a complex

reading literacy skill matrix would help to define what the RLA intends to measure and what it *really* measures; to unfold the occurrent methodological deficiencies of skill measurements, and also to understand and interpret data gained from the tests.

Since **PISA2000** wanted to examine not just the classroom reading, but reading in ‘real-life’, i.e., outside of schools, the RLA identified several *situations* in which “*the text was constructed*” (OECD 1999, 13), or one can read a text. (See *Chart 17*) The term ‘situation’, as it was claimed, “refers more to the uses for which an author composes a text than to location or setting.” (OECD 1999, 22) **PISA2000** distinguished the application of texts according to the following: personal (e.g., a letter), public (e.g., official documents), occupational (e.g., report) and educational (e.g., textbook); and made a comment that there may be differences between students’ reading skills in various situations. (OECD 1999,13)

	Reading for private use	Reading for public use	Reading for work	Reading for education
Others	Self Relatives Friends	Anonymous	Objects Co-workers Managers	Instructors
Use	Curiosity Contact	Information	To do	To learn
Contents	Letters Fiction Biography “How to...” books and magazines Maps	Notices Regulations Programmes Pamphlets Forms	Instructions Manuals Schedules Memos Reports Tables/Graphs	Texts Maps Schematics Tables Graphs

**Chart 17: Applied Texts (Contents) According to Context/Situation in the PISA2000 RLA (OECD, 1999, 23)**

Concerning this distinction, it is worth noting that in my consideration, the *context* and the *situation* of a text are not the same. The context is *within* or *between* texts (e.g., the surrounding sentences, paragraphs, texts, intertexts, and hypertexts), while the situation is the *circumstances* under which one is reading a text (e.g., at home, at school, at an office or an institute, at a noisy shopping centre or a silent library, etc.). Thus, what the RLA defined as context is rather *text types* and *applicability* and does not have anything to do with the term ‘context’. For instance, one can read a personal letter in a crowded shopping mall or read a textbook at the beach, but these circumstances do not affect the *context* of the text. It is important to see these differences because context is one of the fundamental notions in the

literature of reading and using these notions in an ineligible sense could cause misunderstandings.

In the assessment (in all the three fields), students had to perform paper and pencil tests in a given time under school circumstances. (OECD 1999, 16) “The reading literacy survey will not rely solely on the use of multiple-choice formats but will include open-ended tasks which will be designed to engage the students in a broader and deeper range of processes and strategies.” (OECD 1999, 22) *Chart 18* below shows the “recommended distribution of constructed-response and multiple-choice tasks by the five aspects of reading” (OECD 1999, 37):

Aspect	% of test	% of <i>tasks</i> requiring constructed response	% of <i>test items</i> requiring constructed response	% of <i>test items</i> requiring multiple choice
Retrieving information	20	35	7	13
Broad understanding	20	35	7	13
Developing an interpretation	30	35	11	19
Reflecting on content	15	65	10	5
Reflecting on form	15	65	10	5
<b>Total</b>	<b>100</b>		<b>45</b>	<b>55</b>

**Chart 18: Recommended Distribution of Constructed-Response and Multiple-Choice Tasks by the Five Aspects of Reading (OECD, 1999, 37)**

Besides the main test, as parts of the methodological background, PISA2000 assessed children’s *Reading practices and interests, Metacognitive knowledge and achievement, and access to Technological devices.*

**PISA2003** and **PISA2006** did not update their methodological background and applied the same above-discussed categories as PISA2000.

In **PISA2009**, in parallel with the conceptual and theoretical improvements, there were methodological improvements as well. The three organising categories: *text, task, and situation* remained or were extended as follows:

1. the *form of reading material, or text*:
  - a. medium: print and electronic, the latter is “synonymous with *hypertext*: a text or texts with navigation tools and features that make possible and indeed even require non-sequential reading” (OECD, 2009, 27);
  - b. environment (only in the case of electronic reading but only computer-based): authored (=cannot influenced by the reader) and message-based (=the reader is invited to participate);

- c. text format: continuous (texts organised in sentences and paragraphs), non-continuous (lists, forms, graphs or diagrams), mixed (magazines, reference books, reports, web pages, e-mails etc.) and multiple (independently generated but loosely linked together, e.g. set of websites);
- d. text type: description, narration, exposition, argumentation, instruction, transaction.

“In PISA 2009, the framework encompasses both print and electronic texts, and the distinctions outlined above are applied to both. These distinctions are based on the principle that individuals will encounter a range of written material in their civic and work-related adult life (e.g. application, forms, advertisements) and that it is not sufficient to be able to read a limited number of types of text typically encountered in school.” (OECD, 2009, 14)

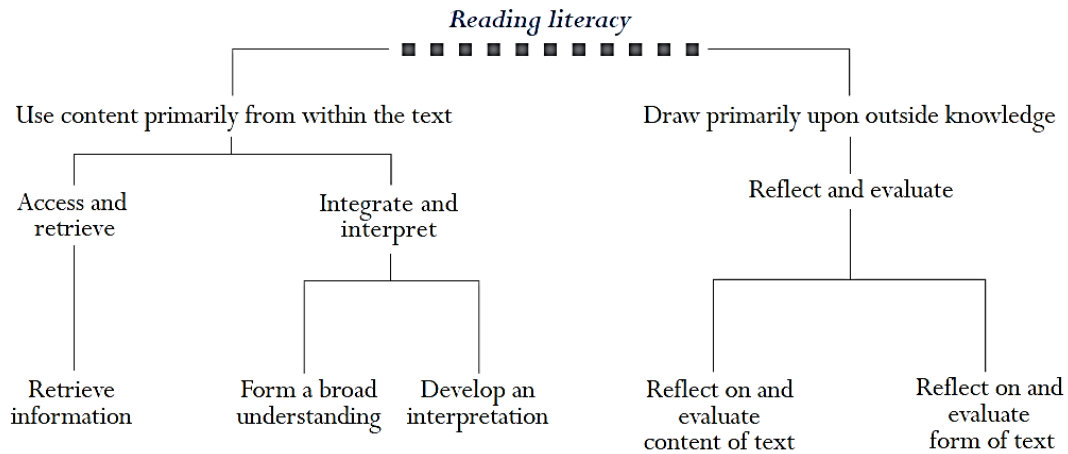
In addition, three other terms are applied both print and electronic texts: text object (e.g., novel, e-mail, home page, timetable etc.); text features (e.g. the number of texts and pages, the length of the texts, linguistic complexity and familiarity with the topics to be read); navigation tools and features (guiders that help readers to find their way both in print and electronic texts, such as icons, scroll bars, menus, indexes, chapters, headings etc.) (OECD, 2009, 25-34)

2. the *reading task* – a newly called aspect in PISA2009:

- a. retrieving information;
- b. forming a broad understanding of the text;
- c. developing interpretation;
- d. reflecting on and evaluating text contents;
- e. reflecting on and evaluating the form of text.

“As it is not possible to include sufficient items in the PISA assessment to report on each of the five aspects as a separate subscale, for reporting on reading literacy these five aspects are organised into three broad aspect categories” (OECD, 2009, 34), these are access and retrieve; integrate and interpret; and reflect and evaluate. Their updated relationship to one another can be seen on *Figure 36* below:





**Figure 36: Relationship Between the Reading Framework and the Aspect Subscales (OECD, 2009, 35)**

Concerning the above-described aspects, the 2009 RLA document says that students “are not assessed on the most basic reading skills, as it is assumed that most 15-year-old students will have acquired these.” (OECD, 2009, 14)

Regarding the situation, PISA2009 applied four types: personal (e.g., a novel, a personal letter), public (e.g., official documents or announcements), occupational (e.g., manual or report), and educational (e.g., textbook or worksheet) contexts. These are the same categories that they used in their previous assessments. The only update is that they used the notion ‘occupational’ instead of ‘work’, presumably, because it has a wider, extended sense that fits better to nowadays lifestyle.

*Chart 19* below summarises the similarities and differences between print and electronic reading, by main framework characteristics according to PISA2009 (OECD, 2009, 44):

	<b>Print reading</b>	<b>Electronic reading</b>
Situations	Personal Public Occupational Educational	Personal Public Occupational Educational
Texts: Environments	not applicable	Authored Message based
Texts: Formats	Continuous Non-continuous [Mixed] [Multiple]	[Continuous] [Non-continuous] [Mixed] Multiple
Texts: Text type	Argumentation Description Exposition Narration Instruction Transaction	Argumentation Description Exposition Narration Instruction Transaction
Aspects (1)	Access and retrieve Search Orient and navigate in concrete information space e.g. <i>Go to library, search in a catalogue, find a book</i> Use navigation tools and structures e.g. <i>Table of contents; page numbers; glossary</i> Select and sequence information - low reader control - one sequence of linear reading	Access and retrieve Search Orient and navigate in abstract information space e.g. <i>Enter URL; user search engines</i> Use navigation tools and structures e.g. <i>Menus; embedded hyperlinks</i> Select and sequence information - high reader control - multiple sequences of linear reading
Aspects (2)	Integrate and interpret Integrate at a lower level of demand: larger portions of text are simultaneously visible (one or two pages) Develop an interpretation Form a broad understanding	Integrate and interpret Integrate at a higher level of demand: limited parts of text are simultaneously visible (limited by screen size) Develop an interpretation Form a broad understanding
Aspects (3)	Reflect and evaluate Pre-evaluate information e.g. <i>use table of contents; skim passages, checking for credibility and usefulness</i> [Evaluate credibility of source - usually less important due to filtering and preselection in the publishing process] Evaluate plausibility of content Evaluate coherence and consistency Hypothesise Reflect in relation to personal experience	Reflect and evaluate Pre-evaluate information e.g. <i>use menus; skim web pages, checking for credibility and usefulness</i> Evaluate credibility of source - usually more important due to lack of filtering and preselection in open environment Evaluate plausibility of content Evaluate coherence and consistency Hypothesise Reflect in relation to personal experience
Aspects (4)	Complex The range of sources to be consulted is relatively undefined The sequence of steps within the task is undirected e.g. <i>finding, evaluating and integrating information from multiple printed texts</i>	Complex The range of sources to be consulted is relatively undefined The sequence of steps within the task is undirected e.g. <i>finding, evaluating and integrating information from multiple electronic texts</i>

**Chart 19: Similarities and Differences Between Print and Electronic Reading, by Main Framework Characteristics (OECD, 2009, 44)**

In the PISA2009 framework document, a separate section can be found about the motivational and behavioural constituents of reading literacy, especially reading engagement and motivation. (OECD, 2009, 69-74) (For more, see *Section 6.5.*) Moreover, task examples are also provided both for the print and the electronic assessment. (OECD, 2009, 48-68)

In the **PISA2012** framework document, the levels of proficiency of print and digital reading are represented on two charts (*Chart 20 and 21*), which are the following:

Level	Lower score limit	Percentage of students able to perform tasks at each level or above (OECD average)	Characteristics of tasks
<b>6</b>	698	0.8%	Tasks at this level typically require the reader to make multiple inferences, comparisons and contrasts that are both detailed and precise. They require demonstration of a full and detailed understanding of one or more texts and may involve integrating information from more than one text. Tasks may require the reader to deal with unfamiliar ideas, in the presence of prominent competing information, and to generate abstract categories for interpretations. <i>Reflect and evaluate</i> tasks may require the reader to hypothesise about or critically evaluate a complex text on an unfamiliar topic, taking into account multiple criteria or perspectives, and applying sophisticated understandings from beyond the text. A salient condition for <i>access and retrieve</i> tasks at this level is precision of analysis and fine attention to detail that is inconspicuous in the texts.
<b>5</b>	626	7.6%	Tasks at this level that involve retrieving information require the reader to locate and organise several pieces of deeply embedded information, inferring which information in the text is relevant. Reflective tasks require critical evaluation or hypothesis, drawing on specialised knowledge. Both interpretative and reflective tasks require a full and detailed understanding of a text whose content or form is unfamiliar. For all aspects of reading, tasks at this level typically involve dealing with concepts that are contrary to expectations.
<b>4</b>	553	28.3%	Tasks at this level that involve retrieving information require the reader to locate and organise several pieces of embedded information. Some tasks at this level require interpreting the meaning of nuances of language in a section of text by taking into account the text as a whole. Other interpretative tasks require understanding and applying categories in an unfamiliar context. Reflective tasks at this level require readers to use formal or public knowledge to hypothesise about or critically evaluate a text. Readers must demonstrate an accurate understanding of long or complex texts whose content or form may be unfamiliar.
<b>3</b>	480	57.2%	Tasks at this level require the reader to locate, and in some cases recognise the relationship between, several pieces of information that must meet multiple conditions. Interpretative tasks at this level require the reader to integrate several parts of a text in order to identify a main idea, understand a relationship or construe the meaning of a word or phrase. They need to take into account many features in comparing, contrasting or categorising. Often the required information is not prominent or there is much competing information; or there are other text obstacles, such as ideas that are contrary to expectation or negatively worded. Reflective tasks at this level may require connections, comparisons, and explanations, or they may require the reader to evaluate a feature of the text. Some reflective tasks require readers to demonstrate a fine understanding of the text in relation to familiar, everyday knowledge. Other tasks do not require detailed text comprehension but require the reader to draw on less common knowledge.
<b>2</b>	407	81.2%	Some tasks at this level require the reader to locate one or more pieces of information, which may need to be inferred and may need to meet several conditions. Others require recognising the main idea in a text, understanding relationships, or construing meaning within a limited part of the text when the information is not prominent and the reader must make low level inferences. Tasks at this level 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.
<b>1a</b>	335	94.3%	Tasks at this level require the reader to locate one or more independent pieces of explicitly stated information; to recognise the main theme or author's purpose in a text about a familiar topic, or to make a simple connection between information in the text and common, everyday knowledge. Typically the required information in the text is prominent and there is little, if any, competing information. The reader is explicitly directed to consider relevant factors in the task and in the text.
<b>1b</b>	262	98.9%	Tasks at this level require the reader to locate a single piece of explicitly stated information in a prominent position in a short, syntactically simple text with a familiar context and text type, such as a narrative or a simple list. The text typically provides support to the reader, such as repetition of information, pictures or familiar symbols. There is minimal competing information. In tasks requiring interpretation the reader may need to make simple connections between adjacent pieces of information.

**Chart 20: Summary Description for the Seven Levels of Proficiency in Print Reading in PISA2012 (OECD, 2013, 79)**

Level	Lower score limit	Percentage of students able to perform tasks at each level or above (OECD average)	Characteristics of tasks
<b>5</b> or above	<b>626</b>	7.8%	Tasks at this level typically require the reader to locate, analyse and critically evaluate information, related to an unfamiliar context, in the presence of ambiguity. They require generating criteria to evaluate the text. Tasks may require navigation across multiple sites without explicit direction, and detailed interrogation of texts in a variety of formats.
<b>4</b>	<b>553</b>	30.3%	Tasks at this level may require the reader to evaluate information from several sources, navigating across several sites comprising texts in a variety of formats, and generating criteria for evaluation in relation to a familiar, personal or practical context. Other tasks at this level demand that the reader interpret complex information according to well-defined criteria in a scientific or technical context.
<b>3</b>	<b>480</b>	60.7%	Tasks at this level require that the reader integrate information, either by navigating across several sites to find well-defined target information, or by generating simple categories when the task is not explicitly stated. Where evaluation is called for, only the information that is most directly accessible or only part of the available information is required.
<b>2</b>	<b>407</b>	83.1%	Tasks at this level typically require the reader to locate and interpret information that is well-defined, usually relating to familiar contexts. They may require navigation across a limited number of sites and the application of web-based navigation tools such as drop-down menus, where explicit directions are provided or only low-level inference is called for. Tasks may require integrating information presented in different formats, recognising examples that fit clearly defined categories.

**Chart 21: Summary Description for the Four Levels of Proficiency in Digital Reading in PISA2012 (OECD, 2013, 80)**

*Chart 20* and *Chart 21* can be considered as slight improvements in the evaluation and interpretation process because they do not just refer to print and digital reading skills separately, but they also add two more levels and work with a seven-levelled scale regarding print reading, while PISA2003, PISA2006, and PISA2009 worked with five levels.

Since reading was a minor domain in the **2015 PISA** assessment, the “reading of digital texts is not included and no data on engagement or metacognition in reading are collected.” (OECD, 2016a, 48) (For more, see *Section 6.5*.) However, digital assessment required some changes in the methodological background. One difference concerns text classification: the RLA worked with the terms of text format, text type, and new text display space. This latter consists of fixed texts and dynamic text. The former means texts that “usually appear on paper in forms such as single sheets, brochures, magazines and books, but tend to appear more and more on a screen as PDFs and on e-readers. This development results in further blurring the distinction between what was labelled » print reading« and »digital reading« in the PISA 2009 framework. As PISA 2015 uses only what was labelled »print reading« in 2009 there are no conceptual change [sic!] in this aspect for PISA 2015.” (OECD, 2016a, 52) In contrast, dynamic

text only appears on a screen, and they are synonymous with hypertext. Despite this new classification, the 2015 RLA document declares: “No dynamic texts are included in PISA 2015.” (OECD, 2016a, 52)

In the framework document, the RLA acknowledged that there “is research evidence that a computer-based testing environment can influence students’ performance in reading [...] although these studies were conducted on proofreading tasks, not in an assessment situation. There is a large body of more recent literature on paper- and computer-based tests’ equivalency [...] however these still reveal conflicting findings [...] it was hypothesised that 2009 reading items could be transposed onto a screen without affecting trend data.” (OECD, 2016a, 48)

However, in PISA2015, three points were considered due to the digital testing mode: item types (e.g., drag-and-drop, hotspots), stimulus presentation (pagination was used for texts rather than scrolling) and IT skills. Concerning this latter, the RLA stated that “computer-based assessments rely on a set of fundamental skills for using computers. These include knowledge of basic hardware (e.g., keyboard and mouse) and basic conventions (e.g., arrows to move forward and specific buttons to press to execute commands). The intention is to keep such skills to a minimal core level.” (OECD, 2016a, 58)

**PISA2018’s** measuring method included varying text dimensions and so-called scenarios, i.e., contexts or reading purposes. (OECD, 2016d, 15) They also gathered information on how students evaluate text quality and credibility, which are cardinal issues in the world of digital reading. (OECD, 2016d, 35) The RLA considers reading motivation, practices, and metacognition as critical reading factors. However, “they are assessed in the questionnaire and are covered in more detail in the questionnaire framework” (OECD, 2016d, 10) and not in the main assessment. (For more, see *Section 6.5.*)

In comparison to the previous cycles, PISA2018 summarises the changes of the former cognitive *aspects* of the measurement that now called *processes*; see *Chart 22* below:



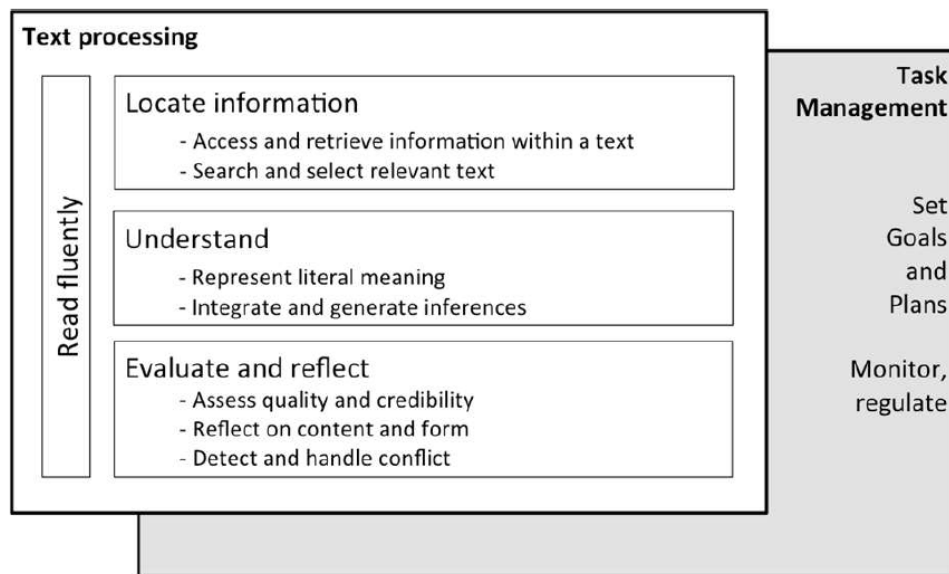
2018 Cognitive processes	Superordinate Category Used for Scaling in 2018	2009-2015 Aspects
Read fluently	Reported but not on PISA scale	Not assessed
Access and retrieve information within a text	Locate information	Access and retrieve
Search and select relevant text		
Represent literal meaning	Understand	Integrate and interpret
Integrate and generate inferences		
Assess quality and credibility	Evaluate and reflect	Reflect and evaluate
Reflect on content and form		
Detect and handle conflict		Complex

**Chart 22: Mapping of 2018 Process Typology to 2018 Reporting Scales and to Former 2009-2015 Cognitive Aspects (OECD, 2016d, 21)**

PISA2018 retained the already applied three categories for assessing the domain, thus *text*, *task*, and *situation* as follows:

1. the *form of reading material, or text*:
  - a. Source (single – have definite author, and multiple – have different authors/published different times/under different titles and references);
  - b. Organisation (screen-sized and orientation) and navigation (static – low density of navigation, and dynamic – high density of navigation);
  - c. Format (continuous – sentences in paragraphs, non-continuous – lists, tables, graphs etc., and mixed – e.g. magazines, reference books and reports): all of them appear in printed and digital texts as well;
  - d. Type (description, narration, exposition, argument, instruction, interaction, transaction). (OECD, 2016d, 22-24)
2. the *reading task*:
  - a. retrieving information;
  - b. forming a broad general understanding of the text;
  - c. developing interpretation;
  - d. reflecting on text contents;
  - e. reflecting on the form of text;

These five reading tasks were reorganised under the title of text processing (see *Figure 37* below).



**Figure 37: PISA 2018 Reading Framework Processes (OECD, 2016d, 17)**

3. the use for which the text was constructed (context or situation):
  - a. personal/private use;
  - b. public use;
  - c. occupational;
  - d. educational.

These four situation types were supplemented with the notion of scenarios, which “can be developed across a wide range of potential situations. Situation is used to define the contexts and uses for which the author constructed the text. The manner in which the situation variable is specified is therefore about supposed audience and purpose, and is not simply based on the place where, or the purpose for which, the reading activity is carried out.” (OECD, 2016d, 28)

## 6.2. Writing Skills and Response Formats

Despite the carefully designed tasks, answer sheets, and response formats of the PISA RLA, some essential problems arise because of neglecting the role of writing skills in the process of reading comprehension. However, research says that the two abilities: reading and writing “are more interdependent than we thought. The relationship between reading and writing is a bit like that of the chicken and egg. Which came first is not as important as the fact that without one the other cannot exist. A child’s literacy development is dependent on this interconnection between reading and writing. [...] reading affects writing and writing affects reading. [...]

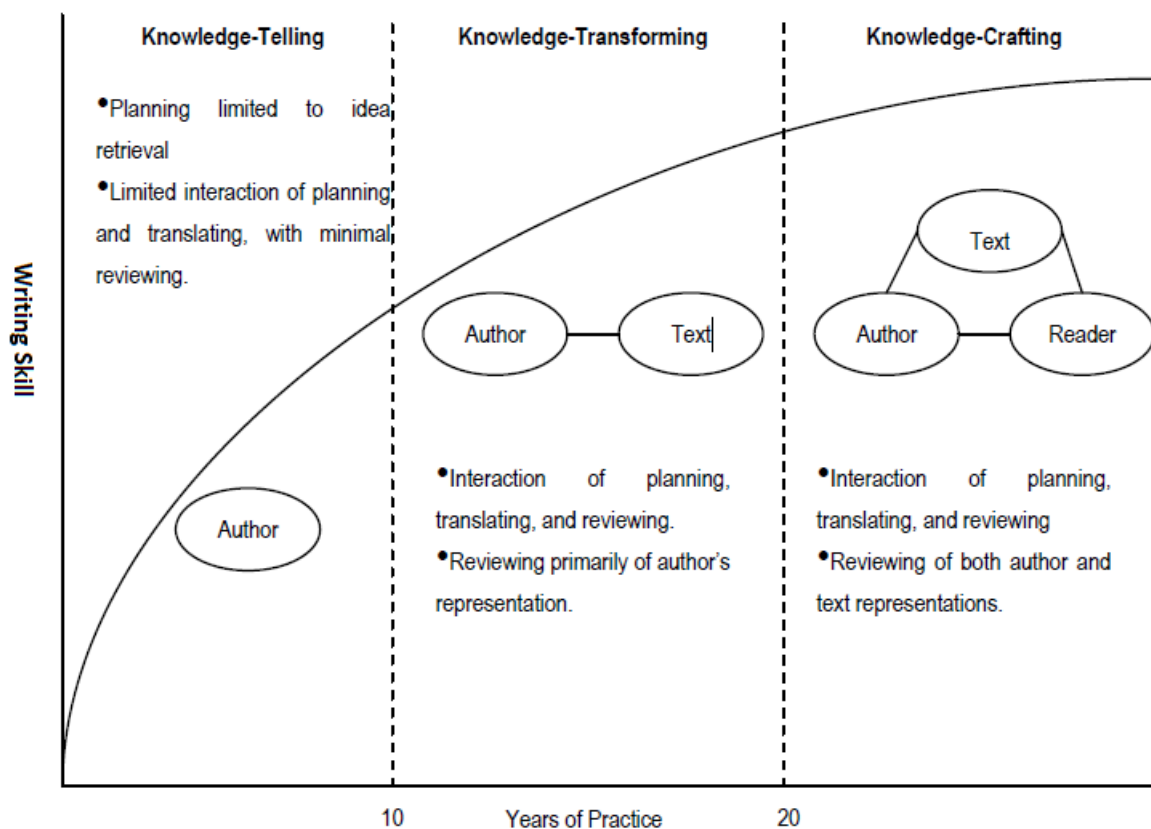


reading plays a major role in writing. At the same time practice in writing helps children build their reading skills. This is especially true for younger children who are working to develop phonemic awareness and phonics skills.” (K12 Reader, 2016a)

The notion of ‘writing skills’ refers to the ability to create paragraphs (e.g., topic sentence, unity, and coherence) and sentences (e.g., fragment, comma splice, run-on/fused sentence, dangling modifier, beginnings, types, patterns, and lengths). Besides, it also means choosing the words (action and linking verbs, concrete, abstract, general, and specific words), creating meaning, and adequately apply grammatical rules (minimum requirements, misunderstandings, clumsiness, inter-language interference, indirectness, and expressiveness). Moreover, it implies draft finalisation (revising, editing, and proofreading), and checking the spelling and the punctuation, finally to do the titling. (Bram, 1995, 9-10) When one would like to phrase something in written format, she usually goes through the majority of these beforementioned processes of writing. This is a complex cognitive action, with constant thinking, creating meaning, decision making, reflecting, evaluating, etc. to make the text understandable, not just for the author, but for the reader as well.

As Ronald T. Kellogg, an expert in Cognition and Neuroscience, explains: “Writing an extended text at an advanced level involves not just the language system. It poses significant challenges to our cognitive systems for memory and thinking as well. Indeed, writers can put to use virtually everything they have learned and stored away in long-term memory. But they can only do so if their knowledge is accessible, either by rapidly retrieving it from long-term memory or by actively maintaining it in short-term working memory. [...] All writers must make decisions about their texts and at least argumentative texts call upon their reasoning skills as well. Finally, the written text serves as external form of memory that others can read and reflect upon, providing a scaffold for thinking and writing in the historical development of a literate culture.” (Kellogg, 2008, 2)

Writing skills, just as reading skills, are not genuinely coded but learned, typically in schools. *Figure 38* below shows the macro-stages in the cognitive development of writing skills.



**Figure 38: Macro-Stages in the Cognitive Development of Writing Skill (Kellogg, 2008, 4)**

As Kellogg explains: “both the basic writing processes of planning, language generation, and reviewing, plus the mental representations that must be generated and held in working memory, undergo continuous developmental changes through maturation and learning within specific writing tasks. As a consequence of the task specificity, a child might be operating at a more advanced stage in writing, say, narrative texts, assuming these are most practiced, compared with persuasive texts.” (Kellogg, 2008, 4) As one can see from *Figure 38*, 15-year-old children are in the interval of practice their writing skills, meaning that performing a well-phrased answer can be a challenge for them by default.

If a particular comprehension task requires reading to go together with writing, e.g., reading a text and answer the related questions, the process of comprehension becomes more complicated. As for reading researchers, Nancy W. Fordham, Debra Wellman, and Alexa Sandmann (2002) put it: “Combining writing with reading enhances comprehension, because the two are reciprocal processes. Considering a topic under study and then writing about it

requires deeper processing than reading alone entails.” (Fordham, Wellman, and Sandmann, 2002, 151) According to this, a literacy test which requires written response from students assess deeper and more complex processes than merely reading and understanding a text, and involve more skills than initially supposed. As education experts Laura K. Allen, Erica L. Snow, Scott A. Crossley, G. Tanner Jackson, and Danielle McNamara claimed: “Results indicated that reading comprehension was strongly related to both vocabulary knowledge and the higher-level cognitive skills. Further, writing ability was moderately associated with a subset of the measured variables, namely vocabulary knowledge and the ability to access prior knowledge. These results support the hypothesis that reading comprehension and writing share common knowledge sources and higher-level cognitive skills, although the writing process is much less reliant on these measured variables than reading comprehension.” (Allen, Snow, Crossley, Jackson, and McNamara, 2014, 663)

Therefore, writing is not separated from reading or just a companion of it, but also a tool for improving comprehension skills. According to reading experts Randy Wallace, Cathy Pearman, Cindy Hail, and Beth Hurst, four research-proven writing strategies can help children to improve their comprehension skills: (1) About/Point, (2) Cubing, (3) Four Square Graphic Organizer, and (4) Read, Respond, Revisit, Discuss. The first is a summarising strategy for finding the essence of a reading material. The second is about viewing information from different perspectives, the third is assisting students in organising information and creating connections, and the last is about integrating reading, writing, and social interaction. (Wallace, Pearman, Hail and Hurst, 2007)

Now, in light of the above, let us examine the RLA’s consideration of writing skills in reading comprehension tasks. The RLA applies the method of the multiple-choice and complex multiple-choice question “as the primary feature of [...] [the] assessments because it is reliable, efficient, and supports robust and scientific analyses”. (OECD PISA FAQ, 2017) Besides, open constructed response tasks are also applied. (OECD 2003, 117) These are tasks with open-ended essay questions that require readers to show their cognitive knowledge and reasoning and form complete answers by applying the information found in the reading material. „Some require little judgement on the marker’s part [...] Others require considerable subjective judgement by markers, as when the reader is asked to summarise a text in his or her own words.” (OECD 1999, 34) We can presume that the tasks, which make students form their answers with

their phrases, require a certain kind of proficiency in writing, and those students who are better writers gain an advantage over them. Besides, it is also supposed that answers, which consist of all the right keywords and formed at a high level, are worth a higher score than those responses which do the same but with a poor sentence quality. Since the RLA does not explain in detail *how* subjective the subjective judgments are, it can be a critical point. E.g., it can occur that a student comprehended a text well but presented a poorly-phrased written answer due to difficulties with writing skills, and therefore she will get bad scores. While another student for a similar answer quality will get good points from another evaluator. In neither case, we will know whether they have good comprehension skills or not. What we will know is a judgement on their writing skills.

However, the RLA did not refer to the issues mentioned above as potential problems, just to the following factors, which affect the process of comprehension:

1. the number of pieces of information,
2. the type of interpretation required,
3. the type of reflection or evaluation required,
4. the length of the text, and
5. the amount of information in the text. (OECD, 2009, 45)

From this list, at first glance, numbers 2 and 3 are affected by readers' writing skills (whereas numbers 1, 4, and 5 are in a strong connection with the level of reading fluency, see *Section 5.3.2*). The RLA used several types of response format that students are familiar with but did not consider students' unforeseen difficulties or poor skills in writing. As a consequence, the framework documents of PISA2000, PISA2003, PISA2006, PISA2009, and PISA2012 completely ignored the issue of writing skills and did not refer to it at all. However, the percentage of open constructed response items – where students had to write down their answers, not just choose and tick them – were 44% (PISA2000) and 43% (PISA2003; PISA2006) even in the beginning of PISA surveys. (See *Chart 23*)

■ Distribution of reading literacy tasks, by reading process (aspect) and item type

Process (aspect)	Item types								Total <sup>2</sup>	
	Percentage of multiple-choice items		Percentage of complex multiple-choice items		Percentage of closed-constructed response items		Percentage of open-constructed response items <sup>1</sup>			
Retrieving information	8	-	2	4	6	14	13	11	29	29
Interpreting texts	32	29	2	4	2	7	13	11	49	50
Reflection and evaluation	2	-	2	-	-	-	18	21	22	21
<b>Total<sup>2</sup></b>	<b>42</b>	<b>29</b>	<b>6</b>	<b>7</b>	<b>9</b>	<b>21</b>	<b>44</b>	<b>43</b>	<b>100</b>	<b>100</b>

1. This category includes short-response items.  
2. Data may not always add up to the total indicated because of rounding.

**Chart 23: Distribution of Reading Literacy Tasks by the Reading Process (Aspect) and Item Type (OECD, 2006, 53)**

Thus, the RLA evaluated literacy skills based on answer sheets that required open constructed answers in 43-44% of the tests, and at the highest level in the aspect of *Reflection and evaluation* that includes both quality and credibility assessing, and reflecting on content and form. (OECD, 2019, 15)

The updated PISA2009 assessment also applied open constructed questions, in which students required to express their opinion and explain their answers with their own words. (OECD, 2009) In the print medium tasks, the percentage of open constructed response formats stayed at 43%, while in the electronic medium, it was 30%. *Chart 24* below shows the approximate distribution of tasks by coding requirements for PISA2009. The category “% of tasks required expert judgement in coding” refers to the percentage of open constructed response formats that are evaluated manually and comprises subjective judgement by the evaluator.

**Approximate distribution of tasks by coding requirement for PISA 2009: print medium**

Aspect	% of tasks requiring expert judgment in coding	% of tasks not requiring expert judgment in coding	% of test
Access and retrieve	11	14	25
Integrate and interpret	14	36	50
Reflect and evaluate	18	7	25
TOTAL	43	57	100

**Approximate distribution of tasks by coding requirement for PISA 2009:  
electronic medium**

Aspect	% of tasks requiring expert judgment in coding	% of tasks not requiring expert judgment in coding	% of test
Access and retrieve	0	25	25
Integrate and interpret	0	35	35
Reflect and evaluate	15	5	20
Complex	15	5	20
TOTAL	30	70	100

**Chart 24: Approximate Distribution of Tasks by Coding Requirement for PISA 2009:  
Print and Electronic Medium (OECD, 2009, 46-47)**

*Chart 24* also shows how high the percentage of the open constructed tasks are in the aspect of *Reflect and evaluate* (18% and 15%), which is the part of the survey where children could prove their reading comprehension proficiency in practice. Namely, when the task requires them not just to rephrase or interpret the texts, but also to apply the information, make their critical thinking mechanism work and phrase their individual and unique answer in written format.

*Chart 25* below presents PISA 2012's approximate distribution of score points by coding requirements, where the overall percentage of open constructed response formats was 42% both in the cases of print and digital reading.

Aspect	Print reading			Digital reading		
	Expert judgement required	No expert judgment required	Total	Expert judgement required	No expert judgment required	Total
Access and retrieve	4	18	22	0	19	19
Integrate and interpret	20	36	56	0	23	23
Reflect and evaluate	18	4	22	15	4	19
Complex	0	0	0	27	12	38
<b>Total</b>	<b>42</b>	<b>58</b>	<b>100</b>	<b>42</b>	<b>58</b>	<b>100</b>

**Chart 25: Approximate Distribution of Score Points in Reading by Coding Requirement for Each Reading Aspect in PISA 2012 (OECD, 2013, 71)**

In 2015, the RLA retained 42% of open constructed tasks, as *Chart 26* clearly shows:

Aspect	% of tasks requiring expert judgement in coding	% of tasks not requiring expert judgement in coding	% of test
Access and retrieve	11	14	25
Integrate and interpret	14	36	50
Reflect and evaluate	18	7	25
<b>Total</b>	<b>43</b>	<b>57</b>	<b>100</b>

**Chart 26: Approximate Distribution of Score Points in Reading by Coding Requirement for Each Reading Aspect in PISA 2015 (OECD, 2016a, 57)**

The problem is that in the case of the open constructed tasks, we cannot be sure whether a student comprehended a text well but did not have the skills to present her thoughts and answers in a proper, well-phrased written format or the wrong, poorly phrased answers reflect on her weak comprehension skills. According to research, it also occurs that some may perform better in oral tasks and exams, while others in writing and those who have difficulties in writing can be easily blocked down when facing an answer sheet. Thus, the results show a questionable picture of students' real reading skills. (Tavares, 1990; Olson, 2010; K12 Reader, 2016a; Graham, 2016; García-Arroyo, n.d.; Lee and Schallert, 2015; Lopez, Whalley, Robbins and Lister, 2008)

The inadequacy is more striking in the case of electronic/digital reading material. There, the notice „Write a Reply” implied that students could use and were familiar with keyboards to the extent that they can manage the task and form their answers. (OECD, 2009, 66) E.g., in PISA2015, when the complete assessment was done via computer, the role of writing skills should have been evaluated because of the application of keyboards and specific guiders. Disappointingly, the RLA ignored the affection of writing skills again, although accepted that

there „is research evidence that a computer-based testing environment can influence students’ performance in reading.” (OECD, 2016d, 58)

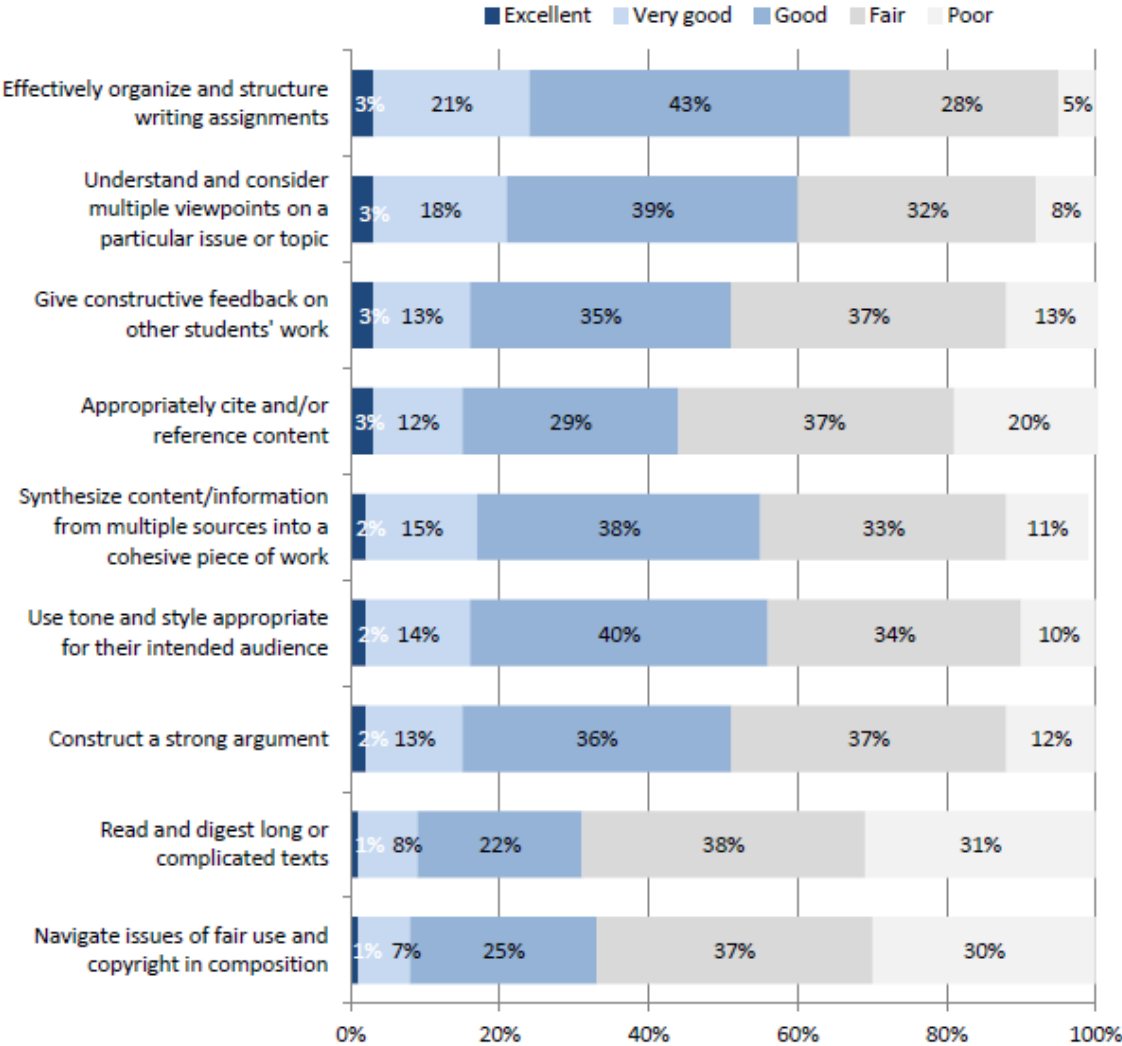
For instance, according to computer-media communication expert Sharmila Pixy Ferris, electronic/digital writing significantly affects traditional writing. Besides, to act writing in the digital space, writers need to acquire new skills. As she puts it, “the writer’s need to learn new and changing technologies. Although most computer word-processing software has the capability of conversion to hypertext, electronic writing requires a knowledge of computers and software. Skilled electronic writers need to incorporate the latest information-organization and design technologies.” (Ferris, 2002, 4) Moreover, she claims that the unique digital environment and form of text require new skills to recognise and understand the meaning and create electronically written texts. “Meaning is very often conveyed by cues recognized only by users of computer-mediated communication. Some examples are acronyms like BTW (by the way) and IMO (in my opinion), and specialized use of typography — for example, \*word\* to signify italics and the use of nonverbal icons or emoticons like a smiley face :- ) — which differ from traditionally recognized textual cues.” (Ferris, 2002, 3) According to this, it is a matter of question whether students use the less sophisticated elements and the loose composition style of digital writing, and if so, how it influences response quality and evaluation. And the term ‘use’ refers here to a much more complex set of skills that in the case of handwriting.

As urban literacy researcher Christie Martin and education expert Richard Lambert phrased in 2015: “To write digital texts, writers must learn to apply both paper-and screen-based writing competencies [...] digital writers use technology and design knowledge and skills developed from experiences with screen-based texts (e.g., choosing and arranging language and images on the screen, inserting hyperlinks or embedded objects to enhance meaning making, consuming related media, appropriating digital genre conventions). Digital writers need to develop [...] facilities to identify, access, manage, integrate, evaluate, analyze and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action, and to reflect upon this process. [...] In other words, learning to write digital texts involves also becoming familiar with and able to use tools, genres, discourses, and interactional conventions associated with digital writing environments to plan, compose, revise, and publish digital texts.”



(Martin and Lambert, 2015, 218-219) In short, digital writing requires practice in digital reading as well, and this can be crucial in literacy surveys. If a student is not familiar with digital texts, screen, and devices, but she is asked to read a digital text and answer the connected questions in a digital format, she will be double challenged. She probably will be struggling not just with reading, understanding the text, and phrasing her answers, but also communicate them in an electronic format.

Moreover, research says that “digital technologies are shaping student writing in myriad ways”. (Purcell, Buchanan, Friedrich, 2013, 2) Education experts Kristen Purcell, Judy Buchanan, and Linda Friedrich investigated the effects of digitalism on students writing skills and quality, based on 2,067 middle and high school teachers’ opinions. *Figure 39* below shows the result of the question: “Overall, how would you rate your students in their ability to do each of the following?”



**Figure 39: The Pew Research Center’s Internet and American Life Project Online Survey of Teachers, March 7 to April 23, 2012. (Purcell, Buchanan, and Friedrich, 2013, 4)**

The results are neither cheap, nor entirely satisfying in the regard of constructing a strong argument (49% ranked of the category of fair and poor), reading and digesting long or complicated texts (69% ranked of the category of fair and poor), or synthesize content/information from multiple sources into a cohesive piece of work (44% ranked of the category of fair and poor). Based on the research, what is for sure is that the digital environment has a significant impact on writing performance. (For more, see Grabill and Hicks, 2005; DeVoss, Eidman-Aadahl and Hicks, 2010; Noblesa and Paganuccib, 2015)

Despite research, the PISA RLA claimed that “overall, administration mode has no statistically significant effect on scores.” (OECD, 2016d, 58) Hence, the assessment considered writing as an “administration mode”, and not as a skill, which is strongly connected to, but also not identical with, text-reading and processing skills. In PISA2018, we got a more sophisticated process typology compared to the previous RLA cycles. However, names of the processes involved are telling: the *Evaluating and reflecting* units were trisected to *Assessing quality and credibility*, *Reflecting on content and form*, and *Detecting and handling conflict*. (See Chart 27 below). Based on the previous RLA practices, these processes were assessed by open constructed response items in the same percentage as in the earlier cycles.

2018 Cognitive processes	Superordinate Category Used for Scaling in 2018	2009-2015 Aspects
Reading fluently	Reported on PISA scale <sup>1</sup>	Not assessed
Accessing and retrieving information within a text	Locating information	Accessing and retrieving
Searching for and selecting relevant text		
Representing literal meaning	Understanding	Integrating and interpreting
Integrating and generating inferences		
Assessing quality and credibility	Evaluating and reflecting	Reflecting and evaluating
Reflecting on content and form		
Detecting and handling conflict		Complex

**Chart 27: Mapping of 2018 Process Typology to 2018 Reporting Scales and to 2009-2015 Cognitive Aspects (OECD, 2019, 37)**

In PISA2018, the issue of writing skills was reflected only in a superficial way by accepting the vital correlation between reading and writing. However, the document nailed down the following: “The PISA 2018 reading framework considers writing to be an important

correlate of reading literacy. However, test design and administration constraints prohibit the inclusion of an assessment of writing skills, where writing is in part defined as the quality and organization of the production. However, a significant proportion of test items require readers to articulate their thinking into written answers. Thus, the assessment of reading skills also draws on readers' ability to communicate their understanding in writing, although such aspects as spelling, quality of writing and organization are not measured in PISA.” (OECD, 2019a, 49)

Thus, it seems that ignoring the role of writing skills in the RLA was on purpose, text quality, and organisation of the written answers were not taken into consideration and evaluated, just the information that they provide. Therefore, the RLA did not differentiate between a poorly performed and a well-written text – if they contained the right keywords or information. This concept could be a good one if we think of the example of good text comprehension skills vs. poor writing skills. However, it does not handle the problem of misunderstandings (which originated from the ability and level of readers’ writing skills). It also does not reflect on the strong connection between reading and writing, and their effects on each other. Thus, the RLA should have given some solutions for the problems of open constructed response items, subjective judgement, and the influence of writing skills on response quality in the survey. If the aim was only to examine reading skills without writing skills, then open constructed response items would have been better to leave out of the survey. Even if, with an adequate appliance, they can give deeper information on reading literacy than multiple-choice response formats.

Moreover, there is an anomaly in PISA2018’s concept of ignoring the role of writing skills. On the one hand, it says that “because the focus of the assessment is on reading and not on writing, constructed response items should not be designed to put great emphasis on assessing writing skills, such as spelling, grammar, etc.” (OECD, 2016d, 31). On the other hand, PISA2018 – based on their previous results – claims: “Several studies based on PISA data suggest that the response format has a significant effect on the performance of different groups” (OECD, 2016d, 31). At first, designing an open constructed response item without “great emphasis” on writing skills, i.e., ignoring the quality and form of the written answer, seems unreasonable. At second, the RLA, relying on its own results, admitted itself that the role of writing skills has important effects on the results.

Bluntly, PISA2018 did not intend to assess writing skills, but reading skills – thus the quality and organisation of the answers did not count, and the response formats were designed according to this concept. However, the response items – especially the open constructed ones – “are particularly important for the reflection and evaluation aspect where the intent is often to assess the quality of thinking rather than the conclusion itself.” (OECD, 2016d, 31). Let us see two task examples in which ignoring the role of writing skills could be misleading concerning the quality of the answer. The first (*Figure 40*) is a print task from PISA2012, while the second (*Figure 41*) is a digital one from PISA2018. Both examples were assessed and evaluated in the final tests. Start with *Figure 40*:

And so the three mail planes from Patagonia,<sup>1</sup> Chile and Paraguay were returning from the South, the West and the North to Buenos Aires. Their cargo was awaited there so that the plane for Europe could take off, around midnight.

Three pilots, each behind an engine casing heavy as a barge, lost in the night, were contemplating their flight and, approaching the immense city, would descend slowly out of their stormy or calm sky, like strange peasants descending from their mountain.

Rivière, who was responsible for the entire operation, was pacing up and down on the Buenos Aires landing-ground. He remained silent, for until the three planes had arrived, the day held a sense of foreboding for him. Minute by minute, as the telegrams reached him, Rivière was conscious that he was snatching something from fate, gradually reducing the unknown, hauling in his crews out of the night, towards the shore.

One of the men came up to Rivière to give him a radioed message:

Chile mail reports that he can see the lights of Buenos Aires.

Good.

Before long, Rivière would hear this plane; already the night was surrendering one of them, just as a sea, swollen with ebbing and flowing and mysteries, surrenders to the shore the treasure it has tossed around for such a long time. And later on, it would give back the other two.

Then this day's work would be over. Then the worn-out crews would go and sleep, to be replaced by fresh crews. But Rivière would have no rest: the mail from Europe, in its turn, would fill him with apprehension. And so it would always be. Always.

Antoine de Saint-Exupéry, *Vol de Nuit* © Éditions Gallimard  
1. Southern region of Chile and Argentina.

**QUESTION 1**

How does Rivière feel about his job? Use the text to give a reason to support your answer.

.....

**Figure 40: PISA 2012 Print Reading Unit (OECD, 2013, 90)**

In this task, children were asked to give an individually constructed response and form a reasoned argument based on the information provided by the text. However, it is not clear what were the exact requirements of the answer: (a) to create one complete sentence, (b) a short paragraph (like a mini-essay), or (c) just list the right information and the supporting arguments in a bullet point form. Did the dotted line indicate the length of the expected answer or not? These questions are essential to decide on what to perform in order to fulfil the task.

Besides, the possibilities involve different writing processes and skills. In case (a), the mission is to create a well-formed, compound sentence, with carefully selected words, right fragment, comma splice, etc. In case (b), topic sentence, unity, and coherence come into the picture, with punctuation, proper beginning and closing sentences, etc. In case (c), the task is to find the right answer and supporting information, connect them, and organise them according to a logical order to create a meaningful argument. If the dotted line is supposed to indicate the length of the expected answer, the child probably chooses the case (a) and try to solve the problem of fitting a well-phrased response to the limited place. However, if the dotted line are not supposed to highlight the length of the required answer, then what does show the length limitation of the solution to be given? Since this task was a part of the print reading test, children needed to provide their answer in a handwritten format, that influenced the way of editing indents, the final physical length of the response, and the style of listing information.

Examining the issues above, one can discover three things. Firstly, to decide on which response strategy to use is not a simple task. Secondly, the choice of response format is influenced by the individual writing skills and knowledge of writing strategies. Thirdly, the process of giving a proper answer is more about writing skills (e.g., forming and editing sentences that fit the answer sheet) of the child and less about comprehension skills.

The second example (*Figure 41*) below is a digital one, displayed on an electronic screen.

PISA 2018

Question 7 / 7

**Rapa Nui**

Refer to all three sources on the right by clicking on each of the tabs. Type your answer to the question.

After reading the three sources, what do you think caused the disappearance of the large trees on Rapa Nui? Provide specific information from the sources to support your answer.

Blog Book Review Science News


www.theprofessorblog.com/fieldwork/EasterIsland

The Professor's Blog

Posted May 23, 11:22 a.m.

As I look out of my window this morning, I see the landscape I have learned to love here on Rapa Nui, which is known in some places by the name Easter Island. The grasses and shrubs are green, the sky is blue, and the old, now extinct volcanoes rise up in the background.

I am a bit sad knowing that this is my last week on the island. I have finished my field work and will be returning home. Later today, I will take a walk through the hills and say good-bye to the moai that I have been studying for the past nine months. Here is a picture of some of these massive statues.



**Figure 41: PISA 2018 Digital Reading Unit (OECD, 2019b, 19)**

Here the task was a complex one: children had to read three texts longer than the screen size, that they had to scroll down with the sidebars, and surf between three pages by clicking back and forth. The text was illustrated with a quite large picture (bigger than the text as seen on the screen), surrounded by specific elements (such as tabs, icons, and boxes), and shown in a divided window. The response box clearly marked the maximum length of the possible answer; thus, in this case, children were implicitly suggested to write a complete paragraph. Seemingly, they did not have the chance to edit the text, because there were no editing tools in the response box, they were expected simply to type their plain response texts.

Now, to answer the question, children needed to have practice using tabs and sidebars, scrolling up and down, and window-flipping during reading. They also needed to have the ability to ignore the left side of the window during reading, then focus on it again for answering. But most of all: they had to be skilled in digital writing, more precisely, typing. It means being familiar with the keyboard and practiced in typing electronic texts. As it has been already

discussed above, typing requires other cognitive and physical mechanisms than handwriting, especially in the case of children. If someone is practiced in both-handed or even ten-fingers typing, she does not struggle with the keyboard and can concentrate all her attention on phrasing her answer. However, if someone is not that skilled in electronic writing, usually mistypes and spends lots of time finding the letters and punctuation buttons on the keyboard, cannot concentrate on forming her response, but typing. This can occur in the case when someone is practiced in electronic text writing, but only with one hand. Students, who usually need to write their homework in handwritten format, but regularly use smartphones and tablets, are used to type with one hand or two hands, but two fingers (their thumbs). These practices cannot really help with the keyboard designed for a two-hands-ten-fingers typing style, especially because students need to perform the task in a limited time. Thus, the mechanism of writing the electronic text can be a challenge for students, a problem to solve, besides the main task of answering the question concerning the reading material. And we have not even talked about those elements of writing skills that are connected to phrasing and composing a text and needed in the electronic environment as well.

In conclusion, one can see from the above examples that writing skills have a significant influence on response quality both in the cases of print and digital. Children more skilled in writing will perform higher quality responses than the others struggling with composing, editing, typing, etc. As we have seen in the cited percentage of open constructed response formats of the RLA, it seems to be a mistake to ignore the influencing force of writing skills in the surveys. Especially because, despite of its statements, the RLA *did* take into consideration writing skills *implicitly* in the evaluation process but did not assess them *explicitly*. It is a significant methodological mistake with a profound effect and influence on the assessments' results and the evaluation process. Thus, the results of the RLA before 2018 seem to be questionable. PISA2018 has demonstrated a kind of awareness of the critical role of writing in the reading literacy assessment; however, its opposing claims lead to an inner conceptual anomaly. The RLA did not face the existing problem of children who read the actual texts but cannot solve the connected tasks because they have a lack of writing or composing skills or have difficulties in grammar both in paper-and-pencil and computer-based tests.



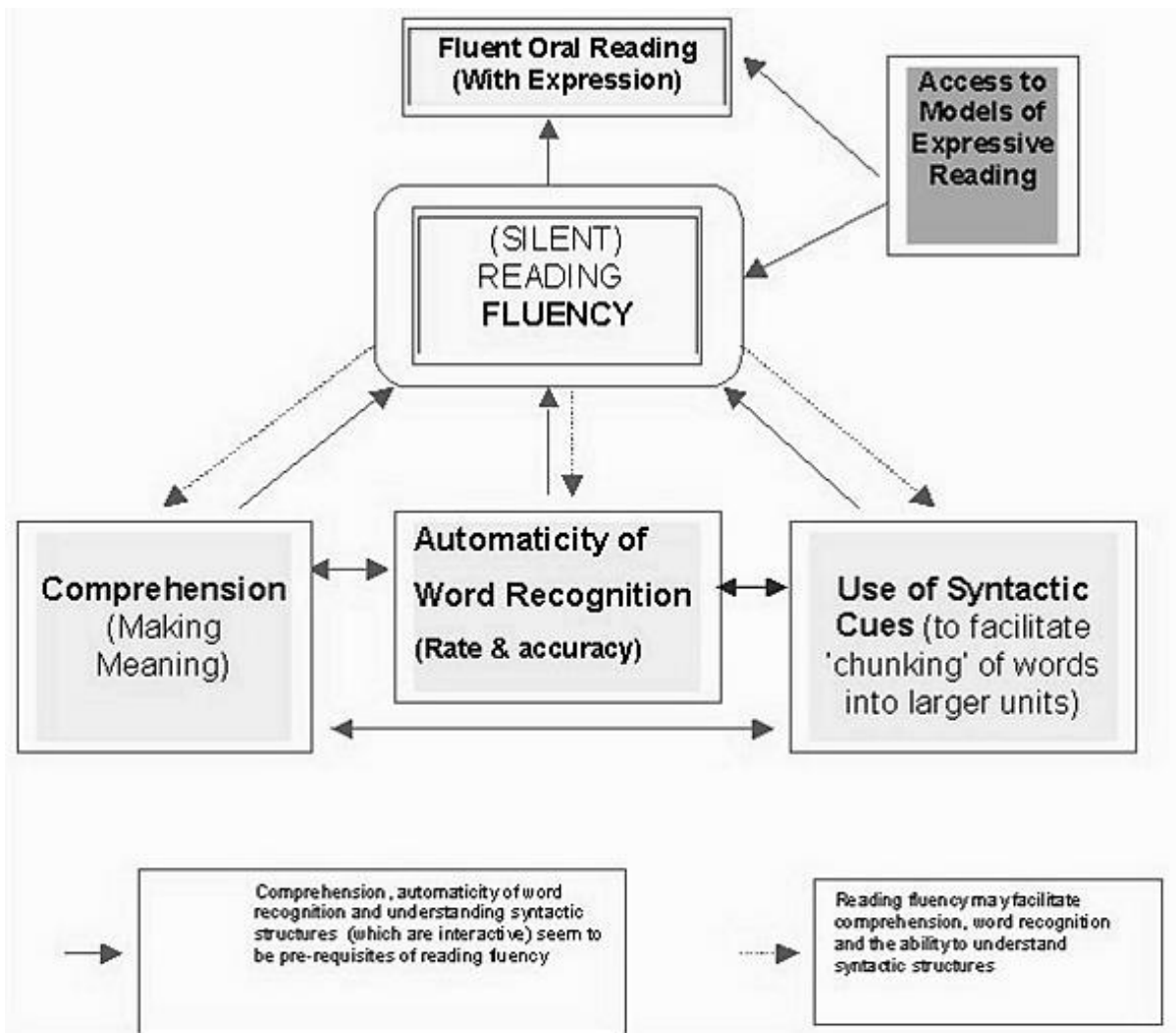
### 6.3. Ignoring the Factor of Reading Fluency

Another critical point of the PISA RLA is the issue of fluent reading, which seems to be out of the game in the testing process – from the very beginning. PISA2000 did not refer to it at all, and PISA2003 only said that „[...] OECD/PISA does not measure the extent to which 15-year-old students are fluent readers or how competent they are at word recognition tasks or spelling”. (OECD, 2003, 129) However, according to the literature, reading fluency is a significant indicator in text comprehension, with a massive effect on reading performance. REFERENCE

The term reading fluency is as sophisticated as the notion of literacy. Based on the literature, as for Mustafa Başaran, who teaches reading and writing assessment of literacy, summarised: reading fluency is “comprehending the text when vocalizing [...] reading of the readers in an appropriate speed and accurate manner with his/her natural voice [...] expressing the meaning in the text with an appropriate voice tone with prosody [...] the indicator all other components of reading including comprehension”. (Başaran, 2013, 2288) Besides, as cognitive scientist Marcie Penner-Wilger phrased, reading fluency is “the ability to decode and comprehend text at the same time”. (Penner-Wilger, 2008, 2) She named the three component skills of fluent reading: (1) accuracy of word decoding, (2) automaticity of word recognition and (3) prosody of oral text reading. (Penner-Wilger, 2008, 2) Thus one’s proficiency in fluency is indicated by how fast and accurately she decodes and recognises words and how she applies suprasegmental elements, such as intonation, tone, stress, and rhythm.

Fluency, as one can presume from the above, is in strong connection with reading comprehension; moreover, as the literature says, “robustly predicts performance on state reading tests across grades and states.” (Penner-Wilger, 2008, 4) Furthermore, “text-reading fluency skill can be considered a »proxy« for overall reading competence.” (Crosson and Lesaux, 2010, 476) *Figure 42* shows ICT and literacy researcher, Grace Oakley’s schematic representation of reading fluency and its relationship to comprehension as follows:





**Figure 42: Schematic Representation of Reading Fluency and its Relationship to Comprehension (Oakley, 2003, 3)**

Figure 42 shows that silent reading fluency involves comprehension (making meaning), automaticity of word recognition (rate and accuracy), and the use of syntactic cues (“chunking” of words into larger units). For oral fluent reading, expressive reading is required as well. These elements vary and depend on the readers’ abilities and the context. (Oakley, 2003)

Despite the above, the RLA took good basic reading skills for granted among 15-year-old students and did not face the problem that there could be students whose reading literacy problems are rooted in the fact that they have struggles with fluent reading. Moreover, proficiency in reading fluency depends on the reading situation, varies according to genres (e.g., magazine articles vs. academic papers), readability of the text, reader’s background knowledge, “and the priority the student gives to speed versus accuracy in the specific situation [...]”

(Penner-Wilger, 2008, 3). Thus, the assessment situation, when children need to read and answer questions in a limited time interval, influences students' fluency level, therefore their overall reading performance. Since "[...] reading depends upon the execution of myriad lower-level subskills (i.e., visual perception of letters and orthographic clusters, accessing their phonological representations) to enable higher-level semantic processing (i.e., organizing word meanings to seek coherence), [...] readers must perform most lower-level processes rapidly and nondeliberately in order to free cognitive resources for higher-level comprehension processes." (Crosson and Lesaux, 2010, 477)

For instance, students who have good abilities in fluent reading do not have to concentrate hard on the reading process itself or on how to find the meaning of, and connection between, words, phrases, sentences, paragraphs, etc. "Fluent readers are able to simultaneously decode and comprehend text. Given that both decoding and comprehension are difficult tasks, at least one task must be automatic in fluent readers. [...] Through extensive practice, readers become automatic decoders, able to quickly recognize a large lexicon of words. When decoding is automatic, attentional resources are available for comprehension, and metacognition (active monitoring and regulation of one's own reading). Decoding has a reciprocal relation with comprehension; when reading in an area of expertise, comprehension can aid decoding." (Penner-Wilger, 2008, 3-4)

In contrast, poor fluent readers must focus on decoding, word recognition, and sentence-connecting harder. Hence, they may not have the energy and cognitive effort to understand the meaning of the text. Research results of Rasinski et al. show that "high school students [...] read with a high degree of accuracy, [...] had to invest so much of their limited cognitive energy in accomplishing [...] task that they drained cognitive capacity away from where it could and should have been used more profitably – to comprehend the text." (Rasinski, Padak, McKeon, Wilfong, Friedauer, Heim, 2005, 25) These are especially true in the case of coping with various text types, since fluency level also varies by text type (e.g., list, chart, linear text, etc.) and "change as children develop reading skills". (Young-Suk, Wagner and Lopez, 2012, 107) Thus, reading material that was given in the test to be read presumably influenced the test results of reading fluency and comprehension as well. According to Crosson and Lesaux's findings, "the lexical quality of a word's representation is also central to efficient word-reading fluency, explaining that rapid retrieval of a word's meaning is also essential for comprehension. The key

premise inherent in all theories of automaticity is that rapid and accurate lower-level processing enables the reader to focus cognitive resources on higher-level processes. In turn, when lower-level reading processes are not executed automatically, comprehension breaks down.” (Crosson and Lesaux, 2010, 477)

It is also worth noting that the level of reading fluency, whether we talk about print or screen reading, is not equal to the level of comprehension. Slow or non-fluent reading is not necessarily equal to poor text comprehension or futile reading, and vice versa. (Walczyk and Griffith-Ross, 2007) For instance, the research results of Mustafa Başaran showed that “there was a weak correlation between reading speed and comprehension.” (Başaran, 2013, 2287) And: “the relationship between the speed of reading and especially in-depth meaning linking was low. [...] it is necessary to reach a reading speed parallel to speaking speed; readers who reach this speed cannot be thought as comprehending faster; even speed reading may influence comprehension negatively and students who read slowly may have problem in comprehending.” (Başaran, 2013, 2289-90)

Thus, research results show that “readers who have shifted from »learning to read« to »reading to learn« [...] fluency is more strongly related to reading comprehension”. (Crosson and Lesaux, 2010, 477) However, PISA2000, PISA2003, PISA2006, PISA2009, PISA2012, and PISA2015, there was no intention to involve fluency, and examine students’ fundamental reading skills, because “it is assumed that most 15-year-olds will have acquired these”. (OECD, 1999, 13) Instead, the RLA assessed the capability for “retrieving information, forming a broad general understanding of the text, interpreting it, reflecting on its contents and reflecting on its form and features”. (OECD, 1999, 13) However, this attitude is in sharp contrast with the RLA’s own, previously cited definition of reading literacy: “Reading literacy includes a wide range of cognitive competencies, from basic decoding, to knowledge of words, grammar and larger linguistic and textual structures and features, to knowledge about the world”. (OECD, 2009, 23) Later, in PISA2018, this definition was strengthened in the following way: “The framework fully integrates reading in a traditional sense together with the new forms of reading [...]”. (OECD, 2016d, 8) Since reading is a complex process, primarily based on the knowledge of decoding and recognising the grammatical elements, it sounds entirely unreasonable to ignore reading fluency.

Besides, possessing the skills of basic reading should not have been taken that evident, even among 15-year-old students. Notwithstanding the opportunity of regular studies and education in the participant countries – there can be regions where there is a lack of ability in fluent reading, or there are at least great differences between students’ proficiency. (Young-Suk, Wagner and Lopez, 2012; Barth, Catts and Anthony, 2009; Penner-Wilger, 2008; Hudson, Lane and Pullen, 2005) Since we do not know much about the standards according to which PISA selects its students for testing, this could occur even in such “elite schools” which have successfully passed the PISA’s pre-selection; therefore, they can take part in the assessments. In contrast, the RLA claimed that since “comparatively few young adults in our societies have no literacy skills, the framework does not call for a measure of whether or not 15-year-old students can read in a technical sense”. (OECD, 1999, 19) It can be true; however, between the two points: to “have literacy skills” and “have no literacy skills”, several stages can be found referring to the quality of one’s literacy skills. These are crucial factors, not to be ignored in a reading literacy assessment. (See Quirk and Beem, 2012; Wolf, Katzir-Cohen, 2001; Lai, Benjamin, Schwanenflugel and Kuhn, 2014; Denton, Barth, Fletcher, Wexler, Vaughn, Cirino, Romain and Francis, 2011)

In contrast with the previous RLA assessments, PISA2018 recognised the substantial role of fluent reading, claiming that the “framework incorporates constructs involved in basic reading processes. These constructs, such as fluent reading [...] are critical skills for processing complex or multiple texts for specific purposes. If students fail at performing higher-level text processing functions, it is critical to know whether it was due to difficulties in these basic skills in order to provide targeted support to student populations within educational systems”. (OECD, 2016d, 8) PISA2018 even referred to several research results (e.g., Jenkins, Lynn, van den Broek, Espin and Deno, 2003; Chard, Pikulski and McDonagh, 2006; Kuhn and Stahl, 2003; Kuhn, Schwanenflugel and Meisinger, 2010) presenting a strong connection between fluent reading and proficient reading comprehension. (OECD, 2016d, 17) PISA2018 even created its own definition for fluent reading as follows: “an individual’s ability to read words and connected text accurately and automatically and to phrase and process these words and texts in order to comprehend the overall meaning of the text [...] In other words, fluency is the ease and efficiency of reading texts for understanding”. (OECD, 2016d, 17) If one examines this definition, it reveals that it is not so different from the RLA’s definition of reading,

according to which it “is often understood as simply decoding, or even reading aloud” (OECD, 2016d, 11), among other characteristics. Therefore, reading consists of the capability of decoding texts and reading them aloud, while fluent reading is to do this automatically and easily, without serious stalling. Both types of reading aim to comprehend reading material. However, this distinction also means that another kind of reading also exists, namely non-fluent reading, which means reading slowly and difficultly with stalling and pauses. And these “weaknesses in reading fluency divert resources from comprehension towards lower level processes necessary to process the printed text, resulting in weaker performance in reading comprehension”. (OECD, 2016d, 17) Thus, with the distinction, the RLA admitted the influencing force of reading fluency correctly.

The issue is more complicated if we involve electronic/digital reading in the discussion. In PISA2015, when the assessment was conducted in an electronic form, reading fluency should have been in focus because of the different types of reading platforms. As it has already been cited, the RLA accepted that there „is research evidence that a computer-based testing environment can influence students’ performance in reading”. (OECD, 2016d, 58) However, later (on the same page), the following can be read: “it was hypothesised that 2009 reading items could be transposed onto a screen without affecting trend data”. (OECD, 2016d, 58) It seems to be a sharp contradiction, and from the RLA’s argument, we cannot presume that a platform shift has no effects on the decoding process at all, and on reading fluency either.

As PISA2018 remarked later: “with the exponential expansion of text content available on the Internet, there is an ever greater need for 21<sup>st</sup> century students to not only be proficient readers, but also efficient readers”. (OECD, 2016d, 32) It is a great mission; however, it is not entirely clear how PISA2018 helps to fulfil this need. In the framework document, we can find the following remarks on fluency: „Reported but not on PISA scale” (OECD, 2016d, 21), and later: “a separate subscore for reading fluency can also be provided as a measure of students’ ease and efficiency of reading. This subscore will not be reported on the PISA scale, but can be used to help interpreting student’s performance”. (OECD, 2016d, 37) Thus, the RLA assessed the level of reading fluency somehow but did not clarify the method how it had been done.

In conclusion, one can see that the RLA took reading fluency among 15-year-old students for granted, and this attitude was in contradiction within their framework until the construction of PISA2018. However, “fluency needs to be a concern for teachers at all grade levels, not just

teachers of beginning readers. It makes good sense that even older students who read with a lack of sufficient fluency will have difficulty comprehending what they read.” (Rasinski, Padak, McKeon, Wilfong, Friedauer, Heim, 2005, 27) Thus, ignoring the factor of reading fluency is the RLA’s severe methodological mistake with huge effects and influence on the assessments’ results and the evaluation process. Hence, the results of the RLA before 2018 are questionable. PISA2018 has started to reflect on the issue of reading fluency that can be considered as an improvement; however, it is not clear how the survey took into consideration the factor of fluency in the evaluation process. The problem could be solved with the reconsideration of the *Conceptual* and *Theoretical* background of the RLA that could reveal the effects of reading fluency on reading performance. Based on this, the *Methodological* background could also be updated. Without these steps, it is presumable that the incorporation of reading fluency to the framework is just an ad hoc solution to hide the deficiencies.

#### 6.4. Difficulties in Solving Onscreen Tests

As it has already been presented in the previous sections, the RLA started to involve digitalism in the assessments, and this tenor meant the application of screen and digital texts. We have already discussed how these changes influenced and modified the RLA’s conceptual and theoretical background, now let us have a closer look at the effects of the screen in the survey solving process.

Firstly, and most importantly, the RLA phrased: “There is research evidence that a computer-based testing environment can influence students’ performance in reading. Some early studies indicated that reading speed was slower in a computer-based environment [...], although these studies were conducted on proofreading tasks, not in an assessment situation”. (OECD, 2016a, 50) Besides, “[t]here is a large body of more recent literature on paper- and computer-based tests’ equivalency [...]; however these still reveal conflicting findings. A meta-analysis of studies looking at K-12 students’ mathematics and reading achievement [...] indicated that, overall, administration mode has no statistically significant effect on scores.” (OECD, 2016a, 50) The RLA agreed with this claim and kept itself to it during all the framework refreshments of PISA2009, PISA218, and PISA2015 when the whole survey was conducted digitally.

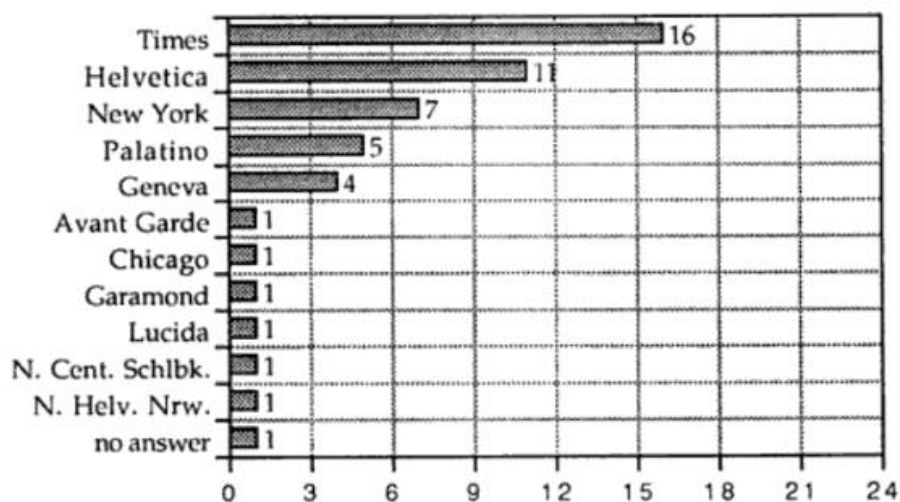
The RLA was right that research on paper-and-pencil (PP), and computer-based (CB) assessments have produced ambiguous results so far. “The two test delivery media may affect

different groups of participants in different ways and this concerns equity issues. Test administration mode affects participants' answering strategies as well [...] the perennial question of validity persists: what do computerized tests really measure?" (Csapó, Molnár and R. Tóth, 2009, 120) Most experts claim that shifting from paper to screen is more than changing the administration mode of texting, and affects error rates, response revision, and test filling speed, hence the overall response quality. For example, Wolfgang Lenhard, Ulrich Schroeders, and Alexandra Lenhard came to the conclusion that „reading on screen results in higher error rates, which can presumably be attributed to different motor and perceptual requirements and working styles. Such effects tend to decrease with proficiency of the reader and complexity of the task.” (Lenhard, Schroeders and Lenhard, 2017, 442) If errors occur not because children do not know the right answers to the questions, but because of the digital environment, then the results and evaluation of the whole survey become questionable.

As Lenhard, Schroeders, and Lenhard (2017) found out, ticking off the right answers in a paper-and-pencil test is based on the movements of fingers, hand, and arm, while in a computer-based environment only the fingers work – usually the trigger-finger makes tiny moves when clicking. This latter seems easier and much quicker; however, this is precisely the root of error: it is difficult to stop a quick click in the move if the responder changes her mind and would like to tick off another answer. Notably, a click can be realised by accident or unintended reflex, while in the paper-and-pencil case, this issue typically does not occur. And if we take into consideration time pressure, since we talk about tests with a limited time interval, the problem becomes more significant. If there is no time and opportunity to revise and correct an answer, going back to a previous task to refill the test, or phrase a better response, the final results will be misleading. Nevertheless, “even providing the possibility to review and correct answers in the CB [Computer-based] condition does not inevitably result in comparable error rates, because switching between items takes more time. In speeded measure tasks, this additional time effort would have adverse effects. It is important to note that higher error rates might be a consequence of either motor or perceptual demands.” (Lenhard, Schroeders and Lenhard, 2017, 439)

Another influencing factor is the font type of the text to be read. The triad of type size, the line length, and spacing, called together typeface, affects readability, as well the colour of letters, both in the case of print and digital. (Boyarski, Neuwirth, Forlki and Harkness Regli,

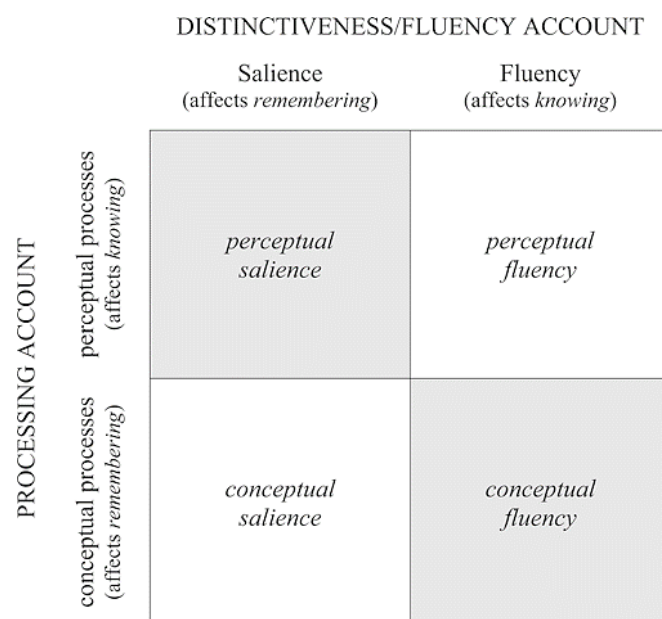
1998; Wille, 2003) Earlier research of Dan Boyarski, Christine Neuwirth, Jodi Forlki, and Susan Harkness Regli (1998) showed, that Times New Roman is the most commonly applied font type, both in print and online environment. Originally it was designed only for print texts; however, it became the default font type in the online space. Other two popular font types are Georgia and Verdana, that were designed for the screen, and their legibility makes them preferable. Patrick A. Holleran (1992) also investigated font preferences, specifically in the online space, and according to his results, Times New Roman was evaluated as best. See *Chart 27* below:



**Chart 27: An Assessment of Font Preferences for Screen-Based Text Display (Holleran, 1992, 451)**

According to recent research, “words written in unusual typography can stimulate a more detailed and clear memory. The same effect of stimulus salience on recollective experience was evoked by presentation of colored words in combination with the task to imagine the described object in that color.” (Wehr and Wippich, 2004, 146) (See *Figure 43*)



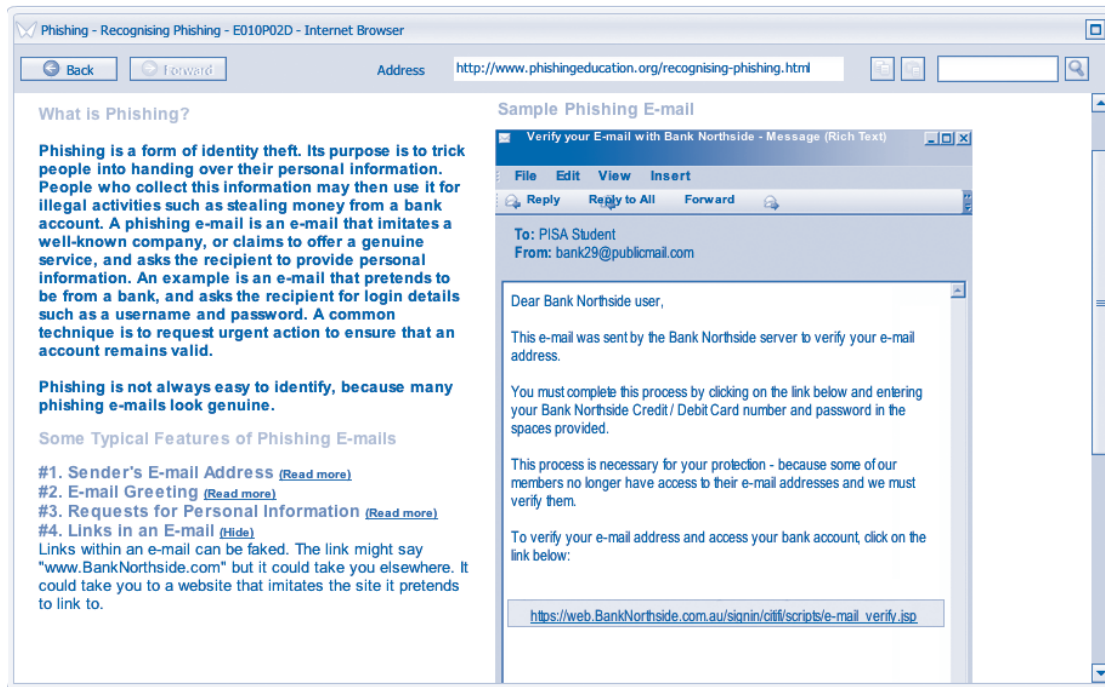


**Figure 43: Four-cell design to contrast the distinctiveness/fluency account with a pure processing account (Wehr and Wippich, 2004, 140)**

Based on the above, typography influences not just the readability of a text, but reading speed, reading fluency and memorisation as well. As it was demonstrated in another research, “optimal text sizes where [sic!] between 9 and 12 typographical points (as measured on the total height of the letters, including descenders and ascenders and normal leading). This applied to a typical reading distance of 25-35 cm. 9 typographical points equals 3,15 mm while 12 pts equals 4,2 mm.” (Wille, 2003, 102)

One can presume that eye-comfort and legibility of a text have positive effects on reading, therefore comprehension as well; thus, these factors should be handled with care in a digital reading assessment. Besides font type, another element that can influence the assessments’ results is the way how the items are arranged: itemwise or listwise. „The item presentation comprises a rather broad set of different aspects such as the need for saccades, distraction, time management, skipping, reviewing, and revising answers. Among these different aspects, the missing possibility to revise answers in the CB [Computer-based] condition seems to be most important.” (Lenhard, Schroeders and Lenhard, 2017, 439)

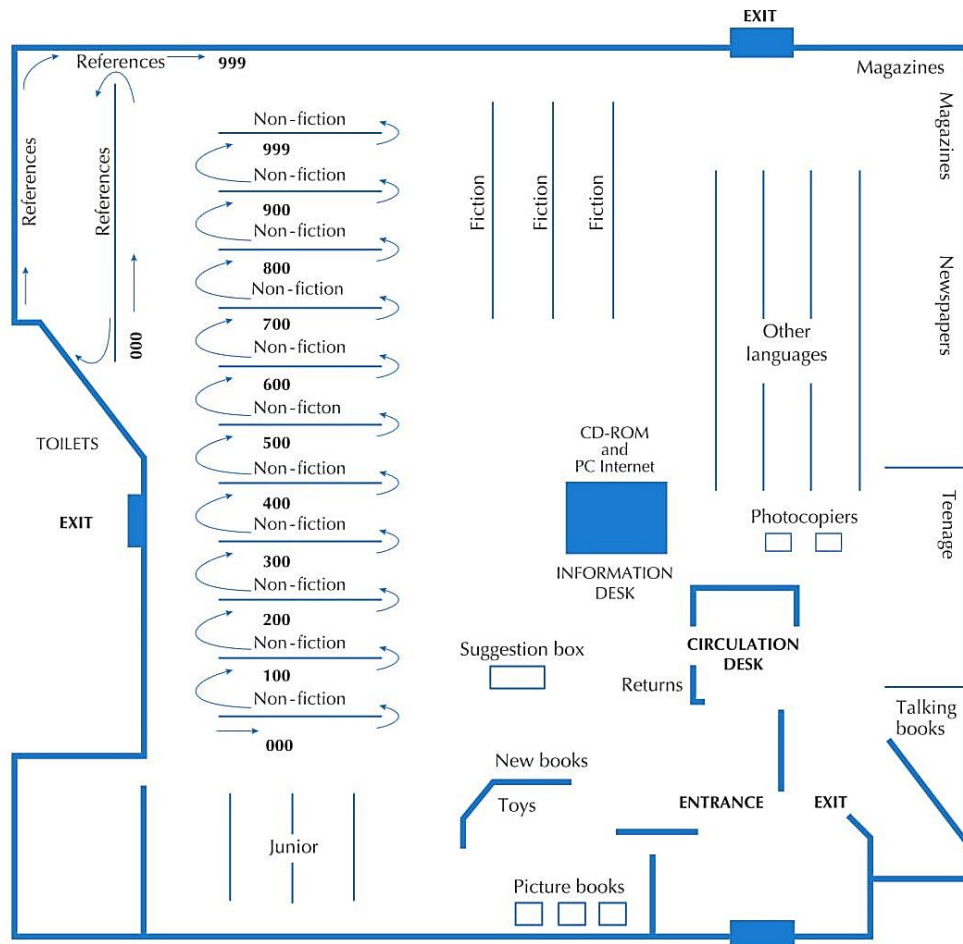
Let us examine three digital task texts from PISA2009 (*Figure 44*), PISA2012 (*Figure 45*), and PISA2018 (*Figure 47*) below:



**Figure 44: An Electronic Reading Sample Task from PISA2009 (OECD, 2009, 246)**

This first example (*Figure 44*) mainly consists of digital text, displayed on one screen, but two windows. The typeface seemingly edited in one style (sans-serif) and coloured in blue and grey. The e-mails look is left-aligned. It has parts edited in listwise (the bottom left side), itemwise (upper left side), and letter format (right side). It contains embedded links as well. The screen has a sidebar, menu strip with header, buttons, searching field, and a few icons (e.g., magnifying glass on the upper right corner). The reader is allowed to scroll up and down. The length of the sidebar suggests that the text continues after scrolling down. Scrolling horizontally is not allowed; however, a relatively wide area left blank on the right side. Presupposedly from the menu strip, children can go back (back button on the upper left corner); thus, the instructions are probably placed on the previous side. Based on the literature discussed above, the typeface, arrangement, the complete layout, and the allowable possibilities of navigation do not entirely support readability. Thus, it is a difficult task to read the task texts by default – it is a question whether by purpose or not. The analytical and framework document does not provide any answer.

The second example (*Figure 45*) represents a library map, so it is a visual text. Here the task is to leave a mark on the proper part of the text (i.e., draw a circle), according to the instruction below.



**QUESTION 1**

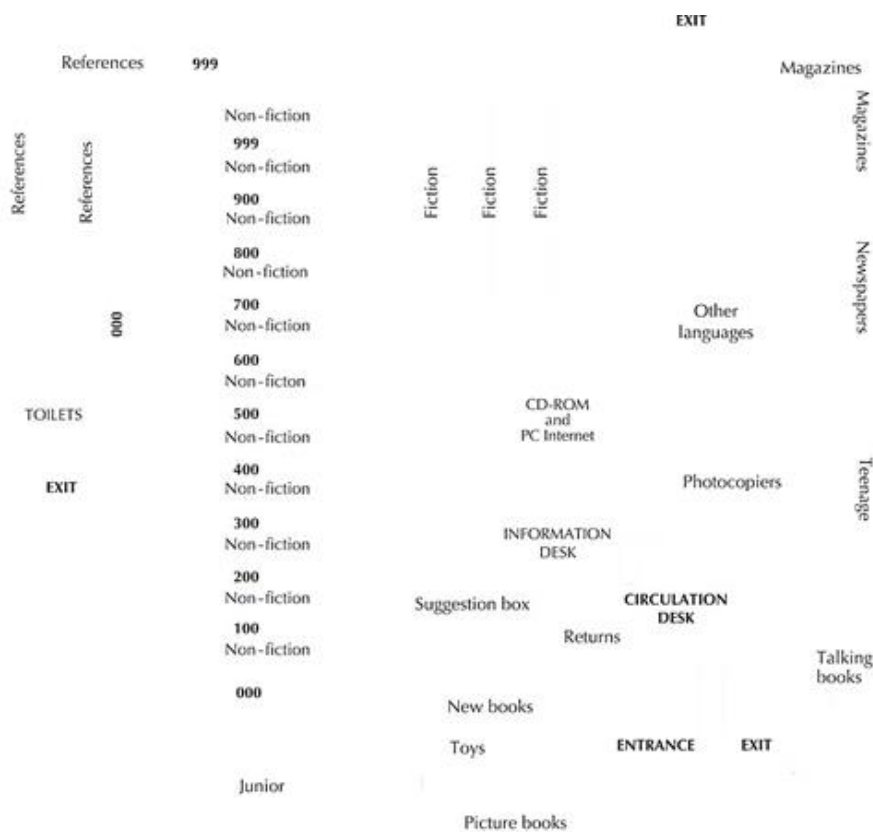
For school you need to read a novel in French.

On the map draw a circle around the section where you would be most likely to find a suitable book to borrow.

**Figure 45: An Electronic Reading Sample Task from PISA2009 (OECD, 2013, 81)**

This visual text is more a drawing, and less a text: the majority of it consists of lines, arrows, and geometrical shapes, with some numbers and words. The applied colours are blue and black, and the typeface of the words varies in style and size. Seemingly, there was no opportunity to zoom.

The actual text to understand is the question (what to do, what to look for), the signs, and the words on the map. This task can measure the ability of information seeking and meaning imputation to visual elements. What is interesting is that one can find the right answer (“Other languages”) without the visual elements of the map. *Figure 46* below shows how:



**QUESTION 1**

For school you need to read a novel in French.

On the map draw a circle around the section where you would be most likely to find a suitable book to borrow.

**Figure 46: Figure 45 Without the Visual Elements**

Moreover, even the arrangement is not necessary to answer the question: one could circle “Other languages” if the words on the map would be listed, as well. However, the task is not this simple, because, for the right response, it is essential to understand what “Other languages” and “section” mean in the context of the question *and* to mark it with a circle. Otherwise, we do not get a score. Since the task is displayed onscreen, children need to be skilled in drawing a circle with a mouse, which is more complicated than with a pencil. Supposedly, this task allows for making corrections (however, the screenshot presented in the framework document does not show the “Undo” button). What is also essential from the aspect of the visual for solving this task is to have good spatial ability (more precisely ‘planar ability’ or ‘planar vision’) and sight to find the right phrase on the map quickly. (Csíkos and Kárpáti, 2018)

The third example (Figure 47) is displayed on three windows. The first two are immediately visible on the screen, but for the third one, we need to click on the button “Text 1”.

**PISA 2018**

**Unit Title: Space Exploration**  
Question 2/5

Refer to both Scott Huffington's article and the comment section that followed it to answer the next question. Select all the choices that apply.

The author Scott Huffington and commenters Yoshi Kubota and Claude Messier disagree on some issues while agreeing on others.

Based on what you have learned, select the radio button for each person that would agree with the issue statement.

Issue Statement	Scott Huffington	Yoshi Kubota	Claude Messier
Enthusiasm for space exploration has decreased	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advances resulting from space exploration have slowed in recent years	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Both human and robotic missions are vital to space exploration programs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Text 1**    **Text 2**

**COMMENTS:**

**Yoshi Kubota: 05/17/2015 09:42 CDT**  
The perception that enthusiasm and commitment for space exploration has eroded is simply false. While funding for governmental agencies has been challenging due to a sluggish worldwide economy, enthusiasm for exploration on an international level is still high. Please note that 14 space agencies from around the world came together in 2007 to draft *The Global Exploration Strategy: the Framework for Coordination*. The purpose of the framework is to create a globally coordinated vision for human and robotic space exploration. Together, our space agencies have a very clear plan for space exploration. In fact, the framework was updated in 2014. Please read the attached copy of the global exploration strategy.

**Randall M. Kay: 05/18/2015 08:31 CDT**  
Scott, like Yoshi Kubota, I think you have misunderstood the current state of global space exploration. The ISS is allowing us to develop the skills and technology needed for deep space exploration. NASA, one of the members of the International Space Exploration Coordination Group that drafted *The Global Exploration Strategy* that Yoshi shared, has published a detailed plan for developing the technologies needed to send a manned mission to Mars. Low Earth orbit is the initial step, not the final goal.

**Claude Messier: 05/19/2015 12:42 CDT**  
This discussion is fascinating, but I do feel the need to point out a few corrections. It is precisely through space exploration that we will solve the problems of the world. With that said, Scott does have a point that advances in the Global Exploration Strategy are slow to materialize. Part of the reason is cost, but also a flexibility built into the Global Exploration Strategy. The article referenced by Yoshi presents a strategy that the moon is our next stop. However, the organization is currently exploring two strategies: moon next and asteroid next.

**Figure 47: An Electronic Reading Sample Task from PISA2018 (OECD, 2019, 70)**

The texts themselves are justified (on the left side) and not (on the right side), and there is an embedded, clickable chart on the left, where children could mark their responses. There is no sidebar to scroll or button to zoom, and the navigation tools consist only of icons (question mark and triangles) on the menu strip. Blue, black, red, and green are the colours that are used, and the typeface seemingly does not vary much. Making annotations in the texts is technically not allowed. The difficulty of this task is that children constantly need to change between texts in order to decide on the right answers. Besides, too many different kinds of information (both textual and visual) are visible together. Thus, it could cause difficulties for a technically un(der)practiced child to distinguish between the instruction and the task texts or handle the navigation tools confidently. Of course, it could be a purpose to evaluate how children manage



digital displays under the label of digital literacy; however, handling the device and comprehending a text are two different abilities. If the given device is not designed for doing the test, or the RLA does not have a say in device choice, the effect of the screen is more problematic.

Now, according to the above discussion of the visual, these three task examples are not among the ones that are simple to read. Just imagine how these tasks would look like, e.g., with different colouring, font style, arrangement, or without additional visual elements. This latter can help in the process of comprehension (e.g., highlights with different colours, underlines, or explicative visual elements), but they can also make texts less legible, or even distractive. Thus, editing, the style of printing, and the additional visual elements are important in the process of comprehension.

According to literature, readers usually use annotations, underlines, and highlights when they would like to understand a text more deeply, especially in the case of documents read for occupational (work or study) purposes. According to Catherine C. Marshall (1997)'s findings, readers apply the following annotations on the books during reading (*Chart 28*):

<b>Characteristics</b>	<b>Within-text</b>	<b>Marginal or blank space</b>
<b>Telegraphic</b>	Underlining; Highlighting Circles and boxes around words and phrases	Brackets, angle brackets, and braces; Asterisks, and stars; Circles and boxes around whole pages; Arrows and other deictic devices to connect within-text markings to other marginal markings
<b>Explicit</b>	Brief notes written between lines, especially translations of words in foreign language texts	Short phrases in margin; Extended notes in margin; Extended notes on blank pages in the front of the book; Problems worked in margins

**Chart 28: Characteristics of Annotations Written on the Books (Marshall, 1997, 135)**

These markings inside or outside texts help in the process of comprehension, memorising, and learning. Now, if we regard the RLA task texts as reading material to understand for occupational purposes (testing situation), one can presuppose that some readers would like to mark them in order to form a good response. In the case of paper-and-pencil tests, they can easily do it; however, on-screen test texts (in these specific cases at least) do not allow this kind of support.

If a child must read a complex text displayed on a screen window and answer questions in another screen window, she has to move forward and backward, continually clicking and changing between the different surfaces. She cannot mark the text, make highlights, underlines, or comments in order to form a better-quality response. She must memorise the passages where she found the necessary information or always reread the text. The former depends on the child's cognitive capacity, while the latter is time-consuming. As Roy Clariana and Patricia Wallace phrased, „computer familiarity is the most fundamental key factor in the test mode effect, especially for unfamiliar content and/or for low attaining examinees [...]. In general, [...] the higher-attaining students likely accommodated more quickly and so benefited more from computer-based assessment. Once all students are fully familiar with computers, then computer familiarity should become less important, though other factors associated with traditional testing are likely to emerge in computer-based testing, such as competitiveness, need for achievement, and independence, as well as new forms of »cheating«.” (Clariana and Wallace, 2002, 600-601)

Another significant difference of screen reading compared to print reading is reading path. The non-linear nature of digital reading, i. e., jumping from one section to another section of the text, clicking between the links and sites, zooming in and out of text result in a fragmental, active, and highly dynamic reading method. It makes text comprehension a much more complex process than print reading that is typically (though not necessarily) linear. (Pullen, 2006; Ulin, 2009; Cull, 2011; Walsh, 2010; Aarseth, 2004; Hillesund, 2010; Bearne et al., 2007)

A possible new metaphor for getting a better understanding of this process could be comic book-like reading. As comic book researcher Tamás Dunai puts it, “reading comics is a process that could be best compared to the active user's activity of the Internet” (Dunai, 2007, n. p.). From the point of view of comic reading research (see also Bolter 2001; Koós, 2004; Maksa, 2007; Kovács, 2009), I claim that digital reading can be similar to comic reading in several aspects. (Szabó, 2015)<sup>22</sup> *Chart 29* below shows a comparison between the two types of reading.

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<sup>22</sup> For the complete argument see: Szabó, 2015.

	DIGITAL READING	COMIC READING
<b>SIMILARITIES</b>	fragmental, non-linear, scanning, contents are freely walkable, hypertext/picture, hybridtext/picture, special cohesion and coherence, active user activity, several content type	
	DIGITAL READING	COMIC READING
<b>DIFFERENCES OF AIMS</b>	(storytelling) (entertaining) information gathering knowledge acquisition etc.	only storytelling and entertaining

**Chart 29: Comparison of Digital Reading and Comic Reading (Szabó, 2015, 173-174)**

In the cases of picture books and comics, as we have already discussed in *Section 5.4*, text and pictures together provide a third quality – the design element, the narration, the action, the “digital link”. This triple signal system (called multimodality) gives the meaning of each content. This triple sign system with the three qualities can be discovered in digital texts as well. I think that introducing the metaphor of comic-like-reading to the discussion of digital reading could serve a step forward to understand digital reading in the long run. (Szabó, 2015)

After having examined the effects of the screen on reading comprehension with the help of some task examples, what seems to be certain is that they should not be ignored; otherwise, the test results would be misleading. It is also „critical to realize that computer-based and paper-based tests, even with identical items, will not necessarily produce equivalent measures of student learning. Instructors and institutions should spend the time, cost, and effort to mitigate test mode effects.” (Clariana and Wallace, 2002, 601)

**6.5. The Effects of Motivation and Engagement on Comprehension and Reading Performance**

In the discussion of reading literacy assessment, the factor or motivation, engagement, and readers’ attitude towards reading are essential factors, because they heavily influence reading habits, chosen platforms, genres, and text types to read. Moreover, they affect text comprehension in several ways. As reading researcher Oddny Judith Solheim phrased in her study, “[w]e have by now comprehensive evidence for a connection between motivation to read and reading comprehension”. (Solheim, 2011, 3) She referred to Guthrie and Wigfield (2000)’s *engagement model of reading development*, according to which “reading comprehension is the result of a large amount of engaged reading.” (Solheim, 2011, 4)



A reader who is motivated to read a chapter of a book, an article, or a guide to reach a specific purpose, will focus her attention and cognitive efforts more willingly to the text. She will read and reread it carefully to get the meaning of it and try to avoid any distractions that could block her during this process. For a motivated reader, time is a tricky factor: one can be so much motivated as she does not care about time. However, on the other hand, she also can be motivated to achieve her goal as rapidly as possible – in this case, she puts efforts on being focused for that short term of time, and get as much information and experience from the text as she could.

Based on Baker and Wigfield (1999), children read mostly because of occupational reasons or performing well (for school, studying, doing their homework, competing, so when they must). In this case, three purposes could motivate them: curiosity, involvement, and importance. These are extrinsic, goal-oriented motivational factors to outperform others, get good scores, evaluation, appreciation, and rewards. “These different dimensions of motivation reflect the fact that children do much of their reading in school, where their reading performance is evaluated and compared to others’ performance. Thus, recognition, grades, and competition may figure prominently in their motivation for reading.” (Baker and Wigfield, 1999, 455)

In contrast, according to the literature, intrinsic motivation is rooted in need for competence, autonomy, and relatedness. (Ryan and Deci, 2000; Thomas and Oldfather, 1997; Vass, 2012, Vass, 2013) Thus, the intrinsic motivational factors of reading refer to inner, personal aims and purposes, that make someone to invest time, energy, effort, and attention in a reading material. It also comprises the desire to seek and construct the meaning of the text and comprehend it, both in the case of children and adults. That is why “an internally motivated reader will be more devoted to reading and thus comprehend better. [...] [A] desire to understand energizes the use of reading strategies by causing the reader to be metacognitive, whether it is by asking a question, forming a summary of what has been read, or activating background knowledge to build a fuller text representation.” (Taboada, Tonks, Wigfield and Guthrie, 2009, 98)

Thus, motivation in the case of text comprehension does not necessarily depend on the length of the text. Besides, text genre, type and quality trigger the reader’s motivation, no matter whether it is a serious fiction, a short leaflet, an information guide, a passage from the daily news, or a chapter of a study book. Moreover, motivation varies according to gender, age, and

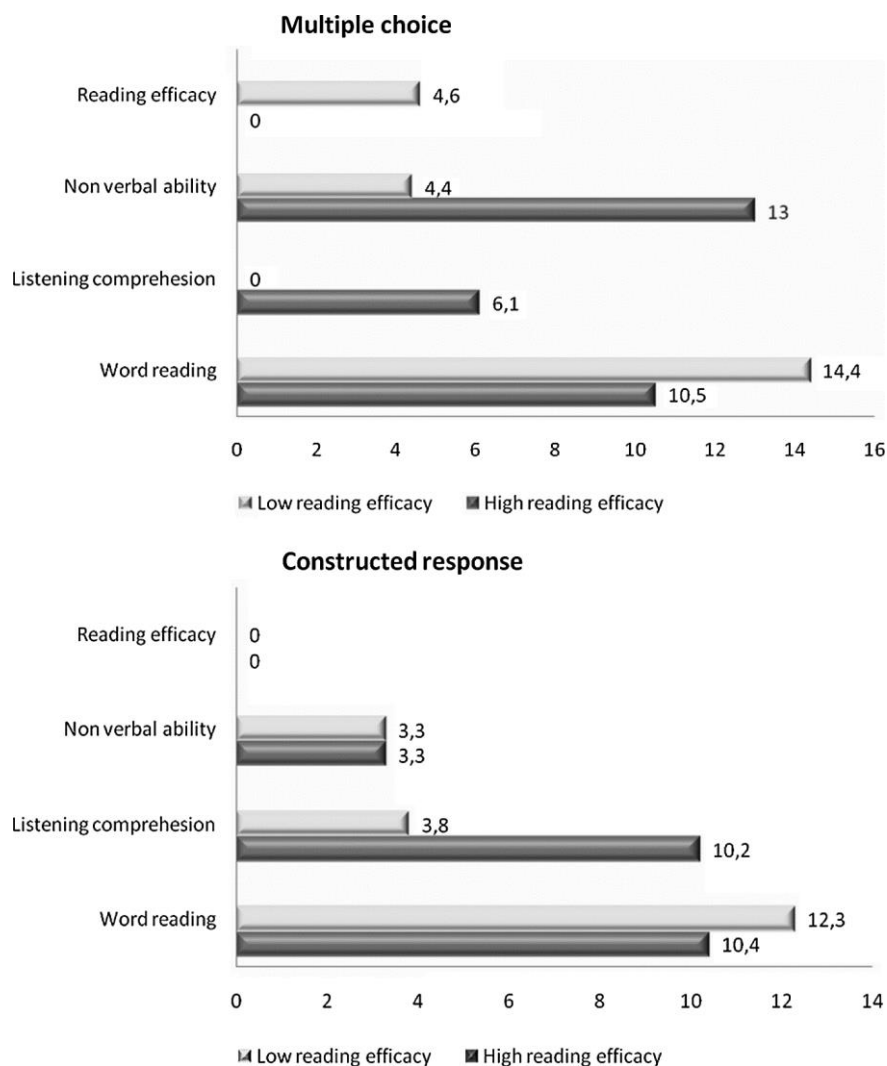
cultural groups as well; thus, it is not a standard attribute of reading. (van Elsäcker-Bok, 2002; Taboada, Tonks, Wigfield and Guthrie, 2009) Concerning reading platforms, we face with individual preferences again: some readers like to read hard copies, other online texts on digital devices. Printed vs. screen, e-book vs. tablet: these opposites and the arguments behind them are in the focus of many types of reading research. Here motivation, purpose, time, and environment are strongly connected. If someone is highly motivated to read a particular passage because of a specific reason, in a given time, for example, at the beach, she will be motivated to find the proper and available reading platform rapidly. However, if she prefers e-book to hardcopy, but the previous is not accessible or comfortable on the beach, but she is highly motivated to read that text immediately, she could choose hardcopy over the e-book, thinking that the reading platform does not matter. In this case, she could reserve her motivation, but also loose – i.e., the device counts for her indeed. Alternatively, she could put the text aside until she finds an e-book version – since her motivation is high but not that high to read on a platform that she does not like.

Research shows that “with intrinsic motivation exerting a positive effect on reading comprehension while extrinsic and escape motivation both affected reading comprehension negatively, for all groups.” (van Elsäcker-Bok, 2002, 198) Reading without real motivation leads to poor text comprehension because the reader will secretly seek for anything that could distract her from reading or could shorten the process. Her attention does not focus entirely on the given text but other things as well – and this profoundly affects her comprehension.

Reading motivation and engagement are clearly shown in literacy assessment results. The literature says, “when students are engaged in reading, they comprehend better and have stronger reading outcomes than when they are not engaged. [...] reading motivation predicts children’s amount of reading, which, in turn, predicts reading comprehension”. (Guthrie, Wigfield, Humenick, Perencevich, Taboada and Barbosa, 2006, 232) Under assessment circumstances, the whole process of reading, so as its factors, are highly manipulated. No matter how exciting and engaging texts are chosen to be read in the measurement process, they are text that *must be* read in a *given* platform, under time *control*, and naturally *stressful* circumstances. There is no point where children can individually decide whether to read or not to read, change text, reading platform, or use their time freely to read the actual text. Besides, they have tasks to do in connection with the texts. Thus, they are immediately forced to share their attention

between reading, comprehending, writing, and managing the text according to instructions, in short: they are forced to do multitasking. Knowing that they are under assessment, and their performance is measured, evaluated, compared, and ranked do not help to be motivated or reach a good level of comprehension. Thus, the tests survey students' performance under pressure, although, by intention, this is not among the researched components.

There is another factor that influences children's reading performances under assessment situations: confidence or self-efficacy concerning their text comprehension and task solving abilities. According to Solheim's findings: "self-efficacy in relation to reading predicted scores on a standardized reading test in middle school children." (Solheim, 2011, 4) In practice, it means that those students who are not confident and have low reading self-efficacy in reading produce worse results in reading comprehension tasks than those who are not struggling with these problems. Children who have doubts concerning their reading abilities "try to avoid challenging reading activities and tend to withdraw from tasks they perceive as too difficult". (Solheim, 2011, 4) However, literature shows that the effect of reading self-efficacy depends on item format and task given to solve; thus, there are differences between multiple-choice and open constructed response items. According to Solheim's findings, forming an answer to an open constructed question in a reading literacy test requires more energy, effort, and higher-level abilities than choosing the right solution in a multiple-choice test format. Thus, "scores on short-answer CR [Constructed Response] items can as a consequence be predicted by motivation to a greater extent than scores on MC items." (Solheim, 2011, 6) *Figure 48* below shows Solheim's results on this issue:



**Figure 48: Reading Comprehension in Terms of Multiple-Choice and Constructed-Response Comprehension Scores for Students with High and Low Reading Self-Efficacy (Solheim, 2011, 17)**

Assessment, as it has already been reflected in *Section 3.1.*, is a highly stressful situation, especially for children, and has a significant effect on confidence, motivation, engagement, and overall reading performance. Research findings show that “skill can easily be overruled by self-doubt, such that skilled persons make poor use of their capabilities under circumstances that undermine their belief in themselves. If certain test characteristics have this effect on some students, and if low scores thus reflect a lack of effort (caused by test circumstances) rather than poor reading comprehension, then this must inform the inferences we make about reading comprehension on the basis of test scores.” (Solheim, 2011, 5) Thus, what students think about

their reading skills is accompanied by those (true or false) beliefs that they ascribe to the testing situation. Their individual, group and school success, the importance of the assessments, teachers' thoughts about their performance, the expected results of the evaluation and their influence on future studies, etc. – the list of “fears” could be easily continued. (Solheim, 2011) In the case of reading research, where motivation and engagement naturally influence comprehension even without observation, researchers should be aware of these issues discussed above.

Now let us examine the RLA's attitude towards the influencing factor of reading motivation in the assessment environment. In PISA2000, children got a questionnaire that aimed to assess their reading practices, interests, and attitudes. (OECD, 1999, 37) “Attitudes toward reading, and motivation, are likely to influence reading practices and achievement; action can also be taken with regard to these aspects by the creation of favourable climate for reading literacy in and out of school. In OECD/PISA, this aspect is accessed by means of a number of targeted questions that require little response time [...]. The answers to these types of questions could prove to be less dependent on the compliance effects that are frequently observed in the assessment of reading practices.” (OECD, 1999, 38) In PISA2003 and PISA2006, motivation and engagement were not referred at all. In contrast, PISA2009 did a huge step forward: motivation, behavioural elements of literacy, and reading engagement were discussed in the framework document. The RLA included (a) individual engagement (motivational attributes and behavioural characteristics) and (b) educational context (the amount and breadth of reading activities). Concerning the former (a), the assessment gathered data about four characteristics: (1) interest in reading, (2) perceived autonomy, (3) social interaction, and (4) reading practices. Regarding the latter (b), the RLA focused on classroom reading engagement, including (1) relevance and (2) autonomy support. The data were collected through background questionnaires, where students needed to report their own attitudes, and motivational and engaging drivers. (OECD, 2009, 69-72) However, there were no reference to the above-discussed factor of motivation and engagement during reading assessment and their influence on reading performance, or on the evaluation process.

In PISA2012 reading was a minor domain, and the assessment did not gather data about reading engagement, and so was the same in PISA2015. (OECD, 2013; OECD, 2016a) In 2018, the last time so far when the framework of the RLA was updated, reading motivation and

engagement were referred, moreover, “self-efficacy, an individual’s perceived capacity of performing specific tasks, and self-concept, an individual’s own perceived abilities in a domain” (OECD, 2019, 52) were also investigated. However, these factors were not assessed in the main survey but only in the form of background questionnaires. They were considered as additional, supplementary data that did not have much impact on the evaluation and result interpretation processes. It seems to be a significant mistake, and not just in the light of the above-discussed literature, but also because even on the results of RLA demonstrate a strong connection between motivation and comprehension, and the significant effect of motivation, engagement, and self-efficacy on reading performance in reading assessment situation (see OECD, 2019, 50-51).

In conclusion, the cycles of the OECD RLA so far did not consider the factors of motivation and engagement in reading literacy assessment situation as it could be expected on the ground of contemporary literature, even if these factors can have a significant impact on the interpretation of test results. According to the analytical and framework documents, PISA gathered data on children’s motivation and engagement in the form of supplementary questionnaires, similarly to sociological background information (e.g., family and school circumstances, wellbeing, ICT tools accessibility, etc.), and not as an inbuilt organic part of the main survey. It is not the peculiarity of the RLA but fits into an unfortunate trend and should be handled with high awareness. As Allan Wigfield and his colleagues draw attention to this attitude as follows: “In today’s policy climate with a high level of test-driven instruction due to No Child Left Behind legislation, this implication merits attention from educators”. (Wigfield, Guthrie, Perencevich, Taboada, Kluda, Mcrae and Barbosa, 2008, 444)

## 7. Overall Discussion. Suggestions. Possible Further Research

This chapter aims to discuss the findings of the dissertation in the context of the research questions and hypotheses provided in *Section 1.2*. Based on these, some suggestions and possible further research directions are also included.

As it has already been referred several times, the OECD/PISA RLA's principal purpose is to assess children's reading literacy competencies to help educational improvement and policymaking. At the beginning of this analysis, it was a question whether the RLA achieves its goals or not. After having examined the OECD/PIRA RLA's analytical and framework documents from 2000 to 2018, focusing on their conceptual, theoretical, and connected methodological background, the following can be said in the context of the hypotheses:

- (1) The *conceptual* and *theoretical* backgrounds of the OECD/PISA RLA are un(der)determined or deficient in many cases.

It was the task of *Chapter 4* to discuss the conceptual grounding of the RLA, including the intentions, emphases, and considerations of each survey cycle. Based on the analysis, it has become clear that the overall intention of the RLA, i.e., assessing the reading skills of 15-year-old children in a broad understanding of reading literacy, was well-defined. The survey program phrased its literacy definition based on its antecedents and in harmony with the literature. However, it was claimed that the RLA's focus was on the *application of reading*, and this implied that there are other methods besides reading for acquiring the meaning of a text or a reading material. Thus, in a strict sense, the RLA did not examine text *comprehension* but text *application* – this shift suggested implicitly that, in reality, the emphasis was on reading tasks, tools, devices, displays, and text management.

In accordance with the conception, reading literacy skills were surveyed according to task, text, and situation, and beside traditional print reading, and from 2009, digital/electronic reading was incorporated as well. However, the assessments did not survey basic reading skills, but understanding, using and reflecting on written texts, later digital texts as well. Thus, 15-year-old children were handled as literate, and their basic reading and fluent reading skills were not assessed until 2018. Factors of motivation and engagement were added to the picture with delay, and writing skills were left out entirely.

Taking into account the literature on the topic, these are severe conceptual problems that affect the theoretical background of the assessment (i.e., the literature and theories incorporated

into the framework), and also the methodological grounding (e.g., task design, response format, and evaluation process) of the RLA.

Besides, it was also the aim of *Chapter 4* to present the analytical and framework structure of the assessment documents. According to the analysis, their structure did not change much through the years. They usually include sections of the actual goals, the definitions and organisation of the domain, task characteristics, assessment structure, reporting scales, other complementing issues, and references. Due to the updates, sections about text format, reporting outcomes, attributes of literacy assessment with print and electronic task building, discussion of reading proficiency, and task examples (PISA2006, PISA2009, PISA2012, PISA2018) are also given a place in the documents.

As one can see from the above, it is hard to distinguish between concept and theory by leaning on the RLA documents because their structures were not organised according to these aspects. This fuzziness strengthens the hypotheses about the un(der)determined or deficient conceptual and theoretical background of the RLA, since the analytical and framework documents blur them by structure, showing that they are not well-demarcated, evidently phrased and complete in many cases. This interweaved editing style can be discovered not just in the sections of the RLA, but in the whole assessment documents. By intention, it represents the integral nature of the surveyed areas in the level of assessing skills and shows how comprehensive and sophisticated the program of PISA assessments is. Compared to its antecedents, the OECD/PISA RLA, at a conceptual level, is unchallenged indeed so far.

*Chapter 5* aimed to discuss the theoretical background of the RLA in detail, i.e., (1) the applied reading theories and professional literature grounding on what the RLA based its assessments, including the terms of (2) reading literacy, (3) text and hypertext were given to read, (4) the visual, (5) reading strategies, and (6) the role of digitalism in the reading assessment according to the RLA.

Concerning reading theories and applied literature, the RLA documents presented their theoretical background in their lists of references. They mentioned some essential reading topics, relevant research, and authors. However, they are not integral parts of the framework documents, and there was no in-depth discussion of these topics and theories at all. With the awareness that the analytical and framework documents are not scientific studies, but descriptions of the assessments' grounding, it still can be claimed, that the exposition of the



theoretical background remained superficial. The RLA documents did not reveal precisely either the reading theories that they leaned on, nor their significance in the assessment design, or the evaluation process. This lack of knowledge and unclearness presented itself supremely on a definitional level when the RLA described its main terms.

The RLA's definitions of reading literacy were quite similar to the ones in the literature in the understanding of reading material, skills, application, learning process, and critical thinking. But their emphasis was on reflection, evaluation, and goal setting. The RLA did not give us any definition of digital literacy, not even of web literacy, and this was a severe theoretical mistake, regarding that digital reading was assessed from 2009, and PISA2015 conducted the full assessment on screen.

The RLA worked with various text types fitted to several situations and aspects, and these were in harmony with the literature on the topic. The text definitions included references to digital text and hypertext as well; however, their interpretation was sometimes confusing. E.g., in 2015, when the whole assessment was conducted digitally, the RLA claimed that there was no data collected on reading digital texts. This is an anomaly since *every* text that children read in that assessment cycle *was* digital.

In the discussion of definitions, the visual was mentioned from the beginning; however, the RLA did not give any definition of visual literacy or connected theory or concept. The assessments did not even involve the topic at a conceptual or theoretical level, which was a serious deficiency and disharmony with the relevant scientific literature. Especially that visuality has an essential role both in print and digital reading.

Regarding reading and comprehension strategies, they were discussed in the OECD/PISA RLA from the perspective of assessment and evaluation, and mainly as data collected from children by complementing questionnaires. However, they were not referred, distinguished, or applied directly in the framework; hence it is not clear on what reading comprehension strategies the RLA based its framework. There are several existing theories of reading comprehension and strategies according to medium types in the literature, and they should have been integral parts of the RLA by giving theoretical grounding and support to establish the assessment framework. Without them, the complete theoretical background remained one-armed at best.

Concerning the last topic examined from the theoretical background of the RLA, the surveys realised the significance and inevitable role of digitalism in reading literacy. The RLA tried to fit its theoretical framework to the literature and incorporated the influence of digitalism into the assessments. However, it failed to meet the challenge entirely. Despite the theoretical improvements and updates that accompanied the RLA cycles so far, some critical factors (e.g., digital text, the visual, digital writing skills, the effects of the screen on reading performance) remained neglected or superficial.

In conclusion, the conceptual and theoretical backgrounds of the OECD/PISA RLA were not entirely in harmony with the contemporary scientific literature on reading, literacy, text, the visual, comprehension strategies, and digitalis. Thus, I regard the first hypothesis confirmed, since both the conceptual and the theoretical background remained un(der)determined, or deficient in many cases.

- (2) The problems of the *conceptual* and *theoretical* background have a significant impact on the *methodological* background as well and that causes misunderstandings.

The second hypothesis was based on the assumption that the RLA fitted its methodological framework to the conceptual and theoretical frameworks.<sup>23</sup> According to the analysis, this hypothesis is correct; the applied conceptions, theories, both their advantages and deficiencies, had a determining force on the methodological background of the measurements. It was the task of *Chapter 6* to examine these issues in detail, including (1) writing skills and response formats, (2) reading fluency, (3) the effects and difficulties of the screen in solving reading literacy tests, and finally (4) motivation and engagement under assessment circumstances.

According to the findings, the three pillars of the observation on which the RLA leaned, i.e., text, task, and situation, were mostly well-developed. The assessments worked with various text and task types, multiple-choice and open-constructed response formats, and distinguished several reading situations. However, the theoretical deficiencies of defining text were clearly visible in the selection of texts and the design of task types. E.g., digital and visual texts were handled superficially in many cases, and their specific attributes did not appear steadily in the

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<sup>23</sup> The hypothesis does not concern PISA in general, but only and exclusively the RLA. For general discussion relevant to this hypothesis, see Csapó (2002), Csapó (2007), Csapó (2015), and Csapó, Molnár and R. Tóth (2009).

assessments. Concerning the situation, its notion was often confused with that of context, and they were understood and applied as equal categories. This was a mistake, since, according to the literature, the former means references within and between texts, background knowledge, or historical and social grounding of the reading material. In contrast, the latter is about the purpose and place of reading, including the application of the reading platform. This confusion influenced the categorisation of text and the meeting of task requirements (e.g., the required background knowledge to solve a task, reading an entertaining text in a testing situation on a digital device).

One of the significant problems of the methodological background derived from the deficiencies of both the conceptual and theoretical background is the neglected role of writing skills in the reading assessments until 2018. Even though the literature claims: writing skills have a significant influence on response quality both in the cases of print and digital reading tests, and the children who are more skilled in writing, will perform higher quality responses than the others struggling with composing, editing, typing, etc., the RLA did not take it into account. It can be considered as a huge mistake since the percentage of open constructed response formats of the RLA was significant in every assessment cycles. Despite its statements, the RLA *did* take into consideration writing skills *implicitly* in the evaluation process but did not assess them *explicitly*. This methodological deficiency had a profound effect and influence on the assessments' results and the evaluation process. Thus, the results of the RLA before 2018 seem to be questionable. PISA2018 had demonstrated a kind of awareness of the critical role of writing in the reading literacy assessment; however, its opposing claims led to an inner conceptual anomaly. The RLA did not tackle the very problem of children who read the actual texts but cannot solve the connected tasks because they have a lack of writing or composing skills, or have difficulties in grammar, both in paper-and-pencil and computer-based tests.

The case was similar with reading fluency. The RLA considered it among 15-year-old students for granted, and this attitude was in contradiction with their framework until 2018, even though the literature says that reading fluency has a significant influence on text comprehension. Thus, ignoring the factor of reading fluency in the RLA was a severe methodological mistake with a possibly huge impact on the assessments' results and the evaluation process. Thus, the results of the RLA before 2018 are, again, questionable.

PISA2018, as an improvement, had started to reflect on reading fluency; however, it was not clear how the survey took into consideration the factor of fluency in the evaluation process.

Creating a complex reading literacy skill matrix, as it was suggested in *Section 6.1.*, could help to clarify and describe more precisely the skills that the RLA measures and would also unfold these methodological deficiencies rooted in ignoring fundamental reading literacy skills.

Besides the skills discussed above, another ignored topic in the RLA's methodological background was the effect of the screen of reading performance. After having examined analytical and framework documents with the help of some task examples, what seems to be certain is that the RLA should have considered the platform of reading in its evaluation process. Due to the literature, reading on screen, managing a digital device, and digital text on the screen, with all the navigation tools, the specific attributes of the display, text layout, etc., could result in misleading test results.

The last examined item in the methodological background of the RLA was the effects of motivation and engagement under assessment circumstances. After the analysis, it can be claimed that the cycles of the OECD/PISA RLA did not consider the factors of motivation and engagement in reading literacy assessment situation according to the contemporary literature, although they could modify the interpretation of test results. The RLA collected data on children's motivation and engagement via supplementary questionnaires, and not as an inbuilt organic part of the main survey. It was not the peculiarity of the RLA but fitted an unfortunate trend that should be handled with high awareness.

In conclusion, after having examined the conceptual, theoretical, and connected methodological background of the RLA, I regard the second hypothesis confirmed.

- (3) If hypotheses 1 and 2 are correct, then the OECD/PISA RLA does not represent children's actual or real state of reading literacy competencies in many cases; thus, the assessments do not succeed in achieving their original purpose.

This third hypothesis aimed to point out that if the assessments are based on un(determined) or deficient conceptual, theoretical, and accordingly methodological background in many cases, and hence they lead to misunderstandings, then the assessments also lead to wrong results and conclusions. Moreover, the collected data and the interpretation of the results do not fulfil the requirements that the RLA explicitly undertakes.

It is the purpose of this chapter (*Chapter 7*) to decide on this issue. Now, after having examined the conceptual, theoretical, and connected methodological background of the RLA, and discussed the deficiencies and anomalies discovered in the analytical and framework documents, it can be claimed that we have firm ground to question what the reports represent about children's reading literacy competencies. Unfortunately, reading performance is detected only in a narrow circle, characteristically among teachers and parents who witness it in school and at home. But other types of reading performance and text creating processes, concerning various genres, prevalence and time interval are mostly not in the fore. That can explain the differences, between, e.g., in reading outcomes, in cases when students need to read belles-lettres and instructions. The former activity is a commonly known school task, which is practiced several times together with the teacher at school as well as individually or with parents as homework. In contrast, the latter, i.e., reading an instruction, such as a guide about the proper usage of a hairdryer e.g., is not a prevalent and school-practiced activity, notwithstanding that in everyday life children presumably face with the challenge and urgent need of understanding an instruction more often than understanding a novel. (Kárpáti, Molnár, Csapó, 2002, 65-90)

Actors who regularly face children's out of school/out of home reading literacy skills and performances, such as salesmen and administrators in shops, offices, entertaining centres, or controllers on public transport, e.g., are not in the position of giving feedback apparent for teachers or parents; therefore a high amount of reading performance remain hidden. In testing situation, the deficiencies of applying reading skills in out-of-school contexts mostly appear in poor reading performance, but in a misinterpreted way: sometimes the reason of underachievement is not that students do not understand the text, but the *problem* of the text. (Kárpáti, Molnár, Csapó, 2002, 65-90)

In sum, the OECD/PISA RLA is an unchallenged, respectable, complex, and high volume undertaking, with several useful data and results; however, there are problems with adequacy, relevancy, and interpretation of the results in many cases, derived from the conceptual, theoretical, and methodological failures. Thus, it is questionable to what extent the information is substantive and provides useful knowledge. Based on this, I consider the third hypothesis confirmed, with the stipulation that further research is required in order to get quantitative data on the issue.

- (4) Since OECD/PISA RLA has a great impact on educational policies all over the world, the problems phrased in hypotheses 1-3 could not only contribute to innovative methodology development, but in some cases, they could also mislead educational improvement connected to reading literacy.

The fourth hypothesis expressed that, due to the determining force of the RLA, the conceptual, theoretical, and the connected methodological issues are significant not just from the perspective of researchers but because of the consequences on educational improvement. It was the task of *Chapter 3* to briefly discuss the impact of the OECD/PISA assessments, and specifically the RLA's, influence on education, including the surrounding debates. Concerning the latter, one cannot forget the successful improvements of the OECD/PISA RLA, such as providing and making publicly available large-scaled, cross-country, comparable data about students' reading performance. It is worth to note that one third of the world population's reading skills is assessed; describing a wide range of reading proficiency levels; applying the notion of reading literacy in a wider sense, thus making possible to examine students' reading ability in a higher level than its antecedents; creating a completely new categorisation system to assess reading performance including text, task characteristics and situation; examining reading skills through various, newly developed reading tasks, answer sheets, diversified text types and reading situations fitted to the contemporary reading habits and practices; involving digitalism and screen in the assessment; that altogether is an exceptionally outstanding and unrivalled achievement not just in the history of assessing children's reading literacy skills, but in the case of adults' as well. It is also not a coincidence that the outcomes of the RLA have such a strong impact on shaping educational practices and policies concerning teaching and learning reading. (OECD, 2009; OECD, 2019a)

With high respect to the above, but considering the discovered anomalies and deficiencies of the RLA compelling, I regard the fourth hypothesis confirmed, with the stipulation that further research is required in order to get quantitative data to make the claim complete.

Now, having reviewed hypotheses 1-4, the following question emerges: is it possible that certain parts of the debates that surround the OECD/PISA RLA are originated from the deficiencies of the conceptual, theoretical, and connected methodological background of the assessments? If so, the consequences involve not just the OECD/PISA RLA, but also other

literacy assessments in general as well. For possible further research, the following, fifth hypothesis can be phrased:

(5) In some cases, an obsolete conceptual, theoretical, and methodological background can be the reason for divergent and often contradictory results or a misunderstanding of reading literacy assessments. It causes unnecessary tension and stress between those who are concerned with the field of reading research, teaching and learning reading literacy skills, and forming educational policies.

This fifth hypothesis refers to the problem that the deficiencies of the OECD/PISA RLA, are not unique or peculiar. What is more, they are probable attributes of other reading literacy assessments as well and carry similar consequences, such as presenting dubious results, misunderstandings, and triggering debates that do not serve improvements but conflicts in many cases. However, the validity of the fifth hypothesis mostly depends on the countries' culture and practice connected to pedagogical evaluations, on their ability of understanding and interpretation, and the application of the OECD/PISA RLA results in their educational innovations.

The task of (dis)confirming this last hypothesis can be a good starting point of possible further research. Since the program of the assessments continues in 2021, there will be fresh material to research and compare to the previous RLA' analytical and framework documents, or any other large-scaled reading literacy assessment as well.

## Conclusion

This dissertation has discussed the topic of reading literacy assessments, focusing on the Organisation of Economic Cooperation and Development (OECD)'s Programme for International Student Assessment (PISA)'s Reading Literacy Assessments (RLA). (OECD PISA, n.d.) These surveys gain enormous attention and trigger so many harsh debates all over the world that there is only one thing that seems to be certain: criticisms of the OECD/PISA RLA's research findings are reliable to a great extent. The dissertation analysed the OECD/PISA RLA analytical and framework documents from 2000 to 2018 (OECD, 1999; 2003; 2006; 2009; 2013; 2016a; 2016d; 2019a; 2019b) and compared them to contemporary theories and concepts of reading literacy assessments. The primary aim, in short, was to examine the cited documents of the OECD/PISA RLA and show the emerging conceptual, theoretical, and methodological deficits if there are any. Here the phrase 'conceptual' referred to the overall approach of the RLA, including the declared intentions, considerations, and framework structure. 'Theoretical' alluded to those principles, research findings, professional literature, and contemporary conceptions of reading literacy on what the RLA based or should have based its assessments. 'Methodological' meant only and exclusively those issues that were connected to the task types, response formats, and reading material, and those factors that affect reading performance, such as writing skills, reading fluency, motivation, and reading platform.

The first part of the dissertation (*Chapter 1*) has set the stage by introducing the guideline, undertakes, and disclaimers of the research, as well as presenting the questions, hypotheses, methodology, and some considerations of the bibliographical background. The second part (*Chapter 2*) has discussed the epistemological grounds of the research and clarified the key definitions and concepts of the domain. The third part (*Chapter 3*) has summarised the traditions, difficulties, and debates in reading assessments briefly and some assessing projects to put the OECD/PISA RLA into context. It has also provided an outlook on the Hungarian reading literacy assessments. Finally, the chapter has presented the OECD/PISA RLA mission, aims, goals, and cycles from 2000 to 2018.

The detailed critical discussion has started with the fourth part (*Chapter 4*), where the focus has been entirely on the OECD/PISA RLA's conceptual background and its problems. In the fifth part of the dissertation (*Chapter 5*), the topic of the discussion has been the RLA's theoretical background, putting it in contrast with the contemporary literature on the applied



terms and reading components of reading literacy assessments. The sixth part (*Chapter 6*) of the dissertation has shown the incompleteness of the methodological background of the RLA, including some influential factors related to reading. Finally, the seventh part (*Chapter 7*) has discussed the findings in the context of the hypotheses. It has shown that many problems of the RLA were originated from the un(der)determined or deficient conceptual, theoretical, and connected methodological background of the assessments that had been analysed in the dissertation. The chapter has ended with some ideas for possible further research as well.

There were four hypotheses to be (dis)confirmed:

- (1) The *conceptual* and *theoretical* background of the OECD/PISA RLA is un(der)determined or deficient in many cases.
- (2) The problems with the *conceptual* and *theoretical* background have a significant impact on the *methodological* background as well and cause misunderstandings.
- (3) Because of these problems (1 and 2), the assessments do not represent children's actual or real state of reading literacy competencies in many cases; thus, OECD/PISA RLA is not succeeded in achieving its original intention.
- (4) Since OECD/PISA RLA has a great impact on educational policies all over the world, the problems phrased in hypotheses 1-3 could not only contribute to innovative methodology development, but in some cases, could mislead educational improvement connected to reading literacy.

After having analysed the referred analytical and framework documents, hypotheses one and two were proved to be correct. Hypotheses three and four were also proved to be correct, but with the stipulation that further research is required in order to get quantitative data to make the claims complete.

Based on the findings of the analysis, the following question has emerged: is it possible that certain parts of the debates that surround the OECD/PISA RLA are originated from the deficiencies of the conceptual, theoretical, and methodological background of the assessments? If so, the consequences involve not just the OECD/PISA RLA, but also other literacy assessments in general as well. Accordingly, a last, fifth hypothesis was phrased at the end of the dissertation for possible further research, as follows:

- (5) In some cases, an obsolete conceptual, theoretical, and methodological background can be the reason for divergent and often contradictory results or a misunderstanding of reading

literacy assessments. It causes unnecessary tension and stress between those who are concerned with the field of reading research, teaching, and learning reading literacy skills, and forming educational policies.

The narrow target group of the dissertation is that of the researchers and teachers who are continually working on the improvement of the OECD/PISA RLA system. In a broad sense, the dissertation addresses all researchers and teachers who are interested in the enhancement of teaching and assessing reading literacy skills among children.

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## Attachments

### Attachment 1: The Reference Lists of the OECD/PISA RLAs, from 2000 to 2018

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**Figure 15: Bibliographical Background of the PISA2000 RLA (1) (Based on OECD, 1999, 73-75)**

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**Figure 18: Bibliographical Background of the PISA2009 RLA (Based on OECD, 2009, 80-82)**

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**Figure 19: Bibliographical Background of the PISA2009 RLA (Based on OECD, 2009, 80-82)**



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**Figure 20: Bibliographical Background of the PISA2009 RLA (Based on OECD, 2009, 80-82)**

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**Figure 24: Bibliographical Background of the PISA2018 RLA (2) (Based on OECD, 2019, 57-66)**

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**Figure 25: Bibliographical Background of the PISA2018 RLA (3) (Based on OECD, 2019, 57-66)**

## Attachment 2: About the Author

Krisztina Szabó is an Assistant Lecturer at the Department of Philosophy and History of Science, Budapest University of Technology and Economics (BUTE), Hungary. She absolved the academic requirements of the Doctoral Program of the Doctoral School of Philosophy and History of Science in autumn 2016, and she started the doctoral process in January 2020 at the Doctoral School of Philosophy, Faculty of Humanities, Eötvös Loránd University (ELTE). Between September 2017 and April 2018, she was a visiting scholar at the School of Education and English Language, University of Bedfordshire (UoB), Bedford, United Kingdom, in the framework of *Eötvös József Hungarian State Scholarship (Tempus Public Foundation)*. There she was tending to write her doctoral dissertation titled *Assessing the “Invisible” – Critical Discussion about the OECD/PISA Reading Literacy Surveys*. Her research interests include Online Reading and Text Comprehension; Digital Literacy; Reading Process; OECD/PISA Reading Literacy Assessments. She is also interested in Educational Improvement, Gamification and Crisis Communication. Her publications are available via this [link](#). She teaches Argumentation, Negotiation, Persuasion, Presentation Techniques, Rhetoric and Public Communication at BUTE. She regularly makes communication skills improvement trainings as well. She graduated from BUTE in 2013 as a Communication and Media Studies Expert specialised in Communication Design and Cultural Industries in the framework of MA in Communication and Media Studies Program.

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**Title of Dissertation:** Assessing the “Invisible” – Critical Discussion about the OECD/PISA Reading Literacy Surveys

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