An approach to Academic Success

Improving Second Language (L2) Reading Performance in Higher Education through Explicit Reading Strategy Instruction

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Improving Second Language Reading Performance in Higher Education through Explicit
Reading Strategy Instruction.

Een Aanpak voor Academisch Succes
Verbeteren van tweedetaal-leesprestaties in het hoger onderwijs door expliciete
leesstrategie-instructie

(met een samenvatting in het Nederlands)

Proefschrift

ter verkrijging van de graad van doctor aan de
Universiteit Utrecht
op gezag van de
rector magnificus, prof.dr. H.R.B.M. Kummeling,
ingevolge het besluit van het college voor promoties
in het openbaar te verdedigen op

vrijdag 19 november 2021 des middags te 4.15 uur

door

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geboren op 7 april 1962
te Birmingham, Verenigd Koninkrijk

For Jeff, Dara and Christy,
for you are *all* the words.

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Introduction

We were never born to read. Human beings invented reading only a few thousand years ago. And with this invention, we rearranged the very organization of our brain, which in turn expanded the way we were able to think, which altered the intellectual evolution of our species. (Wolf, 2007, p. 3)

For many of the world's population, reading is something they take for granted: they read in their first language with relatively little effort and without much preparation (UNESCO, 2007). Moreover, many of the world's citizens also read in more than one language, for many reasons and purposes: people read and interact with each other in English, but also in Chinese, or Spanish, Arabic, or French, to name just a few of the world languages used in daily interactions (McGroarty, 2006). Increasingly, global digitalization means that the world connects with each other faster, and in many different forms. However, this does nothing to change the fact that these new forms of communication have only increased our need for effective L2 reading skills and strategies in order to cope with the large amounts of information we receive and transmit on a daily basis (Grabe, 2016).

The rise of the English language as an academic second language (L2) has had a huge impact on the demand for English academic reading comprehension skills for students in higher education (Wilkens et al., 2013). College students read scholarly texts in English as part of their educational learning and professional development, or in order to later participate on the global stage, either for academic, economic, or professional reasons or for personal growth or leisure (Alexander & Jetton, 2000). The wish to be active and successful in today's digitalized world requires our students to have strong L2 reading skills: "*L2 reading skills represent a significant concern as people negotiate careers and seek advancement in modern economies*" (Grabe, 2009, p. 6). Therefore, it is essential that we provide our higher education students with the best possible opportunity to become skilled L2 readers, which will benefit them not only during their studies but also in their future careers and lives.

For successful reading comprehension, the use of reading strategies, in the first and second language, can be very helpful. Reading researchers such as Grabe and Stoller (2011) have underlined the importance of instruction in reading strategies to create more awareness of student reading behavior and possible reading comprehension pitfalls (Afflerbach & Cho, 2009; Macaro & Erler, 2008).

The studies presented in this dissertation are an attempt to gain insight into the effects of explicit L2 reading strategy instruction on the L2 reading comprehension performance of first-year students within a higher education institution. It explores this aim, firstly, through conducting a meta-analysis of international reading strategy studies. Secondly, by developing an L2 reading strategy intervention and implementing this into the curriculum of an institute for higher education in the Netherlands as a compulsory course for first-year students. And, lastly, by conducting three empirical studies into the implementation of the intervention, the effectiveness of the intervention, and the actual use of reading strategies by students after following the intervention. The studies described in this dissertation reflect a desire to contribute to the existing framework of L2 reading strategy instruction, and, as such, to supplement existing educational practice with theoretical research expertise, by

combining practice and theory in a collaborative project. This project's aims were to design, develop, implement, and investigate the effects of an explicitly instructed L2 reading strategy intervention on L2 reading comprehension within a higher education setting.

1.1 Practical Objective

The need to improve first-year students' L2 reading comprehension, at a University of Applied Sciences in the Netherlands, was a driving motivation behind the studies in this dissertation. Students studying at this type of institution are heterogeneous with regard to their L2 language ability and previous education. While most students entering this type of higher education have completed five years of compulsory English in secondary education, approximately 30% have followed a vocational type training and have had little to no experience with academic texts in English. These students struggle with the complexity, length, and difficulty level of such texts and L2 reading comprehension in general, resulting in them often failing their English exams. The failure to pass English exams has an impact on their study career by creating a bottleneck, as they may not graduate until they pass these compulsory exams.

During a redesign of the faculty curriculum, a design team of English teachers were asked to develop a new English curriculum. The team decided to create an L2 reading comprehension module that all first-year students of the faculty would have to follow. This evidence-based module would include explicit instruction on L2 reading strategies, with the intention of giving poor readers the boost they needed while helping adequate and good readers become even stronger ones.

1.2 Theoretical Perspective and Research Gap

Reading comprehension is a fundamental skill that involves many complex cognitive processes. These processes require the reader to interact with the text using a range of (meta)cognitive skills (Anderson, 2009). In order to create a clear understanding of the text, a reader must integrate any new information with what they already know, i.e. by consciously activating their background knowledge (Van Steensel et al., 2016). Reading strategies are these mental tools that a reader uses to deliberately and purposefully aid and achieve reading comprehension objectives, which can be both metacognitive and cognitive strategies (Afflerbach et al., 2008a). When a reader reads in their L2, transfer of knowledge and reading skills and strategies from the L1 to the L2 cannot be expected to happen automatically (Koda, 2007). Therefore, it is necessary to provide explicit instruction of L2 reading strategies to support L2 reading comprehension goals (Genesee et al., 2006).

The importance of explicit reading strategy instruction in building L2 reading comprehension has been promoted by reading researchers such as Block and Duffy (2008) and Grabe and Stoller (2011). However, there is little research into the effectiveness of explicit L2 reading strategy instruction (Hudson, 2007). Studies investigating the effectiveness of L2 reading strategy studies in higher education are particularly lacking (Taguchi et al., 2004). Meta-analyses conducted in second language reading research have contributed to the field; however, none so far have compared the effectiveness of individual L2 reading strategies while assessing their influence on L2 reading comprehension. The meta-analysis conducted in this dissertation was an attempt to fill the gap by attempting to determine the individual effectiveness of L2 reading strategies, thereby providing us with a list of effective reading strategies that could be used in an intervention.

Furthermore, explicit L2 reading comprehension instruction that includes an explicit focus on why, how, and when to use reading strategies can enable readers to become more self-regulated L2 comprehenders of text (Rapp et al., 2007). Grabe (2012) recommends that almost every aspect mentioned in his book should be pursued in research projects, as more research in L2 reading strategies means that a convergence of research findings may lead to better instruction techniques and improved ways of learning and studying L2 reading (McCardle & Chhabra, 2004). Nevertheless, in order to make progress in L2 reading, further studies need to be conducted as a means to provide evidence from which to draw new conclusions for educational innovations.

This dissertation is an attempt to contribute to the gap in the research. The studies described in this dissertation were set up in order to meet the need to improve existing L2 reading instruction in higher education, by adding evidence-based explicit L2 reading strategy instruction to the curriculum. At the same time, these studies were conducted in order to make a contribution to L2 reading strategy research, especially in providing support toward investigation into the effects of explicit L2 reading strategy instruction on L2 reading comprehension performance of students in higher education. A five-year doctoral grant from the Dutch Research Council (NWO) has made the studies included in this dissertation possible and provided the opportunity to bring the theoretical and the practical together. Furthermore, the grant provided a practicing teacher with the opportunity to become a doctoral researcher in her own area of expertise.

1.3 Relationships between the Different Studies in this Dissertation

The main research question that guided this dissertation asked what possible effect explicit L2 reading strategy instruction could have on the L2 reading comprehension performance

of first-year students within a higher education setting. The first step was to build on the work of other reading researchers before us. To this end, a meta-analysis of 46 international L2 reading strategy studies was conducted in order to determine whether L2 reading strategy interventions were effective on L2 reading comprehension. Also, to what extent the effectiveness of reading strategies had an influence on L2 reading comprehension performance. From this analysis, it was possible to extract a number of effective L2 reading strategies, which were incorporated in the L2 reading strategy intervention.

Based on this meta-analysis, an L2 reading strategy intervention was developed by a team of designers: four teachers and a teacher/researcher who worked collaboratively on the codesign of the intervention. The intervention was seen as an answer to an urgent problem, as students at our institute of higher education were experiencing difficulties with English reading comprehension. The intervention incorporated effective reading strategies gleaned from the meta-analysis along with a number of pedagogical approaches. The instruction method was based on the gradual release of responsibility model of Fisher and Frey (2013). In this model, the four phases of the lesson follow a system of gradually released responsibility from the teacher to the student. The design of the intervention enabled large numbers of students to participate in the treatment group, which was necessary due to the compulsory nature of the reading intervention in the curriculum. This also met a faculty goal: that all participating students be able to benefit from any possible gains that might ensue from following the intervention.

Once the intervention had been developed, it was important to determine how well it had been implemented. If the implementation of the intervention did not follow according to the intended design, it would be difficult to attribute any effects that might ensue from it to the intervention design. Therefore, the implementation process was investigated by determining how much in agreement the actual implementation was to the intended implementation, which corresponded accordingly with the guiding principles of the intervention.

Once the implementation process had been investigated and had been found to be satisfactory, the next step was to determine the effectiveness of the L2 reading strategy intervention on L2 student reading comprehension performance. Three treatment periods were conducted during one academic year, in which first year students of a complete faculty participated. A large effect was found for the intervention, and on average, student reading comprehension increased after following the intervention.

The last step was to investigate what and how much students read, in and out of school, by conducting an in-depth investigation into student reading behavior, reading frequency,

and preferred genre of reading. The researchers also wished to examine the knowledge and actual use of the L2 reading strategies learned by students during the intervention.

1.4 Dutch Educational System

The Dutch educational secondary school system divides students into three different levels according to academic ability in an assessment of the last few years of primary education, as well as the teacher's advice[1]. Typically, about 70% of students following a bachelor degree at a University of Applied Sciences (hbo) will be students with a general secondary education (havo). However, approximately 30% of students entering this institution have followed a vocational and educational training (mbo). Mbo students may continue their studies at a hbo institute on completion of their mbo study. The institution featured in this dissertation is a hbo type institution, and students follow a four-year study that leads to a hbo bachelor degree.

1.5 Outline of this Dissertation

This dissertation contains seven chapters. In Chapter 2, the findings of the meta-analysis investigating the effectiveness of 46 L2 reading strategy studies are reported and discussed. This chapter details the meta-analysis process of searching for studies, exclusion criteria, organizing the reading strategies, coding, analysis, and interpretation.

Chapter 3 describes how the team of English teachers and the researcher created, designed, and developed an L2 reading strategy intervention based on the meta-analysis of Chapter 2, during a process of collaborative codesign. The process that led to the creation of the design principles, method, and teacher guidebook is outlined in this chapter. Further, Chapter 3 explains the training that teachers received in order to implement the intervention as part of their professional development training.

The focus of Chapter 4 is the implementation of the intervention and how faithfully teachers executed the intervention according to the intended curriculum. Teachers kept logbooks and were observed teaching during whole-class observations. The findings of whether the implemented curriculum agreed with the intended curriculum are detailed and discussed in this chapter.

Chapter 5 explores the treatment, results and effectiveness of the L2 reading strategy intervention, in which first-year students participated in three identical treatment waves. Students followed the L2 reading strategy intervention, in which they received explicit instruction on why, how, and when to use reading strategies. Instruction was scaffolded and included opportunities for the students to practice together. Students made three reading comprehension tests of equal difficulty at three moments during the intervention. The results and effectiveness of the intervention are presented in this chapter.

The focus of Chapter 6 is an in-depth study. This study investigates the reading behavior, reading genre, and reading frequency in the L1 and L2 of a sub-sample of students. Students were interviewed about their knowledge and use of L2 reading strategies after following the intervention. Their use of reading strategies, reading frequency, and reading preferences were analyzed together with their reading comprehension results.

Chapter 7 summarizes the main results and findings and discusses the relationships between the studies and the implication these could have for L2 reading instruction, further research, and future educational settings.

Chapters 2, 5, and 6 were written as stand-alone articles, as they were submitted for publication in academic journals. They can be read independently, as they contain separate information on background, method, and procedure. For this reason, there might be some overlap encountered when reading the entire dissertation. However, the chapters mentioned each explore a specific aspect of this investigation and portray a different facet of the main research subject of the dissertation as a whole.

This dissertation and the research it contains would not have been possible without the support of the incredible English team, who are the most dedicated, supportive teachers and colleagues one could ever wish for. This team worked tirelessly, enthusiastically, and professionally to create, develop, and teach the reading strategy intervention to the very best of their abilities. And of course, to the marvelous and talented students who followed the intervention, and to whom this dissertation is respectfully and humbly dedicated: thank you.

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1   For further explanation of vmbo, mbo, havo and vwo, see Michel et al., 2021

CHAPTER 2

Improving Second Language Reading Comprehension through Reading Strategies: A Meta-analysis of L2 Reading Strategy Interventions

Effective readers consciously or unconsciously use reading strategies to help them process information on what they read. All readers can benefit from reading strategy instruction, but empirical research on which strategies are effective is lacking. Less is known about reading strategy effectiveness in a second language (L2). This meta-analysis of 46 L2 reading strategy studies analyzed 10 reading strategies, also in combination with a range of pedagogical approaches, and found an overall mean effect size of *0.91,* underscoring the benefits of multi-strategy teaching. Effect sizes were calculated for each strategy, as well as the combination of strategy with approach, instructor type, intervention duration and type of test used. Some strategies were more effective than others. Also, differences in effect sizes are dependent on the approach used. Some pedagogical approaches are effective for some strategies but not with all. We recommend further research in L2 reading strategy interventions and instruction.

Keywords: L2**,** reading strategies, meta-analysis, intervention, education.

2.1 Introduction

As soon as we are able to read by ourselves, we start to become independent acquirers of information, making the ability to read, perhaps, one of the most important cognitive skills we will ever master (Ali & Razali, 2019). While we read, we construct meaning from the text by connecting the unfamiliar to that which is already familiar, hence acquiring new information and knowledge (Bimmel et al., 2001). Therefore, the transition from learner reader to reader learner (Wigfield et al., 2016) is an important one. Being in control of one's own learning forms a crucial step in our own cognitive development (Paris & Paris, 2001).

Once a child becomes independent in their reading, the young reader will develop their reading skills and strategies further to enable them to learn faster and help them achieve their academic goals (Enright et al., 2000). The concern is whether students have achieved effective and efficient reading skills by the time they exit (formal) education (Chall et al., 2009). Students in full-time education who experience difficulties in comprehending complex and detailed study texts may have not yet developed the sophisticated reading comprehension skillset that these texts require in order to be understood sufficiently (Lee & Spratley, 2010). Furthermore, these students may be unaware of the relationship between their metacognition and its crucial role in monitoring their reading comprehension (Solórzano-Restrepo & López-Vargas, 2019).

The ability of reading comprehension can be defined as the purposeful application of a set of complex cognitive processes, skills, and strategies that combine in such a way as to enable the reader to comprehend textual information and to interpret it accordingly (Grabe & Stoller, 2020; Hedgcock & Ferris, 2018; Koda, 2005). A study by the International Association for the Evaluation of Educational Achievement found that secondary school children were likely to be at a disadvantage in subjects such as science and mathematics if they lacked effective reading skills, as all subjects are effectively text-based. Their conclusion was that better readers outperformed lesser readers with similar mathematical and scientific ability, according to the relationship report on reading, mathematics, and science achievement (IMSS & PIRLS, 2011). As a result, policy makers have endeavored to enhance teaching and learning in mathematics; however, without improvement in reading comprehension skills, there will be limited benefit (Cohen & Ball, 1990). Furthermore, students who have experienced difficulties with their reading comprehension, upon entering higher education, may find themselves unable to meet the substantial reading demands that their studies entail, which in turn could lead to an unnecessary prolongation or at worst, an inability to complete their studies (Kordes et al., 2013; Dreyer & Nell, 2003). Vocabulary and comprehension have been long neglected subjects of instruction in the primary grades and still appear to be neglected in secondary and higher education (Duke & Block, 2012).

Reading strategies are defined intrinsically as the conscious and unconscious steps readers take to correct and improve their comprehension of written text (Oxford, 2016), which can be both deliberate and goal-driven (Yang, 2006). Reading strategies have been described as an ongoing "inner conversation" that helps the reader decide between what is important and unimportant (Allen, 2003, p. 320). Furthermore, pertinent from the longitudinal study of Van Gelderen et al. (2007) is the importance of teaching metacognitive reading strategies (Pinninti, 2016) in order to consciously repair faulty comprehension by employing compensatory reading strategies while being supported and facilitated by the teacher of the class (Macaro, 2001). Indeed, most reading strategy instruction includes some form of focus on metacognition, if only to create more awareness of one's reading behavior and comprehension pitfalls (Macaro & Erler, 2008).

Fully informed awareness instruction, in the form of metacognitive instruction, has been found to result in higher reading performance than non-informed metacognitive instruction (Aghaie & Zhang, 2012). Informed instruction would involve teaching the purpose of reading strategies as well as their application, because when readers are more aware and are informed of the goals, process, and purpose behind reading strategies, they are more able and likely to duplicate the reading behavior of proficient readers. In this way, the why and how of applying strategies forms the knowledge that acts as an "adhesive," affixing skill and will together (Teng, 2020).

A proficient and effective reader possesses the ability to unconsciously and effectively apply reading strategies when necessary in a rapid, frequent, efficient, and fluid fashion at any point during the reading process (Anderson, 2004; Hassan, 2017; Yoshikawa & Leung, 2020). However, less effective readers may find that reading strategies can play a contributory role in the development and acquisition of successful reading skills (Cain et al., 2004; Cho et al., 2018; Pressley & Afflerbach, 1995). Moreover, students who are in possession of a range of strategic reading skills seem to be more successful in expanding and organising their learning via their reading (Huang & Chang, 2019). Given our current reliance on technical appliances such as computers and mobile devices in educational settings, combined with the text-based nature of all academic subjects, it is fair to assume that we are likely to make even greater, rather than lesser, demands on our abilities in reading (Grabe & Stoller, 2020).

Meta-analytical studies of first language (L1) reading interventions, such as Grabe and Stoller (2011), have pointed to the beneficial effects of teaching reading strategies on L1 reading comprehension performance. In these meta-analyses, an overall effect size was applied to indicate effectiveness. Rosenshine et al. (1996) meta-analyzed 26 studies in which L1 students were taught the cognitive reading strategy of asking oneself questions while reading, with overall effect size results of .36 and .86 using standardized tests and non-standardized tests, respectively. Berkeley, Scruggs and Mastroplieri (2010) analyzed

70 interventions of content area instruction for students with mild to severe learning disabilities in which L1 reading strategies as well as information technology (IT) skills were included, and found a large overall effect size of 1.00.

As citizens of the world become multi-lingual, second language (L2) proficiency in a commonly used second language, such as English, is in great demand in areas such as science, technology, and research, as well as many other professional and social communication forms of information transfer. Scientific journals and articles, for example, are increasingly written and consulted in a second language (Grabe & Stoller, 2011), making it more and more necessary to be able to read at a high level of proficiency in one's L2, which requires a considerable resource from reading in one's L1 (Bernhardt, 2011). Whereas English has, to a large extent, been adopted as the lingua franca of the academic, scientific, and global communicative community, it is important for this group that L2 reading research should not be confined to English only but to many second languages offered in an L2 curriculum (Hinkel, 2011), as appreciation of other languages helps lower barriers, eases communication internationally, and may bring cognitive benefits to the learner (Reiche et al., 2017).

When we consider the issues with reading in L2, we realize that L2 reading difficulties are as diverse and urgent as the reading concerns in the L1 (Alderson, 2000; Kato, 2018; Yoshikawa & Leung, 2020). Longitudinal studies such as Van Gelderen et al. (2007) demonstrate that the differences between reading in one's L1 and reading in one's L2 are both significant and varied (Gorsuch & Taguchi, 2008; Kamil, 1995). Moreover, the range of L2 language proficiencies differs more widely than in L1: the student may or may not have acquired tacit L1 experience in their reading, which in turn may either offer support or interfere with their L2 reading development (Grabe & Stoller, 2011). Discussions on the issue of L2 reading transfer focus on the fact that skill transfer cannot be considered to be automatic (Duke et al., 2002). Furthermore, the L2 reading comprehension process involves the interplay of skills and knowledge in two languages, which will determine such factors as word recognition, reading speed, textual organization, expectations of success or failure, motivation for reading, and strategies for comprehension (Cook & Bassetti, 2005; Koda, 2007, 2008; Scott & de la Fuente, 2008). Although research into L2 reading has contributed to our understanding of the process of becoming a proficient L2 reader (Harrington, 2018; Koda, 1996), less research has been conducted in the field of L2 reading strategies and specifically L2 reading strategy instruction with regard to its impact on reading comprehension performance (Grabe & Stoller, 2011).

Reading researchers have provided support for the premise that reading strategy instruction can improve L2 reading comprehension performance (Macaro & Erler, 2008; Taylor et al., 2006). However, where research comes up short in the L2 domain is in the determination of

the effectiveness of the many different and diverse L2 reading strategies and their individual effect on reading comprehension performance (Grabe, 2010). Grabe and Stoller (2011) noted that while much L2 research has centered on which types of reading strategies L2 readers employ, how they are used, and how often they are used (Moktari, Reichard & Sheorey, 2008), we still know very little about which reading strategies work best in improving L2 reading performance, due to a shortage of empirical investigation focusing on different reading strategies and their effectiveness in L2 reading comprehension performance.

Similarly, little analytical research has been carried out at meta-level on the effectiveness of L2 reading strategy instruction. While it is important to examine the quality of studies included in a meta-analysis, it is also essential not to draw comparisons between disparate studies where such comparisons may not be warranted (Ellis, 2018). Taylor et al. (2006) meta-analyzed the effectiveness of *Explicit Reading Strategy Teaching* (ERST) in 23 L2 reading studies. Students taught with ERST performed better when compared to non-ERST groups. The strategies taught and the type of test administered were found to have an influential effect on the reading comprehension results of the ERST groups, with an overall effect size of *.54*. However, while both cognitive and metacognitive strategies were included in the study, the main criterion for inclusion was the comparison of ERST teaching to non-ERST teaching, and no analysis was carried out between the different reading strategies. Hall et al. (2016) took a differential approach by meta-analysing reading instruction for L2 learners across differing academic contexts, such as social studies, science, and mathematics, including 46 L2 studies. Their results suggest the benefit of high impact reading instruction approaches, with an average effect size of *.35* for the experimental groups compared to the control groups. Nevertheless, this study did not compare the effectiveness of different strategies, nor was a distinction made between the various strategies. Furthermore, the scope of academic subjects included was broad, while the inclusion criteria were rigorous: The intervention duration was set at a minimum of 10 sessions, students were required to be in school grades from four to eight, and only studies from the USA were selected. The last criterion excludes the current diversity of reading strategy research being undertaken around the globe, which is something this current meta-analysis has tried to address.

The L2 meta-analyses outlined here have contributed to the field in terms of the importance of L2 strategy teaching and reading strategy awareness. However, none of the above mentioned studies compared the effectiveness of individual L2 reading strategies while assessing their influence on L2 reading comprehension. This present meta-analysis is an attempt to fill this gap by testing the effectiveness of individual reading strategies and their effect on L2 reading comprehension performance. Furthermore, as there seems to be no specification of L2 reading strategy methods created for adolescents and older students,

we modified a number of reading strategies from the general reference reading strategy handbook of Harvey and Goudvis (2007).

Cognitive strategies, which utilize an interactive and conscious process between reader and text, for example the reading strategy of *connecting new information to what is already known* and the strategy of *making predictions while reading* (Pickering & Gambi, 2018), bear similarities to the strategy of *asking questions while reading*, where the reader's attention is directed to self-questioning in response to critical areas of the text (Park & Kang, 2018). Metacognitive strategies such as *guessing for meaning* and *paying special attention to signal words* (Oxford, 1990; Taylor et al., 2006) are typically strategies that involve a repair-making or problem-resolving action by the readers, for example when they come into contact with unfamiliar vocabulary or concepts in the text (Hebert et al., 2018; Khataee, 2019; Pritchard, 1990). Sinatra and Dowd (1991) suggested that readers employ these strategies when encountering ambiguities in the text, to check and correct understanding while establishing textual intrasential and intersential ties (see also Olson & Gee, 1991; Sheorey & Mokhtari, 2008; Sinatra & Dowd, 1991).

While understanding the relevance of reading strategies can prove useful for the independent L2 reader, reading can also be supported by students working with other students in solving reading tasks together (Klinger & Vaughn, 2000). The pedagogical approach of collaborative practice that combines cooperative learning principles together with reading strategy instruction has been found to promote empathy and communication and bolster problem-solving skills (Chu et al., 2011). Students who regularly work together during reading activities were reported to demonstrate more initiative and show a stronger work ethic (Linehan & McCarthy, 2001).

Other pedagogical practices, such as the teacher introducing a strategy to the class, modeling aloud how a reading strategy works, or individual student practice with reading strategies, are pedagogies that are frequently used as instructional approaches in the reading class and were examined in this study. Another factor investigated in this analysis was the role of the teacher in the intervention: for example, whether the intervention was conducted by the standard teacher, a non-standard teacher of the class, or a researcher who was unknown to the students (Wharton-McDonald, 2018). We aimed to determine what influence, if any, these differing instructional approaches could have on L2 reading comprehension performance by isolating different approaches in the reading studies we analyzed. The following three research questions guided this meta-analysis:

1. What is the overall effectiveness of reading strategy interventions on L2 reading comprehension performance?

2. To what extent does the type of reading strategy used in the intervention have an influence on student L2 reading comprehension performance?
3. To what degree is the effectiveness of the L2 reading strategy dependent on contextual and educational variables such as teacher type or pedagogical approach used in the intervention?

2.2 Method

2.2.1 Search Procedures, Inclusion and Exclusion Criteria

We engaged in a step-by-step approach to thoroughly search the literature. First, we compared the search engine Google Scholar with Scopus and Web of Science and found that neither search engine identified more reading strategy studies than Google Scholar. Our first search with this engine used the search terms *reading strategies*, *intervention*, *L2*, *reading comprehension*, which resulted in 64,200 reading strategy studies. We decided to narrow our search to studies published between 2000 and 2017 after consulting the systematic review of Bimmel et al. (2001), which included studies up until 2000. The review of Bimmel et al. can be regarded as an objective measurement for L2 studies before 2000. For this reason, we decided to limit our search to studies published from this year, and we were subsequently able to identify 17,800 potential publications.

Our next step was to hone in on reading strategy studies aimed at L2 reading comprehension by narrowing the range of our descriptors to: *reading strategies, study, Language Learner L2, reading comprehension*. This combination of descriptors located 5,390 publications. By refining our descriptors even further to the combination of *reading strategies, Language Learner L2, study,* we limited our yield to 4,992 possible studies. By adding an additional descriptor of *secondary school education* and/or *higher education* to those previously described, we reduced our yield further to 1,412 studies. We added these descriptors in order to discount studies with young children, because at primary school, L1 plays a greater role in reading studies and formal L2 instruction is mostly introduced at secondary school or at least not until the later stages of primary school. We did allow studies with students from age 11–12 years and above, as this would be the most likely age at which students would be introduced to formal second language learning. The 1,412 studies we had retrieved were then scanned at abstract level. Potential studies were retained for further screening if they included all of the following inclusion criteria:

1. The study measured the effects of reading strategy instruction with the direct aim of the intervention being to improve L2 reading comprehension.

2. The methodology of the study incorporated either an experimental or a quasi-experimental design, either with separate experimental and control groups or a within groups design, in which experimental conditions were compared.
3. Participants must be old enough to receive formal second language education (normally from 12 years), which discounted early to middle primary education but included late primary and secondary education.
4. A minimum of one session or one week of formal reading strategy instruction must have been given in order for the L2 reading strategies to be tested.
5. The dependent measure(s) generated quantitative data of reading comprehension performance, either from a standardized test (i.e. Cambridge ESOL, TOEFL, CELDT, MAP, etc.) or a non-standard reading comprehension test. The data provided from the test must be sufficient in order to calculate a weighted effect size in the form of Cohen's *d*.[1]

Next, a search by hand was carried out of author bibliographies, which we scoured for additional reading studies; this search yielded three studies with six databases that had not been found during our initial search. This was followed by a search by hand of journals frequently cited during the database search. This search included: *Journal of Second Language Studies*, *Review of Educational Research, Reading Research Quarterly, Language Teaching Research, Reading Psychology, Journal of Research in Reading, Research in the Teaching of English, Reading in a Foreign Language, Reading and Writing Quarterly,* and *TESOL Quarterly*. No new studies were identified during this journal search. Concluding our search, which had identified 453 studies that seemed to satisfy our initial inclusion criteria, from these studies 393 were eventually excluded, and 60 were retained for more detailed examination. Exclusion was based on one or more of the following exclusion criteria:

1. Studies that were initially included but were later excluded on the basis of missing information (*n = 13*).
2. The item was not an empirical study but a literature review or synthesis of existing reading studies (*n = 27*).
3. The study featured an intervention, but there were no results published in the report (*n = 112*).
4. Reading strategy instruction was outlined in the introduction, but neither treatment nor testing were described in the method (*n = 52*).
5. Despite a promising abstract, participants of the study were not given either reading strategy instruction or strategy training prior to testing reading comprehension (*n = 86*).

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1 Cohen's *d* is a corrected measure of effect size that shows how much one group, i.e. the experimental group, differs from another group, for example, the control. Hedges' *g* and Cohen's *d* are similar measurements of effect size; however, Hedges' *g* uses pooled (weighted) standard deviations, making it a more reliable measure for small sample sizes.

6. The study did not administer a reading comprehension test as quantitative measure but instead used a questionnaire or qualitative data was featured, for example, interviews or reading strategy feedback (*n = 103*).

From these 60 studies, a further 14 studies had to be discounted as the authors were unable to provide the information requested necessary to calculate an effect size. As a result, a total of 46 studies were selected, some of which had more than one data set, resulting in 58 data sets being prepared for coding. An overview of the database search and study selection is presented in A3: Appendix.

2.2.2 Coding Procedure

We devised an inclusive coding scheme that incorporated study identifiers, study sample and context, research design, and measures based on suggestions offered by Plonsky and Oswald (2012). Weighted effect sizes were calculated during the statistical analysis (see 2.4: Calculation of effect sizes). We discovered that while the studies often used different names to describe the reading strategies used in the study, all reading strategies employed in the studies could be successfully distilled into 10 core reading strategies, i.e. "a rose by any other name..." The names and descriptions of the 10 reading strategies (see list below) were modified from descriptions of reading strategies provided in the reading strategy handbook "*Strategies That Work*" from Harvey and Goudvis (2007) and also from our literature search of reading strategy studies.

Although the method of Harvey and Goudvis is intended as a method to teach reading strategies to L1 elementary school children, we found their approach in grouping reading strategies to be applicable to L2 reading comprehension in higher forms of education; the reading strategies described in the handbook could be applied, almost universally, as a general frame of reference to every reading comprehension setting. After making a number of slight modifications to the reading strategies from the handbook, we were able to add these to the most frequently mentioned and used reading strategies discovered during our extensive L2 reading strategy literature search, in order to form a more direct connection with the literature.

In addition to the coding identifiers we included author, year of publication and whether the study was published or an unpublished thesis or dissertation. The identifiers also included the study context, such as English as a Second Language (ELL), English as a Foreign Language (EFL), school type, number of participants, intervention duration, instructor type, pedagogical approach used, reading test (standard or non-standard, i.e. self-made), and the mean scores (pre-and post-test) for the control and experimental groups, as well as the standard deviation and weighted effect size(s). Regular meetings between the raters

Table 2.1: Reading strategies and descriptions

	Reading strategy name	Reading strategy description
1	Activating background knowledge	Activation of previous knowledge on a subject, for example mind-mapping, as a means to help support and expand background knowledge
2	Guessing meanings from context	Contextual clues in the text are used to guess meanings of a word or phrase and to help build up a picture of the text as a whole
3	Semantic mapping	Creating meaning-based connections between words or phrases in the text to help facilitate understanding
4	Making predictions while reading	The reader thinks ahead while reading and predicts outcome and anticipates events in the text, which in turn enables a faster and more efficient reading process
5	Visualization	Creating visual images of what is being read in order to engage more fully with the text
6	Skimming and scanning	Skimming is reading for general gist in order to form a global concept of the text as a whole. Scanning is the search for specific information by ignoring irrelevant parts of the text and concentrating on the parts that deal with that item
7	Looking for clues in headings, subheadings, and pictures	Gleaning information from headings, subheading, and pictures or illustrations to form a coherent concept of the main topic and subtopic of the text
8	Connecting new knowledge to what is already known	Attaching new information to what is already known about a subject in order to comprehend and make connections in order to draw inferences in the text
9	Asking questions while reading	Adopting an inquisitive frame of mind while reading in order to form a deeper understanding and anticipate outcome
10	Paying attention to text structure and signal words	Recognizing and identifying the structure of a text to comprehend the text's internal logic. Being aware of the use and meaning of signal words can help the reader follow the direction of the writer's thoughts

enabled the authors to discuss potential problems and suggest solutions in order to eliminate any coding problems. [2]

2.2.3 Calculation of Effect Sizes

The effect sizes were calculated using Hedges' *g* and were adjusted for the possibility of small subject bias using weighted effect sizes. We calculated Hedges' *g* via the website Psychometrica [3] by using the control and experimental groups pre-test and post-test means, standard deviations, and sample sizes (Morris, 2008). The total number of pre-test-post-test

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2   It is worth mentioning that the original coding procedure underwent a number of stages of refinement, for example, in a previous coding phase the reading strategies were divided into four categories: cognitive, compensation, memory (Zhang, 1993), and combined strategies. However, the authors felt that there was insufficient empirical evidence to justify this particular categorization of reading strategies.
3   The Psychometrica website: Computation of Effect Sizes can be found at https://www.psychometrica.de/effect_size.html

data sets with separate control and experimental groups in our sample was 46, whereas the total number of within group data sets in our sample was 12. We will return to this point later in limitations of this study. Seven studies had more than one treatment group (see A2: Appendix). We decided not to combine effect sizes within a multiple treatment analysis, but rather to calculate separate effect sizes for each treatment group, as the treatments used in these studies were sufficiently different and diverse to warrant this.

2.2.4 Main Effects Analysis and Moderator Analysis

As the studies in our sample were extremely varied in terms of approach, number of participants, and type of intervention, a random effects model was run in order to obtain an overall estimated mean effect size, rather than one true effect size. A random effects model estimates the mean of a distribution of effects, rather than one calculating one true effect size. Observing the large diversity of our sample, we expected little homogeneity between studies. A random effects model was run to test for heterogeneity, as well as to determine total and sampling variability. We ran a moderator analysis in the form of a mixed-effects model in order to investigate possible publishing bias, with "publication" as a moderator on all studies. We subsequently applied further mixed-effects moderator analyses on factors: the 10 reading strategies, pedagogical approaches, treatment duration, school type, and level. We observed that the more complicated model fits better than the simple model that allows us to interpret the parameters accordingly, i.e. the effect size for each moderator effect.

2.2.5 Description of Studies Included in the Meta-analysis

The studies included in this analysis are described in A2 (see Appendix). The 46 studies provided us with 6,675 participants in total. Thirty-seven data sets used a standard test for assessment, which was in most cases supported by a measure of reliability, such as Cronbach's alpha. 21 data sets used a non-standard test, in which no measure of reliability was provided. 52 data sets were published as an empirical study in a peer-reviewed journal, and six data sets were empirical studies featured in unpublished master's theses or doctoral dissertations. Twenty-eight interventions were taught by the standard teacher, and 18 interventions featured the non-standard teacher or researcher teaching the intervention. While no differentiation in selection criteria was made between secondary school and higher education studies, it is interesting to note that 30 interventions were conducted in secondary school environments and 28 within higher education. Forty-one interventions used collaborative practice, 45 interventions used self-practice by students, and 40 used modeling as pedagogical approach. Lastly, the effect size can be found in A2 (see Appendix), which is given as a calculation of Hedges' g.

2.3 Results

The overall effect size for all studies was estimated as $g = .91$ ($se = .17$, $p < .001$). This overall effect size can be interpreted as a large effect (Cohen, 1992), suggesting that the interventions were effective; in other words, the students who participated in an intervention group outperformed the students in control groups, in terms of reading performance. However, at the same time, we should exercise caution when assuming an overall effect size for all studies, due to the wide variety of focus and approaches in the studies included in our sample; this was confirmed by a test for homogeneity, ($Q = 4483.10$, $df = 53$, $p < .001$), which showed significant heterogeneity amongst our studies.

2.3.1 Preliminary Analysis

Possible publication bias was tested using a mixed-effects analysis, by applying a dummy variable for studies published in a peer-reviewed journal. Adding the effect of published studies did not improve the fit of the model ($\Delta\chi^2 (1) = 0.36$, $p = .55$). The difference between the effect sizes of unpublished studies did not differ significantly from the effect size of all published studies; therefore, no detectable publishing bias can be established.

The design of the studies divided into two groups, where one group contained two sub-groups: the studies had either a (quasi-)experimental design ($n = 21$) or a post-test only or within subject design ($n = 25$). Results show that none of the above mentioned design elements influenced the reported effect size ($\Delta\chi^2 (1) = 0.91$, $p = .33$). Therefore, study design differences do not appear to affect results. Preliminary analysis for all moderators determined that no significant difference in effect size was found between the two language contexts of the study, i.e. whether the study was conducted in an English as a second language (ESL) or English as a foreign language (EFL) context: ($\Delta\chi^2 (1) = 1.14$, $p = .22$).

We also looked at whether the study was carried out at a secondary school ($n = 30$) or in higher education ($n = 28$). Results indicate that effect size differs between secondary education and higher education: ($\Delta\chi^2 (1) = 6.85$, $p = .01$), indicating that the effect size of secondary education exceeds that of higher education: ($\Delta g = 0.88$, $se = .35$). When comparing the effect of the teacher in the intervention ($n = 30$) to that of the researcher ($n = 16$), no significant difference in effect size was found: ($\Delta\chi^2 (1) = 0.60$, $p = .44$). This was also true for the variable of duration of the study (min. duration: six weeks; max. duration: two years), as effect size did not appear to have been influenced by the length in duration of the study: ($\Delta\chi^2 (1) = 1.01$, $p = .31$).

2.3.2 Differences in Reading Strategies

Firstly, by way of an introduction to the effectiveness of the reading strategies, we found that making a difference between the reading strategies improved the fit of the model: ($\Delta\chi^2$

$(9) = 19.44, p = .02$), meaning that not all reading strategies have the same mean effect size. For each strategy, a mean effect size was calculated (see A2: Appendix). Our results indicate that the reading strategy *connecting new knowledge to what is already known* appears to be the most effective reading strategy of the 10 strategies analyzed: *(g = 1.08)*. In contrast, the reading strategies *looking at pictures (g = .35)* and *visualization (g = .42)* were not found to be statistically effective for *reading comprehension*. In studies that incorporated either the reading strategy *looking at pictures* or the strategy *visualization*, the average effect size for the experimental condition did not differ significantly from the control. All other reading strategies were effective with significance: *making predictions while reading (g = .64)*, *skimming and scanning (g = .64)*, *semantic mapping (g = .69)*, *guessing meanings from headings,* and *pictures (g = .75)*, *paying attention to structure (g = .77)*, *activating background knowledge (g = .92) and asking questions while reading (g = 1.07)*. The estimated effect sizes, standard error, significance values, and confidence intervals are presented in Table 2.2.

Table 2.2: Estimated effect sizes of reading strategies (g), standard error (se), significance values (p), and 95% confidence intervals (ci)

Reading Strategies	g	se	p	Confidence Intervals	
				-ci	ci
Looking for clues in pictures and headings	.35	.45	.22	-.53	1.23
Visualization	.42	.40	.15	-.37	1.20
Skimming and scanning	.64	.48	.09	-.30	1.58
Making predictions while reading	.64	.26	.01	.13	1.15
Semantic mapping	.69	.28	<.001	.14	1.24
Guessing meanings from headings and pictures	.75	.26	<.001	.24	1.26
Paying attention to structure	.77	.25	<.001	.28	1.26
Activating background knowledge	.92	.24	<.001	.45	1.39
Asking oneself questions while reading	1.07	.20	<.001	.68	1.46
Connecting new knowledge to what is already known	1.08	.27	<.001	.55	1.61

2.3.3 Pedagogical Approaches

Pedagogical approaches are the methods employed by an instructor during the exchange of knowledge and skills, mostly initiated by the teacher in the development of knowledge or skills for/in the student. The type of pedagogical approach can vary in the study analyzed, depending on the nature of the educational interaction. However, typical approaches included introducing the strategies, teacher modeling, strategy awareness raising, collaborative practice, and student self-practice. We did not detect any statistical significance for pedagogical approaches when these moderators were analyzed as main effects: teacher modeling: ($\Delta\chi^2 (1) = 0.07, p = .80$), awareness raising: ($\Delta\chi^2 (1) = 0.01, p =.94)$, collaborative practice: ($\Delta\chi^2 (1) = 0.09, p = .76)$, introducing strategies: ($\Delta\chi^2 (1) = 0.00,$

$p = .97$), student self-practice: ($\Delta\chi^2 (1) = 0.27, p = .59$). However, when we analyzed the pedagogical approaches in interaction with the reading strategies, we found the effects to be dependent not only on the type of reading strategy taught, but also on the interaction with students within the specific intervention program; in other words, the effectiveness of the pedagogical approach is dependent on which reading strategy is used.

We analyzed the effectiveness of the various pedagogical approaches together with the reading strategies outlined in each study. We began with the approach of teacher modeling ($n = 40$). We analyzed the effect of teacher modeling according to two models: 1. The effect of teacher modeling the strategies is the same for all strategies. 2. The effect of teacher modeling the strategies is not the same for all strategies. Using this approach, we found that the following strategies had a positive effect that was significant for teacher modeling: *visualization (g = 1.40, n = 11)* and *skimming and scanning (g = 1.66, n = 10)*. For these strategies, there was a positive effect of teacher modeling when combined with these reading strategies: *visualization ($\Delta\chi^2 (11) = 23.16, p = .01$), skimming and scanning ($\Delta\chi^2 (11) = 22.6, p = .01$).* Further, no other reading strategies seemed to be effective in combination with teacher modeling, and five strategies, *guessing meanings from context, semantic mapping, making predictions while reading, looking for clues in pictures and headings, and asking oneself questions,* were observed to have negative effect sizes when analyzed in combination with the strategies.

The combination of reading strategies and awareness raising of strategies ($n = 41$) was not statistically effective with any of the strategies ($\Delta\chi^2 (11) = 16.04, p = .14$). The combination of reading strategy and approach of introducing the strategy ($n = 40$) was found to be effective for one reading strategy: *semantic mapping (g = 3.64, se = 1.82)*; the other combinations of reading strategy and introducing the strategy were not found to be significantly effective. We found that the combination of reading strategies with student self-practice with strategies ($n = 45$) was not statistically effective as an approach ($\Delta\chi^2 (1) = 1.10, p = .29$).

Lastly, we analyzed the reading strategies with collaborative practice between students as a key element in the instruction ($n = 41$), using the same approach as with teacher modeling. We found that only one strategy was statistically effective with this approach: *connecting new knowledge to what is already known (g = 1.61, ($\Delta\chi^2 (19) = 37.33, p = .001$).* As an approach, collaborative practice between students requires much practice, and the necessary conditions that need to be present in order to work together might not always be available. We observed that in studies where collaborative practice was featured and where the focus was on reading strategies in which it was indicated that collaborative practice was a key element of the delivery, these studies did not significantly outperform control groups ($\Delta\chi^2 (11) = 14.24, p = .21$).

2.3.4 Contextual Variables of Teacher Type and Test

Next, we tested whether the effect of the use of standard tests over non-standard tests would differ according to which reading strategy is taught. However, we could not show a significant difference in effect size ($\Delta \chi^2 (9) = 15.21, p = .09$). Nevertheless, we did note that the use of standard tests in interventions tended to lead to smaller effect sizes and the use of non-standard tests in an intervention resulted in significantly larger effect sizes ($g = 1.28, se = .27$).

The effect sizes of standard ($n = 38$) and non-standard teacher ($n = 20$) depended on which strategies were used in the intervention. Statistically significant different effect sizes were detected between the standard teacher of the class and the non-standard teacher of the class teaching the intervention ($\Delta \chi^2 (11) = 25.12, p < .01$). In other words, there is a difference if the standard teacher or the non-standard teacher teaches the intervention: when the standard teacher teaches the intervention, this reduces the effect size ($g = -.70, se = .35$). The differences in effect sizes of standard and non-standard tests and standard and non-standard teachers will be explored further in the discussion.

The effect of the standard versus the non-standard teacher of the class, in interaction with the reading strategies, was analyzed further. For this, we again used two models: we found the model where the effect of the standard teacher differed between strategies to be the better fit: ($\Delta \chi^2 (11) = 40.4, p < .001$). We observed that there is more variation in effectiveness of reading strategies when there is a non-standard teacher teaching the intervention, and that the standard teacher lowers the effect size of the reading strategies somewhat. The combination of the following reading strategies with the non-standard teacher resulted in large effect sizes: *connecting new knowledge to what is already known (g = 5.58), activating background knowledge (g = 2.63)*, and *making predictions while reading (g = 1.29)*.

We observed that the model where the effect of the standard teacher differed between strategies is the best fit for our analysis; however, we surmise that our results may have been influenced by the presence of heterogeneity in our sample. This conjecture was confirmed by a homogeneity test of the last model, which indicated that there was significant residual heterogeneity in the sample ($QE = 256.97, df = 26, p < .0001$). To complete our investigation, we inspected our funnel plot (see Figure 2.1) to identify possible outliers that could be a potential source of heterogeneity. A funnel plot is a scatterplot of the intervention effect against a measure of study size. In the funnel, the residuals of the model with the strategy categories, and, for example, the standard teacher as explanatory variables are plotted against the standard error. The funnel lines represent the region in which 95% of the studies are expected, in the absence of homogeneity. We observed that while most of the studies were clustered around the overall average effect size of *0.91* and scattered within the funnel lines, some studies were not. This confirmed our assumption that while there was at least
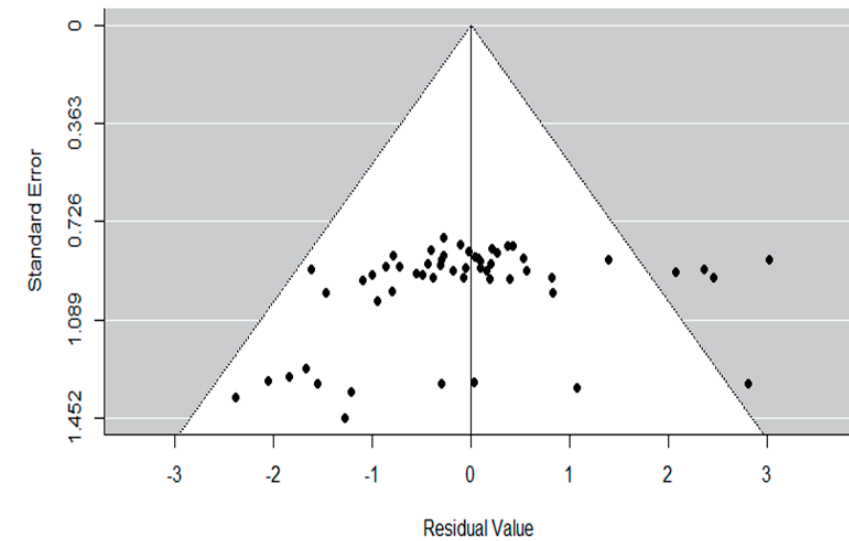
Figure 2.1: Funnel plot of treatment effect against study measures

some heterogeneity in our sample, a small number of studies ($n = 5$) were outliers and were located outside the lines of the funnel plot. In order to identify which studies were outliers, we created a forest plot (see A4: Appendix). A forest plot presents the effect sizes on the *x* axis with the studies (author and date) on the *y* axis. The effect sizes plotted bisect the (symmetrical) bar, which represents the 95% confidence interval (CI). Our forest plot identified five studies to be outliers: McNeil (2011): $g = 5.7$, McNeil (2011): $g = 4.2$, Hind (2016): $g = 5.3$, Mozafari et al. (2016): $g = 3.2$, and Gurk et al. (2016): $g = 3.6$.

All five of these outliers exhibited an effect size larger than could be expected from the model. In the study of Hind, where an effect size was reported of *5.3*, a self-made oral reading test was designed and implemented by the researcher, which may have contributed to this larger effect size, as self-made tests tend to produce larger effect sizes than normally to be expected (Riffert, 2005). The large effect size of Mozafari et al. of *3.2* could possibly be explained by the fact that the researchers used the results from a complete set of tests from a *Cambridge Preliminary English Test* (PET) in order to homogenize the participants into two groups. In this case, reading, writing, and speaking scores from the PET tests were used to calculate a pre-test and post-test score, which may have contributed to the large effect size. The large effect sizes of McNeil's studies of *5.7* and *4.2* may be attributed to the fact that a teacher-made non-standard test was used. We found that when non-standard tests were used, it resulted in significantly larger effect sizes (see Contextual variables of teacher type and test). In the case of the study of Gurk et al. (2016), where an effect size of *3.6* was reported, no obvious identifying cause could be found for this outlier.

To this end, we were unable to identify one common cause for these five outliers that may explain their result. We are aware of the fact that with a relatively small sample of studies, such as in this analysis, there is a hypothetical possibility of encountering larger effect sizes, which may or may not be achieved as a coincidental result. Moreover, we had established that there was a significant difference in effect size between the moderators standard and non-standard tests, which may have contributed to some extent to the outlier effect. Thus, in the absence of proof of publication bias and other mentioned variables, we must conclude that the reason might be due to the above mentioned factors, but also may be due to otherwise hitherto unknown study characteristics, which these studies do not have in common with the other studies in our analysis.

2.4 Discussion

The aim of this meta-analysis was to determine the overall effectiveness of L2 reading strategy interventions and to identify which reading strategies were the most effective in improving L2 reading comprehension. This investigation examined the effectiveness of different intervention features and hoped to pinpoint those which might specifically aid L2 reading performance. Our intention is to discuss our findings in what Plonsky and Oswald term a "meaningful" way (Plonsky & Oswald, 2012, p. 286). It should be noted, however, that meaningfulness should not be perceived as interchangeable for effect size, as not all large effect sizes represent a meaningful result; likewise, not all small effects are devoid of meaning (Prentice & Miller, 1992).

With regard to our research question on the overall effectiveness of L2 reading strategy interventions, our result of an average effect size of .91 supports the educational benefits of L2 reading strategy interventions for reading comprehension performance. Our finding concurs with results from previous meta-analytic studies of L1 studies investigating reading strategies (Berkeley, Scruggs, & Mastropieri, 2009). These are similar to findings of Edmonds et al. (2009), who reported an overall effect size of .89, and Swanson (1999), with an average effect size of .72. However, it should be noted that studies with significant effect sizes tend to be published more often than studies that show no effect. Positive effect sizes may possibly be the result of overestimation, meaning that we must exercise caution when drawing a conclusion regarding overall effect sizes. Nevertheless, an effect size of .91 is an encouraging indication that L2 reading performance can be served by reading strategy instructional input.

Regarding our research question on the influence of reading strategies on L2 reading performance, our results indicate that reading performance is positively affected by a number of the reading strategies tested. This leads us to conclude that a combination of reading strategies is effective, the most particularly effective being: *connecting new knowledge to what is already known, asking questions while reading* and *activating background knowledge*. Moreover, the reading strategies of *visualization* and *looking at pictures* do not appear to be particularly effective reading strategies for L2 reading performance, according to the studies tested. These findings are in congruence with an L1 study by Berkeley, Scruggs & Mastropieri (2009), who reported the effectiveness of structured cognitive strategy instruction featuring reading strategies such as *using background knowledge* or *connecting new knowledge to what is already known*, which were found to be particularly effective strategies.

Our third question focused on whether the effectiveness of L2 reading strategies is dependent on the type of pedagogical approach. We found that it mattered not only which type of strategies were taught but whether a standard teacher or non-standard teacher of the class taught the intervention. For not only when the standard teacher taught the intervention did this result in overall smaller effect sizes; there was more variation between reading strategy effectiveness when the non-standard teacher taught the intervention. This is particularly true for the reading strategies *connecting new knowledge to what is already known, making predictions while reading*, and *activating background knowledge*. Our findings concur with those found in the synthesis of reading interventions of Edmonds et al. (2009), where the unfamiliar instructor was found to be more effective in interventions than the familiar teacher of the class. Edmonds et al. (2009) attributed the effectiveness of the non-standard teacher to their attentiveness in implementing interventions with high levels of fidelity during implementation and noted that standard teachers may want to "*consider their fidelity of implementation*" during reading interventions (p. 294). The effectiveness of the non-standard teacher might also be due to their familiarity and explicit knowledge of the theory of reading strategies, which may be ascribed to their expert role in the research (Berkeley, Scruggs & Mastropieri, 2009). Another explanation is that strategy teaching may require more "ownership" of the material and that more implicit understanding of the theories behind strategy research may be needed in order to become more effective in strategy teaching (Allen, 2003). This is a point that we will address in the recommendations for teaching.

We found that the combination of reading strategy and specific pedagogical approach was effective for some reading strategies but not for all. For example, teacher modeling was effective with the reading strategies of *visualization* and *skimming and scanning*, and *connecting new knowledge to what is already known* appears to be effective when combined with the pedagogical approach of student collaborative practice. That collaborative practice, when it was used as a key element of teaching approach, did not significantly outperform control groups corresponds to some extent with the second model: that the teacher modeling the strategies does not have the same effect for all strategies. Our results

suggest that while collaborative practice as a moderator may have been featured in the intervention, it did not have sufficient "power" to demonstrate its effectiveness.

The approach of student self-practice seemed to be effective with the strategy of *activating background knowledge*, and the strategy *semantic mapping* appears to be effective with the approach of the teacher introducing the strategy. However, the pedagogical approaches in the studies were not always reported; furthermore, the approaches within a study may have been combined or not tested at all, that is, it was not always possible to know with certainty their role during the intervention.

There is always the concern that the number of studies with one particular approach is too limited. In our case, the number of studies with a particular pedagogical approach varied between 40 and 45, with some overlap, meaning, we cannot rule out the possibility that with more studies, the effectiveness of this approach might have been different. Our findings concur partly with the study of Pintrich and De Groot (1990), whose research pinpointed the importance of students exerting control over their own reading by incorporating a pro-active approach to strategies into their reading activities, such as *using one's background knowledge, asking questions while reading,* and *connecting new knowledge to what is already known*. These were found to be particularly effective reading strategies in this analysis. Furthermore, according to Dignath et al. (2008), the benefit of being in charge of one's own reading was found to be an effective approach. Nevertheless, we offer a tentative conclusion with regard to our third research question on the role of reading strategy effectiveness and teaching pedagogy approaches. We conclude that there is a degree of uncertainty to the process of extracting pedagogical approaches from intervention design descriptions and that, as researchers and educators, our implicit understanding of how learning and teaching interact with each other has not developed sufficiently (Rijlaarsdam et al., 2018, p. 284).

We observed that the difference in effect sizes for studies conducted within higher education institutions was higher (*Δg* = *.49*) than for those conducted within secondary schools. This may be due to the fact that while secondary school is mandatory for all children, higher education is chosen by those who wish to continue their education of choice, whether for academic or vocational purposes. A longitudinal analysis of Chicago school students and their educational outcomes by Lesnick et al. (2010) found correlational evidence that students who read well at lower secondary school level performed better at college than their peers who read poorly at secondary school.

Looking at study design, we feel that we should mention that studies in our analysis using a within group design were analyzed according to the available pre-test and post-test measures, standard deviations, and sample sizes in order to calculate an effect size. Plonsky and Oswald (2012) have advocated caution and separation when handling data from studies with pre-test-post-test designs with separate control groups when other studies in the sample use a within group design, because pre-test-post-test with separate control designs tend to produce larger effect sizes. We decided, for this reason, to err on the side of caution when dealing with the different methodological designs within our meta-analysis.

Whereas one aim of a meta-analysis is to determine and isolate the useful and effective aspects of an intervention, meta-analysis can also contribute by pinpointing ineffective aspects. For example, we observed that the duration of an intervention did not influence the effectiveness of reading performance. The minimum duration of an intervention in our sample was six weeks, and the maximum was 104 weeks, providing us with an average intervention duration of 13.6 weeks. Our result corresponds with the findings of Rosenshine et al. (1996): their L1 analysis indicated that longer durations of interventions do not necessarily result in improved reading performance. Moreover, Rosenshine et al. noted that there is no conclusive evidence of a correlation between longer durations of reading interventions and increased reading performance results. This point notwithstanding, Vaughn et al. (2010) investigated tutoring programs in reading for students at risk and found that effect sizes of such studies decreased as tuition duration in weeks increased, suggesting that shorter duration may result in higher effect sizes (Elbaum et al., 2000). Nevertheless, Vaughn recommended longer interventions in the case of struggling readers in order to effectively close the gap with typically higher achieving readers (Vaughn et al., 2010).

In contrast, Edmonds et al. (2009) observed in a meta-analysis of L2 reading interventions that although longer interventions may seem to play a role in helping students apply strategies more proficiently, a longer duration of a study did not seem to improve the students' ability to apply new strategies flexibly, independently, or in new contexts. All in all, the issue of intervention duration is a complex one, and the contrasting advice from experts has lasting implications for future reading strategy research, as researchers and schools will have to consider and weigh both potential benefits and drawbacks of shorter and longer interventions (Berkeley, Bender et al., 2009; Rosenshine et al., 1996).

There was a significant difference found between the effect sizes of standard or non-standard tests (*Δg* = .68). Standardized tests in our sample produced smaller effect sizes than non-standardized tests. These findings are supported by the findings of Rosenshine et al. (1996), who reported both significant and non-significant results for standard and teacher self-made tests in an L1 meta-analysis of 26 studies ranging from the third grade to higher education level. Studies that administered a standardized test reported lower effect sizes than those using a non-standard test (Riffert, 2005). While self-made tests may be more tailored to the teaching program of the intervention, standard tests could be considered more robust and objective for the purpose of empirical research. Other aspects such as

study context (EFL or ESL) or teacher versus researcher did not appear to have any influence on the effectiveness of L2 reading performance within the bounds of this meta-analysis.

2.4.1 Limitations of This Study

Our intention in this meta-analysis was to ascertain which L2 reading strategies were most effective in reading comprehension. To this end, we distinguished and compared 10 core reading strategies in effectiveness. Our results suggest that interventions should endeavor to offer a wide range of reading strategies and combine these with different pedagogical approaches, as our results indicate that one approach may not necessarily be effective with all reading strategies. This is in order to reach as many students as possible, rather than to concentrate on one or two strategies and one pedagogical approach.

While the interpretation of our results in general remains a tentative one, due to the considerable heterogeneity between studies, which cannot be fully explained by identifiable factors, it is conceivable that the number of small studies in our sample (total participants $< 50: n = 20$) may have accounted for greater heterogeneity between studies. It is also possible that if the studies we selected had contained larger samples of participants, there might have been more heterogeneity within the studies, and less between studies; however, as these were the studies that met our stringent selection criteria, the point is moot. Moreover, our studies differed greatly and diversely in terms of teaching materials, teaching instructions, and the reading tasks administered. The details of these were not always clearly documented in the study methodology, which may account for some degree of heterogeneity between the studies, which, unfortunately, we are unable to explain within the parameters of this study.

Lastly, a review of 174 L2 interactions by Plonsky and Gass (2011) found that as average effect sizes continue to fluctuate over time, fluctuation is attributed to the introduction of more sophisticated models of interaction developed over the last 30 years that have increased subtlety in investigation (Plonsky & Gass, 2011). The hypothesis offered by Plonsky and Oswald (2012) is that in the future we could expect larger effect sizes, as improvements in design and measurement in particular research areas surpass previous imperfections. Their hypothesis is corroborated by this meta-analysis. We offer the prognosis that future meta-researchers may continue to expect substantial fluctuation in terms of effect sizes, and that the interpretation of meta-analytic results will continue to remain both a challenging and a complex undertaking for the meta-analysist.

2.4.2 Suggestions for Further Research

We extend the careful conclusion that a wide range of L2 reading strategies appears to be effective when taught by a non-standard teacher of the class, who employs a variety of pedagogical approaches. We urge more research to be undertaken to explore this

supposition, and hope to be able to add to the field of research ourselves by undertaking further L2 reading strategy research, where we will attempt to put our own L2 reading strategy method to the test with L2 reading students, the results of which we believe may have relevance for secondary and higher education. Research into L2 reading strategies should especially be supported, as we believe that this is an area that could benefit from more academic interest, especially as students in higher education are expected to be self-sufficient in their pursuit of the required reading and study skills. While our sample of reading strategies was relatively small, we feel that these positive results are encouraging. We also recommend more funding in L2 reading research featuring a wide range of high order reading strategies, such as *connecting new knowledge to what is already known* and *asking questions while reading*, in the context of L2 reading strategy teaching, while taking into account the sociocultural context, student, teacher, and setting. The field could also benefit from more research into improved methods of measuring and maintaining reading comprehension.

Furthermore, we believe adolescent and young adult literacy problems that have been brought to attention in the studies of this meta-analysis warrant additional research into L2 reading remediation among adolescent and young adult and adult students, along with studies investigating engagement, involvement with text, motivation to read, self-efficacy, and reading for academic purposes. Lastly, we observed that relatively few studies in our sample used a delayed post-test (8%). In order to arrive at a conclusive claim on reading strategy retention and the effectiveness of the intervention in the long term, we believe that a delayed post-test should be included as common practice in reading study design.

2.4.3 Recommendations for Teaching Practices

On the basis of our findings, we recommend the teaching of the widest possible range of high-order L2 reading strategies and the development of teaching materials that enable diverse pedagogical approaches in the classroom. From our analysis, we postulate the following: Successful L2 readers are those who engage in cognitive and metacognitive activities that involve self-planning, monitoring, evaluating, and, when necessary, re-evaluating their reading efforts. We observed that the non-standard teacher seems more effective in teaching certain strategies than the standard teacher and that certain pedagogical approaches are more effective with particular reading strategies. We believe that while the non-standard teacher of the class may maintain a higher level of fidelity toward the intervention, on the other hand, the standard teacher's ability to scaffold and support metacognitive thinking is more in line with student support (Dignath et al., 2008).

For this reason, action research, where teachers participate in designing and implementing classroom research projects for the purpose of improving their teaching approach, should be encouraged by schools and universities. However, more research would be welcome

on this topic. We also encourage more support for teacher development in L2 reading strategies as a matter of good practice. We believe that a better understanding of reading strategies in the L2 reading classroom will help teachers, and those involved in educational planning, to improve and innovate reading instruction in their institution.

2

3

The Development of the Intended L2 Reading Strategy Intervention

As teachers, we believe it when we say "Reading is power." But for students to believe that reading is power, we must put them in position to experience the power of reading. That means they must do tasks and activities that demonstrate the power of reading. (Duffy, 2009, p. 5)

3

3.1 Designing the Reading Strategy Intervention

For some time, the English teaching staff at an institute of higher education in the Netherlands had been concerned about their students' level of English language proficiency, and especially their L2 (English) reading comprehension ability. The existing program for teaching English had been, for the most part, focused on learning grammar rules and on the expansion of (L2) vocabulary. Students were not particularly motivated in class, and the examination pass rate of approximately 48% meant that for many students, the mandatory English courses created a "bottleneck" in their study career. In order to increase students' English language skills in general, and specifically their English reading comprehension, the English team were eager to create an intervention that would help students to improve in all their English language skills. During the redesign of the institutional curriculum, the English team was given the opportunity to reinvent the English curriculum under the institutional slogan, "The student wants to learn."

The initial task of the design team was to discuss the main problems behind current student attitudes toward English classes, and these were summarized as the following:
● Students have issues with their motivation, especially with regard to their English reading.
● Students have problems with concentration in the English classes: they undertake too many tasks at the same time and find it difficult to prioritize.
● Students use too much guesswork when completing English reading tasks and are not enough aware of other English reading strategies that are available to them, besides strategies such as "skimming" and "scanning."

The design team discussed these problems and came to the conclusion that our students would be best served by an educational program that focuses on the learning and improvement of English language skills such as reading, speaking, and writing. The team of teachers agreed that the first English course that students should follow should be an English academic reading intervention. The reasoning behind this decision was that if students are not reading well in English, they will be unable to process new English textual information necessary for their studies.

The next priority of the design team was to address the differences in English language ability of our students. Heterogeneity in terms of our students' level of English is very large at this institution. Some students are quite proficient, whereas others have only a basic command of English. For this reason, our students vary considerably in their entry level

Abstract

This chapter sets out to detail the creation and development of an L2 reading strategy intervention by the English teaching staff at an institute of higher education, with the aim of improving L2 reading comprehension among first-year students. The design team of five teachers, including a teacher/researcher, developed eight design principles that guided the construction of the intervention. Each of the seven lessons followed four explicit phases of instruction, which were based on a gradual release of teacher responsibility. Which reading strategies and pedagogical approaches were the most effective and should be included in the intervention were identified by a meta-analysis conducted the previous year. Further, this chapter explains why the design team opted to create their own intervention and describes the different components that supported the intended method, such as the teacher's guide and the different types of student activities in the student workbook.

of L2 English. A student's level of English varies between B1 to C1[1] (CEFR) on entry to the institute. This is an issue that the design team needed to address.

Students with a vocational education, who make up approximately 30% of the institute's student population, are accepted into a University of Applied Sciences education after successful completion of their four-year vocational postsecondary study. Their previous education is comprised for the most part of vocational experience, with little training in formal reading comprehension in an L2 such as English. In this respect, they are frequently the most disadvantaged when following English modules.

Other students may have had more experience with the English language, having followed five or six years of compulsory English at secondary education. A small number of students may have taken and passed certificates in English as a second language (ESL), with entry English skills at C1+, although this is exceptional. The courses leading to these qualifications may have been offered to them as part of their secondary school English program, or they may have followed the course outside of school; in any case, these students would be more than well prepared for the level of competency expected from them during their studies in Dutch higher education. The team was more concerned with the large number of students whose English language skills were not at the level (B1 – B2) expected of them on entering higher education.

Most of the teaching methods and materials available to the team for teaching English as an L2 for academic purposes (EAP) were not found to be applicable for the purposes of the team, as they centered around academic essay writing in English and English grammar and vocabulary. The team was looking for materials that dealt with and encouraged the application of skills, such as English reading and speaking, which would enable students to meet the competency criteria of the institution and apply them to the workplace. These competencies involve an attention to personal development, the stimulation of a responsibility toward society, attention to sustainability, and the development of intercultural and international multi-competencies. There were no readily applicable methods that would meet the needs of the students or fit the competency requirements of the institution; for this reason, the design team decided to create their own method and materials.

To this end, the design team was tasked with designing two English courses for first-year students, which would be mandatory for all students across the whole faculty of Management and Governance. Until this point, each department (Law, Communications, Commercial Economics, Human Management Resources, Social Juridical Services) within

the faculty had designed its own English modules. However, the redesign of the curriculum coincided with a new policy aimed at creating a flexible foundation program that would enable students to switch studies more easily within the faculty. Subjects such as English, Dutch, student coaching, and financial and research skills were to become "generic" and would be offered to all first-year students in the same form, with the same assessment criteria, across the whole faculty. Teachers of these modules would also be available to teach students outside of their own department, and classes would be mixed, with students from different course disciplines as far as class scheduling would allow.

The team decided to create two separate skills courses in English: a reading course called *Effective Reading for Professionals* and a speaking course called *The Power of Speech*. This chapter concerns itself with the development of the *Effective Reading* course, which began as an intervention. The content of the intervention was developed by the design team in close collaboration with the English teaching staff and the curriculum commission. The design team consisted of five teachers and a teacher/researcher. After several sessions of evaluation and discussion, the design team decided on eight design principles that would guide the reading intervention. These design principles were mostly derived from the meta-analysis of L2 reading strategy studies conducted by the teacher/researcher as part of her doctorate studies (Yapp et al., 2021a). See Table 3.1 for guiding principles of the reading course.

It was planned that the design team would begin by absorbing the findings of the meta-analysis of L2 reading strategy studies recently completed by the researcher. The findings of this research provided the team with insights into which reading strategies were effective and which pedagogical approaches worked best with which strategy. The design team decided on seven effective reading strategies from the meta-analysis to be taught over the seven-week intervention. See Table 3.2 for reading strategies taught per week, with descriptions from the meta-analysis.

The design of each week's class followed four lesson phases and would begin with the teacher explaining and modeling the reasoning behind the particular strategy and why it can be useful. The design team based this concept on the pedagogical principle that in order to incorporate a strategy successfully, a student needs to know why and how it can be useful to them (Bimmel et al., 2001). For this reason, each reading strategy would be explained in explicit terms: how it works, when to use it, and why it can be useful (Dewitz & Jones, 2013).

After the reading strategy had been modeled and explained, the students would be given the opportunity to practice the strategy collaboratively and individually by applying the reading strategy to reading strategy activities (for examples of activities see Appendix C).

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1   CEFR is the Common European Framework of Reference for Languages: Learning, Teaching and Assessment. The levels range from A1 to C2 (Council of Europe, 2001, 2018).

Table 3.1: Design Principles of the L2 Reading Strategy Intervention

Design Principles	Teacher Role	Intended Student Learning Outcome
• Explicit and direct L2 vocabulary instruction (Nelson & Stage, 2007).	• Dedicate a portion of classroom time to explicit L2 vocabulary instruction; analyze and explain syntactic, semantic, and context clues; connect what is new to what is already known. • Teach word classes, prefixes, and suffixes. • Apply repeated exposure of new L2 vocabulary to multiple and diverse new contexts. • Provide ample opportunities for new L2 vocabulary to be used in a variety of contexts, discussions, and extended reading situations. • Introduce reading strategies for learning new L2 vocabulary.	• Students become independent learners of new L2 vocabulary. • Students are able to comprehend new L2 vocabulary in reading comprehension contexts.
• Explicit and direct L2 reading comprehension instruction (Bimmel et al., 2001). • Explicit and direct L2 reading strategy instruction (Biancarosa & Snow, 2006).	• Raise awareness of L2 reading strategies; introduce and model reading strategies. • Select a diverse range of L2 textual material to teach reading comprehension and apply reading strategies. • Explain to students how to use and how to apply L2 reading strategies to different text contexts by using direct, explicit instruction. • Give guided and modeled practice in how to use L2 reading strategies and discuss reading strategies while teaching them.	• Students become aware of their reading behavior and use reading strategies when necessary to solve L2 reading comprehension issues. • Students become more successful and productive when completing L2 reading comprehension tasks. • Students reach a higher level in their L2 reading comprehension proficiency.
• Extended discussion opportunities of L2 text meaning and interpretation (Adler & Rougle, 2005).	• Select engaging L2 materials and develop stimulating questions for discussion. • Use follow-up questions that encourage continuity and extended L2 discussion. • Create tasks or discussion formats that encourage L2 discussion in small groups.	• Students are able to engage in extended L2 discussion.
• Opportunities for collaborative and individual practice with L2 reading strategies (Chang & Windeatt, 2016).	• Provide students with opportunities to practice using the reading strategy to solve L2 reading tasks, either collaboratively or individually. • Ensure that students are able to use the L2 strategies autonomously. This is achieved through a gradual release of teacher involvement via scaffolding.	• Students are able to solve L2 reading comprehension tasks independently or collaboratively. • Students are able to use the L2 reading strategies autonomously.
• Engagement in L2 reading through teacher modeling and scaffolding and stimulation of student motivation (Guthrie & Humenick, 2004).	• Explicitly explain the thought process behind the why, when, and how to apply L2 reading strategies. • Establish meaningful and engaging content learning goals around essential ideas as well as specific learning processes.	• Students understand why, when, and how to apply L2 reading strategies. • Students are interested in L2 learning.
• Evaluate own success in using L2 reading strategies through evaluation and expansion (Abbasian & Hartoonian, 2014). • Awareness of own L2 reading process through support and guidance (Housand & Reis, 2008).	• Provide a positive learning environment that promotes student autonomy in L2 learning. • Make L2 literary experiences more relevant to student interests. • Promote classroom conditions that promote L2 reading engagement and conceptual learning through reading strategies, goal setting, self-directed learning, and collaborative learning.	• Students are able to evaluate their own mastery of the L2 strategy or strategies and effectively apply them to new reading tasks. • Students are able to learn L2 independently. • Students are able to set goals, direct their own L2 learning, and engage in collaborative learning with success.

Table 3.2: Effective L2 Reading Strategies From the Meta-analysis Taught Each Week with Descriptions

Week	Reading strategy	Reading strategy description
1	No reading strategy instruction (pretest)	
2	Connecting new knowledge to what is already known	Attaching new information discovered in the text to what is already known about a subject; by attaching new to already known information, the reader is able to comprehend and make connections in order to draw inferences and meaning from the text. For a study on connecting new information to what is already known, see Jiang and Grabe (2007).
3	Asking questions while reading	Adopting an inquisitive frame of mind by asking oneself questions while reading about unfolding events in the text in order to form a deeper understanding and anticipate outcome in the text. For a study with the strategy of asking questions while reading, see Underwood and Pearson (2004).
3	Making predictions while reading	The reader thinks ahead while reading and predicts outcome and anticipates events in the text, which in turn enables a faster and more efficient reading process. For more on this strategy, see Grabe and Stoller (2011).
4	Visualization	Creating visual images of what is being read in order to engage more fully with the text. For studies on visualization, see Anderson (2008b).
5	Paying attention to structure + signal words	Recognizing and identifying the structure of a text to comprehend the text's internal logic. Being aware of the use and meaning of signal words; this can help the reader follow the direction of the writer's thoughts and intention. A study with the strategy of paying attention to text structure and signal words can be found in Fry and Kress (2012).
6	Skimming	Skimming is a method of reading for general gist in order to form a global concept of the text as a whole.
6	Scanning	Scanning is a method used for searching for specific information in the text by ignoring irrelevant parts and concentrating on the parts of the text that deal with that particular item of information. A study that features skimming and scanning can be found in Mokhtari & Thompson (2006).
7	No reading strategy instruction— preparation for final examination	

The team decided on the four instructional phases for each lesson: raising awareness of reading strategies, teacher explaining and modeling, provision of multiple opportunities to practice, and self-evaluation. See Table 3.3 for the four phases of the individual lessons.

3.1.1 Creating Reading Activities: Before, During, and After Reading.

Once the design team had decided on the phases of instruction and which strategy would be taught in which week, they proceeded to create in-class activities for before, during, and after reading. The team designed activities based on the two functions of in-class reading activities. For an example of an in-class activity, see Exercise 1, C1, Appendix C. The concept behind in-class activities is that:

Table 3.3: The Four Phases of Instruction

Instruction phase	Phase description	Teacher role / Instructional stage	What takes place in class
One	Raising awareness Introducing strategy	Direct and explicit instruction of L2 vocabulary, L2 reading comprehension, and L2 reading strategies	Raising awareness of the reading strategies that students may already use and may have used in the past, and introducing new strategies that the student may not yet be aware of. This phase requires the teacher to introduce and raise awareness of reading strategies, while explicitly explaining the process behind the *why*, the *when*, and the *how* of the use of the strategy. In class, the teacher explicitly talked about the characteristics, usefulness, and applications of the strategy and gave examples.
Two	Teacher modeling and explaining	The stimulation of student motivation and engagement through modeling and scaffolding	Teachers were trained during the weekly sessions on modeling the use of reading strategies by explaining their mental processes aloud when reading a text (Schunk & Zimmerman, 2007). High-quality modeling has been reported to result in readers gaining more insight into, and understanding of, their own reading process (Okkinga et al., 2016). The teacher also illustrated his or her own strategy use through a reading task, such as examining unknown vocabulary items in a text by explicitly connecting the new information to what vocabulary or knowledge might already be known on the subject. Teachers were also encouraged to give feedback to the group or to scaffold where necessary. For example, if a group or individual student was having difficulty with the task, the teacher would either model the strategy again or scaffold until the student was able to continue with the task unaided; this process is known as the "Gradual Release of Responsibility" (Fisher & Frey, 2013). Students were asked to make a conscious effort to use the metacognitive strategies in combination with the reading task. Students were also shown how to recognize when one strategy was not working and how to move on to another strategy.
Three	Provision of multiple opportunities to practice	Provides the student with opportunities for extended discussion of text and interpretation	Providing students with opportunities to practice using the strategy to solve reading tasks, either collaboratively or individually. This phase ensures that readers are able to use the strategies autonomously, which is achieved through a gradual release of teacher involvement. Students were encouraged to work together collaboratively to apply the reading strategies while solving a reading task. Collaborative practice among students has been found to promote empathy and communication and to bolster problem-solving skills (Chu et al., 2011).
Four	Self-evaluation of reading strategy effectiveness	Provides the student with the opportunity to evaluate their own success in using reading strategies through evaluation and expansion of their reading	Promoting awareness of the student's own reading process, and requiring the student to evaluate their own mastery of the strategy or strategies and effectively apply them to new reading tasks. The main purpose of this phase is to provide students with opportunities to evaluate their own success in using reading strategies, thus developing metacognitive awareness of their own learning processes (Cubukcu, 2008). Activities used to develop students' self-evaluation insights included self-questioning and evaluative discussions after strategy practice, checklists of strategies used, and open-ended questionnaires on reading behavior, in which students expressed their opinions about the usefulness of particular strategies. In the expansion phase, students were encouraged to use the strategies that they found most effective and apply these strategies to new contexts (Van Silfhout et al., 2014). A variety of texts were used in the method, which highlighted topical or cultural issues interesting to this particular target group in order to increase student motivation to read (Guthrie & Wigfield, 2000).

1. They help the student understand the particular text they are currently reading. For example, see Exercise 2, C3, Appendix C.
2 They help the student develop effective reading strategies for reading other texts.

Pre-reading activities were designed in order to prepare students for the linguistic, cultural, and conceptual challenge of L2 reading, and also to activate the student's prior knowledge (McKeown & Beck, 2009). For an example of an activity of activating prior knowledge, see Exercise 3, C4, Appendix C.

Especially during phases two and three of the instructional phase, students were encouraged to use a "questioning the author" approach, and the team developed teacher materials in order to engage students and manage discussions and questions. The method of "asking questions before reading" was incorporated, as it is an approach that engages and stimulates comprehensive reading (Taboada et al., 2009). Both "questioning the author" and "asking questions before reading" are approaches that prompt the student to ask themselves questions before reading, with the intent to engage students in a meaningful dialogue with the text (Han & d'Angelo, 2009). More examples of pre-reading activities used in the design of the course were: producing a semantic web of vocabulary, making predictions based on the title or subtitle, sharing questions that the student would like answered, and sharing (pre)existing knowledge. For an example of asking questions while reading, see Exercise 5, C6, Appendix C. Furthermore, the reading strategy of "visualizing" was introduced to students in week 4 of the intervention. This strategy can be useful to students who are visually perceptive. For an example of activities for "visualizing," see Exercises 6 and 7, C7 and C8, Appendix C.

The purpose of "during reading" activities is to model good reading strategies. Good readers are those who are actively involved in the text, as they interact with it as they read. Readers who take mental action by predicting what is coming and managing their expectations are able to monitor their reading process (Grabe & Stoller, 2011). The aim of "during reading" activities is to make explicit some of the (semi-)unconscious processes by "modeling" good reading habits (Gibbons, 2002). Some examples of "during reading" activities used in the intervention are: modeled reading, skimming and scanning the text, re-reading for detail, summarizing the text, and jigsaw reading. An example of a "during reading" activity can be found in Exercise 4, C5, Appendix C. The design team also scripted and filmed a teacher modeling the reading strategies in order to assist other teachers with modeling.

"After reading" activities are those that use the text as a means to focus on particular ideas or concepts that have occurred in the text; this allows students to respond creatively to what they have read, or to focus more deeply on the information in the text, such as using information transfer activities that represent the information in a different form, i.e. a table

or a graph (Wells, 2000). Some examples of "after reading" activities used in the intervention are: time lines, cloze exercises, vanishing cloze, text reconstruction, mixed matching, and true/false statements. For examples of "after reading" activities, see Exercises 8, 9, and 10, C9, C10, C11, Appendix C.

3.1.2 Reading Material
The design team chose authentic texts for each week, which were selected from diverse sources. The most important criterion for selection was that the texts should be interesting to students studying in higher education and from different disciplines. Texts were modified and simplified to B2 level, if necessary. Examples of the different types of texts can be found in Appendix C at the end of this dissertation.

3.1.3 Teacher Guidebooks
The teacher's guidebook was designed alongside the intervention material and contained suggestions for extra activities, for example warming-up activities and collaborative task activities. There were also pedological diagrams included, for example, a model of the scaffolding steps: the "Gradual Release of Responsibility Approach" on which the four phases were based, was included in the teaching guide using the figure (see Figure 3.1) adapted from Fisher and Frey (2013). In this model, the teacher begins by accepting responsibility for the lesson by introducing the reading strategy. After that, the teacher explains how the strategy works, models the strategy, and by using guided instruction gradually releases transponibility to the student by demonstrating the strategy and how to apply it. After this, the students practice the strategy together in a collaborative practice and then they apply it alone in an individual reading comprehension task. The steps are outlined below and follow the four phases of gradually released instruction of the lesson.

1. The teacher first models the strategy and explains and demonstrates its use (*I do it*).
2. The teacher uses guided instruction by using the strategy together with the students (*We do it*).
3. The students practice the strategy together, collaboratively (*You do it, together*).
4. The student applies the strategy alone in an individual activity (*You do it alone*).

3.1.4 Conclusion
All in all, after six months, the design team was able to create and complete the intervention, which incorporated the seven L2 reading strategies using the guiding principles and phases of instruction as the leading guidance of the intended curriculum. By first establishing these principles and phases of the lesson, the team was able to work efficiently in order to complete the seven-week reading strategy intervention. This intervention formed the intended curriculum for the module *Effective Reading for Professionals.*
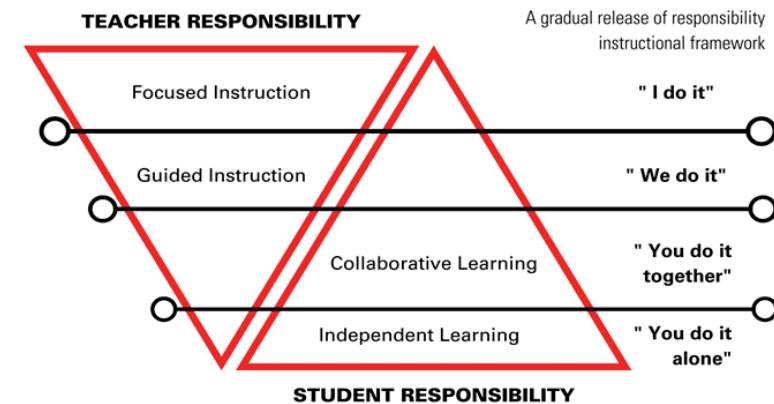
Figure 3.1: Fisher and Frey (2013, p. 3). *A gradual release of responsibility instructional framework*

3.1.5 Extract From the Teacher's Guide
Week 2. Strategy 1: Connecting new knowledge to what is already known
Phase 1:
○ The teacher explains the strategy.
○ The teacher models aloud on how to effectively use the strategy to understand the text.
○ The teacher thinks aloud when reading to show his / her thinking process and strategy use.
○ Modeling and scaffolding: scaffolding is the temporary assistance by which a teacher helps a learner know how to do something, so that the learner in the future will be able to complete a similar task without assistance; in reading, scaffolding helps make the text more explicit and easier to understand (Gibbons, 2002).

4

The Alignment of the Implemented and Intended Curriculum of a Second-Language Reading Strategy Intervention for First-Year Higher Education Students

4.1 Introduction

Educational interventions that are codesigned in collaboration between teachers and researchers have a better chance of succeeding (Broekkamp & Van Hout-Wolters, 2007). This is because when teachers collaborate in the codesign of projects, they are able to combine their extensive classroom experience and expertise with researchers' theory based on research and knowledge (Fisher & Frey, 2013). During the collaborative process of knowledge exchange, the flow of wisdom does not occur as a top-down process, but instead as a two-way flow of information, i.e. a democratic epistemology (Voogt et al., 2011). This can lead to a higher quality in the research design (Biesta, 2007). Furthermore, the combination of research-based theory added to classroom knowledge helps make the intervention a better fit for the specific educational context, which as a consequence has a positive impact on the viability and success of the project (Harn et al., 2013).

Collaboration in research codesign between teachers and researchers also results in a shared responsibility for and ownership of the method (Fichtman Dana & Yendol-Hoppey, 2016). This shared ownership means that teachers are more dedicated to making the intervention more sustainable, which then allows the intervention be tested repeatedly; after each iteration, and it can be improved (Cviko et al., 2014). Shared ownership also implies that both teachers and researchers are responsible for the successful and faithful implementation, i.e. the fidelity of the intervention (Beerwinkle et al., 2018). Fidelity of implementation describes how faithfully an intervention has been implemented in accordance with the implementation guidelines (Lee et al., 2009). When researchers and teachers create and develop the design principles in collaboration, the implementation of such projects is more likely to occur within these guidelines, as both parties were involved in their creation (Gresham et al., 2000; Mowbray et al., 2003).

Codesign can benefit educational projects as a whole. This is because when teachers share responsibility, knowledge and co-ownership of the intervention, this can lead to a professional reflection on their approach to instruction (Koenig et al., 2018). Research codesign opportunities which combine scientific knowledge with practical expertise have the additional benefit of sharing responsibility for a successful implementation of the intervention (Hammersley, 2002). During the design process, teachers will become aware of the tools necessary for the intervention in order to ensure its successful implementation (Rietdijk et al., 2018). Conversely, the implementation of the intervention is less likely to succeed when there is no collaboration between teachers and researchers, as teachers do not share responsibility for the intervention's successful implementation (Burkhardt & Schoenfeld, 2003).

Abstract

This chapter investigates how faithfully a team of English teachers implemented a seven-week second-language (L2) reading strategy intervention. It reports how faithfully the intervention was implemented according to the intervention's design principles. Teachers kept weekly logbooks, and whole-classroom observations were conducted; both measures were used to determine how well teachers implemented the intervention. Teachers also met weekly during the year to discuss the implementation process. A comparison of the observations of teachers and logbook notes shows considerable agreement. Further, the implementation concurrence between logbooks and observations was in alignment with the design principles. The results from the obtained curriculum concluded that 80% of all lessons were executed in accordance with the design principles. This indicates that the intended and implemented curriculum were both feasible and acceptable.

4

Sharing theoretical knowledge and practical insight has been described as a "synergistic" process (Grabe, 2009, p. 193). Such collaborative undertakings between teachers and researchers can provide opportunities for professional development within the teaching community, as teachers are stimulated to examine existing teaching knowledge and reevaluate their best practices (Bannon-Ritland, 2008). This can have the additional benefit of the intervention achieving long-lasting effects, which would not have occurred otherwise (Koster et al., 2017). Researchers can also benefit from this, as they gain valuable insight into practical, hands-on classroom experience and teaching skills; for example, they learn how to adapt the teaching objective should the specific classroom situation require it (Ormel et al., 2012; Schnabel et al., 2016).

The knock-on effect of collaborative undertakings is that professional teaching development is stimulated, which improves and innovates educational instruction. The result is that students achieve more (Gore & Gitlin, 2004). When codesign entails collaborators conducting meaningful, informative discussions on the provision of support, collegial feedback, and evaluation (Jesson & Spratt, 2017). This means the project is more likely to lead to opportunities for collaborators to expand educational research possibilities beyond indirect theoretical implications and into direct instructional practice instead (Anderson, 2009). This can be seen in Figure 4.1, in which the relationship between collaboration, professional development, and implementation on student achievement is illustrated.

Collaboration between researchers and teachers on new educational projects should be accompanied by extensive and sustained professional development support (Darling-Hammond & Richardson, 2009). Unfortunately, extensive and sustained collaboration between teachers and researchers is often lacking, and codesign on educational projects between researchers and teachers is rare (Bogaerds-Hazenberg et al., 2019). Schools do little to encourage educational and research communities to work together (Taylor et al., 2006), and teachers are not encouraged to make constructive use of scientific findings: "teachers are not rewarded for keeping up with current thinking on educational issues" (Gore & Gitlin, 2004, p. 50). This division between teachers and researchers has been
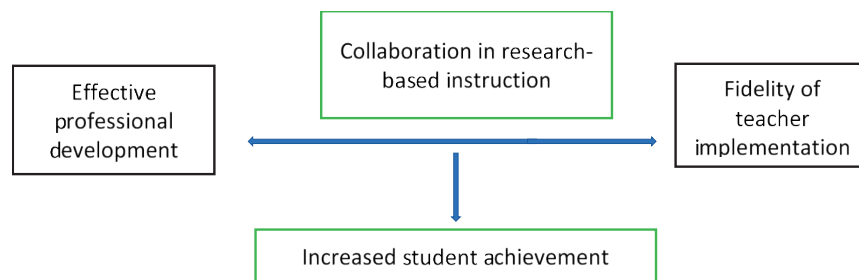
Figure 4.1: Relationship between collaboration, professional development, and student achievement (based on Echevarria et al., 2011)

described by the American National Research Council (2002, p. 14) as a "sharp divide" and an "impasse." As a result, educational research does not find its way into the classroom (Levin, 2004), and theoretical research is not rooted in the classroom experience (Broekkamp & van Hout-Wolters, 2007). This flies in the face of a clear societal demand and call from within the educational community for useful and innovative educational research that can deliver convincing and long-lasting practical results (Hammersley, 2002).

When teachers implement an intervention, it is necessary to verify whether it has been implemented as it was intended, i.e. implemented according to the intervention guidelines; otherwise, we can make no inferences as to the effectiveness of the intervention (Kress et al., 2012). Teaching logbooks are a useful instrument for teachers to keep track of their teaching during the implementation process (Elmore, 2007). While it is possible that teachers may rate their ability to teach the intervention more highly, which may indicate that their instruction towards students has improved, we must exercise caution, as more highly rated instruction does not necessarily mean that students are better informed (Harris & Wood, 2013). Moreover, teaching tools provided to the teacher for the implementation process should, for this reason, include practice-based professional development support with a focus on pedagogical content knowledge of understanding the skills and know-how of *how* to implement the intervention (Loewenberg Ball & Forzani, 2009).

Whole-class observations of teachers can be helpful as a second instrument to pinpoint any differences between actual and intended implementation of the intervention (Dusenbury et al., 2003). Through classroom observations, emphasis can be placed on monitoring the instructional factor—which is often missing in implementation evaluations—and the impact of teacher fidelity on student outcomes often remains unexplored (Echevarria et al., 2011). Adopting a form of collaborative sharing and active learning, a process in which teachers are observed and receive feedback, means that teachers can learn from the experience and improve instruction (Borko, 2004; Harris & Wood, 2013).

When teachers are involved in the codesign of an intervention, they are more likely to implement it well (Levin, 2004). Studies in second-language (L2) development have shown that when teachers are actively involved in the design and development of L2 language interventions, they are more likely to adhere to the guiding design principles of the intervention, with the result being improvements in teacher instruction and student achievement (Allen et al., 2014). Furthermore, when teachers are supported in L2 language research by ongoing, extensive, and sustained professional development—one in which collegial collaboration is encouraged and facilitated by long-term support and sharing of knowledge—then student achievement is more likely to benefit (Gallimore et al., 2009; Wei et al., 2010). For details on the training offered to teachers in the form of professional development, see Table 4.1.

Table 4.1: Design Principles of the L2 Reading Strategy Method

Design principles	Teacher role	Intended student learning outcome	Training given to teachers
• Explicit and direct L2 vocabulary instruction (Nelson & Stage, 2007).	• Dedicate a portion of classroom time to explicit L2 vocabulary instruction; analyze and explain syntactic, semantic, and context clues; connect what is new to what is already known. • Teach word classes, prefixes, and suffixes. • Apply repeated exposure of new L2 vocabulary to multiple and diverse new contexts. • Provide ample opportunities for new L2 vocabulary to be used in a variety of contexts, discussions, and extended reading situations. • Introduce reading strategies for learning new L2 vocabulary.	• Students become independent learners of new L2 vocabulary. • Students are able to comprehend new L2 vocabulary in reading comprehension contexts.	• Learning how to dedicate a portion of classroom time to L2 vocabulary instruction. • Importance of repeated L2 vocabulary exposure. • Using different activities and applying computer software to boost L2 vocabulary learning.
• Explicit and direct L2 reading comprehension instruction (Bimmel et al., 2001). • Explicit and direct L2 reading strategy instruction (Biancarosa & Snow, 2006).	• Raise awareness of L2 reading strategies; introduce and model reading strategies. • Select a diverse range of L2 textual material to teach reading comprehension and apply reading strategies. • Explain to students how to use and how to apply L2 reading strategies to different text contexts by using direct, explicit instruction. • Give guided and modeled practice in how to use L2 reading strategies and discuss reading strategies while teaching them.	• Students become aware of their reading behavior and use reading strategies when necessary to solve L2 reading comprehension issues. • Students become more successful and productive when completing L2 reading comprehension tasks. • Students reach a higher level in their L2 reading comprehension proficiency.	• Instructions on how to model L2 reading strategies. Recorded videos of modeling used during training sessions. • Learning how to use L2 guided practice activities, instructions on giving feedback. Explaining specific instructions in lesson plans and teachers' logbooks and guide. • Learning how to guide students through the application process of L2 reading strategies.
• Extended discussion opportunities of L2 text meaning and interpretation (Adler & Rougle, 2005).	• Select engaging L2 materials and develop stimulating questions for discussion. • Use follow-up questions that encourage continuity and extended L2 discussion. • Create tasks or discussion formats that encourage L2 discussion in small groups.	• Students are able to engage in extended L2 discussion.	• Learning how to prepare L2 discussions and questions for discussion. • Learning how to create tasks, discussion formats, and discussion protocols for L2 discussions.

Continue

Continued

Design principles	Teacher role	Intended student learning outcome	Training given to teachers
• Opportunities for collaborative and individual practice with L2 reading strategies (Chang & Windeatt, 2016).	• Provide students with opportunities to practice using the reading strategy to solve L2 reading tasks, either collaboratively or individually. • Ensure that students are able to use the L2 strategies autonomously. This is achieved through a gradual release of teacher involvement via scaffolding.	• Students are able to solve L2 reading comprehension tasks independently or collaboratively. • Students are able to use the L2 reading strategies autonomously.	• Learning how to build and encourage L2 collaborative learning. • Planning and creating new collaborative or individual activities for practicing reading strategies.
• Engagement in L2 reading through teacher modeling and scaffolding and stimulation of student motivation (Guthrie & Humenick, 2004).	• Explicitly explain the thought process behind why, when, and how to apply L2 reading strategies. • Establish meaningful and engaging content learning goals around essential ideas as well as specific learning processes.	• Students are able to understand why, when, and how to apply L2 reading strategies. • Students are interested in L2 learning.	• Learning how to model and scaffold the L2 reading strategy process. • Practicing modeling and watching recorded modeling during training sessions.
• Evaluate own success in using L2 reading strategies through evaluation and expansion (Abbasian & Hartoonian, 2014).	• Provide a positive learning environment that promotes student autonomy in L2 learning. • Make L2 literary experiences more relevant to student interests.	• Students are able to evaluate their own mastery of the L2 strategy or strategies and effectively apply them to new reading tasks. • Students are able to learn L2 independently.	• Learning how to build in the student goal of self-directed L2 learning. • Learning how to give structured feedback to encourage learner autonomy.
• Awareness of own L2 reading process through support and guidance (Housand & Reis, 2008).	• Promote classroom conditions that promote L2 reading engagement and conceptual learning through reading strategies, goal setting, self-directed learning, and collaborative learning.	• Students are able to set goals, direct their own L2 learning, and engage in collaborative learning with success.	

Note: Theoretical knowledge was offered to the design group via the researcher.

Note: The researcher was also a teacher during the implementation. The researcher kept a teaching logbook and was observed teaching; however, the researcher's logbook and observation rubric were not included in data collection.

Note: The design team provided training to all teachers teaching the implementation.

4

4.1.1 The Present Study

This present study investigated the implementation of a seven-week L2 reading strategy intervention for higher education students codesigned by teachers and a researcher. This interventional method was the collaborative product of a design team at an institute for higher education. Teachers and researcher met weekly for a full school year to codesign the reading strategy intervention method and continued to meet together during the first year of implementation. Teachers kept logbooks, discussed the implementation process, and were observed teaching. After the observation, they received extensive feedback on their teaching performance of the intervention. We wished to know how well the teachers had implemented the intervention according to the design principles. For this reason, the differences in implemented and observed implementation of the guiding principles of the intervention forms the focus of the present study.

Research questions guiding this study
1. To what degree are the different measures of teacher kept logbooks and whole class observations in agreement with each other as a means of measurement of implemented curriculum of the L2 reading strategy intervention?
2. To what extent does the implemented curriculum correspond with the intended curriculum of the L2 reading strategy intervention?

4.2 Method

4.2.1 Participants

Five members of teaching staff, including the researcher/teacher, formed the design team. Together, these colleagues collaboratively co-designed the L2 reading strategy method taught as the intervention. Eight members of teaching staff—five of whom were members of the design team, including the researcher/teacher—taught the intervention and actively participated in the implementation process. One teacher, who fell ill, was replaced by an existing member of the teaching team. Among the teachers, there were more female teachers (n = 6) than male teachers (n = 2), with a mean age of 46.3 ($SD = 10.54$). Mean years of teaching experience in higher education was 12.0 years ($SD = 7.65$) (minimum = 3, maximum = 25).

Participants in the L2 reading strategy intervention were a complete year's cohort of students enrolled in their first year of a bachelor degree at a university of applied sciences in the Netherlands ($N = 801$).

4.2.2 Design Process

Over the course of one academic year, the design team worked together, in collaboration, one afternoon a week to codesign and develop the seven-week L2 reading strategy module *Effective Reading for Professional Purposes*. This intervention was taught to a complete cohort of first-year undergraduate students as part of their foundation year. The members of the design team were all teachers with a considerable wealth of expertise, teaching experience, and dedication towards re-structuring the English curriculum as a contribution to the faculty's redesign program aimed at higher education students. The intervention had to be designed completely from scratch, as no previous materials for this particular educational purpose or context were available. The design principles were cocreated by the design team as a result of lengthy collegial discussion of scientific L2 reading research presented by the researcher. The design principles derived from these collegial meetings guided and shaped the design process of the intervention (see Table 4.1). For more information regarding the design process of the intervention, see Chapter 3.

Specific elements for instruction were selected and then further adapted to the particular educational context from the handbook *Language Learner Strategies* (Rubin et al., 2007). These included the promotion and development of learner self-management, fostering language and cognitive development by integrating content, language, and strategy-based instruction. For instructional elements used in the guiding principles, see Table 4.1.

The four phases of instruction indicate that the first phase should be heavily scaffolded by the teacher, after which teacher input gradually lessens over the subsequent three phases. Eventually, in the fourth phase, the student can assume autonomy in using L2 reading strategies independently. Each phase of the lesson (see Table 4.2) is divided into a number of stages of instruction and describes the teacher's and student's role, showing the teacher gradually releasing responsibility to the student. The concept of the four phases of instruction was inspired by Fisher and Frey (2013) also, with examples from the handbook of Rubin et al. (2007), and was adapted to our specific educational context.

The codesign team was able to substantially draw on the research findings of a meta-analysis of L2 reading strategy studies completed by the teacher/researcher in the previous year (Yapp et al., 2021, see Chapter 2). This meta-analysis reported on ten L2 effective reading strategies which were the most effective in improving L2 reading comprehension performance. The most effective strategies in the meta-analysis were found to be those that required the reader to undertake explicit and conscious action, such as: *Connecting new information to what is already known*, *Asking questions while reading*, and *Paying attention to structure and signal words* (see Table 3). These strategies were therefore included in the reading strategy intervention.

Table 4.2: The Four Phases of Instruction

Phase description	Teacher role / Instructional stage	What takes place in class
1. Raising awareness Introducing strategy	Direct and explicit instruction of L2 vocabulary, L2 reading comprehension, and L2 reading strategies	Raising awareness of the reading strategies that students may already use and may have used in the past, and introducing new strategies which the student may not yet be aware of. This phase requires the teacher to introduce and raise awareness of reading strategies, while explicitly explaining the process behind the *why*, the *when*, and the *how* of the use of the strategy. In class, the teacher explicitly talked about the characteristics, usefulness, and applications of the strategy and gave examples.
2. Teacher modeling and explaining	The stimulation of student motivation and engagement through modeling and scaffolding	Teachers were trained during the weekly sessions on modeling the use of reading strategies by explaining their mental processes aloud when reading a text (Schunk & Zimmerman, 2007). High-quality modeling has been reported to result in readers gaining more insight into, and understanding of, their own reading process (Okkinga et al., 2016). The teacher also illustrated their own strategy use through a reading task, such as examining unknown vocabulary items in a text by explicitly connecting the new information to what vocabulary or knowledge might already be known on the subject. Teachers were also encouraged to give feedback to the group or to scaffold where necessary. For example, if a group or an individual student was having difficulty with the task, the teacher would either model the strategy again or scaffold until the student was able to continue with the task unaided; this process is known as the "Gradual Release of Responsibility" (Fisher & Frey, 2013). Students were asked to make a conscious effort to use metacognitive strategies in combination with the reading task. Students were also shown how to recognize when one strategy was not working and how to move on to another strategy.
3. Providing multiple opportunities to practice	Provides the student with opportunities for extended discussion and interpretation of the text	Providing students with opportunities to practice using the strategy in order to solve reading tasks, either collaboratively or individually. This phase ensures that readers are able to use the strategies autonomously, which is achieved through a gradual release of teacher involvement. Students were encouraged to work together collaboratively to apply the reading strategies while solving a reading task. Collaborative practice among students has been found to promote empathy and communication and to bolster problem-solving skills (Chu et al., 2011).
4. Self-evaluation of reading strategy effectiveness	Provides the student with the opportunity to evaluate their own success in using reading strategies through evaluation and expansion of their reading	Promoting awareness of the student's own reading process, requiring the student to evaluate their own mastery of the strategy or strategies and effectively apply them to new reading tasks. The main purpose of this phase is to provide students with opportunities to evaluate their own success in using reading strategies, thus developing metacognitive awareness of their own learning processes (Cubukcu, 2008). Activities used to develop students' self-evaluation insights included self-questioning and evaluative discussions after strategy practice, checklists of strategies used, and open-ended questionnaires on reading behavior, in which students expressed their opinions about the usefulness of particular strategies. In the expansion phase, students were encouraged to use the strategies that they found most effective and apply these strategies to new contexts, (Van Silfhout et al., 2014). A variety of texts were used in the method, which highlighted topical or cultural issues interesting to this particular target group in order to increase student motivation to read (Guthrie & Wigfield, 2000).

The effectiveness of pedagogical approaches of instruction such as teacher modeling, raising awareness of reading strategies, and student collaborative and individual practice had also been analyzed in the meta-analysis. It was found that the effectiveness of the reading strategy depended on the pedagogical approach with which it was taught. For this reason, the design team found it advisable to include the most effective reading strategies from the meta-analysis—along with as wide a range of instructional approaches as possible—in the design of the L2 reading strategy intervention. It was decided to teach a maximum of two reading strategies per week within the four-phased instructional approach (see Table 4.2), as this was agreed by the design team to be the most applicable to the educational situation, based on their teaching experience and practice. Therefore, it was deemed the most suitable manner in which to integrate the design principles of the L2 reading strategy intervention, together with research-based reading strategy instruction, into the practical setting of the reading classroom (see Table 4.1).

Table 4.3: Reading Strategies Taught in the Intervention

	Reading Strategies
Week 1	No reading strategy instruction provided
Week 2	Connecting new knowledge to what is already known
Week 3	Asking oneself questions while reading
Week 3	Making predictions while reading
Week 4	Visualization
Week 5	Paying attention to structure and signal words
Week 6	Skimming
Week 6	Scanning
Week 7	No reading strategy instruction provided, preparation for the examination

4.2.3 Planning and Professional Development Training

During the weekly codesign sessions, the researcher would share findings and results from L2 reading strategy research with the design team, and the team would subsequently determine how best to integrate these findings into the proposed intervention. Consequently, it was agreed that in order to successfully implement the intervention, all the teachers would participate in a number of professional development training sessions. These would provide them with the requisite tools for successful implementation. Professional learning for teachers was therefore organized via five sessions of two hours each, which were built around the practice-based professional development approach (Loewenberg Ball & Forzani, 2009). This approach lays the focus on developing a teacher's understanding and skill in effective implementation of the intervention, rather than solely concentrating on improving teacher knowledge. For this reason, the professional development of teacher training provided to this team of experienced teachers centered on how best to implement

the guiding principles of the intervention and on practical matters to do with the course, such as modeling (see Training for Teachers in Table 4.1).

The design team used the first few team sessions to brainstorm and discuss the educational problems surrounding L2 instruction currently employed at the institution, the importance of L2 reading comprehension skills for higher education students, and the lack of instructional material aimed at improving L2 reading abilities available to higher education students. The researcher also shared research findings, such as scaffolding, the development of a student's internal self-regulation process, and individual differences in student learning, which would be applicable to second-language learning (Dörnyei, & Chan, 2013). These insights underpinned the researcher's own recent reading research and were shared with the design team during the weekly design meetings.

Subsequent sessions revolved around practical issues, which led to the development of the weekly program which focused on the L2 reading strategies and the pedagogy of the design principles, such as modeling and scaffolding. Teachers were provided with instructions on how to model L2 reading strategies and watched a recorded video of a teacher modeling, which had been created explicitly for use during the implementation training sessions. During this session, teachers discussed how they could best implement modeling in their own classes.

4.2.4 Teacher's Guide and Activity Book
To aid the implementation process, a teacher's guide and activity book had been created, which contained seven detailed lesson plans and suggestions for extra activities and practice. The teacher's guide contained a brief recap of the guiding principles behind the design of the intervention as well as answers to exercises, suggestions and ideas for warm-up activities, and activities for student collaborative and individual practice with follow-up activities were also included (for examples of student activities see Appendix C).

With the help of the teacher's guide, teachers were instructed on how to use the L2 guided practice activities, and were supplied with instructions on how to scaffold and give students feedback. One session was devoted to explaining the specific instructions on how to implement the detailed weekly lesson plans in the teacher's guide and how to use the teacher logbooks. In addition, the design team was provided with support from the IT department in the form of a digital learning environment, in which students could further practice their reading comprehension skills outside of the classroom. During the final stages of design, the reading strategy intervention was refined and revised to the seven-week, seven-reading-strategies intervention (for an example of the Teacher Reading Strategy Log and Activity Book see D2 in Appendix D) .

4.2.5 Implementation
The intervention was implemented over three periods in one academic year. The researcher and teachers met weekly, for one hour, during the academic period before the implementation of the intervention and during the three periods of the intervention. In total, the design team met 25 times and the teaching staff (four members of which were also part of the design team) met a further 35 times. These meetings were facilitated by the management team by adding the meeting to the teachers' schedules. The meetings were a moment during which teachers could discuss the implementation process, share teaching experience, and exchange best practices. The implementation session was held before the first wave of experimentation, i.e. the teaching of the intervention. During this session, any issues that were encountered in implementing the intervention were shared and discussed. In subsequent sessions teachers shared their experiences of teaching the intervention, and some points from the teaching observations were shared and discussed. A recap of the implementation session was held before the beginning of each teaching period.

4.2.6 Instruments
Teacher logbooks
Teachers participating in the intervention were requested to complete a teacher-kept logbook after each class, in which they reflected on how well they taught the class according to the implementation method guidelines (see D2, Appendix D). They also recorded themselves teaching each lesson; however, this recording was consulted only if they could not recall how they had taught any particular instructional phase of the lesson. Mostly, the video recording was intended for their own guidance purposes only and was deleted after the lesson by the teacher.

The logbook was divided into seven weekly units. Each unit began with a reflection of the reading strategy to be taught in that week's class, followed by suggestions for class warm ups, collaborative practice exercises between students and individual practice. The logbook asked teachers to assess how well they handled teaching each instructional stage of the four different phases of instruction of the reading strategy intervention, e.g.: *warm up, awareness, introducing, explaining, modelling, individual practice, collaborative practice, feedback, scaffolding, explaining benefits of strategy use,* and *further practice*. Teachers could indicate whether they taught these stages of instruction *perfectly, well*, *to some extent,* or *not at all,* according to the descriptive guidelines of the intervention.

Upon completion of the intervention, teachers submitted their logbooks and also discussed, during the weekly meetings, which challenges they might have experienced during the teaching of the intervention. If a teacher forgot to complete any section of the logbook, the researcher and teacher would attempt to complete the missing section together, using notes from observations or using the video recording of that particular lesson.

4

Teacher observations and observation rubric
Classroom observations tend to provide additional insight, i.e. more reliable and valid data on what teachers actually implemented of the lesson guidelines as opposed to what teachers intend to implement or report they have implemented (Desimone, 2009). Therefore it was decided to carry out whole-class teaching observations of all teachers who taught the intervention, at least once per academic period. In total ten whole-class observations, which were carried out by the researcher and a senior teacher, were used for data analysis purposes.

A double observation of four lessons, conducted by a senior teacher and a researcher, was carried out as a means of calculating inter-rater reliability. As indicated by the agreement between observers, this proved to be high (93%). The same senior colleague observed the researcher/teacher teaching during all three teaching periods. These whole-class observations of the researcher/teacher were not included in data collection.

Observations were carried out through the use of an observational rubric (see D1, Appendix D) and provided a helpful summary of the lesson as well as the logbooks. The rubric followed a similar construction to that of the teacher logbooks. The observational rubric was devised to examine whether the teachers implemented the instructional elements of the intervention according to the implementation guidelines, i.e. whether the teacher adhered to the guiding principles of the intervention. Examples of the variables listed in the observation rubric are: *generating awareness of the strategy, introducing the strategy, explaining the strategy, modeling the strategy, allowing collaborative and individual practice, providing feedback and scaffolding,* and *explaining the benefits of strategy use.* The activity could be observed as adhering to the implementation guidelines: *perfectly, well, to some extent,* or *not at all.* Space was provided for individual teacher observations. After the observation session, the observed teacher and researcher met to discuss the observation. The experience was entirely collegial, as the observation did not carry any repercussions for future employment decisions, but was intended as feedback and guidance to the instructional approach and the implementation process of the intervention.

4.2.7 Data Collection and Procedure
The completed logbooks were collected from each participating teacher at the end of each teaching period (week eight). One logbook was discounted, as it was incomplete, and one logbook was excluded from data collection as two teachers had taught the intervention together, due the original teacher falling ill. The logbook completed by the teacher researcher was also discounted. The complete data set contained in total ten logbooks and ten completed observation rubrics.

Whole-lesson observations of each of the eight teachers who taught the intervention were conducted between weeks two and six of the intervention's implementation. The observer indicated in the rubric how well the teacher had adhered to each of the phases of the implementation process. There was also space to add additional comments. On several occasions, the observer noted a new and innovative approach of a teacher to the lesson materials and was able to share this approach with the team during the weekly sessions, after having first gained the teacher's permission to do so. This enabled teachers to learn with and from each other during the implementation process.

4.2.8 Analysis
The relationships between the two types of data—coded teacher logbook entries and coded whole-classroom teaching observations—were analyzed. We analyzed these measures using a cross tabulation of the data in order to determine any relationship between these variables. In the analysis, a distinction was made between the execution and the observation of each of the instructional stages within each of the four phases of instruction (see Table 4.2). In each of the instructional stages, teachers and observers had to rate the implementation of that stage on a scale from 1 to 4. A rating of 4 was given for the activity being executed *perfectly* according to the implementation guidelines, 3 for an activity executed *well*, 2 for an activity executed *to some extent*, and 1 for the activity *not* (being executed) *at all*. The analysis followed the instructional stages within the four phases of instruction as follows: Phase one: *raising awareness of strategies, introducing strategies.* Phase two*: explaining and modeling what strategies are, explaining why strategies are important, explaining when to use strategies.* Phase three*: individual practice, collaborative practice, giving feedback, scaffolding.* Phase four: *explaining the benefits of strategies, asking them to explain how they would use the strategy in other contexts,* and *providing opportunities for further practice*.

4.3 Results

In the analysis, a distinction was made between the separate instructional stages in each of the four phases of instruction. For each lesson phase, teachers and observers had to rate the implementation of each instructional stage.

Teacher Logbooks
The averages reported for each of the four phases gives a general impression of the implementation according to the teachers' reported response according to the logbooks. For result comparison purposes, we report the execution categories *perfectly*, *well*, and *to some extent* separately. Overall, results show that the lessons were executed as well as the intervention guidelines had intended. Teachers reported that they executed the four

phases of the lesson mostly in the manner in which the guidelines had specified, i.e. which did not much differ from the intended curriculum. The end of the lesson was implemented less well than the beginning; however, teachers perceived of themselves in the logbooks as executing all four phases of every lesson either *well* or *perfectly* more often than *to some extent*. The average percentage for the execution of all stages of the lesson *perfectly* was 29%, for *well*, 48%, and for *to some extent*, 18%. Phase one and phase two were reported by teachers as being executed on average more *perfectly* and *well* than the other two categories, while phase three was executed on average more often *well* than *perfectly* or *to some extent*, and phase four was reported as being executed *well* more often than '*perfectly* or *to some extent*. The results of teachers' reported implementation of the stages of instruction according to the logbooks are reported in Table 4.4.

In each of the four instructional phases, more than 78% of the lessons were implemented at least *well*. Only in the third and fourth phases were there relatively more lessons executed as intended *to some extent* (27% and 21% respectively). Note that the category *not at all* did not appear in any of the teacher logbooks.

Lesson Observations

We continue with the observed implementation of the stages of instruction according to the observation rubrics. Overall, teachers were observed to have executed the first two phases of the lesson on average *perfectly* (70% and 73%) more often than the last two phases (28% and 27%). However, they were observed executing all stages of the lesson *perfectly* (48%) more often than the other three categories. The category *not at all* was observed to have been executed on average less often than the other categories (10%). In total, 48% of all phases of all lessons were executed on average *perfectly*, 27% of lessons *well*, and 15% *to some extent*. The teachers' observed implementation of the stages of instruction according to the observation rubric can be found in Table 4.5.

Reporting on the observed percentages for each of the instructional stages of each of the four phases, we can report that for every stage, the observed execution was higher for the categories *perfectly*, *well*, or *to some extent* than for the category *not at all*, with the exception of the stage asking students to explain how they would use the strategy in other contexts (30%). On the whole, teachers were observed implementing each stage either *perfectly* or *well* more often than *to some extent*. The highest percentages for observed implementation for the category *perfectly* were found in phase two, for the stages of explaining why the strategy was important (80%) and when to use the strategy (80%); the lowest percentage of observed execution for this category was found in phase three, for the stage scaffolding (10%).

Table 4.4: Teacher's Reported Implementation in Percentages According to Logbooks

Phase of lesson	Teacher activity: instructional stage	Implemented *perfectly* as intended	Implemented *well* as intended	Implemented *not at all*	Implemented *to some extent* as intended
1	Generating awareness	35	48	0	18
	Introducing	45	31	0	17
	Phase average %	40	40	0	18
2: Explaining and modeling	What the strategy is	45	48	0	2
	Why the strategy is important	36	52	0	7
	When to use the strategy	26	57	0	12
	Linking information to what students already know	26	41	0	26
	Phase average %	33	50	0	7
3: Creating opportunities for	Individual practice	45	48	0	0
	Collaborative practice	31	40	0	24
	Giving feedback	10	62	0	24
	Scaffolding	5	50	0	38
	Phase average %	23	50	0	27
4	Reminding students of benefits of strategy	40	52	0	2
	Asking students to explain how they would use strategy	26	43	0	26
	Providing opportunities for further practice	10	50	0	36
	Phase average %	25	48	0	21
Category total %		30	48	0	18

4.3.1 Level of Agreement Between Logbooks and Observations

When we consider the level of agreement between the measurements of logbooks and observation rubrics, we report that the level of agreement between them is considerable ($k > .80$). This indicates that the agreement between logbooks and observation rubrics largely converges. Most lessons, either as observed or in the logbooks, were executed as either *perfectly* or *well*; as a consequence, we can interpret that the logbooks and observations can be used as a basis for intended and implemented curriculum. A strong relationship (executed *perfectly*) has been established between the intended and implemented curriculum. To put it simply: in terms of implementation fidelity, teachers did not just report that they taught the lesson as it was intended; they were also observed to have taught what

Table 4.5: Observed Implementation of the Stages of Instruction in Percentages According to the Observation Rubric

Phase of lesson	Teacher activity: instructional stage	Implemented *perfectly* as intended	Implemented *well* as intended	Implemented *to some extent* as intended	Implemented *not at all*
1	Generating awareness	70	10	0	20
	Introducing	70	30	0	0
	Phase average %	70	20	0	10
	What the strategy is	60	20	20	0
2: Explaining and modeling	Why the strategy is important	80	10	0	10
2	When to use the strategy	80	20	0	0
	Linking information to what students already know	70	30	0	0
	Phase average %	73	20	5	3
	Individual practice	40	40	20	0
3: Creating opportunities for	Collaborative practice	40	40	0	20
3	Giving feedback	20	20	40	20
	Scaffolding	10	50	30	10
	Phase average %	28	38	23	13
	Reminding students of benefits of strategy	30	10	40	20
4	Asking students to explain how they would use strategy	20	30	20	30
	Providing opportunities for further practice	30	40	30	0
	Phase average %	27	27	30	17
Category total %		48	27	15	10

they said that they had taught, which, in turn, corresponded with the guiding principles of the intervention

In the first phase of the lesson, teacher activity centered on raising awareness of the reading strategy and introducing the strategy to the students. The logbooks and observation rubrics were much in agreement for this phase. In other words, the teachers' perceived implementation of this phase was in agreement with the actual observed implementation and was in line with the design principles. Teachers always introduced the reading strategy and nearly always raised awareness of the strategy.

In the second phase of the lesson, teacher activity focused on modeling the reading strategy and explaining what the strategy was, why it was important, and when to use it. Again, there was much agreement between the teachers' perceptions of how they implemented this phase according to the logbooks and observation rubrics; for example, all teachers were observed modeling. Teachers' perceptions of explaining why the strategy was important were observed to be extremely high quality, in agreement with the intended execution of this activity.

In the third phase of the lesson, teacher activity was centered more on creating opportunities for students to practice with the strategies individually or collaboratively. Also, teachers scaffolded or gave feedback when necessary. The observed implementation of providing opportunities for individual or collaborative practice and providing scaffolding was very similar to teachers' reported execution of these activities. However, providing feedback when necessary was reported to be executed by teachers somewhat more than by the observers.

In the fourth phase of the lesson, teacher activity was focused on reminding students of the benefits of the reading strategy, asking them how they might use the strategy in different contexts, and offering opportunities for further practice. The reported execution of these activities differed somewhat from the observed implementation, and this phase had the least agreement between logbooks and observation rubrics when compared to the other three phases. With regard to the activity reminding students of the benefits of using the strategy, teachers reported themselves executing this activity more than they were observed executing it. In contrast, the activity providing further opportunities for students to practice with the reading strategy was observed to have been implemented more often than teachers reported executing this activity. This point was referred to during the collegial interview, which followed after a whole-class observation.

All in all, for the four phases of the lessons, much agreement was found between the reported and observed implementation. Phase four, which had the lowest level of agreement between logbooks and observation rubrics, came at the end of the lesson. Several teachers reported that they experienced a lack of time in which to execute all the guiding principles of the fourth phase and would, in this case, end the class with suggestions for further practice and self-study with the reading strategy. We shall return to this point in the discussion.

4

4.4 Discussion

The goal of this study was to investigate the fidelity with which teachers implemented the L2 reading strategy intervention according to the guiding principles by comparing what teachers reported teaching in their logbooks with what was observed in their classes.

Our first research question set out to determine to what degree the different measurements of teacher-kept logbooks and whole-class observations were in agreement with each other, as a means of measurement of intended and implemented curriculum of the L2 reading strategy intervention. It was found that the logbooks and the observations agreed considerably with each other for most of the phases of the lesson, especially with regard to the first two phases. This may be due to the fact that many of the intervention teachers had worked from the start on the codesign of the intervention and would have had "insight" into how they executed the intervention in line with the guiding principles. Other teachers, who were not members of the original design team, worked in close collaboration with the design members and met weekly for the whole year to share insights and experiences. Sharing experiences and knowledge may have contributed to these teachers being able to execute the lesson phases in a fashion similar to the execution of the phases of the original design team members.

To this end, there was considerable agreement between what teachers reported in the logbooks and what was observed in their classes according to the observation rubrics. Therefore, with respect to our first research question, we can conclude that perceived and observed practices were, for the most part, in agreement with each other as a means of measurement of intended and implemented curriculum. However, some small differences between the observed implementation and teachers' reported implementation were found, most notably in phase four, in which teacher activities were not executed as well as intended. This may have been due to time limitations in the lessons, and is a reminder that interaction with students sometimes requires a necessary deviation from the planned lesson in order to accommodate students' questions about or struggles with the material.

Our second research question set out to investigate to what extent the implemented curriculum corresponded with the intended curriculum of the L2 reading strategy intervention. In order to answer this question we used two steps of argument. The first step was to establish whether there was agreement between the logbooks and the observations, which we have established. The second step was to determine whether the intended and implemented curriculum corresponded with each other. We found that what teachers had implemented and what was observed to have been implemented were much in agreement with each other. There was considerable agreement between what was reported in the logbooks, in terms of implemented curriculum, and what was observed to have been

implemented in the observation rubrics. Besides, in the vast majority of lessons, only slight discrepancies with the intended curriculum appeared. For these reasons, we conclude that the implemented curriculum corresponds with the intended curriculum, the intended curriculum, in turn, corresponds with the guiding principles of the intervention.

Having established this second step, we can answer our second research question by concluding that the implemented curriculum corresponded to a large extent with the intended curriculum on which the intervention's guiding principles were based. During the design phase, teachers and the researcher collaborated in designing the guiding principles of the intervention and shared "ownership" and responsibility in implementing the intervention according to these principles. During the implementation of the intervention, the team met weekly to discuss any issues they encountered, share teaching experiences, and discuss the guiding principles of the intervention. Our results concluded that eighty percent of all lessons were executed faithfully and were in accordance with the design principles.

While all teachers demonstrated considerable fidelity in terms of implementation of the intervention, some activities were not executed as well as others. For example, the teacher activity of giving feedback was not executed as well as intended; this is a point which we will return to in the limitations of this study. Nevertheless, there seems to be much benefit to be gained from the collaborative interaction between researchers and teachers. In more general terms, we believe what could be accomplished by subsequent educational projects could be mutually beneficial to both practice-based educational projects and similar research partnerships between teachers and researchers in L2 reading research.

4.4.1 Limitations of this Study

Although the results of this study are largely positive, there are some limitations to report. Our results were based on the responses from a relatively small sample of teacher data: forty-two logbooks and ten classroom observations. Unfortunately, more classroom observations were not possible due to scheduling conflicts, as the intervention classes were often scheduled at the same time.

The teacher activity of giving feedback is a complex one, much more so than the teacher activity of modeling, for example. The ability of the teacher to provide feedback appropriate to the student's skill level is a complicated task, requiring didactical skills that connect the learning goals of the student and their expected growth with the intended task outcome (Svanes & Skagen, 2017). This aspect of teaching, while taught in teaching training, is often difficult to execute well. As a teacher myself, I appreciate the many complex roles a teacher must assume during a class, and giving feedback to students is one of these. Furthermore, research suggests that there may be a difference in expectations among trainers and

trainees regarding the role and performance of teacher feedback (Copland, 2010). For many reasons, therefore, it is not surprising that teachers report experiencing this activity differently from how it was observed. Moreover, observations noted only whether feedback was executed or not, we have no data on the quality of the feedback or the reasons why it may not have occurred.

We are aware that we focused on implementation fidelity as a possible outcome of professional development by collaboration between teachers and researchers. In this study, we explored aspects of professional development such as codesign, logbook keeping, weekly implementation sessions, and observations. We did not explore other possibilities of professional development, such as teachers observing each other and giving each other feedback on their teaching. Although these could have been valuable sessions, classes were often scheduled parallel to each other, which made it logistically impossible for teachers to observe each other's classes.

4.4.2 Suggestions for Further Research
We highly recommend further research on collaborative undertakings in codesign of L2 interventions in other educational contexts, for example in secondary education or vocational education settings, in which we believe the benefit of such undertakings could be extensive. Facilitating teachers for one hour a week, in order to meet and discuss teaching experiences and share "best practices" was instrumental in the successful implementation of this intervention. Furthermore, the pedagogical implications of this study are far-reaching: teachers who collaborate in the codesign and share "ownership" of educational innovations seem to be able to teach effective interventions, and their students benefit from the teachers' increased knowledge and expertise. To this end, we heartily encourage codesign and collaborative undertakings between research and teaching departments, which can create educational projects of lasting benefit to students.

4

5

Effects of Reading Strategy Instruction in English as a Second Language on Students' Academic Reading Comprehension

5.1 Introduction

Being able to digest large amounts of academic text in a fast, efficient, and effective manner is a crucial skill that not all students in higher education have yet mastered (Trudell, 2019). Especially so when one bears in mind that the extensive demands of academic reading experienced by students in higher education differ a great deal from the reading demands faced by students in secondary education (Hermida, 2009). For example, college students are often required to digest and process large amounts of detailed and complex textual information within a short time frame. Moreover, academic texts often tend to be written in a concise and compact style, so that even good readers must utilize a considerable amount of their reading comprehension abilities in order to extrapolate and comprehend their meaning (Lee & Spratley, 2010).

Furthermore, the demand for English as a second language (ESL) being used as a medium of academic information exchange is expanding within higher education, in what could be seen as a globalization of academic linguistic expression (Block, 2004). Certainly, there has been a notable growth in scholarly articles and papers in higher education offered in the English language, particularly within the north of Europe. The Netherlands and Scandinavia, for example, offer the highest percentage of higher education courses in English as a second language (Kuteeva & Airey, 2014). Increasingly, college textbooks, lecture notes, and materials are also written in English, which can pose an extra reading challenge for non-native readers (Van Weijen et al., 2012). For this reason, instruction in second language (L2) reading comprehension at higher education level for ESL students is an important and relevant issue (Grabe & Stoller, 2011).

5.1.1 Reading Strategy Instruction
Reading instruction that incorporates reading strategies and promotes strategic reading behavior has been found to be conducive to and helpful in the development of a student's academic reading ability (Mokhtari & Thompson, 2006; Sheorey & Mokhtari, 2008). However, as strategies learned in the first language (L1) do not automatically transfer to the L2, it is essential that instruction is extended, in formal education, to include L2 reading strategy instruction (Baddeley et al., 2009; Van Gelderen et al., 2007). Furthermore, due to the increase of the use of ESL reading within academia, it is all the more urgent to continue L2 reading strategy instruction beyond that of secondary school level (Holligan, 2018). Nevertheless, research into L2 reading strategies and the role of L2 reading strategies in reading comprehension at college level has been scant, and investigations into L2 reading strategy interventions in higher education have been lacking (Taylor et al., 2006).

For the last 30 years, most L1 reading comprehension programs in primary and secondary schools include reading strategies in some form (Duke & Pearson, 2002). Reading

Abstract

The ability to read in a second language (L2) for academic purposes is essential for higher education students. Dutch colleges increasingly use materials in English or teach in English. This can be challenging for L2 readers, especially students entering higher education from vocational studies, who may have less experience with L2 academic reading. Teaching L2 reading programs containing explicit instruction of reading strategies may benefit higher education students in L2 academic reading, particularly since reading strategies learned in the first language (L1) may not transfer to the L2. In this seven-week L2 reading strategy intervention, 801 first-year polytechnic students learned to use seven reading strategies that were effective according to a meta-analysis of L2 reading strategy studies. Data regarding students' reading skills were collected over one academic year, from three treatment waves, using a Regression Discontinuity design. Three tests of equal difficulty were given to participants. In each wave, students completed reading tests several weeks before the intervention, at the beginning and directly after the intervention. Results show that in all three waves, the improvement in reading comprehension scores between the second and third measurement (due to the experimental course) significantly exceeded the increase between the first two measurement occasions. Although the intervention was shown to be effective, the effects were to some extent mediated by the previous education level. This study supports the explicit instruction of strategies in L2 reading for students in higher education and welcomes more research into L2 reading strategy interventions for students from vocational backgrounds.

Keywords: higher education, improving reading comprehension, L2 language teaching pedagogy and approaches, L2 reading strategy instruction, reading English for academic purposes, reading intervention, reading strategies, second language (L2) reading, vocational education and training.

comprehension can be described as a complex and complicated process, in which the reader engages with a text in order to obtain meaning and understanding from it. Comprehension is achieved by employing the reader's cognitive processes and metacognitive skills to understand the text's meaning (Kintsch, 2002). The reader's understanding, and resulting comprehension, is thus facilitated by the skills and strategies at his or her command. A reading strategy is therefore the mental tool that the reader may apply consciously, or semi-consciously, to monitor, repair, or comprehend what they read (Afflerbach & Cho, 2009). Afflerbach et al. (2008a) noted that reading strategies are in fact techniques the reader employs that over time may become an automatic part of the reading process but will require practice and frequent use "during reading in order to become so" (Afflerbach et al., 2008b, p. 368).

Reading comprehension, therefore, is a skill that every teacher of each subject at all educational levels of instruction needs to be fully aware of (Strickland & Shanahan, 2004). Reading instruction can also be effective for older students (Anders et al., 2016), and knowledge on how to use and apply reading strategies can be particularly helpful, especially since there is no guarantee of automatic transfer from the L1 (Snow et al., 2005).

Furthermore, the explicit instruction of reading strategies, for example in the form of a teacher modeling when and how to apply reading strategies, may provide useful insights to student readers in helping them manage their metacognition and reading processes (De Milliano et al., 2016). Grabe and Stoller (2011) found that reading strategy studies that had introduced reading programs that incorporated cognitive and metacognitive reading strategies along with training in planning and self-monitoring showed significant improvements in reading comprehension performance.

Reading strategies that help the reader determine what is important in the text and what may be implied but not explicitly stated, and which assist the reader to form a synthesis of the information presented are considered to be effective strategies for active reading purposes (Harvey & Goudvis, 2007). Moreover, Pressley (2002) noted that reading strategies such as asking questions, making predictions, and strategies aimed at inferential thinking enabled readers to think more strategically and to make more sense of what they are reading. After being taught metacognitive reading strategies that invite reflection of the reading process as a whole, students became more active in their reading, mimicking the successful strategic reading process that would normally be automatically employed by proficient readers (Pressley, 2002; Pressley et al., 2006).

Reading strategy training that places the focus on strategic reading, i.e. the planning, monitoring, and evaluation of the reading process, can lead to significant improvements in L2 reading comprehension (Bimmel et al., 2001; Cohen, 2014; Duffy, 2002). Moreover,

structured training instructs students in using L2 reading strategies effectively and, combined with the metacognitive understanding of why and how reading strategies can aid understanding, can assist in the monitoring and checking of the reading process (Paris et al., 2016). Training such as this can also be helpful to less skilled readers in acquiring new reading comprehension skills in the L2 (Koda, 2007).

When considering the effectiveness of reading strategy interventions in improving reading comprehension, it is important to consider the full variety of reading strategies available. Pressley (2002) and Guthrie and Humenick (2004) found that student reading performance improved significantly when instruction employed the widest range possible of reading strategies aimed at cognitive and metacognitive understanding.

For example, this was the case in The Benchmark School (Pressley et al., 2006), where 203 students aged between 12 and 16, all with a previous history of school failure and in particular difficulties with reading, were provided with an hour and a half of explicit literacy instruction every day, twice a day. The instruction of strategic reading skills occurred via direct explanation models, which provided students with explicit knowledge about why, when, where, and how to use reading strategies. Reading strategy instruction included a focus on overt teacher modeling, with teachers spending time explaining to students how to become aware of and monitor their own reading process. Students were taught reading strategies used by successful readers to comprehend and integrate new texts and ideas, and emphasis was placed on the importance of self-monitoring and self-evaluation of the reading process as a whole. The researchers praised the overall consistency in the delivery of the reading instruction, in which all teachers participated. The Benchmark School's rigorous approach of placing reading instruction as the keystone of the daily curriculum resulted in 100% of their students graduating from high school.

Taraban et al. (2004) found support in their study for the view that students in higher education choose and utilize reading strategies that they believe orient them toward their success in academic tasks. The researchers asked 575 college students to complete the Metacognitive Reading Strategy Questionnaire (MRSQ)[2] on their use of cognitive and metacognitive reading strategies to solve reading comprehension issues encountered during their studies. The researchers found that reading comprehension was not perceived by students to be an automatic process but one that required direct cognitive effort and the application of metacognitive input, by way of reading strategies. Students reported

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2   The MRSQ developed by Taraban et al. (2004) encompasses metacognitive reading strategies within the questionnaire; the questionnaire comprises an analytic-cognitive component aimed at reading comprehension and a pragmatic-behavioral component aimed at studying behavior.

allocating significant attention to the checking, monitoring, and evaluation of their reading process.

In a meta-analysis on the effectiveness of L2 reading strategies studies on reading comprehension performance, Yapp et al. (2021a, see Chapter 2) analyzed 46 L2 reading strategy studies to ascertain which reading strategies and pedagogical approaches were the most effective in improving reading comprehension performance. The average effect size of the reading strategy studies analyzed was found to be large ($g = .91$), meaning that reading strategy interventions in L2 reading comprehension are effective. Furthermore, the meta-analysis found that reading strategies that required explicit cognitive action to be taken by the reader produced significantly large effect sizes, for example: semantic mapping, paying attention to structure and signal words, activating background knowledge, asking questions while reading, and connecting new information to what is already known (for descriptions and effect sizes, see A1 Appendix A). For this reason, these strategies were deemed to be particularly effective in L2 reading comprehension and were therefore integrated into the present L2 reading strategy intervention.

Additionally, the reading strategies "activating background knowledge" and "connecting new knowledge to what is already known" were specifically selected from the meta-analysis to be used in this intervention due to the fact that at-risk students, i.e. those who have struggled with L2 reading in the past or who enter higher education from senior vocational education[3] may find the difficulty and complexity level of L2 texts daunting. These students have had little or no experience at all in dealing with complex academic texts in English and have often not accumulated the reading expertise and background knowledge that would be expected from them to tackle their higher education reading demands (Beeker, 2012). Likewise, these students have not attained sufficient academic reading proficiency in their four years of vocational secondary school, compared to other undergraduate students with a non-vocational previous education.

Moreover, the meta-analysis tested the effectiveness of pedagogical approaches such as modeling and introducing strategies, as well as raising awareness of the reading strategies being taught and approaches such as collaborative and individual practice. It was observed that the effectiveness of the pedagogical approach analyzed was dependent on which reading strategy was being taught. In other words, not all pedagogical approaches were found to be equally effective with all reading strategies taught, but some approaches were more effective with certain reading strategies than other approaches. For example, teacher

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[3] Mbo (senior vocational education) is a four-year (post-)secondary school vocational education system that combines practical-based study with work placement and training. Students are admitted to an mbo study after four years of preparatory vocational secondary education.

modeling, an approach used by the teacher that is used to demonstrate the application of a particular reading strategy (Amirabadi & Biria, 2016), was found to be significantly effective with the reading strategies of visualization and skimming and scanning, but less effective with the strategies of semantic mapping and asking questions while reading. Therefore, in this present intervention, it was decided to employ a wide range of pedagogical approaches in combination with the most effective reading strategies.

Scientific investigation into the effectiveness of reading strategy instruction in ESL contexts in higher education has been lacking (Khalifa & Weir, 2009). This study is an attempt to address this research gap by, first, exploring whether a specifically designed L2 reading strategy method could be effective and could lead to improved levels of L2 reading comprehension performance among first-year college students. Second, due to the difficulties experienced in L2 reading for students from a previous education at a vocational level, we wanted to know whether the effect of the intervention would vary between the sub-populations of the student participants according to different previous educational levels.

5.2 Method

5.2.1 The Present Study
An L2 reading strategy program was designed, which lasted seven weeks and taught one strategy per week. This program combined seven L2 reading strategies that had been found to be effective from our meta-analysis with the intention to improve L2 reading comprehension and promote students' self-efficacy as long-term successful L2 readers (Pinninti, 2016). The reading strategies were taught with a variety of instructional pedagogy, such as awareness raising, introducing strategies, teacher modeling, collaborative and individual strategy use, feedback, scaffolding, and teaching why the strategy was useful and when and how it could be used. The benefits of teaching students the *why* and *how* of reading strategies has been found to be beneficial in facilitating reading comprehension, rather than the instruction of reading strategies alone without background explanation (Paris et al., 2016).

5.2.2 Participants and Study Institution
A complete year's cohort of students from a faculty of Management and Governance took part in this study ($N = 801$). There was no selection for participation, as a formal requirement from the management of the faculty had required that all first-year undergraduate students of that year's cohort be allowed to follow treatment and should enjoy an equal opportunity to reap the benefits of any improvement experienced in their L2 reading comprehension performance. For this reason, the whole first year's cohort participated in the study.

The participants were students in full-time education at a university of applied sciences located in the urban center of the Netherlands. This institution began in 1981 as a higher technical school and has since grown to its current size of roughly 11,000 students. Most students are accepted into the institution on the basis of a five-year general secondary education diploma[4], which constitutes approximately 70% of the student population at this institute. Some students (approximately 2%) enter after a six-year secondary school university preparatory education diploma, which prepares students for a research university education[5].

Students with a senior vocational education are also accepted, after successful completion of their four-year vocational post-secondary study. These students make up approximately 30% of the entire student population. However, student attrition is higher among these students than in other groups. Their previous education is made up for a large part of vocational experience, with little formal reading comprehension training in an L2 language such as English. In this respect, they are frequently the most disadvantaged when following English modules, due to their lack of L2 background knowledge and overall lack of exposure to English academic type texts.

As the student influx is heterogeneous in nature, there is much variance in reading comprehension ability. English modules are part of the compulsory curriculum, and entry level requirements expect students to have achieved an English language proficiency of B2; during the course of their polytechnic bachelor degree, they are expected to extend this to B2+/C1 (CEFR) level in English. Moreover, other subjects may use textbooks or other academic materials written in academic English, which poses a particular problem for students arriving from vocational backgrounds. These students have completed their previous studies with either, at the lowest end, the level of A2 (CEFR) English proficiency, or, at the highest end, the level of B1[6]. In either case, this falls short of the minimum requirement of proficiency in English for institutes of higher education.

The participants of the study were full-time undergraduate students who agreed to participate in the study after completion of a signed informed consent form ($N = 801$). The students were enrolled in one of the following disciplines of study: Law, Communications, Commercial Economics, Human Management Resources, or Social Juridical Services, and

were in the first year of their bachelor degree course. To accommodate the large volume of students participating in the study, treatment occurred in three equivalent moments of treatment, i.e. waves, by using an intervention design that could accommodate this program of treating large numbers of participants (see Design). For this reason, the specifically designed English reading program was offered across the entire faculty, and all students were required to follow the program regardless of their study discipline. However, students were able to opt out of data collection by indicating in the informed consent form that they did not give their consent to their data being used. For a breakdown of participants per wave, according to gender and previous education, see B1 Appendix B.

There were relatively more female students ($n = 546$) than male students ($n = 255$) in this sample, which is consistent with the ratio of females to males in these disciplines in Dutch higher education. Students with general secondary education as their previous education were the largest group ($n = 493$), 61.5% of the sample. This was to be expected, as a university of applied sciences education is the conventional route through higher education for students with this type of secondary school diploma. The number of students with senior vocational education as their previous education was within normal range for this student population ($n = 250$) and comprised 31.1% of the sample. The number of students with university preparatory education as their previous education was relatively small ($n = 28$), 3.6% of the sample population. This was not unusual, as most students with this type of secondary school diploma pursue a research-orientated university education. The number of students with previous education unknown was small ($n = 30$), 3.8% of the sample. Ages of the student participants ranged between 17 years and 22 years, with a mean age of 19.22 ($SD = 1.87$).

Student attrition in higher education in the Netherlands is a large and common phenomenon. Most student attrition occurs within the first year of study; the institution where this study took place was no exception to this phenomenon. From our student sample, 359 students did not complete all three tests, as they had either left the institution or, for other reasons, were no longer participating in their studies. Students tend to suspend their studies or transfer to other studies or institutions halfway through the year, or they may choose to discontinue their studies completely. To this end, an extra analysis was carried out to determine whether attrition caused any variation in results between student sub-populations. For a breakdown of numbers of missing scores per wave see B3 Appendix B.

Ten members of teaching staff participated in the study (eight females), with a mean age of 46.3 ($SD = 10.54$) and a mean of 12.0 years' teaching experience in higher education ($SD = 7.65$, min. years' experience = 3, max. = 25).

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4   Havo: a general secondary education school diploma awarded after successfully completing 13 years of formal education. Successful havo school graduates will have passed a national reading comprehension exam in English at the B2 (CEFR) level for reading.

5   Vwo: a university preparatory secondary education for academic university level study, completing 14 years of formal education. Successful vwo graduates will have passed a national reading comprehension exam in English at C1 (CEFR) level.

6   Students with a completed mbo education will have a level of English of between A1 and A2/B1 (CEFR) waystage or elementary level to B1, described as lower intermediate.

5.2.3 Design

The assumption made is that students' reading performance will improve due to the experimental reading intervention. In order to make a distinction between "natural growth" and the effect of the reading intervention followed by the students, three reading comprehension tests of equal difficulty were required to be completed on three subsequent measurement occasions (testing moments). The difference between the first two measurement occasions is indicative of "natural growth" in reading skills, whereas the difference between the second and third measurement occasions reflects the effect of the experimental reading intervention. In this Regression Discontinuity data design, we wish to test whether the slope of the regression line changes due to the introduction of the reading intervention (Shadish et al., 2002).

Not all students were able to follow the intervention at the same time, as the number of students exceeded the amount (N = 801) that could be accommodated within one academic period. Therefore, students were assigned to one of three waves of equivocal treatment, which coincided with the students' departmental course curriculum. For a breakdown of numbers of students per wave see B2 Appendix B. In each wave, students completed the first measurement occasion (M1) 10 weeks prior to the start of the reading intervention and the second measurement occasion (M2) at the start of the intervention. The third and last measurement occasion served as a post-test (M3) that was taken on completion of the intervention. Table 5.1 shows administration of measurement occasions and treatment under a Regression Discontinuity Data design, where the experimental conditions are divided over four consecutive academic periods of 10 weeks each.

The compulsory nature of the reading program meant no student could be excluded from treatment, meaning all students had to be allowed to follow treatment, whether participating in the study or not. This coincides with our intention that all participants be able to benefit from any possible gains that might ensue from following the intervention. In this intervention, each of the three waves followed an identical sequence in terms of treatment assignment, set-up, and duration.

5.2.4 Treatment

The intervention "*Effective Reading for Professional Purposes*" was a seven-week L2 reading strategy instruction program of two hours a week, in total 14 hours of instruction, offered to all students in periods two, three, or four of the academic year. The students completed two of the measurement occasions during the intervention and one prior to starting the intervention, see Table 5.1.

Teachers met weekly for one-hour training sessions on the implementation and teaching of the instructional principles of the intervention, over the complete academic year. Treatment

Table 5.1: Treatment and Measurement Occasions per Wave

Wave	Department	Academic period M1	Academic period M2	Intervention	Academic period M3
1	LAW, HRM, SJD	1	2	7 weeks	2
2	CE, SJD, LAW, COM	2	3	7 weeks	3
3	LAW, CE, HRM	3	4	7 weeks	4

HRM: Human Management Resources; SJD: Social Juridical Services; COM: Communications; CE: Commercial Economics

fidelity was closely adhered to by conducting teacher observations during each treatment wave and through teacher logbooks, in which teachers reported to what extent they had followed the instructional principles for each week of the intervention. The reading strategy program followed four distinct stages:

5.2.5 Explicit Instruction of L2 Reading Strategies

Each week concentrated on one type of strategy use. For each strategy or strategies, explicit instruction was given on what the strategy was, and on *how*, *when*, and *why* to use it (Veenman et al., 2006). The purpose of this phase was to create awareness of the strategies, explain the importance of cognitive and metacognitive reading strategies, help students identify the strategies that they already use, and develop students' metacognitive awareness of the relationship between their own mental processes and the promotion of effective reading behavior.

5.2.6 Teacher Modeling

Teachers were trained during weekly implementation sessions on modeling the use of reading strategies, by explaining their mental processes out loud while reading a text (Schunk & Zimmerman, 2007). In class, the teacher explicitly explained the characteristics, usefulness, and applications of using the strategy, why to use it, and when, and gave specific examples. The teacher also explicitly illustrated his or her own strategy use by demonstrating a think-out-loud approach to a reading task, for example by examining unknown vocabulary items in a text by explaining their thought processes out loud and connecting the new information to what vocabulary or knowledge might already be known on the subject.

5.2.7 Collaborative Practice, Scaffolding, and Individual Practice

Students were encouraged to work together collaboratively to apply the reading strategies while solving a reading task. This was found to be an effective approach in the meta-analysis of L2 reading strategies (Yapp et al., 2021a, see Chapter 2). Collaborative practice among students has been found to promote empathy and communication and to bolster problem-solving skills (Chu et al., 2011). Teachers were also encouraged to give feedback to the group

or to scaffold where necessary. For example, if a group or individual student was having difficulty with the task, the teacher would either model the strategy again or scaffold until the student was able to continue with the task unaided. Students were asked to make a conscious effort to use the metacognitive strategies in combination with the reading task. Students were also shown how to recognize when one strategy was not working and how to move on to another strategy.

5.2.8 Evaluation and Expansion

The main purpose of this stage was to provide students with opportunities to evaluate their success in using reading strategies, thus developing metacognitive awareness of their learning processes (Cubukcu, 2008). Activities used to develop students' self-evaluation insights included self-questioning and evaluative discussions after strategy practice, checklists of strategies used, and open-ended questionnaires on reading behavior, in which students expressed their opinions about the usefulness of particular strategies. In the expansion phase, students were encouraged to use the strategies that they found most effective and apply these strategies to new contexts (Van Silfhout et al., 2014).

A variety of authentic texts were used in the method, which highlighted topical or cultural issues interesting to this particular target group in order to increase student motivation to read (Guthrie & Wigfield, 2000). Classes of approximately 25–28 students per class were comprised of students from the different study disciplines, which meant that texts and tasks had to be interesting and appealing to students studying from the five disciplines. Each class contained a core lesson that would be presented in a PowerPoint presentation, with tasks and additional texts provided in a printed or digital handout. Each class began with a brief recall of the previous reading strategies learned. Students were encouraged to apply all the strategies they had learned so far during the reading tasks and to select the reading strategy that worked the best with any given reading task. Students were also invited to share, in an open discussion, what they found to be effective reading practices.

In the last week of the intervention, students were given a practice reading exam so they could use the reading strategies that they had learned from the intervention, while the teacher was available for scaffolding or for questions. In the following week of the intervention, all the students completed a final examination in the form of a formal reading comprehension test. This reading comprehension examination was used to determine their post-test result. The list of reading strategies with a short description that were taught in the intervention are listed below. For calculated effect sizes for each reading strategy, see A1, Appendix A.

Table 5.2: Reading strategies Taught in the Intervention and Descriptions

Week	Reading strategy name	Reading strategy description
1	**Connecting new knowledge to what is already known**	Attaching new information to what is already known about a subject in order to comprehend and make connections in order to draw inferences in the text
2	**Asking questions while reading**	Adopting an inquisitive frame of mind while reading in order to form a deeper understanding and anticipate outcome
3	**Making predictions while reading**	The reader thinks ahead while reading and predicts outcome and anticipates events in the text, which in turn enables a faster and more efficient reading process
4	**Visualisation**	Creating visual images of what is being read in order to engage more fully with the text
5	**Paying attention to structure and signal words**	Recognizing and identifying the structure of a text to comprehend the text's internal logic. Being aware of the use and meaning of signal words can help the reader follow the direction of the writer's thoughts
6	**Skimming**	Skimming is reading for general gist in order to form a global concept of the text as a whole.
7	**Scanning**	Scanning is the search for specific information by ignoring irrelevant parts of the text and concentrating on the parts that deal with that item

5.2.9 Instruments

A crucial requirement of a Regression Discontinuity design is that the instruments of measurement must be of equal difficulty, due to the fact that we wish to rule out differences in difficulty as a possible explanation for observed differences. For this reason, we choose the Cambridge Advanced English (CAE) reading comprehension tests to be a suitable instrument for ESL comparison purposes, while also being a reading comprehension test that was relevant for higher education academic purposes. The argument behind this choice was based on the level of English reading proficiency of the participating students and the high reliability and validity of CAE reading tests. The extensive and worldwide use of Cambridge exams by comparable student populations within academia can be attributed to the fidelity and trustworthiness of these tests. Furthermore, during correspondence with the Cambridge test construction team, we were assured of a guarantee of equal test difficulty[7] (Vidakovic et al., 2015).

The University of Cambridge ESOL[8] examinations make use of an item banking system, which uses the Rasch scale to determine the level of difficulty of items along a common scale of difficulty. Through item banking, Cambridge explicitly guarantees that each CAE reading test is equal in difficulty and equivalent in its "predicted level of difficulty" to all other CAE reading tests (Marshall, 2006; Vidakovic et al., 2015). All three measurement

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7   This guarantee of equal test difficulty was kindly provided to us in their *Research Notes* 62 (Vidakovic et al., 2015).

8   ESOL: English for speakers of other languages.

occasions used in this intervention were complete CAE reading tests with 30, 34, and 36 (respectively) multiple-choice questions at B2–C1 level[9] (CEFR).

Each CAE reading test is divided into four parts: Part one consists of three short texts with a similar theme and a focus on reading for global understanding. This part contains two questions per text with six multiple-choice questions in total. Part two consists of one text that contains "gaps" of missing paragraphs, and the reader chooses which of the seven paragraphs fits best into the six gaps in the text; there is one extra paragraph that is not needed. This task focuses on understanding textual structure and knowledge of signal and linking words. Part three consists of one long text with seven to nine multiple-choice questions; this task focuses on reading for detailed understanding. Part four is a multiple matching task, where the reader matches five or six short texts with 15–20 statements. These statements are matched to a specific part of the text and by reading the statements first, the reader must locate specific information in the text. Parts three and four can vary in the total number of items they contain, depending on the "predicted level of difficulty" of the items used.

The first measurement occasion (M1) was completed digitally, 10 weeks prior to students following the intervention. The second measurement occasion (M2) was completed under written paper-and-pen exam conditions at the start of the intervention, and the third measurement occasion (M3) was completed under similar exam conditions to the second test, after completion of the intervention. Students did not follow any English classes between the first and second measurement occasion. The three measurement occasions were tested for reliability using the Cronbach's alpha coefficient: M1: $\alpha = .84$, M2: $\alpha = .80$, M3: $\alpha = .67$. These results indicate that our tests were satisfactory in terms of reliability. The data from our research suggests a comparable concurrent measure of reliability that corresponds to the findings of Cambridge ESOL examinations on the reliability of their examinations.

5.2.10 Treatment Fidelity
In order to observe and evaluate whether teachers carried out the intervention according to the treatment plan, observations of teachers were necessary and logbooks were completed by teachers directly after each class. Teachers also met weekly, for an hour, for the entire year to discuss treatment implementation and any issues that might have arisen during the teaching of the intervention. Teachers also shared best practices and their own experiences in teaching the reading strategy intervention.

Teaching observations were conducted for all teachers between weeks two and six of each wave. An observational rubric was devised to examine if the teachers conducted the

intervention according to the module description and the treatment plan, i.e. if the teacher adhered to the guiding principles of the intervention. Inter-rater reliability was calculated by means of observed agreement between two observers (the researcher and a senior colleague). An observer agreement of 92% was reached when teaching observations were compared. There were a small number of individual differences between teachers observed, for example, some teachers modeled more than others, but all teachers modeled. When all observations were compared, it was found that teachers conducted the intervention according to the teaching guidelines of the program; in other words, high fidelity was observed, as teachers taught the intervention in the manner that was expected of them.

5.2.11 Procedure
Integral to this intervention was the use of three tests (see Design). The first measurement occasion was completed via the electronic learning environment used by the institution. Participating students were sent an invitation to complete the test 10 weeks prior to the period in which they would follow the intervention. The test was made available to students during "campus time,"[10] when most students would be on campus but not in scheduled classes. The participants took the test by logging in under their student number. Once they completed it, the students would not be able to retake the test, and the test had to be completed in one sitting. The test did not contain any explanation of reading strategies other than the necessary instructions required for completion.

After completion, the participants' score was calculated automatically; participants were informed of their score without any further explanation. The researchers retrieved the completed test results by logging into the online learning environment. Students were requested not to use dictionaries while completing the test. There was no maximum time given, as the participants completed this test digitally with minimum supervision; however, the researchers inspected the duration times of the test sessions and were able to verify that no student exceeded the maximum duration of two hours.

The second measurement occasion was administered during week one of the intervention, under formal test conditions with the intervention teacher. Students were not permitted to use dictionaries and were given two hours to complete the test. Score sheets were collected, marked, and returned to the students the following week. The decision to administer the first test digitally had to do with logistical factors. Students following course subjects, during an academic period, are assigned to class groups that may vary according to the particular classes that they are following for that period. However, the first and second measurement occasions were completed under, as far as possible, identical conditions, using equally difficult tests. Information and research data obtained from Cambridge ESOL,

9   C1 level at CEFR is considered to be "effective operational proficiency," or advanced level.

10   Campus time is supervised study time on campus, where staff are on hand to answer questions or provide academic support.

on examinations conducted by candidates via computer and on paper, found no indication of an influential factor between the two conditions of paper-based versus computer-based examinations, on candidate performance (Thurlow et al., 2010).

The third measurement occasion was administered under formal examination conditions, i.e. a passing grade would receive study credit, one week after completion of the intervention. In all three measurement occasions, equally difficult tests were administered and students were given a maximum of two hours to complete the tests; the use of dictionaries was not permitted.

5.2.12 Analysis

After the collection of all data, the data set contained test results of 801 students. The reading scores of the three tests were analyzed using SPSS mixed model procedures. In this study, we are interested in the changes in slope of the regression line due to the introduction of the experimental reading intervention. Therefore, we expect to be able to observe that the student's reading performance will improve more during the reading strategy intervention than could have been expected from "natural growth" following business as usual.

In order to assess the effect of the experimental reading intervention, six models were formulated, which differ in fixed effects only. In all the models, differences within and between students as well as between classes are estimated. In the first model, a so-called *null model*, it is assumed that there is neither an effect of the experimental reading intervention nor a (natural) increase in reading ability. In the second model, for *natural growth* it is assumed that there is an increase in reading scores but the experimental intervention does not have an additive effect above and beyond natural change. In the third model, the *experimental treatment effect model*, it is assumed that there is an extra increase in reading scores, which is due to the experimental reading strategy intervention. In the fourth model, the *wave model*, any differences in means between the three waves are allowed. In the fifth model, the *natural growth * wave model*, we allow for differences in natural growth between the three waves. In the sixth model, the *experimental effect *wave model*, differences in effectiveness of the program between waves are allowed.

The fit of these six models is compared by means of the –2loglikelihood, as the difference between the –2loglikelihood of these (nested) models is chi-square distributed with the difference in number of parameters as degrees of freedom. The model can be extended with explanatory differences, such as level of previous education; these differences will be taken into account in order to estimate whether possible effects are attributable to these said differences. Taking explanatory differences into account, any difference between these models could be attributed to the effect of the intervention. If the intervention influences

reading comprehension performance, the increase in scores between the first and second measurement occasion will be less than the increase between the second and third measurement occasion.

5.3 Results

In order to demonstrate the effect of the intervention, we measured if reading comprehension performance improves more between the second measurement occasion and the third measurement occasion than between the first measurement occasion and the second measurement occasion. The fit of the models was compared for changes in reading scores due to natural growth, wave, and the experimental program. The fit of the six models is presented in Table 5.3.

Table 5.3 shows that the fit of the model increases if we allow for differences between measurement occasions due to natural growth; the increase between the first and second measurement occasions is the same as between the second and third measurement occasions: $\chi2(1) = 675.72; p < .001$. If an extra effect of the experimental condition is allowed above and beyond natural growth, the fit of the model increases significantly, in comparison between models 2 and 3: $\chi2(1) = 195.41; p < .001$.

Comparison of models 3 and 4 also shows that there are differences in reading scores between waves: $\chi2(2) = 74.33; p < .001$; natural growth differs between the first and second measurement occasions, which differs between waves: $\chi2(2) = 14.05; p < .001$, but the experimental effect cannot be shown to differ between waves: $\chi2(2) = .22; p = .90$. Hence, there are some differences between waves in "natural growth," but the effect of the

Table 5.3: The -2loglikelihood fit (-2ll) and comparison of six models for changes in reading scores due to natural growth, wave, and the experimental program

Model	-2ll	Model comparison			
		Model	*χ2*	*df*	*p*
1. null model	8092.01	1 vs 2	675.72	1	<.001
2. natural growth m1 – m2	7416.29	2 vs 3	195.41	1	<.001
3. experimental effect m2 – m3	7220.88	3 vs 4	74.33	2	<.001
4. wave model	7146.55	4 vs 5	14.05	2	<.001
5. natural growth * wave model	7132.50	5 vs 6	.22	2	.90
6. experimental effect * wave model	7132.28				

Notes. m1 = measurement 1; m2 = measurement 2; m3 = measurement 3

intervention does not differ between waves. Irrespective of the effects of natural growth, the effects of the intervention are comparable between waves.

Figure 5.1 shows the mean reading scores per measurement occasions per wave. The figure clearly shows that there is a discontinuity. Natural growth between the first and second measurement occasions is smaller than between the second and third measurement occasions, hence the natural growth is smaller than growth due to the intervention, despite there being small differences detected between waves. Moreover, the differences in the experimental effect did not differ significantly between waves. The confidence intervals in Figure 5.1 are relatively small; therefore, we are confident in assuming differences between measurement occasions and waves (see Figure 5.1). For numbers of students per wave, calculated means, and standard deviations per measurement occasion and wave, see B2, Appendix B.

With respect to attrition, it was tested whether the average reading score of students who took the reading tests on all three measurement occasions differed from the average reading score of students who did not take all three tests. Results show that the average reading score of both groups of students did not differ significantly from each other ($F (1, 1396.4) = 1.51; p = .22)$. Neither did the effect of attrition seem to be related to measurement occasion ($F (2, 1363.0) = .11; p = .89$), nor to wave ($F (2, 868.1) = .02; p = .98$). Hence, students who took all three reading tests do not (on average) systematically differ from those who missed one or two of the reading tests. Therefore, we may assume that L2 reading score is not related to attrition. For number of missing scores per wave, see B3, Appendix B.

A difference in average reading scores due to previous education was assessed ($F (2, 722.89) = 80.37; p < .001$). Pairwise comparison showed that the average reading scores of students
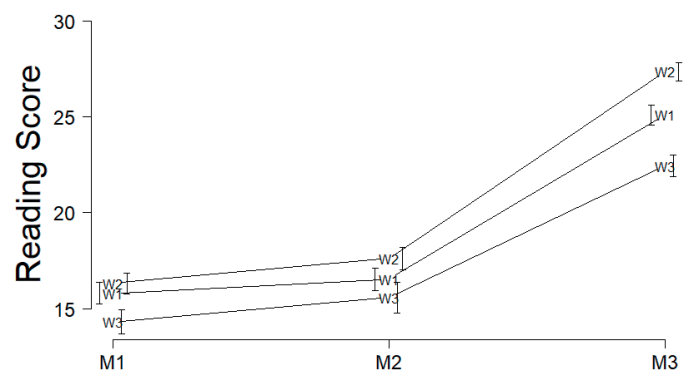
from senior vocational education were lower than those of students from general secondary education ($p < . 001$) or with university preparatory education ($p = .03$). The difference in average reading scores between the latter two groups did not reach significance ($p = .99$).

The effect of previous education appeared to depend on measurement occasion as well ($F (6, 1107.3) = 4.73; p < .001$). Further analysis showed that the effect of previous education did not reach significance on the first two measurements ($p = .52$). The gain in mean reading scores between the second and third measurement occasion appeared to be lower for students from senior vocational education than for those from general secondary education ($t (1167.3) = 5.20; p < .001$), which was comparable to the difference with those from a university preparatory education ($t (1114.6) = 5.14; p < .001$). The difference between general secondary education and university preparatory education students did not reach significance ($t (1064.2) = 1.20; p = .23$). However, the number of participants with a university preparatory education was relatively small ($n = 28$). Therefore, this test may have lacked sufficient power. Hence, the learning gain due to the experimental reading course is (on average) lower for students with a background in senior vocational education than for those with a general secondary or university preparatory education (see Figure 5.2).

Finally, we investigated whether our results depended on a student's skills in English regardless of their previous education. In other words, whether a student with a previous vocational education with good reading skills in English, for example, would derive more benefit from the intervention than a student with a general secondary previous education, with poor English reading skills. The group of students in our sample with a previous education of general secondary education ($n = 493$) achieved the highest mean improvement score of 10.19. The group of students in our sample with a university

Figure 5.1: Estimated means per measurement occasion (M1, M2, M3) and per wave (W1: Wave 1, n = 273; W2: Wave 2, n = 321; W3: Wave 3, n = 207; 1: 90% confidence intervals)

Figure 5.2: Differences in mean reading performance per measurement occasion (M1, M2, M3) according to previous education (M: MBO (senior vocational education), n = 250; (H: HAVO (general secondary education), n = 493; (V: VWO (university preparatory education), n = 28; 1: 90% confidence intervals)

preparatory education as their previous education (*n* = 28) had a mean improvement score of 8.22. The students with a senior vocational education as previous education (*n* = 250) had the lowest mean improvement score of 7.01.

We were interested in the growth between proficient and less proficient readers, irrespective of previous level of education. In other words, whether growth is dependent on reading comprehension ability according to the differences between the three measurement occasions. To this end, two alternative models were analyzed. In the first model, the reading scores of the first measurement occasion (M1) were used as a covariate to predict the reading scores on the second measurement occasion (M2) and the third measurement occasion (M3). In the second model, the effect of the covariate was allowed to differ between both measurement occasions. This last model clearly fits the data better than the first model ($\chi2(1) = 42.27$; $p < .001$). An inspection of the regression weights showed that the effect of M1 on M2 ($\beta = .92$; $se = .04$) is much stronger than the effect of M1 on M3 ($\beta = .55$; $se = .04$). Both effects are shown in Figure 5.3. The left figure shows a strong relationship between M1 and M2, with a wider distribution along the M1 reading scale score. The right figure shows less proficient readers at M1 with an increase in reading scores, who are clustered along the M1 reading scale.
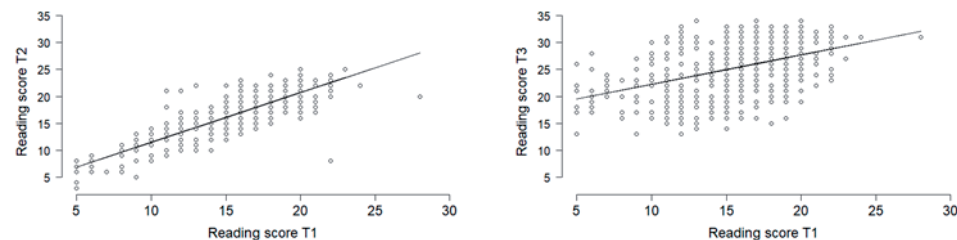
Figure 5.3: Relationship between measurement occasion M1 and measurement occasion M2 (shown left) and between measurement occasions M1 and M3 (shown right), including regression lines.

5.4 Discussion

This study set out to determine if an L2 reading strategy program specifically designed for higher education students could improve first-year students' English L2 reading comprehension performance. Our results indicated that the effect of the intervention was significantly effective. It was also found that previous education plays an influential role in the level of L2 reading comprehension improvement for the students in our sample. On average, weaker readers improved (including those students with a senior vocational education as previous education) more than good readers from all levels. Indeed, on

average, students with senior vocational education as previous education improved a great deal in their L2 reading comprehension.
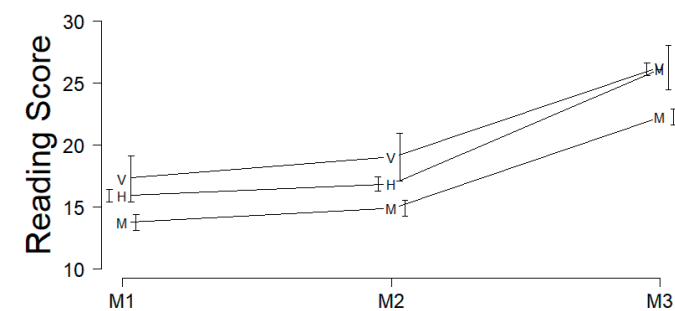
However, not all students from this level of education were poor readers before starting the intervention; correspondingly, not all students with a general secondary education as previous education were good readers at the start of the intervention. Nevertheless, we conclude that vocational students benefited considerably from this intervention, and students with a general secondary education benefited even more so. We will return to this point when we examine our results in the context of our research questions.

Specifically, with regards to our first research question, as to what extent does this L2 reading strategy program improve undergraduate student reading performance, we conclude that student reading comprehension performance seemed to improve significantly between the second and third measurement occasions. In other words, the effect of experimental growth exceeded that of natural growth, which was true for all three waves, and on average students improved in their reading comprehension scores. Our reading strategy intervention works.

In this respect, our intervention corresponds to Duffy (2002), where a large-scale study teaching reading strategies to young adults through direct explanation was conducted with good results. In this study, teachers used a wide range of pedagogy to introduce strategies, explained when and how to use them, modeled, used scaffolding, and practiced with the strategies, also explaining their use and implementation.

The results of our study also bear some resemblance to the results achieved at The Benchmark School (Pressley et al., 2006): our study showed the clear effects of explicit reading strategy instruction, even though our students are much older; both studies employed explicit reading strategy instruction in how, why, and when to use reading strategies.

Our second research question focused on the intervention effect with regard to the role of previous education. To address this question fully we will divide our response into three parts. First, we present a general observation. Second, an observation based on the specific level of previous education. And third, our findings based on individual student gains.

Our general observation is that the L2 reading strategy intervention works. Students improved their average scores in L2 reading comprehension after following the intervention. Moreover, less proficient readers seemed to derive more benefit from the intervention than proficient readers, which is understandable, as readers who already achieved a high score in their first measurement occasion are most likely efficient readers already.

Our findings with regard to the influence of previous education level is that while this intervention was effective, students from a general secondary education or a university preparatory education seemed to improve more in their average L2 reading performance than students from a senior vocational education. This could be expected, since most students with vocational backgrounds have had, on average, less experience in L2 reading comprehension and less exposure to complex academic texts in English. Furthermore, these students often lack general background knowledge in L2 reading. A general interest in reading and having possession of reading background knowledge were found by Strickland and Shanahan (2004) to be two determining factors that contributed to students being able to improve their reading comprehension beyond their currently held reading level. For some of our vocational students, this intervention was their first exposure to this type of reading material. This lack of exposure was confirmed at the start of the intervention, as the M1 scores of vocational students' reading comprehension were lower than those of the other two subgroups in this study population.

When we examine our results from an individual student level, we observe that not all poor L2 readers were from vocational backgrounds: a number of students with a general secondary previous education achieved lower-than-expected scores in their M1 scores. Correspondingly, some students with a vocational background were exceptionally proficient L2 readers. This phenomenon accounts, to some extent, for the observation of the strong relationship between the first and second measurement occasions seen in the left diagram of Figure 5.3.

In some respects, our study is similar to the results of Amirabadi and Biria (2016), where 50 Iranian higher education students from different study backgrounds, with ESL reading difficulties, were administered an ESL reading program treatment via a reciprocal treatment approach. Students in the experimental group were taught to use a number of reading strategies through modeling, scaffolding, and self-regulation activities, in order to improve their ESL reading comprehension. The experimental group outperformed the control group in reading comprehension performance and the study observed an average effect size of .84.

Our conclusion with regard to our second research question on previous education is that in the context of this reading strategy intervention, previous education seems to have an influence on student L2 reading comprehension performance. This outcome gives room for concern. It is possible that lack of exposure in terms of level and/or experience with complex academic texts in English, during vocational type studies, has later repercussions for higher education students in their L2 reading. Alternatively, the type of L2 reading strategies offered in this intervention seemed to work particularly well for students who

previously followed a general secondary level type of education. This point will be further explored in implications for future research.

Our conclusion with regard to individual improvements in L2 reading comprehension performance, as a result of this intervention, is that poor readers come from all levels of previous education and not solely from vocational backgrounds. For whatever reason, these students have not yet developed their reading skills sufficiently to deal with the ESL reading demands faced by students in Dutch higher education. To this end, it is essential that L2 reading strategy instruction programs be extended past secondary school level to that of higher education. Anders et al. (2016) noted that the issue of how and when teachers should be teaching reading was one that had received little attention from the research community. We hope that the findings in this study have contributed to the interest and debate on this particular topic.

5.4.1 Limitations of this Study

In this study, only one post-test was administered. However, in order to determine whether the effects of treatment lasted beyond the post-test, it would have been beneficial to have had participants complete a delayed post-test, such as used in the study of Duffy (2002). A delayed post-test would show whether improvements in student reading comprehension are still evident for a longer period after end of treatment; however, a delayed post-test was not a feasible option, as it would have created an extra strain on the already over-burdened study curriculum.

Further, conducting the first test digitally and the subsequent two tests with paper and pen may have had some minimal influence on the outcome. While our results revealed virtually no difference in natural growth between measurement occasions one and two, and the testing conditions and difficulties of the two tests were identical, as far as technically possible, we cannot exclude the possibility that completing a test on a computer may have had some small effect on the outcome.

On a positive note, the faculty made a note in their yearly report that the number of students who had passed English academic reading in the school year 2017–2018 had increased from 45% to 75%, which is a substantial increase in L2 reading comprehension performance.

5.4.2 Suggestions for Further Research

The results of our intervention point to the importance of L2 reading strategy instruction within higher education, where reading strategies are taught, as well as explicit instruction and practice of why, where, and when to use reading strategies. Duffy (2002) noted that readers must first be taught strategies in order to be able to have a choice in whether or

not to use them. However, while our results are encouraging, they may to some extent be attributable to the individual characteristics of this particular faculty's student population. This point notwithstanding, it is important to note that the effect of this intervention has been replicated twice, over the three equivalent treatment waves. Nevertheless, we would encourage similar L2 reading strategy interventions to be conducted in other higher education contexts.

Furthermore, while on average students showed improvement after treatment, students with general secondary as previous education seemed to benefit more than students with a vocational previous education. This is an area where more research should be encouraged, especially since this vulnerable group of students comprises approximately a third of those currently in Dutch polytechnic higher education. Additional research would be especially welcome as to how future L2 higher education reading strategy interventions can better support students entering higher education from vocational backgrounds. This would also be invaluable for students who have little or no experience with L2 academic material or little background knowledge of academic reading in general. Students entering higher education, especially from vocational backgrounds, may derive benefit from a broad reading approach in reading in English as well as an ESL instructional approach that would help equip them with the necessary reading know-how and skills that their fellow students from non-vocational backgrounds are more likely to already possess.

5.4.3 Implications for Educational Practice

This higher education L2 reading strategy study has added to the existing research by exploring the possible benefits of explicit reading strategy instruction in the L2 reading program. We believe that the rigorous and meticulous development of the treatment program based on the outcomes of a meta-analysis of what was effective in L2 reading strategy studies contributed substantially to its positive outcome. It is therefore recommended as a useful tool in order to gain valuable prior insight into what is effective in the classroom.

Furthermore, this study leaned heavily on the professionalism and dedication of the intervention teachers who were responsible for the implementation of the intervention and for maintaining experimental integrity over four academic periods. For future educational practice, it is beneficial to know that L2 reading strategy interventions are effective and that L1 reading strategies do not automatically transfer to the L2. Lastly, we hope to see L2 reading strategy interventions be extended to more higher education institutions in the future.

What and How Are They Reading? An Analysis in Reading English as a Second Language for Higher Education Students

6.1 Introduction

Given the importance that effective and efficient reading plays in our daily lives of work, education, and study, it is not surprising that the development and improvement of literacy skills during our formal educational years are often hailed as milestones along the road to academic success (Trudell, 2019). There is some reason to be concerned, however, especially when we consider that language development is dependent on many factors (Lowie et al., 2017) and how little attention is given to teaching reading comprehension in secondary and higher education, or indeed to reading comprehension abilities in general, beyond primary school level (Bimmel et al., 2001). Reading comprehension can be described as a complex and interactive process in which the reader attempts to extract meaning and understanding from a text by employing their own cognitive processes and metacognitive skills (Kintsch, 2002). Vernooy (2019) described reading comprehension as the most important skill of the 21st century. Neglecting skills in reading comprehension is not in the interest of society, and certainly not in the best interests of the student (Vernooy, 2019).

There has been a notable increase in the use of English for academic purposes (EAP) within higher education, and also as a second language (ESL) in which to read and write academic texts. Scholarly articles and scientific papers are increasingly offered in the English language (Kuteeva & Airey, 2014). Polytechnics and universities worldwide offer an increasing percentage of their higher education courses via English-medium instruction (EMI), a decision driven by economic, societal, and academic reasons (Wilkinson, 2013). College textbooks, lecture notes, and materials are also frequently written in English, which, all in all, can provide extra challenges for second language (L2) readers, and especially less proficient readers (Van Weijen et al., 2012).

Reading strategies can be useful aids for solving L2 reading comprehension issues (Cantrell et al., 2010). The reader, consciously or unconsciously, decides at the moment of reading whether a strategy should be applied or not, and not every reading strategy will be considered equally useful for every task. Meaning that a reading strategy need not be universally applicable for each and every reading problem (Westhoff, 1991). In order to solve a reading issue, the reader needs to be able to apply reading strategies flexibly and appropriately, to cater to the particular task at hand (Pressley, 2002; Pressley & Afflerbach, 1995). For reading research, it is relevant to observe differences between the use of strategies, as not all strategies will be, or indeed should be, used in equal measure for every occasion or task. However, the extent to which reading strategies are applied and used during reading comprehension tasks is of particular interest to reading strategy research (Sheorey & Mokhtari, 2008).

Abstract

Research has shown that second language (L2) reading strategy instruction in higher education can benefit students in their L2 reading for academic purposes. For this study, 55 higher education students from a large-scale L2 reading strategy intervention were interviewed and observed to investigate possible relationships between the use of reading strategies, out-of-school reading frequency, reading behavior, and L2 reading comprehension. Usage of reading strategies was observed using think-out-loud protocols while students completed a reading task. Further, students were asked which strategies they knew and used and what they read outside of school. A mixed methods approach used coded interview responses, observed use, and students' reading comprehension scores. Results show that the students' L2 reading comprehension scores significantly improved following a specially designed L2 reading strategy intervention. The degree of improvement in reading comprehension was dependent on the degree to which students applied the reading strategies to solve comprehension tasks. Students seemed to give preference to the reading strategies that helped them to solve the task. Students who read in the L2 every day had higher L2 reading comprehension scores, but L1 reading frequency had no effect. Students who frequently read the news or read for pleasure in L2 had significantly higher scores than those who read in L2 for their study outside of school. This study demonstrates the value of L2 reading strategy interventions and encourages more L2 extensive reading programs in higher education, in which frequent and extensive L2 reading both in and out of school is supported.

Keywords: languages, teaching, ESL, reading strategies, L2 reading, extensive reading, analysis, higher education

A reading strategy can be defined as the conscious plan of mental action undertaken by a reader during the reading process, in order to (re)gain comprehension and thereby achieve a particular reading objective (Westhoff, 1991). Introducing reading strategies to the reading program has been found to significantly improve a student's reading comprehension performance, and can be helpful in increasing the ability to self-monitor the reading process (Grabe & Stoller, 2011; Yapp, et al., 2021b, see Chapter 5). Nation (2009) stresses that in order to help readers learn to read more effectively, there should be an emphasis on teaching students *how* to read more effectively. One possibility is to motivate them to use reading strategies in order to bring more explicit purpose and awareness into their reading process (McKeown & Beck, 2009).

First language reading (L1) differs extensively, in terms of lexical, grammatical, and discourse knowledge, from L2 reading (Grabe & Zhang, 2016). This means that metacognitive knowledge from L1 may not extend to L2 reading (McCardle et al., 2008), as there is little evidence to support the automatic transfer of L1 reading strategies into the L2 (Koda, 2007). A study by Bimmel (2001), where 131 secondary school students followed a reading instruction program, found no transfer effects of reading strategies from the L1 to the L2. In a reading comprehension skills study in secondary school students, no transfer effects from L1 to L2 could be shown (van Gelderen et al., 2007).

If the transfer of reading skills from the L1 to the L2 cannot be assumed, it stands to reason that the direct instruction of effective reading strategies in the L2 can help make readers more aware of how to govern their strategic reading process while working in the L2 (Alexander & Jetton, 2000; Bimmel, 1999; Pressley, 2000). For example, strategies such as *Activating background knowledge*, *Connecting the unfamiliar with the familiar*, *Predicting and questioning the text while reading*, and *Paying attention to structure and signal words* may positively support L2 reading development alongside word recognition skills, vocabulary learning strategies, and cognate use, as reported by Baddeley et al. (2009). The teaching and learning of such effective L2 reading strategies may help to engage readers and promote efficiency while reading, making readers more actively involved in the L2 reading process (Macalister, 2011).

Particularly, there is an overall lack of research on the effect of L2 reading strategies in higher education (Bimmel et al., 2001). Moreover, empirical effect studies investigating L2 reading strategy instruction in higher education are lacking (Khalifa & Weir, 2009). Furthermore, little research has been undertaken to examine the influence of student L2 reading behavior outside school on L2 reading comprehension performance (Afflerbach et al., 2008b). An L2 reading strategy meta-analysis by the researchers (Yapp, et al., 2021a, see Chapter 2) analyzed the effectiveness of L2 reading strategy interventions on L2 reading comprehension performance. Forty-six high-quality second language reading strategy

studies conducted between 2000 and 2018 were investigated. The studies were analyzed in order to ascertain which of the reading strategies and pedagogical approaches used were the most effective in improving L2 reading comprehension performance. Reading strategies that require explicit action to be undertaken by the reader, *Connecting new information to what is already known*, *Asking questions while reading*, *Activating background knowledge*, and *Paying attention to structure and signal words*, were found to be the most effective L2 reading strategies, and were therefore integrated into the L2 reading strategy intervention.

Reading behavior, and in particular the frequency of reading in school and outside school, can also be influential in how well a student reads (Crawford Camiciottoli, 2001). Research findings suggest that when secondary school students follow an L2 reading strategy training, they tend to read more extensively in the target language, and when students read more extensively in the L2, their L2 reading improves (Westhoff, 1991). It follows that the more frequently and extensively a student reads, the more reading experience is developed, and the more productive their reading will become (Bimmel et al., 2001; Mol & Bus, 2011). In a similar fashion, ESL reading behavior in school, as well as outside school, can itself have an influence on L2 reading skills. When higher education students adopt effective reading behavior, that is, reading behavior that leads to improvements in ESL and EAP reading, this manifests itself in a more successful and productive reading output (Rasinski, 2004). This improvement is not only observed in their ESL or EAP reading and in the expansion of their vocabulary, but has also been linked to a more positive attitude to L2 reading in general (Bamford & Welch, 2000). This is particularly beneficial, as a positive attitude toward reading in the L2 can lead to increased motivation to read in the L2 (Anderson, 2009).

In a study by Takase (2007) of 219 Japanese L2 readers, students were encouraged to read extensively at home in English, and to write reports on what and how much they read, for 10% of their grade. The study found that while the motivation to read in English was primarily driven by the desire to fulfil course requirements (i.e. the 10 % grade), as students read more in the L2 and became more proficient in reading, the extrinsic motivation to read was replaced by an intrinsic one: the pleasure of reading in English for its own sake. In fact, intrinsic motivation became the instrumental factor for extensive L2 reading and was a significant predictor of the amount of L2 reading that actually took place. Extensive reading in the L1, however, was not found to be an influential factor for extensive reading in the L2, (Dörnyei & Taguchi, 2009; Takase, 2007).

Student attitudes toward L2 reading may also be linked to their previous experiences with reading, for example, their perceptions of the usefulness of reading activities (Grabe & Stoller, 2011). Learning what students like to read outside school and how often they read can be a useful aid for the teacher/researcher (Dörnyei & Taguchi, 2009). The data gathered can be used to focus on relevant activities in order to achieve efficacy as ESL and EAP

readers (Grabe, 2016; Dörnyei & Chan, 2013; McCardle et al., 2008). It follows, therefore, that if researchers are interested in L2 reading, they should measure how extensively and frequently a student reads in their L2, also outside of the educational context. It also falls to the reading strategy researcher to determine the extent to which improvement in L2 reading can be attributed to the application and use of reading strategies in solving L2 reading comprehension issues, and to extensive and frequent reading in L2, or both. Accordingly, while reading strategies can be a useful aid to the reader, they are only an aid if the reader uses them (Sheorey & Mokhtari, 2008). For this reason, the researcher should make the distinction between a reader knowing reading strategies and actually using them.

To this end, we are interested in how much and how frequently higher education students read in their L2, because when students read not only extensively, but also frequently in the L2, they will over time become more successful and effective L2 readers (Horst, 2009). Part of the responsibility of reading intervention research is being able to account for the extent to which ESL reading outside school may play a part in improving L2 reading comprehension performance, which is why we are interested in what our students read outside of the school program.

6.1.1 Research Questions Guiding this Study

In this study, we used a random sample from our original large-scale study (Yapp et al., 2021b) to investigate the extent to which the application and use of reading strategies taught during the L2 reading strategy intervention is determinant for any improvement in L2 reading comprehension performance. In addition, we explore the degree to which the frequency and genre of ESL reading conducted outside the intervention may influence L2 reading comprehension performance in our sample. We wish to determine whether there is a relationship between L2 reading skills, reading behavior, and reading comprehension performance.

This study is guided by three research questions. Firstly, is there is an effect for L2 reading comprehension performance observed in this sample of students who followed an L2 reading strategy intervention? Secondly, to what extent does the use of L2 reading strategies explain the improvement in L2 reading comprehension scores? Thirdly, to what degree does extensive and frequent reading and the genre of reading in the L1 and L2, outside of the intervention, explain the improvement in L2 reading comprehension performance?

6.2 Method

6.2.1 Participants and Study Institution

Fifty-five first-year students in full-time education at an institute of higher education in the Netherlands participated in this in-depth study. The students were randomly selected for the study and invited to take part in an interview. Participation in the interview was entirely voluntary, and no reward was given for participating. All selected students agreed to participate. There were proportionately more female students ($n = 39$) than male students ($n = 16$) in this sample of interviewees. This is consistent with the ratio of females to males within this type of study program in the Netherlands. The ages of the student participants ranged between 17 years and 22, with a mean age of 19.22 ($SD = 1.87$).

6.2.2 The Reading Strategy Intervention

All selected students were participants in the same large-scale L2 reading strategy intervention ($N = 801$). This study aimed to determine whether the intervention could improve student L2 reading comprehension (Yapp, et al., 2021b, see Chapter 5). The results of this intervention concluded that average L2 reading comprehension performance improved significantly after following the seven-week L2 reading strategy intervention.

The reading strategy method used in the study was designed using reading strategies that were found to be effective in a meta-analysis of L2 reading strategy studies conducted the previous year by the authors (see A1, Appendix A for reading strategy descriptions and Table 6.1 for effect sizes). The goal of the study was to improve L2 reading comprehension and promote students' self-efficacy as long-term successful L2 readers (Pinninti, 2016). The reading strategies were delivered with a variety of instructional pedagogy, for example: awareness raising, introducing strategies, teacher modeling strategy use, feedback, scaffolding, teaching why the strategy was useful, and when and how it could be used.

The intervention was conducted over three identical treatment periods within one academic year. Students completed three measurement occasions (tests) and formed

Table 6.1: Reading Strategies Taught in the Intervention with Effect Sizes (*ES*)

	Reading strategies taught	Effect sizes (*ES*) from meta-analysis
Week 1	Connecting new knowledge to what is already known	*1.08*
Week 2	Asking oneself questions while reading	*1.07*
Week 3	Making predictions while reading	*.64*
Week 4	Visualisation	*.42*
Week 5	Paying attention to structure and signal words	*.77*
Week 6	Skimming	*.64*
Week 7	Scanning	*.64*

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their own control in a Regression Discontinuity design (Shadish et al., 2002). The first measurement occasion (M1) was completed 10 weeks before commencement of the intervention, the second measurement occasion (M2) at the start of the intervention, and the third measurement occasion (M3) on completion of the intervention, 10 weeks after M2. These three measurement occasions formed the experimental component, and every student completed these three tests. "Natural growth" could be expected between M1 and M2, and "experimental development" and "natural growth" between M2 and M3.

During the reading strategy intervention, high fidelity of treatment was observed by conducting teacher observations and through teachers keeping teaching logbooks. The reading strategy intervention method followed four distinct stages:

1. Direct and explicit instruction of L2 reading strategies.
2. Teacher modeling of L2 reading strategies.
3. Collaborative practice, scaffolding, and individual practice of reading strategies.
4. Evaluation and expansion. Students were encouraged to use the strategies that they found most effective and apply them to new contexts.

The goal of the intervention to improve L2 reading comprehension was achieved, as mean student L2 reading comprehension scores improved significantly. While the difference between the mean M1 and M2 scores was not significant, mean M3 reading comprehension scores differed significantly from mean M2 reading scores. "Experimental growth," therefore, exceeded and differed significantly from "natural growth."

6.2.3 Assessment of Reading Strategy Use

One method for determining the actual use of reading strategies during reading comprehension task completion is the think-out-loud protocol, which has been used with success in order to evoke interactive cognitions in respondents (Clark & Peterson, 1986). This technique has the advantage of producing data as the reader explains their own reading process while it is developing and in actual progress, thus providing valuable insight into the complex mechanisms of their individual reading and problem-solving process. The disadvantage of this method is that the reader's thought process may become contaminated while describing the reading process aloud, and the speed of reading and thought may become affected (Duffy, 2002; Smagorinsky, 1998).

An alternative research method involves questioning readers about the reading strategies they used directly after completion of the reading task (Davies & Stone, 1995). Whilst this technique may result in data that is less direct than think-out-loud protocols, it has the advantage that it is less invasive, as it does not disrupt the thought process of the reader. Both techniques require the researcher to be present in the room while the reader reads the

task, in order to observe and question the reader during or directly after the reading process. Using both think-out-loud protocols and questioning readers directly after completion of the task should combine the best of both techniques and form a robust method with which to collect valuable data (Dörnyei & Taguchi, 2009). When combined, these techniques can provide the researcher with useful "hands-on" data from actual reading strategy application regarding the *what* and *how* of readers solving L2 reading comprehension tasks (Peckham & McCalla, 2012).

6.2.4 Instruments

Reading Comprehension Tests
Standardized *Cambridge Advanced English* (CAE[11]) reading tests were used as comparable tests of equal difficulty for all three measurement occasions (M1, M2, M3) during the study in order to collect and compare student L2 reading comprehension data. We were most interested in the difference between the second and third measurement occasions (M2 and M3), as this is when students followed the reading strategy intervention. The CAE tests used were tested for reliability using the Cronbach alpha coefficient: M1: $\alpha = .84$, M2: $\alpha = .80$, M3: $\alpha = .67$. All three tests were considered trustworthy in terms of reliability.

Reading Comprehension Task
The reading comprehension task used in the interview was a short CAE text on video gaming called "It's only a Game," taken from the CAE reading comprehension test for ESL speakers. The short text was comprised of two paragraphs followed by two multiple-choice reading comprehension type questions. While completing the task, students were asked to use think-out-loud protocols to describe their ongoing reading comprehension process. After completion of the task, interviewees were asked which, if any, reading strategies they had used to solve the task (see E2, Appendix E for the Reading Comprehension Task).

Interview Rubric
Data were collected on student reading behavior during the interviews, which followed shortly after the seven-week L2 reading strategy intervention. Fifty-five students from the sample were interviewed for the study using an interview rubric concerning their use of reading strategies and their reading behavior. We constructed a custom-designed interview rubric (see E1, Appendix E for the Student Interview Rubric). Students were interviewed about what they read in their L1 (Dutch) and L2 (English), and how frequently and extensively they read in both languages, outside the intervention. Students were asked during the interviews to complete an L2 reading comprehension task while using verbal think-out-loud protocols and to specify which reading strategies they used to solve the task.

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11 *Cambridge Advanced English* (CAE) reading tests are considered to be at C1 level on the European Frame of Reference (EFR).

The interview rubric consisted of four parts, and 22 open and closed questions on reading habits and reading strategy use. The first part of the interviews contained general background questions: gender, study, native language, previously completed education, reading comprehension scores, reading habits, frequency of reading (how often they read), and what they read in English and Dutch. Part two focused on reading strategies and the student's own assessment of their L1 and L2 reading ability. In part three, the students were given a short reading comprehension task to complete. In part four, students were asked to evaluate the reading strategy intervention and to explain whether they experienced any reading comprehension problems in this particular task, and how they would solve them.

6.2.5 Procedure

Data Collection and Coding
Test results from the three measurement occasions (M1, M2, M3) were collected, marked, and coded anonymously for each student, for each of the three treatment waves (academic periods) the interviewees participated in.

Interview Procedure
Each individual interview lasted approximately between 25 to 30 minutes. The complete interviews were recorded for transcription purposes, after having first gained permission from the interviewee to record the interview. During each interview, the interviewer also kept notes of the respondent's responses. All interviews were completed satisfactorily, and there were no adverse conditions. Time was allowed for follow up questions for each part. A coding scheme was devised that corresponded to the questions asked, and the responses from the interviews were coded.

Interviews were conducted according to the interview rubric, where the interviewer led the interviewee through the four parts of the interview. The interviewee was encouraged with prompts to provide more individual information and to give examples wherever possible. The interviews were conducted in a study room on the university main campus reserved for individual appointments.

The students completed the reading comprehension task during part three of the interview. Think-out-loud protocols were used in order to understand the students' thoughts and reading processes, where participants explained their reading process out loud to the interviewer (Schepens et al., 2007). Students were asked to read the text, using the think-out-loud protocol to explain their reading process in solving the reading comprehension task, i.e. to answer the two reading comprehension questions. If the student could not name the reading strategy they had just used, an estimation was made, together with the student, about which reading strategy had most likely been used. The students had

been asked which mental actions they had undertaken to obtain the answer and whether they had used reading strategies to solve the task, and if so, which ones they had used. The same reading comprehension task was used for all interviews. During part four of the interview, students were asked about their knowledge and use of the reading strategies that had been taught in the reading strategy intervention and whether they had found these strategies to be useful to them.

In order to maintain consistency, the first author/researcher conducted all interviews, on a one-to-one basis, and interviews were carried out directly after the last week of the intervention. Participants were identified in the rubric by student number only. The interviews were conducted using the interview rubric, with scripted questions to ensure fidelity for interlocutor purposes.

6.2.6 Data Analysis
The final data set contained data of student reading comprehension scores from three measurement occasions and 55 interview rubrics from three treatment waves. The students' coded responses were analyzed together with their reading scores (M1, M2, and M3). A multilevel model was used, as observations were nested within students. Consequently, in addition to the mean of each measurement occasion, a variance component for the differences between students as well as a variance component for the differences within students was estimated.

A distinction was made between "natural growth" and "experimental growth" following the intervention. It was calculated if the difference in "experimental" and "natural growth" between M2 and M3 was greater than the "natural growth" between M1 and M2. If the difference in growth between M2 and M3 exceeded that of between M1 and M2, then this can be interpreted as the effect of the intervention. The interview data obtained on L1 and L2 reading behavior was analyzed to explain differences between students in reading comprehension performance. That is, whether the influence of reading behaviors can be used to explain differences between students in the measurement occasions in general: i.e. a main effect of reading ability.

6.3 Results

First of all, we looked for an explanation for the difference between "natural growth" and "experimental growth." We estimated the mean reading comprehension scores from each of the three measurement occasions (taking into account the variance within and between respondents) in a multilevel model in order to answer our first research question: whether the intervention had an effect. While we expect there to be some "natural growth" between

M1 and M2, as students may read in their L2 outside school, we expect "experimental growth" between M2 and M3 to exceed "natural growth." In addition to a main effect from type of reading behavior, we therefore also expect to observe an interaction between measurement occasions: an effect of time between the three measurement occasions and of specific reading behavior was therefore estimated.

Next, we tested whether a student's reading comprehension scores increased more during the intervention between M2 and M3 than between M1 and M2. The mean reading comprehension scores for the three measurement occasions are shown in Table 6.2.

Table 6.2 indicates that "experimental growth" due to the intervention between M2 and M3 is much greater than "natural growth" between M1 and M2. A more formal test showed that "experimental" growth (M2 vs. M3) is significantly larger than the "natural growth" (M1 vs. M2): ($\Delta\chi2$ *(1)* = *62.12; p < .001*).

Table 6.2: Means of Measurement Occasions, Standard Error (se) and Variance Components (N = 55)

	Measurement occasion			Variance component	
	M1	M2	M3	$S^2_{between}$	S^2_{within}
Estimate	14.37	15.87	25.57	13.10	9.30
(se)	(.64)	(.64)	(.64)	(3.11)	(1.25)

In order to answer the second research question—whether the use of reading strategies explains the improvement in L2 reading comprehension—percentages were calculated for the observed use of strategies during the reading comprehension task. Also for the reported knowledge, use, and perceived usefulness of reading strategies obtained from student responses during the interview. We will first examine the observed use of reading strategies during the reading comprehension task.

Percentages for the observed use of each of the reading strategies by the interviewed students were calculated during the reading comprehension task. Calculations were either based on responses gathered via the think-out-loud protocol or on asking the interviewee directly after completion of the task. We found that the strategies *Connecting new knowledge to what is already known* (observed use 78%) and *Paying attention to structure and signal words* (observed use 80%) were observed to be used more than all other reading strategies taught in the intervention (See Table 6.3 for the perceived use of reading strategies observed during the reading comprehension task).

We propose that the usage of reading strategies appears to be task-specific. Students seem to find certain reading strategies more applicable and useful in solving this task than other

Table 6.3: The Perceived Use of Reading Strategies in Percentages Observed During Task (N = 55)

Reading Strategy	Perceived use of strategies observed during task in %
Connecting new knowledge to what is already known	78
Asking oneself questions while reading	56
Making predictions while reading	51
Visualisation	14
Paying attention to structure and signal words	80
Skimming	31
Scanning	31

reading strategies. Strategies that focus on *Paying attention to structure and signal words* and *Connecting new knowledge to what is already known* seem to be especially useful for solving this particular type of reading comprehension task. It is possible that there will be large differences in the use of reading strategies, which may be dependent on the requirements of the specific reading comprehension task. Furthermore, it is logical that we will see differences between the student responses on usefulness of strategies and their observed use, as we asked students about their use of reading strategies in general and not in specific situations.

Certainly, the textual comprehension of this particular task hinged on the correct interpretation of a number of carefully positioned signal words, such as "yet," "but," and "despite." The task also contained some unfamiliar and somewhat specific vocabulary, which would have been familiar to someone within the context of video gaming, such as: "darkened rooms," "glow of displays," "first-person shooter games," "*Doom*," and "*Nintendo*." Which explains, to some extent, the high score for observed use of the strategy *Connecting new knowledge to what is already known* and the strategy *Paying attention to structure and signal words*.

The effect of the observed use of reading strategies depends on the measurement occasion (*F (2, 108) = 10.67, p < .001*). For the third measurement occasion (M3), there is a significant effect for the use of reading strategies (*β = .86, se =.36, p < .01*), and not for the first (M1: *β = -.41, se = .38, p = .14*) and second (M2: *β = -.57, se = .38, p = .14*).

However, the effect of the observed use of reading strategies proved dependent on which reading strategy was used. For the first four strategies (see Table 6.1), the effect proved to be positive for the third measurement occasion (*F (2, 108) ≥ 5.82, p ≤ .004; β ≥ 2.99*), whereas for the reading strategies *Skimming* and *Scanning*, the relationship with reading comprehension performance proved to be negative (*β =−4.95, se = 1.35, p = < .01*) and (*β =−5.52, se = 1.29, p = < .01*), respectively.

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One student explained when they would apply the strategy of *Paying attention to structure or signal words*:

"*I only use this strategy when there are these type of words in the text or in the questions; recreationally, I wouldn't normally pay attention to structure. Skimming and scanning, on the other hand, I do this regularly.*" Taken from Student Interview #41.

Another student remarked, during the interview, that *Connecting new knowledge to what is already known* was an automatic reflex for her:

"*I do that* [*Connecting new knowledge to what is already known*] *automatically; it's useful, because you need to have some kind of basis, something you can build on, for your idea of what the text is about.*" Taken from student Interview # 32.

6.3.1 Student Responses on Knowledge, Use, and Perceived Usefulness of Reading Strategies

Student responses on their knowledge, use, and perceived usefulness of reading strategies taught during the intervention were obtained and gathered during the last part of the interview. Percentages were calculated for each strategy for the student knowing the strategy, using the strategy, and finding the strategy useful (see Table 6.4 for percentages of each reading strategy). *Skimming* and *Scanning* were strategies that students reported knowing the most and using the most: *Skimming*: knowing 70%, using 70%, finding useful 100%; *Scanning:* knowing 93%, using 89%, finding useful 98%. However, the percentages of actual observed use of *Skimming* (observed use 31%) and *Scanning* (observed use 31%) during the reading task were much lower.

The reading strategy *Connecting new knowledge to what is already known* scored relatively lower for knowing (30%) and using (28%); however, this strategy scored higher for finding

Table 6.4: Student Knowledge, Use, and Finds Useful of Reading Strategies in Percentages (N = 55)

Reading Strategy	Knows strategy %	Uses strategy %	Finds strategy useful %
Connecting new knowledge to what is known	30	28	96
Asking oneself questions while reading	30	19	83
Making predictions while reading	22	17	63
Visualisation	26	24	54
Paying attention to structure and signal words	79	63	96
Skimming	70	70	100
Scanning	93	89	98

useful (96%) and observed use (78%) (see Table 6.4 for percentages of student responses for knows, uses, and finds useful of the reading strategies).

The average student in our sample appeared to use more than three different reading strategies (*M = 3.4, SD = 1.6*) for the task. Some strategies were used more than others, for example *Paying attention to structure and signal words*, *Connecting new knowledge to what is already known*, and *Asking questions while reading*. We found a significant interaction effect between the amount of reading strategies a student uses and an increase in their M3 score: the more strategies students use, the more their M3 score increases. A student's M3 score increases per extra reading strategy used (β = *1.30, se = 0.30, p < .001*). It therefore appears that the more reading strategies a student applies and uses, the better their M3 score in L2 reading comprehension. Therefore, it seems that the use of reading strategies can explain, to some extent, the positive effect on L2 reading comprehension in this study.

Students who state that they find a reading strategy useful show greater improvements in their reading comprehension performance, for all three measurement occasions (β = *.92, se = .19, p < .001*). The more reading strategies a student finds useful, the higher their reading comprehension performance. Consequently, the average student who finds (*5.8*) strategies useful has a(n) (expected) score that is (*5.8 x .92 =*) *5.3* higher than students who do not find strategies useful. We observed that students did not need to use all the reading strategies they knew, as they seemed to be able to identify which particular strategies would be useful for solving the reading comprehension task that they had been given.

We observe that a distinction can be drawn between a student knowing reading strategies and a student knowing and *using* reading strategies. An interaction effect can be found in the mean M3 scores between students who know reading strategies and those who know and actually use reading strategies (β = *1.30, se = 0.30, p < .01*). This M3 score was lower if students reported that they knew reading strategies before starting the intervention, but did not necessarily use them. Therefore, we report that there appears to be a significant difference between the reading comprehension scores of students knowing strategies and using them and of students knowing strategies but not using them. Students who said that they knew reading strategies but did not use them had lower reading comprehension scores for all three measurement occasions, however only M3 was significantly lower: (*M1: β =−0.60, se = 0.40, p = .13; M2: β =−0.70, se = 0.40, p = .08; M3: β = 0.90, se = 0.40, p = .02*). The use of reading strategies in L2 reading comprehension is explained in "usefulness" when related to differences in reading comprehension performance in all three measurements (M1, M2, M3), which we use to explain the difference in L2 reading comprehension in general; however, only M3 was significantly different: (*M1: β =−0.61, se = 0.40. p = .12; M2: β =−0.70, se = 0.34, p = .03; M3: β =−0.90, se = 0.40, p =.02*).

We suggest that a relationship can be drawn between usefulness and the actual use of reading strategies. That there is a relationship between the reading strategies that students say that they find useful and their actual use of this strategy. For example, Student #24 observed that *Asking oneself questions while reading* was useful as a strategy, because it was a way for them to become more engaged with the text: "*Even before the course, I always asked myself questions (while reading)… it was my way of getting into, you know, understanding the text.*" Taken from Student Interview #24.

Another example can be found in the strategy of *Paying attention to structure and signal words*, which scored the highest for "observed use" and for "finds useful." A student observed during the interview that *Paying attention to signal words* was particularly important for them while completing the task: "*For me, signal words show a key sentence… (they) show something that's going to be turned around… you think it's this, but it's actually this. So if I see the word 'yet' or 'despite' then I think, right, this is important!*" Taken from Student Interview #10.

One student explained that using the strategy of *Paying attention to structure and signal words* was a useful method for checking their comprehension while reading: "*Asking myself questions, I kind of did that already automatically, but it's useful to learn about structure and signal words, also connecting to new information, because you need to check yourself, and you need to have some kind of basis for making sure what you think you are reading is correct.*" Taken from Student Interview #2.

A student remarked during the interview how the use of reading strategies in reading comprehension bore a resemblance to their study: "*Reading [comprehension] is sort of 'puzzling' with the words, it's what they say about the study of law, you need to 'puzzle' with it, until it makes sense.*" Taken from Student Interview #15.

Another student explained during the interview that they had known about reading strategies prior to the intervention but had not thought of using the full range until after they had followed the intervention: "*I knew all the (reading) strategies, but I didn't use them; I mostly used Skimming and Scanning, because that's what we learned at school. Now I do use them, when I need to.*" Taken from Student Interview #25.

The strategies learned during the intervention were new for some students, as one student explained during the interview" "*I hadn't really heard of them [reading strategies] before, but I thought there were certain ways to improve my reading, and in the course, I picked up a few of them, such as asking questions and Skimming and Scanning.*" Taken from Student Interview #3.

A student commented that they appreciated the relevance of having reading strategies at hand for when they were needed: "*I definitely think it [the intervention] has made me more aware of the reading strategies, in itself, because I knew of them, but my first instinct was never, oh, let me use these strategies, but now, I am kind of like, oh, this is very interesting, some (strategies) work, some don't work for me. But I think I'll keep them in the back of my mind. You never know when they'll come in handy.*" Taken from Student Interview #1.

Another student remarked during the interview that *Paying attention to structure words* was something new to them: "*Before this course, nobody explained (to me) that there is … structure, that structure can help you read quickly. For me this was new.*" Taken from Student Interview #34.

One student remarked on how, becoming aware of reading strategies, they had changed their approach to reading comprehension: "*Now,* [after following the course] *I will pay more attention to the structure, signal words and language style.*" (Taken from Student Interview #19).

In order to answer our third research question on the role of student reading behavior outside of the educational context, we first report on student reading frequency. Then we shall focus on student choice of reading genre, in order to discover any relationship between factors or influence that reading behavior and genre may have on L2 reading comprehension performance.

To analyze reading behavior, we first made a distinction regarding student reading frequency: we defined reading frequency as being that either a student read frequently in their L2, i.e. every day, or they did not read frequently, meaning they read less than every day or weekly. Having established this distinction, we found a significant main effect between frequent reading in English and L2 reading comprehension performance: ($F (1, 54) = 6 .00, p = .004; \beta = 2.10, se = .83, p = .01$).

The main effect found for reading frequency in English seems to suggest that there is a relationship between reading frequently in English and L2 reading comprehension performance. Students who read frequently in English achieved higher reading comprehension scores in all three measurement occasions than those who do not read frequently in English or read less frequently or only once a week (see Table 6.5 for student mean reading scores and reading frequency in English).

As illustration: a student explained during the interview that frequent reading in English meant that it was easier to digest passages of a text without skipping parts of it:

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Table 6.5: Mean reading comprehension scores per measurement occasion and reading frequency (N = 55)

Reading frequency in English	Measurement occasion		
	M1	M2	M3
Frequent, (every day)	16.50	18.45	28.60
Infrequent (less than every day)	13.26	14.30	25.74
Weekly or less	12.82	14.46	24.64

"*I read in English every day; I enjoy learning about new things, learning new words. I am always looking for ways to improve my reading. I find when I'm more involved in my reading I don't need to skim the text, it's not necessary.*" Taken from Student Interview #23.

Next, we looked at which genre students read as extra reading outside school, and we analyzed our results according to three reading genres, for both L2 (English) and L1 (Dutch): reading the news, reading for pleasure, and reading (extra) for one's study. We combined genre with frequency in our analysis, for example, if a student frequently read the news in English. We calculated the percentages for reading in English for each reading genre: 47% of students in our sample read the news frequently in English, 44% read for pleasure frequently in English, and 15% frequently read extra in English for their study. In their L1 (Dutch), 55% of the students in our sample read the news frequently, 51% read extra for their study frequently, and 7% read for pleasure frequently (see Table 6.6 for reading frequency percentages of reading genre in English and Dutch outside school).

Table 6.6: Reading Frequency Percentages Outside School per Language and Reading Genre (N = 55)

Reading genre	Reading frequency per genre in English (L2) %	Reading frequency per genre in Dutch (L1) %
News	47	55
Study	15	51
Pleasure	44	7

When we examined our results according to which genre students read outside of school in their L2, we found that students who read the news frequently in English appear to have higher mean scores for all three measurement occasions ($\beta = 3.36, se = .99, p < .01$). We found a main effect between reading the news frequently in English and an improvement in L2 reading comprehension ($F (1, 55) = 11.10, p < .01$). Also, a main effect was found between reading frequently in English for pleasure and an improvement in L2 reading comprehension ($F (1, 55) = 4.09; p = .05; \beta = 2.13, se = 1.04, p = .01$).

With regard to extra reading (in addition to the study requirements) in English for one's study, we found that only 15% of students read frequently in English outside school for their study; however, 50% of students frequently read extra in Dutch for their study. No significant effect on L2 reading comprehension was found for reading frequently in the L2 as extra for one's study ($F (1, 55) = 0.01; p = .99$).

Reading frequently in the L2 and L2 reading comprehension performance do seem to have a relationship with regard to reading frequently for pleasure and reading the news in the L2. Both reading genres, combined with reading frequency, seem to lead to improvements in L2 reading comprehension. Students who read for pleasure also seem to become better readers; however, these improvements do not hold for frequent extra reading in the L2 for one's study. This point will be returned to in the discussion.

During the interview, a student explained why they frequently read the news in English, as it allowed them to keep up with world events while improving their English reading fluency: "*Every day, I read the news, I enjoy reading about important events on news sites, I want to keep up with world events, so I read news stories every day.*" Taken from Student Interview #10.

The comments gathered from students during the interview suggest that reading in English for pleasure does seem to lead to enjoyment in reading. One student remarked that reading in English was, for him, an activity that afforded much enjoyment: "*Most of the time, when I'm online, I'm in a rush, I skip a lot (of the text) but when I read something I like, I kind of slow down and read more slowly, it's kind of soothing, and I find that I'm focused on reading to the end; for my mind it's like a little holiday.*" Taken from Student Interview #16.

During an interview, one of the students described how their enjoyment of reading in English was often instrumental to their motivation to read: "*In one of the questions in the exam … you had multiple texts, you needed to match them, but some of these texts were, how do you say, when you like it? You are getting enthusiastic about it. I was motivated, but also interested, and I need to be interested in the text too.*" Taken from Student Interview #40.

One student explained why he reads the news frequently in English, as he found there was more choice on the internet of articles in English: "*I often read news articles on things I find interesting on sites like CNN, sometimes the BBC; I mostly browse and read what I find interesting, like The Alchemist, either in English or Dutch, but I'm more likely to find things in English, because there are more English sources on the internet, out there.*" Taken from Student Interview #11.

Not all students had equally positive attitudes with regard to reading in English. For example, one student remarked that that they did not frequently read in English for pleasure, but

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instead, if they read in English, it was mostly to keep up with world events or for their study: "*If I find something on the internet that interests me, yeah, I'll read it in English, but most of the time, when I read in English, it's either for news or for school.*" Taken from Student Interview #4.

We examined reading frequency in the student's L1 (Dutch) for any effect on L2 reading comprehension and found that there was no main effect between L1 reading frequency and L2 reading comprehension performance. We analyzed L1 reading frequency for the three measurement occasions (M1, M2, and M3) and we could not find a main effect (*F (2, 110) = .92; p = .45*) nor an interaction effect (*F (1, 55) = 2.00; p = .16*) between L1 reading frequency and L1 genre and L2 reading comprehension. In other words, we could not demonstrate that these L1 reading behaviors are related to L2 reading skills in general, or to any of the three L2 reading comprehension measurement occasions in particular (*F (2, 110) = 2.56; p = .08*).

6.4 Discussion

This in-depth study set out to explore to what extent students improved in their L2 reading comprehension performance after following an L2 reading strategy intervention. Based on whether an improvement in student L2 mean reading comprehension scores could be explained by use of reading strategies and student reading behavior and also on whether there was a relationship between reading frequency and reading genre on student L2 reading comprehension performance.

With respect to our first research question, we found an experimental effect for L2 reading comprehension performance in students who had followed the reading strategy intervention. Average L2 mean reading comprehension scores improved significantly after following the L2 reading strategy intervention.

With regard to our second research question, on whether student use of reading strategies could explain their improvement in L2 reading comprehension performance, we observed that the strategies used by students seem to be those most suitable for this specific task. It is remarkable that the strategies that were used by students seemed to fit particularly well to this specific task. We observed that other strategies that seemed to be less applicable were used less often. Students appeared to find those reading strategies that focus on *Paying attention to structure and signal words* and *Connecting new knowledge to what is already known* more applicable and suitable to the specific task given to them. In general, it seems that the more reading strategies a student uses, the greater their improvement in reading comprehension. Specifically, it appears to us that students seem to purposely choose the individual reading strategies that will be most useful to them in solving the particular task at hand.

Students who said they knew more reading strategies before the intervention but did not necessarily use them scored lower in their post-test (M3) scores than other students who knew and used reading strategies. However, students scored higher the more useful they found reading strategies. We also found a positive correlation between students finding a reading strategy useful and the intention to use that strategy in the future, suggesting that students tend to actually use strategies that they find useful and applicable in reading comprehension tasks.

One condition for the use of strategies is that the reading strategy needs to be relevant for the specific task at hand, for example the reading comprehension task used in the interview. Our study revealed that students who find reading strategies useful will often actually use these strategies in successfully solving L2 reading comprehension tasks. This may be due to the fact that the reading strategies taught in the intervention were found to be particularly effective in terms of effect size in our earlier meta-analysis. For example, the reading strategy *Connecting new knowledge to what is already known* had a large effect size, which was also found to be large in the meta-analysis (Yapp et al., 2021a: see Chapter 2). Furthermore, the observation of reading strategies was based on two observational instances: during the comprehension task and directly afterwards, meaning that these observations are not perceptions but observed actual usage of reading strategies.

The reading task given to students contained 14 lines of text divided into two paragraphs, followed by two multiple-choice questions. The textual brevity of this task may have contributed in making the reading strategies of *Skimming* and *Scanning* unnecessary, as these are strategies that a reader would typically use with a longer text. It was, therefore, interesting that our students reported these strategies as being particularly useful, as these strategies were found to score relatively low in observed use during the reading task. However, we asked students during the interview about their use of reading strategies in general, and not specifically. In addition, the nature of the task used during the interview may have resulted in the low observed use of *Skimming* and *Scanning*.

We found that the students who said that they did not use the strategy *Connecting new knowledge to what is already known* before the intervention found this strategy to be an extremely useful one after following the intervention. It is possible that students who were not familiar with this strategy before, and became aware of it during the intervention, were also students willing to actively monitor their reading process, which can often be to the benefit of reading comprehension performance. This finding can be compared to that of Edmonds et al. (2009), whose synthesis of reading interventions in older readers found that

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reading strategy interventions had an overall positive effect on reading comprehension performance.

Our study also shares similarities and some differences with the study of Bimmel et al. (2001), which studied the effects of L1 and L2 reading strategy training on 15-year-old secondary school students. Their findings of a connection between L1 reading comprehension and the mastery of the strategies of *Semantic mapping*, *Asking questions while reading*, and *Paying attention to structure and signal words* are in contrast with our own observations. Moreover, our students were in higher education and not secondary school. However, in their study they found a significant relationship between the strategy *Paying attention to structure and signal words* on L2 reading comprehension was similar to our own results.

Our observation of strategy use during the reading comprehension task is that students seemed to be aware of which strategies would work best for them to achieve a successful result. For this reason, we conclude that teaching students the strategy of *Paying attention to structure and signal words* can have a beneficial effect on their ability to focus on, or locate, important information in a text (Hyon, 2002; Pearson & Fielding, 1991; Yapp et al., 2021a). Our conclusion, therefore, with regard to our second research question is that the teaching and subsequent use of reading strategies can explain the positive effect on L2 reading comprehension.

When we turn to our third research question on reading frequency and reading genre, we observed different results for L1 and L2 reading behavior on L2 reading comprehension.. We found that frequent reading in the L2 had a significant effect on L2 reading comprehension performance. Our results suggest that extensive and frequent reading in the L2 can be beneficial to a student's L2 reading comprehension performance. With regard to frequent L1 reading, however, we did not find this to be related to L2 reading comprehension. It does not seem to matter what a student reads or how frequently a student reads in their L1, as L1 reading does not seem to affect their L2 reading comprehension.

Based on our findings from this sample, we conclude that students who read frequently and extensively in L2 English and students who develop their L2 strategic reading skills will improve in their L2 reading comprehension skills more than students who do not read frequently in their L2 and do not employ L2 reading strategies in their L2 reading comprehension. These conclusions are in line with some aspects of the study of Lee and Schallert (1997), who investigated the contribution of L2 language proficiency and L1 reading ability in L2 reading performance among 809 Korean high school students. Their study concluded that the contribution of L2 language proficiency in L2 reading comprehension was greater than the contribution of L1 reading proficiency.

Our last finding explores the impact of reading genre outside of school. We found a relationship between students reading the news frequently in English L2 or reading for pleasure in English, and an improvement in their L2 reading comprehension. Our observations on reading fluency seem to indicate that more and frequent reading in the L2 can lead to improvements in L2 reading comprehension. In this respect, our findings on the effect of increased reading and improvements in L2 reading comprehension bear some similarity to the L2 study conducted by Hyon (2002), where undergraduate students were taught an EAP reading course based on newspaper articles, textbooks, and novels in order to increase student attention for formal rhetorical features found in news type texts. While the purpose of the Hyon study was not to ascertain which genre of reading best improved the student's reading proficiency, it does, however, bear some similarity to our study, as it draws attention to the typical features of reading the news genre. The purpose of news type texts being to describe interesting and recent events, where readers must separate facts from speculation and detect important parts of the text from the non-important ones (Berkenkotter & Huckin, 1995).

Locating key information in news texts is also an essential ability in reading comprehension tasks, which Shih (1992) described as "knowledge of the organization of a particular text, and of common textual signals which can help a reader identify important information, as well as relationships between ideas in the text" (p. 302). The students from our sample who preferred reading news articles and reading for pleasure in English, above reading extra in English for their study, described their reading activity as not only developing their reading proficiency, but also developing greater confidence and enjoyment in their L2 reading.

We observed that from our sample of students, those who said that they used the reading strategies *Connecting new knowledge to what is already known*, *Asking oneself questions while reading*, and *Paying attention to structure and signal words* had the highest L2 mean reading comprehension scores. It does not seem to be a coincidence that students who reported that they used the most effective strategies scored highest in their reading comprehension test. This is something we will return to in our suggestions for future research. One student noted that following the reading strategy intervention had made her more self-assured and confident in her L2 reading abilities: "*Yes, I do think that I am more confident in my reading in English now that I have followed the course.*" Taken from Student Interview #29.

6.4.1 Limitations of this Study

During the interview, students' use of reading strategies was observed, and students were interviewed regarding their out-of-school reading frequency, reading behavior, and L2 reading comprehension by using think-out-loud protocols while students completed a reading task. Further, students were asked which strategies they knew and used and what they read outside of school. When we take into account reading behavior with respect

to reading genre, we can see that student responses relating to their preferred genre of reading material could be overlapping in nature. For instance, news articles could be read either for study or pleasure, or for both. Therefore, the distinctions between these two genres may somewhat blur. There may be little difference between the types of reading genres that students read outside of school, and different interpretations may be possible. Technical skills required in reading the news may also be required for reading for one's study, and so forth. Reading for pleasure could incorporate non-fiction, for example, and alternative interest study-like material, such as articles on life sciences or human behavior.

During the interview, if the student could not recall which of the seven reading strategies were used while solving the task, the researchers estimated, together with the interviewee, which reading strategies would most likely have been used, according to the approach taken by the student. It is reasonable to assume, however, that there may be some overlap between strategies and also some uncertainty in reading strategy interpretation. Further, we did not ask students during the interview for their knowledge and use of reading strategies in their L1. However, as results from the intervention indicated there to be no influence of transfer effect from L1 to L2, we do not expect this to have played a role in the results of this study.

The reading comprehension task used during the interview was relatively short, and we observed that students chose strategies that were most suitable and applicable for solving this specific task. Strategies such as *Skimming* and *Scanning* did not seem to be suitable for this type of task and were used less often. Had the task been longer in length, then the interview time would have had to be extended. Students participated in the interview on a voluntary basis, so interviews were planned between classes and campus time activities. Thirty minutes was the maximum time available for the majority of students for this interview. It is possible that the brevity of the reading comprehension task administered, combined with unfamiliar vocabulary associated with the gaming world in the text and specific signal words crucial to understanding, meant that students would not need to use strategies such as *Skimming* and *Scanning*. Instead, students seemed to use the strategies that seemed most suitable in solving this particular task and employed reading strategies that focused on structure words and unfamiliar lexicon. However, the use of different and more diverse types of reading comprehension tasks could be used in future studies to explore and expand on this point further (see Suggestions for further research and implications for educational practice).

6.4.2 Suggestions for Further Research and Implications for Educational Practice

The results of our in-depth study highlight the importance of teaching effective reading strategies in L2 at higher education level. We recommend that future studies investigate the use of L2 reading strategies and reading behavior with different types of L2 texts, different task contexts, different reading strategies, different and diverse reading tasks, alternative purposes for academic reading, different age groups, or different educational contexts. Our conclusion that learning certain reading strategies and frequent reading outside school improved L2 reading comprehension scores could also be explored further in different educational contexts.

We are of the opinion that educational investment in L2 reading in higher education should be facilitated and encouraged. Furthermore, we stand behind the promotion of extensive L2 reading inside and outside of school. For this reason, we heartily support future reading research and interventions in L2 reading, and in particular reading strategies for ESL reading comprehension purposes within secondary and higher education. It is our hope that higher education students become increasingly able to utilize reading strategies to access L2 textual information in order to reach their EAP goals. This is of course relevant in a much wider context, as this may in turn help to further their professional careers.

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General Discussion and Conclusion

7.1 Aims, Outline, and Setup of the Study

The aim of this dissertation was to investigate the effects of instruction in second language (L2) reading strategies, and how explicit L2 reading strategy instruction could be used to improve L2 reading comprehension in higher education. This dissertation intended to examine the design, creation, and implementation of an English as a second language (ESL) reading strategy course. The course included reading strategies used before, during, and after reading, together with an appropriate pedagogical approach. Such approaches included, for example, modeling, scaffolding, and collaborative and individual practice.

The course was developed as an L2 reading comprehension course. The design team of four English teachers and a teacher/researcher created the course using the design principles at an institute for higher education in the Netherlands (see Chapter 3). The seven-week reading strategy course was able to make use of the findings gleaned from the meta-analysis of (L2) reading strategy studies (see Chapter 2). These findings contributed to the development of the reading strategy method, as it was possible to draw on what was found to be most effective in terms of reading strategies and pedagogical approaches from the meta-analysis and develop this into the course.

In order to determine the fidelity of implementation of the course, an investigation was conducted to verify whether the implemented curriculum corresponded with the intended curriculum. This was achieved by comparing the degree of agreement between teacher-kept logbooks and whole-class observations and the design principles (see Chapter 4). A large-scale study of the effects of the L2 reading strategy course was conducted, in which all first- year students of the faculty participated ($N = 801$). The study followed the course for three consecutive academic periods, and all students from that year's cohort participated in the treatment group. This was made possible by using a Regression Discontinuity design in which students acted as their own control. In this study, the objective was to determine whether explicit L2 reading strategy instruction was effective in improving L2 reading comprehension (see Chapter 5). Lastly, an in-depth study of 55 students was conducted to examine what and how students read in English during and outside school, in order to gain insight into student use and knowledge of L2 reading strategies and student ESL reading behavior (see Chapter 6).

In this concluding chapter, the main findings of the studies are outlined and discussed. The chapter will continue by examining these findings and any implications these findings may have for future L2 reading strategy research. The chapter will conclude with a consideration of the general implications of this research and the advice and professional recommendations offered to institutions for higher education in teaching L2 reading strategy instruction within higher education settings.

7.2 Summary of the Research and Main Findings

In Chapter 2, the objective was to systematically review the overall effectiveness of L2 reading strategy studies. For this reason, we were looking for effective reading strategies, and therefore tried to detect any natural differences in effectiveness between reading strategies. In other words, the aim was to "pluck the fruits" by picking the most effective reading strategies. The eventual meta-analysis sample comprised 46 studies from more than 1,400 L2 reading strategy studies gathered during the online search. These 46 studies fulfilled a number of rigorous inclusion criteria according to their content, design, and methodology.

These high-quality L2 reading strategy studies were all conducted between 2000 and 2017, in 20 different countries. The effect of each study was expressed in an effect size (Hedges' *g*). The overall effect size for the teaching of L2 reading strategies proved to be *.91*. This is a large effect, indicating that L2 reading strategies clearly seem to improve L2 reading comprehension performance.

The reading strategies *Connecting new knowledge to what you already know*, *Asking oneself questions while reading*, and *Activating background knowledge* proved to be very effective strategies, and during our analysis of the differences between the reading strategies, these strategies appeared to be more effective than other reading strategies.

The meta-analysis continued with an analysis of the reading strategy in combination with the pedagogical approach. The effect of the reading strategy appeared to depend on the pedagogical approach it was taught with. Some approaches seemed to be more effective with certain reading strategies than with others. For example, the approach teacher modeling was effective with the reading strategies of *Visualization* and *Skimming and Scanning*. The approach of introducing the strategy was effective with the strategy *Semantic mapping*.

These results provided us with important, useful information in the development of the L2 reading strategy method. Despite the fact that students learn about reading strategies during their L1 primary and secondary education, providing instruction in L2 reading strategy at higher education level seems to be effective. This means that effective L2 reading strategy interventions can continue to be of benefit to students further along their educational career. This information was applied when designing the L2 reading strategy method outlined in Chapter 3.

Chapter 3 detailed the construction process of the L2 reading strategy method by the English teaching team at an institute of higher education. During the redesign of the faculty

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syllabus, it was decided that students should follow an academic L2 reading course to improve their L2 reading comprehension. As there was no applicable course available that met the requirements, the design team chose to design and create their own course. The team developed eight design principles, which were gathered for a large part from the L2 reading research conducted by the teacher/researcher and from the results of the recent meta-analysis. The collaborative effort of the team resulted in the L2 reading strategy course discussed in Chapter 3.

Ten English teachers taught the seven-week reading course, which taught seven effective reading strategies, the central focus of the course, which used a variety of teaching approaches. Each lesson was divided into four gradually reduced phases of responsibility, and each phase was divided into a number of scaffolded stages of instruction. The teacher guidebook developed with the course contained the theory behind the method and extra activities for the teacher to use. The next step was to implement the course, for which the teachers were trained by following training sessions, which were held weekly for a number of months. The course was implemented three times within one academic year. All first-year students were obligated to follow the course. Thereafter, the intention was to determine whether the implemented curriculum corresponded with the intended curriculum, which made it necessary to investigate and measure how well teachers had implemented the course.

To this end, teacher-kept logbooks and whole-class observations formed the basis for the investigation of the implemented curriculum of the course, which is outlined in Chapter 4. The goal of this study was to ascertain whether the different measurements of logbooks and observations were in agreement with each other as an indication of the implemented curriculum of the L2 reading strategy course. Subsequently, to verify whether the implemented curriculum corresponded with the intended curriculum. Results show a large agreement between logbook results and classroom observations. Furthermore, the implemented curriculum corresponded to a large degree with the intended curriculum. Although the first two phases of the lesson were, on average, executed somewhat better than the last two phases, overall, 80% of all lessons were executed as intended. This meant that the implemented curriculum did correspond, to a large extent, with the intended curriculum.

The design team's positive experience with codesign underscores that there is much to be achieved from collaboration between teachers and researchers on educational projects. The results appear to highlight that sharing theoretical knowledge and educational practice, while creating and designing the reading strategy course, seems to have produced beneficial results. Furthermore, the collegial weekly meetings of teachers during the year

appear to have played a positive role in the success of the course due to the "sharing of best practices."

Teachers appreciated the opportunity to reap the benefits of collaboration, as they appeared to be satisfied with their teaching of the course and perceived of themselves as executing the four phases of the lesson as intended. Teachers sharing in the ownership of and responsibility for the implementation of the course seem to have ensured that the guiding principles of the course were adhered to, which may have played an important role in the successfulness of the course itself. Having established that implementation of the course was largely as intended, the investigation continued with the determination of the effectiveness of the reading strategy course on student L2 reading comprehension performance.

In Chapter 5, the investigation into the effects of the L2 reading strategy course on students' ESL academic L2 reading comprehension was the main focus. The intention of this study was to determine whether the L2 reading strategy course could improve student reading comprehension in a higher education English for academic purposes (EAP) setting. The question of whether any improvements in reading comprehension might be mitigated by the level of students' previous education was also explored.

To this end, the seven-week, seven reading strategy course was run over three consecutive academic periods, in which 801 first-year University of Applied Sciences students from one faculty participated as part of their mandatory foundation-year course requirement. Ten English teachers taught the course, and some teachers taught the course several times. All students followed the reading course and took the tests but could opt out of data collection by indicating that they did not want their results to be included in the study.

Data were gathered according to the Regression Discontinuity design. In this design, the effect of an intervention is related to natural growth (i.e. in absence of a specific intervention); students completed three tests of equal difficulty. The first test was completed 10 weeks before students started the reading strategy course; the second test was completed during the first week of the course. Between the first and second test, students did not follow any English classes. The last test was completed after students had followed the course. In this way, students formed their own control group, and it was possible to measure the slope, or discontinuity, between the three measurement occasions. It was found that the improvement in average L2 reading comprehension scores between the second and third tests, which was directly related to students having followed the course, significantly exceeded any improvement between the first and second tests. In other words, the first research question was answered: the course proved to be effective in improving student L2 reading comprehension.

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The effects of the course were mediated by the students' previous education: students who had previously completed a vocational education started with lower scores at the beginning of the course, and while they improved in their L2 reading comprehension, they improved less so compared with the other, non-vocational students. This provided an answer to the second research question: whether L2 reading comprehension improvement was influenced by the level of previous education. This influence might be partly explained by the fact that students who followed a vocational education may have less experience with reading academic type texts in the L2. They may also lack reading strategies and L2 background knowledge in general, when compared to students from non-vocational backgrounds. This point will be returned to in the limitations and recommendations of this discussion.

Chapter 6 examined, in an in-depth study, which text genres a sub-sample of 55 students read in their L2 and how frequently they read, in and out of school. The students selected were drawn from the L2 reading strategy course discussed in Chapter 5. The study set out to determine whether their knowledge of and their use of the L2 reading strategies taught during the L2 reading strategy course were related to any improvement in their reading comprehension scores. Also, whether their frequency of reading and preference of reading genre in the L2 had any influence on their L2 reading comprehension improvement. Further, the aim of the study was to gain access to the students' thought process while solving an L2 reading comprehension task.

The students were invited to participate in a 30-minute interview during which think-out-loud protocols were used to gain access to the students' thought process while reading. In addition, the students were asked questions concerning their knowledge and use of L2 reading strategies and their reading preferences, frequency, and genre in their first language (L1) and in their L2. The students' responses were first analyzed together with their reading comprehension scores from the course. This analysis determined that the L2 reading comprehension results of the students in this sample were comparable with the results of the larger reading strategy study of Chapter 5. To this end, a conclusion can be reached that, in this respect, this sample was representative of the complete sample.

The students were asked during the interview to complete a reading comprehension task while using think-out-loud protocols. It was found that the use of reading strategies by these students seemed to be task-specific, i.e. students seemed to use the specific reading strategies that they thought were appropriate for the task they were solving. In this task, students seemed to give preference to some reading strategies over others, which helped them in solving the reading comprehension task.

Results showed that there was an observed difference between a student knowing a strategy and a student actually using the strategy. A student knowing *and* using a reading strategy demonstrated a larger increase in L2 reading comprehension as opposed to a student knowing a reading strategy and not using it. Students who knew strategies but did not use them performed less well in the L2 reading comprehension task than the students who knew and used the reading strategies. Students who did not use reading strategies had lower reading comprehension scores for all three measurement occasions.

Consequently, the actual use of L2 reading strategies is the determining factor for improvement in L2 reading comprehension performance. Students used on average three reading strategies during the think-out-loud task, and the more reading strategies a student used, the higher their L2 reading comprehension score was.

Results also show that students who frequently read in their L2 showed more progress in their L2 reading comprehension performance. In other words, the more students read in the L2, the better their L2 reading comprehension. Students who read frequently (i.e. every day) in the L2 performed better in their mean post-test results compared to students who did not read frequently in English. Also, when students read the news in the L2 or read in English for pleasure, they would improve in their mean L2 reading comprehension from the second to the third test. Conversely, reading frequency or reading genre in the L1 did not seem to have had any influence on L2 reading comprehension performance.

These results meant that the second research question could be answered. Frequent reading and reading genre, such as reading the news or reading for pleasure in the L2 seem to positively influence L2 reading comprehension performance. Students who read infrequently in English had lower mean posttest reading comprehension scores compared to those who read every day.

7.3 Impact of Findings

After conducting the meta-analysis and the intervention study, the conclusion reached was that some L2 reading strategies are more effective in improving L2 reading comprehension than others. It was also found that some teaching approaches were more effective when used in combination with certain reading strategies than with other approaches. However, the most important finding from the meta-analysis and from the large-scale study explored is this dissertation is that the L2 reading strategy courses worked. The students at the institution in which the reading strategy course was run improved in their L2 reading comprehension so considerably that pass rates of a compulsory English course improved from 45% to 75%, which has been sustained each year since the course was introduced

into the curriculum. This result has had a long-term impact on study success. These successes point to the benefits of employing L2 reading strategy instruction in higher education. Unfortunately, L2 reading comprehension still receives too little attention in higher education curriculums. Students stand to gain from L2 reading programs that deliver extensive and explicit instruction on L2 reading strategies and L2 reading comprehension.

Further, during the investigation of implemented and intended execution of the curriculum of the course, it was observed that implemented and intended delivery of the reading strategy course were in agreement with each other and aligned with the design principles of the course. It was also found that teacher logbooks and whole-classroom observation measurements were largely in agreement with each other as a means of measuring actual implementation and intended implementation of the curriculum. To this end, collaboration in the form of teacher and researcher codesign on educational projects appears to lead to positive outcomes in terms of implementation.

7.4 Future Directions

Reading in the L2 is a cognitively challenging activity, to and with which students entering higher education have had differing amounts of exposure and experience. In order to become a proficient reader in the L2, a reader needs to be knowledgeable of their own reading process and skills and have been sufficiently exposed to enough diverse L2 reading situations, with multiple opportunities to practice their reading skills. Teachers require the necessary know-how in how to teach L2 reading as well as being in possession of a wide range of teaching activities for L2 reading. Although L2 reading strategies are effective in improving L2 reading comprehension, students must not only become aware of which reading strategies they can apply but should be encouraged to actively use them while reading.

A number of research factors have yet to be explored and are not yet known. For example: How might these findings interact with each other, and how might they relate to other settings and levels? Was the L2 reading strategy intervention successful because the teachers and researcher codesigned it in collaboration? Would it be as equally effective if the teachers had not worked in collaboration with the researcher and had not shared in their knowledge and responsibility for the implementation of the intervention? Would the intervention be as effective with different reading strategies or different pedagogical approaches? Or would the intervention be even more effective for students in secondary education, where reading comprehension plays a crucial role in their national diploma examinations?

What is known from the studies conducted is that extensive and frequent reading in the L2 can be beneficial to students' reading comprehension; what is not yet known is how a teacher can best encourage and stimulate frequent and extensive L2 reading. Which extensive reading programs work best, and what is the best teacher approach for an extensive L2 reading program?

For the studies covered in this dissertation, conducting a meta-analysis before designing the method seems to have played an influential role, as it provided guidance regarding the choice of effective reading strategies for the intervention. Therefore, on the basis of this research, the researchers encourage either conducting a meta-analysis beforehand or making use of an existing relevant meta-analysis, before designing an educational intervention.

Furthermore, during the implementation of the course, teachers met weekly for the whole year to discuss their experiences and to share best practices. These weekly meetings were scheduled into the teachers timetable, which meant that no other scheduled teaching duties could interrupt this collegial interaction. One might wonder whether the course would be as effective if these collegial meetings had not taken place.

The conduction of a meta-analysis beforehand, weekly sessions between teachers during implementation, and collaboration between teachers and researchers in designing the intervention were key factors that helped contribute to the success of the large-scale reading strategy course. Reading frequently in the L2 was also found to have a positive effect on L2 reading comprehension from the in-depth study. Therefore, were a future reading strategy study to be attempted, it might incorporate an extensive L2 reading program, where students are encouraged to read frequently and in different genres.

7.5 Challenges Overcome

The studies explored in this dissertation were intensive in terms of time, labor, and resources. Teachers had to be frequently and timely informed of any changes to the program, especially as their lessons were being observed and discussed. Tests and questionnaires had to be produced, distributed, collected, coded, and analyzed. Teacher logbooks had to be given out, collected, and, where necessary, followed up on. As the studies involved a whole faculty, a myriad of protocols had to be followed, which were different for each department. Managers required frequent updating and to be reassured that teachers would not be overburdened with extra work for this study.

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Being the only teacher/researcher of the team meant that the researcher was responsible for information distribution and all queries or problems encountered from teaching through to testing. Training sessions had to be arranged, and if a teacher missed a session, a catch-up session was held. Sometimes, there simply did not seem to be enough hours in the day to get everything done. Moreover, keeping teachers and managers enthusiastic about the project while endeavoring to preserve the integrity of the experimental conditions could be, at times, a difficult balancing act. After all, it was important to remember that not all teachers and managers who were outside the project domain but still affected by it had as much interest in it as those more actively involved with the research project. The challenge with empirical research is that one does not know beforehand if the experiment will be a success or not. Utilizing a large amount of time and resources for a project is a risk, with an unknown outcome.

But, despite the challenging demands of the research project, there were also some unexpected dividends: this project spurred more collaborative educational undertakings among the design team, in L2 speech and L2 writing. An institute-wide collective initiative for English higher education teaching, where teachers could share ideas and swap materials, was set up and continues to this day.

One methodological consideration in the design of the large-scale reading strategy study (Chapter 5) was that of parallel testing. Three reliable and trustworthy tests of equal difficulty were necessary for the measurement occasions during the course, otherwise alternative conclusions could not be excluded. The *Cambridge Certificate in Advanced English for Speakers of Other Languages* (ESOL) reading exam was chosen for this purpose. Cambridge examinations guarantee an equal level of difficulty for each of its exams due to its use of item banking. The level given for this test of C1 from the *Common European Framework of Reference for Languages, Learning, Teaching and Assessment* is assured, the test is internationally used, and, according to the Cronbach alpha test, is considered reliable.

Further, much consideration was given to choosing an appropriate design for the large-scale study. The design had to be able to accommodate large numbers of participants who would follow the course at three separate moments. The intention was to make the potential benefits of the course available to all participants and not just the experimental group. For this reason, a Regression Discontinuity design was given preference over a pre-test vs. post-test design. This is a complex design that requires stringent conditions, such as identical tests and treatment. However, an advantage of this design is that it can accommodate large numbers of participants who can function as their own control.

The attrition of students in higher education is a problematic issue for all institutions. Students stop with their studies during the academic year for any number of reasons.

The repercussions of student attrition meant that some of the participating students did not complete all three tests in the large-scale study. Fortunately, student attrition did not affect the results.

In the in-depth study (Chapter 6), think-out-loud data collection was used in order to help the researchers to follow the thought process of the reader while solving an L2 reading comprehension task, even though these protocols may impair thought by making the reader more aware of their thought process. Nevertheless, through think-out-loud protocols, more is known about which reading strategies a reader employs, but what is not yet known is *how* they solve reading comprehension issues during the task. It was not possible to determine to what extent a lack of L2 vocabulary, grammar, or background knowledge has contributed to L2 reading comprehension issues during a task, as think-out-loud protocols are not sufficient to determine this.

The research presented in this dissertation aimed at improving higher education students' L2 academic reading comprehension performance. Further, it aimed to demonstrate how L2 reading strategy courses are effective in improving college students' L2 reading comprehension, and how codesign collaborations between teachers and researchers produce beneficial educational courses. For each of the studies, either a unique interview rubric, reading strategy questionnaire, or logbook, teacher guidebook, and an L2 reading strategy method was developed. These materials were tailormade and were developed by taking into consideration the learning context of higher education students.

7.6 Teacher Development: The Crucial Role of the Teacher

Successful education depends on good teaching materials, but more importantly, it depends on the teaching abilities of the teacher. The large-scale study showed that, while all teachers were successful in improving reading comprehension, some teachers were more effective in teaching the course than others. These teachers were those who went beyond the minimum requirements of instruction and class management and were able to explain, model, and scaffold the course more explicitly to their students, which resulted in higher average reading comprehension results of their students. For these particularly successful teachers, even weak students show a clear improvement effect, which can be observed along the discontinuity line (see Figure 7.1). Nevertheless, in terms of successful implementation, the implemented curriculum was overall much in agreement with the intended curriculum. In other words: all teachers delivered the course, for the most part, *well* to *perfectly* and faithfully implemented according to the guiding principles. The teachers were satisfied with their performance and felt supported in the training sessions. In order to instruct students to the best of their abilities, teachers require sufficient content knowledge
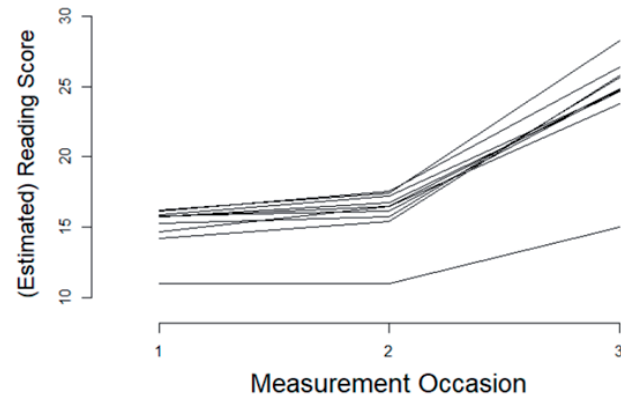
Figure 7.1: Average Student Reading Comprehension Scores According to Teacher and per Measurement Occasion

and pedagogical knowledge. However, they also need to know how to scaffold and support students in the most effective manner, in order to teach their students how to apply the reading strategies independently.

To this end, a professional development program ran parallel to the codesign of this course. Teachers met weekly, they shared experiences and best practices, and they were observed teaching, and these observations were discussed in an open and professional dialogue as part of the collegial conversation: "we learn from and with each other, in order that we can all become better teachers". Teachers reported that they were positive about teaching the course, that they enjoyed teaching reading, some for the first time. Teachers completed logbooks faithfully, were immensely proud of the course they had codesigned, and were delighted to have been given the opportunity to have contributed to the improvement of their students' L2 reading comprehension results.

Moreover, sharing in the ownership and responsibility of implementation meant that teachers perceived of themselves as being more involved in the course from the very beginning, as was observed in the productive weekly sessions during the entire school year of implementation. Although some teachers reported that they experienced challenges with modeling the reading strategies, all teachers were observed to have modeled. It is possible that some teachers would have preferred more practice to feel confident in modeling.

When teachers were observed teaching, they were measured to see whether, and to what extent, they delivered the four key phases of the lesson. However, the quality of any changes teachers administered to improve their teaching instruction was not measured. This would have required a more frequent observation and more detailed analysis that was not possible given the circumstances of the study. In future research, this is recommended in order to add changes in instruction to the professional development program. Furthermore, this investigation focused on only one aspect of professional development, namely implementation. Therefore, results should not be applied to other aspects of professional teacher development, such as classroom management skills or eliciting engagement, which could form the focus of future teacher development investigations.

7.7 Implications and Recommendations for Educational Practice

L2 reading strategy instruction in higher education works. As it cannot be assumed that reading strategy skills learned in primary or secondary education will transfer from the L1 to the L2, reading strategies need to be taught in the L2, preferably at each level of educational development, i.e. secondary *and* higher education. Furthermore, the increasing demands made on L2 academic reading skills means that higher education institutions should provide L2 reading strategy instruction as part of the regular curriculum.

If educational institutions wish their students to succeed in an increasingly global and connected world where scientific knowledge is often distributed and disseminated in the English language, then school policy needs to commit toward making L2 reading instruction a priority in the classroom. Reading in English is where it begins, and students reading extensively and receiving instruction in comprehending academic texts in English is how students can gain competence in L2 reading skills. That is, if students are lacking in their L2 reading comprehension skills, they will not be able to process and digest their L2 reading assignments and L2 reading needs. For this reason, time and resources are necessary in order to make L2 reading instruction effective and productive. Language teachers need support in the form of more expert know-how and teaching resources to help their students become better L2 readers. L2 reading is a skill that should be supported, facilitated, and encouraged throughout secondary and higher education, which is insufficiently the case at the moment.

In order for students to improve in their L2 reading comprehension, L2 reading strategy programs should become integrated into the educational curriculum. Students should receive explicit instruction in which reading strategies are available and when and how to use them at every stage of their educational career. Extensive L2 reading programs should also be part of the curriculum. This reading strategy study has demonstrated how a committed team of teachers can successfully develop, implement, and execute an L2 reading strategy course dedicated to improving student L2 reading comprehension. Therefore, these results need not be limited to this study but could be applied to other

programs and institutions. The contribution offered in this dissertation has added in some way to how L2 reading is successfully instructed in higher education. The hope is that other L2 reading researchers will build on this research and continue to improve this important aspect of student development within higher education settings. To this end, the researchers encourage the investigation and implementation of explicit L2 reading strategy instruction in other higher education institutions and secondary school settings, in languages other than English, and in other contexts.

Lastly, collaboration between teachers on the design of this reading strategy method has led to the development of a series of professional development initiatives, where the spotlight has been on the continual improvement of the curriculum and improvement of instruction for our students. Nevertheless, it is recommended that along with L2 reading strategy courses, collaborative projects where teachers and researchers can codesign educational courses together should also be encouraged.

7.8 Deborah Yapp. A Reflection on My Own Development During My PhD Research

When I started my PhD research, I was an English teacher, not a researcher. In fact, I had been a teacher for almost 30 years before I began with my funded doctoral research. Many of those teaching years were spent with students in their final year at secondary school, 5 HAVO and 6 VWO.[12] I prepared them for their English reading comprehension exam, which counted for 50% of their grade and was a compulsory subject that they must pass in order to obtain their secondary school diploma. For many of my students, this exam was an enormous challenge: they struggled to see what was implied but not explicitly stated in the text, they did not always recognize the importance of signal words, and they could not separate key phrases from less unimportant ones.

I found it difficult to relate to these reading problems, as I have always been an avid and prolific reader myself. I read to my students, I talked to them about what I was reading, I took books with me when I went out, took them to school. Reading has always been part of who I am. When I read, I unconsciously connected new knowledge to what I already knew; I made predictions and asked questions while I was reading. When I needed to find specific information from a text, I skimmed and scanned for it. I assumed that everyone did this when they read and that for them, like me, it also required very little effort.

However, as a teacher, I never thought that reading strategies, or lack of them, might play such a role in the problems my students were having with their reading comprehension. I knew that my students had learned reading strategies in Dutch throughout their primary and secondary school education. I assumed that they would be able to apply these strategies to their English reading comprehension. During an English class in secondary school, my second-year students (13–14 years) surprised me by flat out denying that they had learned about the importance of signal words in the text. I was perplexed, as I knew that their Dutch teacher had covered this in Dutch class a few weeks before. This was, what they call, an epiphany moment. What they had learned in Dutch really had not transferred to English, which meant that reading strategies would have to be re-learned in their English classes. Taking this into account, I changed my approach: I no longer assumed my students automatically knew how to navigate a text, but I explained to them how I would read a text. I modeled, and I told them how I used reading strategies, what they were, and why they were helpful. I used scaffolding to help students who had difficulty and I asked the better readers to collaborate with the poorer readers. I started to read up on the theory behind reading and added new ideas to my approach, and my students did better in their exams. My class became an action research class, and my colleagues were curious and impressed. They suggested that I shape my idea into a research proposal. And the rest, they say, is history. Nevertheless, the process of preparing and submitting the research proposal and being awarded a research grant took three years to achieve. However, this time enabled me to improve and clarify the research plan to a clear and obtainable goal.

Now, five years later, I am both a researching teacher and a teaching researcher. The skills that I have learned during my research study have changed my way of thinking and teaching. I have learned to code studies, calculate effect sizes, analyze results, and apply methodology. I interpret statistics and I have learned to see the relationships and effects between different elements in a study. Scientific enquiry and empirical research have become an integral part of my professional persona and have added an extra dimension to my knowledge and understanding as an educator. I can see beyond what my own role as teacher entails. I observe the effects of my educational improvements and evaluate these effects and compare the results. I investigate and report. The world of theoretical knowledge and that of practical teaching have become connected for me, and I hope to be able to contribute in some small way to both worlds. I am excited and inspired to be part of and to contribute to the mutual symbiotic domains of education and research. I believe that this transformation has made me a better teacher as a result. I hope to continue to contribute to the field of L2 reading research as both a teacher and a researcher in the coming years ahead.

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12 5 HAVO is the final year of senior general secondary education, which takes five years and prepares students for polytechnic (University of Applied Sciences) higher education. 6 VWO is the final year of university preparatory education, which takes six years and prepares students for a research university higher education.

7.9 General Conclusion

This research project has demonstrated that student L2 reading comprehension can be improved through explicit L2 reading strategy instruction. The intervention resulted in overall improvements in students' L2 reading comprehension performance, which could be implemented into general classroom practice. The involvement of teachers in the design and implementation of the method meant that the implemented and intended curriculum were in alignment.

The findings explored here indicate that the explicit instruction of a range of effective L2 reading strategies, combined with opportunities for individual and collaborative practice, can result in students successfully improving their L2 reading comprehension performance. The provision of professional development and support for teachers can allow the L2 reading strategy course to offer a structure for building L2 reading skills at secondary schools and higher education institutions. It is hoped that more educational institutions will offer their students programs in L2 reading strategies. As demonstrated in these studies, the benefits of L2 reading strategy courses on the L2 reading comprehension skills of students in higher education are considerable.

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Appendix A

A1 Reading Strategies, Descriptions, and Effect Sizes

1. Activating background knowledge: *(es = .92)*, activation of previous knowledge on a given subject, for example mind-mapping, as a means to help support and expand background knowledge production. This was often used in combination with other reading strategies, such as asking questions while reading. For a study on activating background knowledge, see Block and Duffy (2008).

2. Making predictions while reading: *(es = .64)*, the reader thinks ahead while reading and predicts outcome and anticipates events in the text, which in turn enables a faster and more efficient reading process. For more on this strategy, see Grabe and Stoller (2011).

3. Visualization: *(es = .42)*, creating visual images of what is being read in order to engage more fully with the text. For studies on visualization, see Anderson (2008a).

4. Skimming and scanning: *(es = .64)*, skimming is a method of reading for general gist in order to form a global concept of the text as a whole. Scanning is a method used for searching for specific information in the text by ignoring irrelevant parts and concentrating on the parts of the text that deal with that particular item of information. A study that features skimming and scanning can be found in Sheorey and Mokhtari (2008).

5. **Connecting new knowledge to what is already known**: (*es = 1.08*), attaching new information discovered in the text to what is already known about a subject; by attaching new to already known information, the reader is able to comprehend and make connections in order to draw inferences and meaning from the text. For a study on connecting new information to what is already known, see Jiang and Grabe (2007).

6. Asking questions while reading: (*es = 1.07*), adopting an inquisitive frame of mind by asking oneself questions while reading about unfolding events in the text, in order to form a deeper understanding and anticipate outcome in the text. For a study with the strategy asking questions while reading, see Underwood and Pearson (2004).

7. Paying attention to text structure and signal words: (*es = .77*), recognizing and identifying the structure of a text to comprehend the text's internal logic. Being aware of the use and meaning of signal words helps the reader follow the direction of the writer's thoughts and intention. A study with the strategy paying attention to text structure and signal words can be found in Fry and Kress (2006).

A2 Description of the L2 Reading Strategy Studies Included in the Meta-analysis

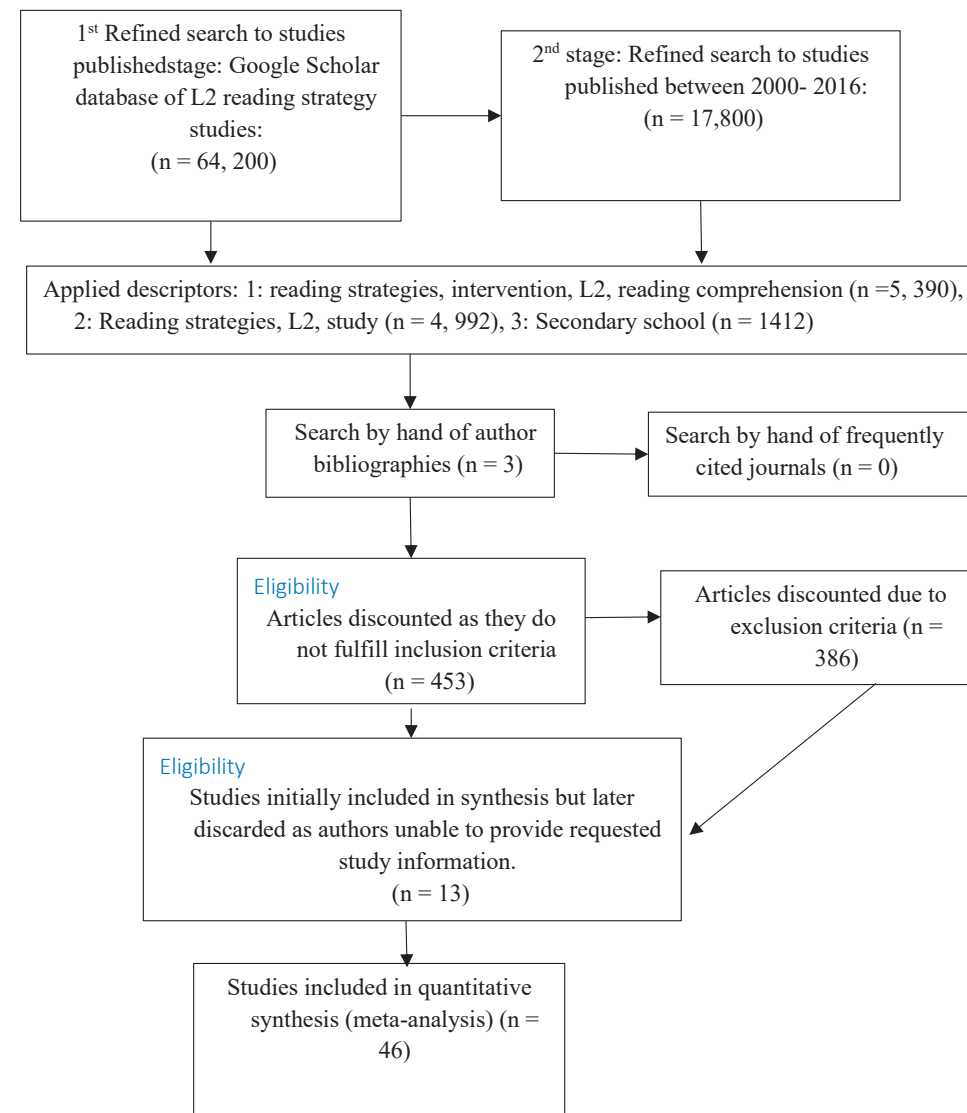| Study and date	Description of intervention	Published (Yes or No)	N	* Reading strategies used in study	Standard test (Yes or No)	Standard teacher (Yes or No)	Effect size
Abed (2018)	Using summary strategies	Y	59	10	Y	Y	.58
Akkakoson (2013)	Strategies-based approach	Y	164	1,2,4,6,9	Y	Y	.81
Alenizi and Alanazi (2016)	Enhancing reading skills	Y	65	1,4,8	N	Y	1.26
Amirabadi and Biria (2016)	Self-regulation and problem-solving in reading comprehension	Y	50	1,2,3,4,8,9,10	N	N	.84
Amirabadi and Biria (2016)	Critical thinking and problem-solving through scaffolding reading	Y	50	1,2,3,4,8,9,10	N	N	.36
Amirabadi and Biria (2016)	Scaffolding and self-regulation in reading	Y	50	1,2,3,4,8,9,10	N	N	1.47
Bagheri et al., (2016)	Focused tasks	Y	90	1,6,7,8,9	Y	Y	.70
Bimmel (2001)	Pair-assisted consciousness raising reading strategy training	Y	21	3,9,10	Y	Y	.69
Cubukcu (2008)	Enhancing vocabulary development	Y	130	1,2,3,4,8	Y	Y	.13
Dabarera et al., (2014)	Reciprocal teaching approach	Y	67	1,2,3,8,10	Y	Y	.14
Dreyer and Nel (2003)	Learning content management system	Y	131	1,2,3,4,5,6,8,9,10	Y	Y	.89
Fatemipour and Hashemi (2016)	Cooperative group approach	Y	40	2,3,9,10	Y	Y	.48
Fatemipour and Hashemi (2016)	Visualization group reading	Y	40	2,3,9,10	Y	N	.12
Ghaniabadi et al., (2016)	Multimedia texts on interactive whiteboards	Y	53	2,7,9	Y	N	-0.39
Gurk and Mall-Amiri (2016)	Cooperative learning techniques	Y	60	1,2,4,8,9,10	Y	Y	3.65
Hind (2016)	Blended learning prog.	Y	50	1,2,8,9	N	N	5.31
Jafari and Biria (2016)	Utility of concept orientated reading	Y	60	1,2,3,8,9,10	Y	Y	2.75
Kadkhodaee and Tamjid (2016)	Self-generated vs. group-generated text-based questions	N	63	9	Y	Y	.84
Karimi (2018)	Prior topic knowledge and strategic processing in AP multi text comprehension	Y	48	1,2,4,5,7,8,9,10	Y	Y	.10
Karizak and Khojasteh (2016)	Think-out-loud protocols	Y	100	2,3,6	N	N	1.34
Karbalaei (2011)	The cognitive academic language learning approach	Y	189	3,10	Y	N	1.72
Kusiak (2001)	Meta-cognitive strategy training on reading comprehension	N	158	2,3,6,10	N	N	.46
Lee (2007)	Reading strategy awareness raising	N	72	3,4,6,9,10	N	N	.61
Lestari (2016)	Using visual scaffolding strategies	Y	70	5,7	Y	N	1.16
Macaro and Erler (2008)	Longitudinal study of L2 French reading	Y	86	1,2,4,6,7	N	N	.16
McElvain (2010)	Transactional literature circles	Y	150	1,2,3,4,5,8,9,10	Y	Y	.40
McKeown and Gentilucci (2007)	Think-out-loud strategies	Y	27	1,4,7,8	Y	Y	.34
McKeown and Gentilucci (2007)	Think-out-loud and self-questioning strategies	Y	27	1,4,7,8,9	Y	Y	.83

Continue

Continued

Study and date	Description of intervention	Published (Yes or No)	N	* Reading strategies used in study	Standard test (Yes or No)	Standard teacher (Yes or No)	Effect size
McNeil (2011)	Background knowledge and self-questioning	Y	30	1,8,9	N	N	5.7
McNeil (2011)	Self-questioning	Y	30	1,8,9	N	N	4.29
Mozafari and Barjesteh (2016)	Critical orientated reading strategies	Y	109	2,3,9,10	Y	Y	3.29
Nassaji (2003)	Vocabulary learning from context	Y	21	1,2,4,7	N	N	.04
Ntereke and Ramoroka (2016)	Academic literacy instruction	N	30	1,2,3,8,10	N	Y	.22
Olson et al., (2012)	Cognitive strategy interpretive reading	Y	54	1,2,3,4,5	Y	Y	.64
Olson and Land (2008)	Pathway Project: Cognitive strategy approach	Y	547	1,2,3,4,5,8,9,10	Y	Y	.54
Pappa et al., (2003)	Metacognitive strategy training	Y	38	3,10	Y	Y	.80
Proctor et al., (2009)	Deep vocabulary instruction	Y	240	2,4,5,8,9	Y	Y	.41
Quanwal and Karim (2014)	Intensive reading strategy instruction	Y	40	1,2,3,4,5,6	N	N	.16
(Rakhshan and Moghaddam 2015)	Dynamic assessment	Y	175	1,2,4,5,8,9,10	Y	Y	-0.93
Rodriguez and Martin (2016)	EFL text-based questioning	N	40	1,2,3,6,9,10	N	Y	-1.07
Safarpoor et al., (2015)	Self-questioning as a generative learning strategy	Y	60	8,10	Y	Y	.20
Salataci (2002)	Think aloud protocols	Y	8	1,2,4,5,8,9	Y	N	1.73
Shang (2010)	Self-efficacy and EFL reading comprehension	Y	53	3,4,6,9	Y	Y	.41
Spörer and Brunstein (2009)	Peer-assisted reading strategies	Y	186	3,4,9,10	Y	Y	.31
Suk (2016)	Extensive reading	Y	171	2,3,4,10	N	N	.46
Trendak (2014)	Strategy training in FL learning	Y	40	1,2,8,10	N	N	1.52
Urlaub (2012)	Generating questions	Y	21	9	N	N	.88
Vaughn et al., (2011)	Multi-component reading comprehension on instruction	Y	782	1,2,4,7,8,9,10	Y	Y	.12
Vaughn et al., (2011)	Silent reading ability	Y	782	1,2,4,7,8,9,10	Y	Y	.13
Vaughn et al., (2009)	Teacher-led student reading	Y	414	4,10	N	Y	.28
Vaughn et al., (2009)	Paired student reading	Y	414	4,10	N	Y	.28
Wettlaufer (2016)	Balanced strategy instruction	N	20	1,2,4,8,9	Y	Y	.01
Wettlaufer (2016)	RI-understanding explicit instruction	N	20	1,2,4,8,9	Y	Y	.47
Wettlaufer (2016)	Making connections from reading to personal knowledge and instruction	N	20	1,2,4,8,9	Y	Y	.40
Yapp (2015)	Intensive strategy training	N	36	1,4,5,8,9	Y	Y	.65

* Reading strategies:
1. Activating background knowledge
2. Guessing meanings from context
3. Semantic mapping
4. Making predictions while reading
5. Visualization
6. Skimming and scanning
7. Looking for clues in pictures and headings
8. Connecting new knowledge to what is already known
9. Asking questions while reading
10. Paying attention to structure

A3 The Meta-analysis Search Procedure for L2 Reading Strategy Studies. Identification

1st Refined search to studies publishedstage: Google Scholar database of L2 reading strategy studies: (n = 64, 200)

2nd stage: Refined search to studies published between 2000- 2016: (n = 17,800)

Applied descriptors: 1: reading strategies, intervention, L2, reading comprehension (n =5, 390), 2: Reading strategies, L2, study (n = 4, 992), 3: Secondary school (n = 1412)

Search by hand of author bibliographies (n = 3)

Search by hand of frequently cited journals (n = 0)

Eligibility
Articles discounted as they do not fulfill inclusion criteria (n = 453)

Articles discounted due to exclusion criteria (n = 386)

Eligibility
Studies initially included in synthesis but later discarded as authors unable to provide requested study information. (n = 13)

Studies included in quantitative synthesis (meta-analysis) (n = 46)

A

A4 Forest Plot Showing Studies with Measure of Effect and Observed Outcomes
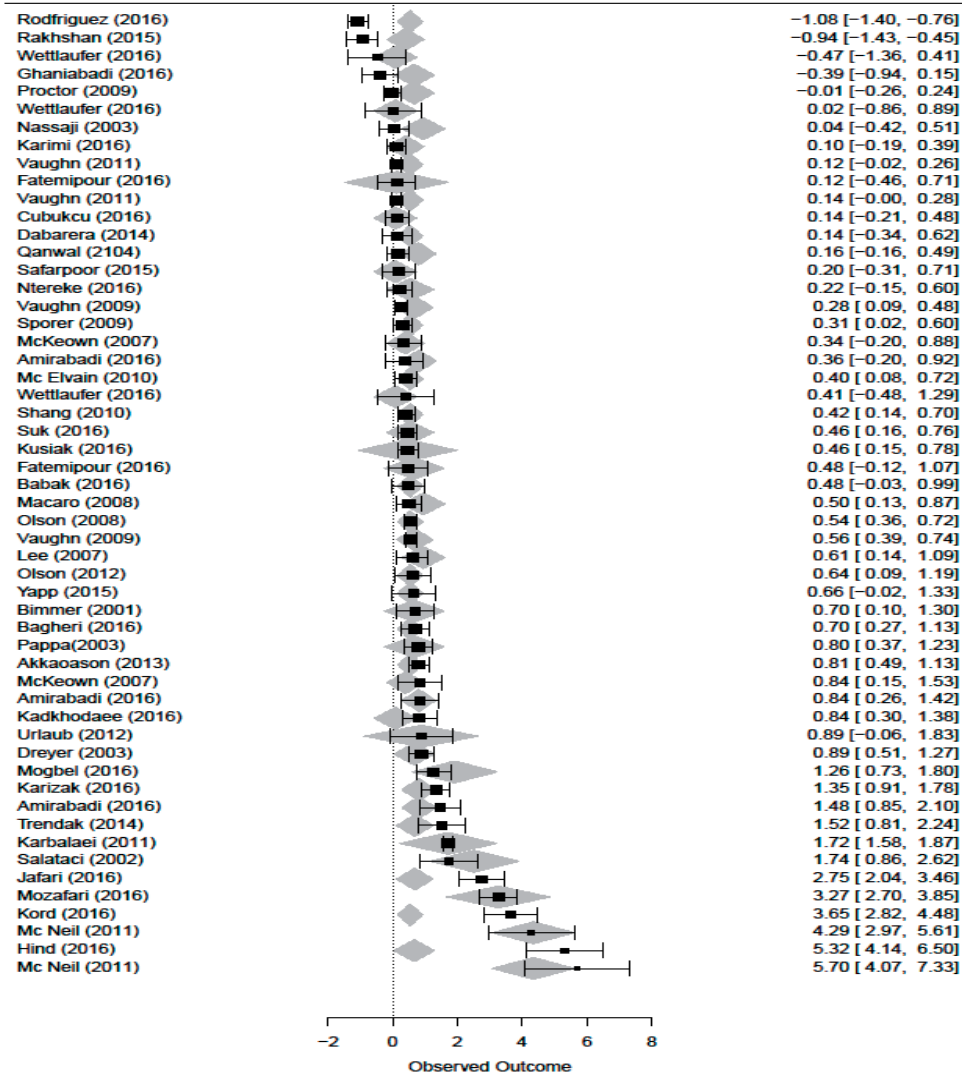
Appendix B

B1 Study Participants per Wave According to Gender and Previous Education

Wave (N = 801)	Previous school level	Males	Females	Previous education unknown
1 (n = 273)	HAVO	55	110	n = 4
	VWO	1	11	
	MBO	32	60	
2 (n = 321)	HAVO	60	150	n = 11
	VWO	2	10	
	MBO	35	53	
3 (n = 207)	HAVO	48	70	n = 15
	VWO	1	3	
	MBO	26	44	

HAVO: General secondary education, VWO: University preparatory education,
MBO: Senior vocational education

B2 Number of Students per Wave (minimum and maximum), means and standard deviations (SD) per measurement occasion and wave.

	N	M1		M2		M3	
Wave	Min–Max	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	176–233	15.81	3.73	16.54	4.33	25.11	6.03
2	172–314	16.25	3.60	17.50	3.93	21.25	6.71
3	90–226	14.60	4.23	15.57	4.89	18.52	5.71

B3 Number of Missing Scores and Total per Wave

Wave	M1	M2	M3	Total missing scores
1	0	0	0	0
2	60	90	8	158
3	89	99	13	201

A

Appendix C

C1 Activities from the Student's workbook

The following activities are extracts from the student's workbook and provide an illustration of the different activities that were used in the four instructional phases of the lesson.

Week 2: Activating and connecting to background knowledge, Reading Strategy 1:
This introduction to the strategy would be given in the first phase of the lesson:

Introduction: You are going to read a number of texts with a similar context: The Ocean. The texts become longer and more difficult as you progress. You will complete a number of exercises; to begin with, your teacher will help you. Once you have mastered the strategy, you will be able to complete the exercises yourself.

What is this strategy and how does it work?
The purpose of this first strategy is to connect new information that you are going to learn to any background or existing information; this is information that you (probably) already know.

Why is this strategy useful for you?
In order to understand the text and answer the questions, you need to connect new information to knowledge you already have. It is easy to feel overwhelmed by the complexity of a text; however, when we break the information down into new and existing knowledge and make connections between the two, it becomes easier to understand the text and answer the questions.

Exercise 1:
Your teacher will read the text with you; as you read, try to connect the new knowledge (given in red) to the existing/background knowledge (given in black) that you probably already know.

C2 Text 1: BBC News Article about a beached whale

> The operation to save a pilot whale which beached itself in Orkney appears to have been successful.
> The young female was discovered on a beach in Deerness on the east of the Orkney mainland.
> Local marine mammal experts worked alongside the Scottish SPCA and tourists in a bid to help keep the animal alive on Wednesday.
> They managed to refloat the whale at high tide, and it has not been seen since.
> Last week, 21 long-finned pilot whales stranded on the shore at Staffin on Skye.
> While the majority were successfully floated back out to sea, several of the whales then stranded on the shores of nearby Staffin Island.
> Eight whales died, including a female and her newborn calf.

Now look at the table underneath: here the new information (in red) has been connected to existing information (in black)

Background information / Existing knowledge	New information
Whales–large sea mammals.	1. Pilot whale: type of small common whale, also called a pothead whale.
The beach – sandy area where land meets sea, sometimes called the shore.	2. Beached/ stranded on the shore brought by tides to shore, unable to escape the beach back into the water, similar to stranded on the shore, but not *just* stranded; *He was **stranded** in town when the last bus left without him.*
Scotland – country north of England with many islands.	3. Orkney: An area of north east Scotland, Deerness is a town in Orkney.
The English **RSPCA** stands for *The Royal Society for Prevention of Cruelty to Animals.*	4. SPCA: therefore the SPCA must stand for *The Scottish Prevention of Cruelty to Animals.*
An attempt to try to do something even though it may not succeed.	5. Bid: an attempt to do something, often with risk or danger involved.
Float – to remain on or near the surface of the water, the opposite of to sink.	6. Re-float: re=to do something again, to float the whale out again, create the opposite effect of beaching.
Skye – One of the islands off the coast of Scotland.	7. Staffin on Skye: an area near to the Island of Skye; Staffin Island would be nearby.
Calf – Normally used as name for young bulls or cows.	8. Calf can also be used for the young of elephants, seals, or whales.

A

C3 Exercise 2:

Could you see how the new and existing information connect to each other helping you to understand the text?

Try to link what you already know on the beaching of whales while reading this text about whales in Japan.

The mass beaching of more than 150 melon-headed whales on Japan's shores has fueled fears of a repeat of a seemingly unrelated event in the country – the devastating 2011 undersea earthquake that unleashed a tsunami and triggered a nuclear disaster.
Despite a lack of scientific evidence linking the two events, a flurry of online commentators pointed to the appearance of around 50 melon-headed whales on Japan's beaches six days prior to the monster-quake, that killed around 19,000 people.
Scientists were dissecting the bodies of the whales, 156 of which were found on two beaches on Japan's Pacific coast on Friday, but could not say what caused the beachings.
"We don't see any immediate signs of diseases on their bodies, such as cancer. We want to figure out what killed these animals," Tadasu Yamada, a senior researcher at National Museum of Nature and Science, told public broadcaster NHK.
Despite the lack of any clear link between the beachings and earthquakes and comments from local officials downplaying such a connection, many took to social media to point to the link.
"Is the next one coming? Be ready for a quake," wrote Twitter user aoeos40d. Another Twitter user wrote simply: "We might have a big one on the 12th [of April]."
The 2011 Japan earthquake was not the only instance of beached whales closely preceding a massive tremor. More than 100 pilot whales died in a mass stranding on a remote New Zealand beach on February 20, 2011, two days before a large quake struck the country's second-largest city Christchurch.
Japanese officials nevertheless tried to calm fears and insisted there was no scientific data to prove the link. Scientists are meanwhile unclear as to why the marine animals strand themselves in large groups, with some speculating healthy whales beach themselves while trying to help sick or disorientated family members that are stranded.
Others believe the topography of certain places somehow scrambles the whales' sonar navigation, causing them to beach. Once stranded, the whales are vulnerable to dehydration and sunburn until rescuers can use the high tide to move their massive weight back into deeper water.

Taken from BBC International News, June 2018.

C4 Exercise 3:

Read the text on the next page and practice the strategy yourself. Write down any new information that you have managed to connect to the existing information you have gathered or already knew.

Tracking the world's loneliest whale
A Song of Solitude
HUMANS are social animals, and the lifeblood of society is conversation.
In its absence, loneliness awaits. Indeed, one reason humans deploy radio telescopes and send time capsules into space may be their hope that evidence of another intelligence will relieve their feelings of intergalactic solitude.
Perhaps this explains why the paper "Twelve Years of Tracking 52-Hz Whale Calls From a Unique Source in the North Pacific," published in the December issue of Deep Sea Research, sparked interest well beyond the usual small circle of oceanographers. The paper reported that for many years, a whale had been cruising the Pacific from central California to the Aleutians, calling out with a voice unlike any other whale's, and getting no response. The call, possibly a mating signal, suggests that the animal lives in total, and undesired, isolation.
The paper's authors, from the Woods Hole Oceanographic Institution on Cape Cod, first heard the voice in 1992, and have since tracked it with underwater microphones the Navy uses to listen for enemy submarines.
The solitary wanderer emits its metronomic calls at around 52 hertz, a tuba pitch that is, nonetheless, far higher than the calls closest to it – those of the giant blue and fin whales. Its voice subtly deepened through the 1990's, which suggests it was still maturing.
Mary Ann Daher, a marine biologist at Woods Hole who is one of the paper's authors, speculated that the whale might be malformed or mis-wired, "broadcasting on the wrong frequency but listening on the right one." Or it could be the offspring of a blue whale and another species – and hence truly alone of its kind.
News of the unanswered song provoked a host of e-mail messages to the Woods Hole research team, Ms. Daher said. Many came from deaf people, who wondered if the whale shared their disability. And Dr. Kate Stafford, a researcher at the National Marine Mammal Laboratory in Seattle, said that if the song is in fact a mating display, "He's saying, 'Hey I'm out here.'"
But nobody is answering. There is no conversation. "He must be very lonely," Dr. Stafford said, wistfully.

Make a note here in the table of any new knowledge that you have gathered from the text.
How well were you able to use *all the information* you have gathered so far to understand the text?

A

C5 Exercise 4:

Use all the information you have gained to work through this text. Also, as you read, try to connect what you already know to help you understand any new information.
Answer the question at the end of the text.

Tsunami tip-off

RECENT natural disasters have made it all too clear that we need cheap and simple ways to prepare for nature's wrath. That's the thinking behind a novel approach to tsunami detection, which would use the submarine cables that supply your broadband.
Existing warning systems use pressure sensors on the seafloor to detect the weight of a tsunami in the water column above. Only five countries own such sensor arrays – the US, Australia, Indonesia, Chile and Thailand – partly due to the high cost of installation. This lack of coverage leaves many countries vulnerable to a tsunami strike.
Now a team led by Manoj Nair at the National Oceanic and Atmospheric Administration in Boulder, Colorado, has proposed a cheaper way to detect an approaching tsunami: use undersea telecommunications cables to detect its electric field. Such fields are created as electrically charged tremors in salty seawater pass through the earth's magnetic field.
Computer modelling by Nair's team shows that the electric field generated by the tsunami that struck south-east Asia in 2004 induced voltages of up to 500 millivolts. Their calculations show this is big enough to be detected by voltmeters placed at the end of the fibre-optic and copper cables that carpet the floor of the Indian Ocean. The work will appear in the journal Earth, Planets and Space.
The idea has its limitations, though. Cables would not reveal the exact location or direction of the tsunami, and you would have to subtract noise created by fluctuations in the earth's magnetic field, tides and the cable itself to avoid misleading signals.
Still, "it seems promising," says Bill McGuire of University College London. But he points out that it's just as important to set up a system to quickly pass on warnings to coastal towns after a tsunami has been detected.
[*New Scientist*, 2010.]

Question: *Indicate with either a 'yes'/ 'no' if the following statements appear in the text.*
1 A network of cables on the seabed that measure increased electricity.
2 A system calculating discrepancies in gravitational pulls and tidal changes.
3 Devices on the seabed that register increased water pressure.
Note the number of the statement followed by 'yes' or 'no'.
1. _____
2. _____
3. _____
Were you able to connect your existing and learned knowledge to help you answer these questions?

C6 Exercise 5:

You are now going to read a short text about the game 'Assassin's Creed'; try to ask questions as you read and you should find that you are able to answer the question at the end of the text without much difficulty.

Made-up history

The Assassin's Creed video game series has spent five games taking historical figures and constructing fantastical narratives around them to advance its core story about an ancient religious order conspiring to control the Earth's population using alien artifacts (How Canada Exports Distorted History editorial, Nov. 15). The protagonist combats them using assassination skills learned by reliving genetic memories of his ancestors stored in his DNA. And we're worried about historical accuracy? Why is this conversation only happening now? What about the other portrayals in the series? And why not criticize HBO and Showtime's historically inspired dramas for their inaccuracies, as well? If students are really getting their facts about history, unfiltered, from Assassin's Creed, our schools have failed them at far more than historical education. (Aside to the editor: Yes, five games. Two were unnumbered sequels continuing the story of Assassin's Creed II.)

Jason Robertson, Calgary.

Why does Jason Robertson respond to the article "How Canada Exports Distorted History"?
a. He believes *Assassin's Creed* can be used to get pupils interested in history.
b. He claims the faults in *Assassin's Creed* are the result of inadequate schooling.
c. He feels annoyed because the editor clearly is no expert on *Assassin's Creed*.
d. He is surprised by the concern about the historical incorrectness of *Assassin's Creed*.
e. He is worried about the effect on children of violent games like *Assassin's Creed*.

Were you able to ask yourself questions as you read? How did this strategy work for you?

A

C7 Exercise 6

Week 4: Visualizing and Inferring, Making what's implicit explicit, Reading Strategy 4:

Introduction:
Inferring involves merging background knowledge with text clues to come up with ideas that are not explicitly stated in the text. In other words, inferring means that we "read between the lines."
When we infer, we often draw conclusions or make predictions. Inferring may also involve using the context to figure out a meaning of an unfamiliar word or noticing a character's actions to bring a theme to the surface.
When we make a mental picture or visualize something, we are inferring with a mental picture rather than words. Visualizing strengthens our inferential thinking, as both of them do not occur in isolation but work together. When we visualize while we are reading, we bring clarity and enjoyment to our reading as we create pictures in our mind, which keeps us engaged and motivates us to keep reading.

Inferring is an umbrella under which falls:
-making predictions,
-using context to figure out meaning,
-interpreting and visualizing,
-inferring the author's purpose,
-creating interpretations based on the text

This week, you are going to work on making inferences and creating visual images from the text.

C8 Exercise 7:
Your teacher will read the following text to you; as the text is read, try to picture each of the items mentioned in the text and create a mental picture in your head of the barn that is described.

The barn was very large, it was very old. It smelled of hay…it smelled of the perspiration of tired horses and the wonderful sweet breath of patient cows….it smelled of grain and of harness dressing and of axle grease and of rubber boots and new rope…it was full of all sorts of things that you find in barns: ladders, grindstones, pitch forks, monkey wrenches, scythes, lawn mowers, snow shovels, ax handles, milk pails, water buckets, empty grain sacks and rusty rat traps. It was the kind of barn that swallows like to build their nests in. It was the kind of barn that children like to play in.

Now, visualize the barn in your mind: what does it look like? What does it smell like? What other things can you see in the space where the barn is standing? Write a few of your thoughts down here; when you have finished, share these thoughts with other students and your teacher.

As you may have discovered, the barns described by your fellow students are very different, even though the text was the same. This is because when we visualize things, we take the words from the text and we mix them with our own background knowledge to draw pictures in our mind. When we combine the author's words with our own background knowledge, it allows us to create mental pictures that brings the text to life and helps us to understand the text better.

A

C9 Exercise 8: Creating images with compelling non-fiction

As you read the following text yourself, try to visualize the scene in your mind and make a mental picture of what was happening.

Shadow Ball

The crowd stirs with anticipation as the Indianapolis Clowns, an all-black team, take the field for their warm ups. The second baseman's glove snaps back when he snags a quick peg from first. He hurls the ball to the third baseman, whose diving catch brings the fans to their feet. Then a batter steps up to the plate. The pitcher sets, gets his signal, winds up, and throws. The batter swings. He hits it! The shortstop leaps to his right and makes a tremendous backhand stab. He jumps up, whirls, and throws to first just ahead of the sprinting runner. The low throw kicks dirt up by the first baseman's out-stretched glove. The runner is out! The crowd roars.

But wait! There's no ball in the first basemen's glove. The batter didn't really hit it. The Clowns were warming up in pantomime – hurling an imaginary ball so fast, making plays so convincingly, that fans could not believe it wasn't real.

They called it shadow ball – and it came to stand not only for the way the black teams warmed up, but the way they were forced to play in the shadows of the all-white majors. Many black ballplayers were as good – if not better – than the big leaguers. All that kept them out was the color of their skin.

Now picture the entire scene in your mind and pick out as many of the details as you can. Some parts of the text invited visualizing; complete this list below with your own mental picture.

1. The running
2. The sliding
3. The roar of the crowd
4. The kicked-up dirt
5. The hurling of the ball
6. _____
7. _____
8. _____
9. _____
10. _____

And to finish: Which sport were the Indianapolis Clowns playing? _____
Were you able to visualize the action in the text?

C10 Exercise 9: Inferential Thinking: Reading between the lines

Inferring is essential when we are reading for comprehension; we use inferential thinking to extract clues from the text. When we read a text, we must infer (read) tone and text clues in the same way that we infer (read) facial expressions. Read the two texts below and try to infer clues by reading between the lines.

Teddy Kremer – The Most Excited Bat Boy Ever

Last year, Teddy Kremer's parents won a silent school auction that allowed their son to be the Cincinnati Reds' bat boy for a day. No one else bid against them because everyone knew how much Teddy loved the Reds. The Kremer's son knew every stat by heart.

He is 30 years old and he has Down Syndrome. The Reds players talked glowingly about how Teddy raised everyone's spirits with high fives all around and smiles for everyone in the clubhouse. Teddy was so loved by the Reds team they brought him back on April 18. Before the game, Teddy asked for three wishes. A home run by his favorite player, Todd Frazier, 11 runs and 11 strikeouts so the crowd could win free pizza. He told Frazier that he loved him and he was his best friend. Frazier did his part… so did the rest of the team in route to a crushing defeat of the Marlins.

Now answer the questions.
1. What was happening with the Reds on April the 18th?
_____

2. How did Teddy's 3 wishes inspire the Reds team?
_____

A

C11 Exercise 10:

Jose Fernandez – A Lifetime of Stories at Age 20

It was only a short while ago when Jose Fernandez was still in Cuba. He tried three times to defect before finally succeeding with his family in 2008. His attempts weren't at an international competition where he walked over to a cop to announce his defection. He and his family made the trip the hard way via the harrowing sea journey. His adventures had him avoiding being shot and going to jail. On one of the attempts, he jumped into the water to save someone who fell in. It turned out to be his mother. That sort of makes most teenagers' normal drama pale in comparison.
Almost exactly five years later – at the age of 20 – he's made the jump from single-A to pitch for the Miami Marlins. Seems like cake. And it makes it hard to root against him.

1. What kind of drama has Jose Fernandez endured?

_____

2. Why is it hard for the writer to root against him?

_____

C12 Exercise 11: Using inferential thinking to fill in the gaps in a text

When we have to fill in a gap-filling text, we are tempted to look at the questions first and see what 'fits'. The problem, however, is that all the items could fit into the text, so we often have to guess which one is the best fit, with a bigger chance of choosing an incorrect answer.

A better way is to infer, read between the lines, and fill the information in before looking for the answer. That way, whichever answer best fits your inference is the correct one.

Try this approach with the following text: 'Just Like Humans'. Each time you reach a numbered gap, try and predict or infer what the missing piece of text should be: form a clear picture in your mind of the answer. Write your inferences under the number in the text; then, when you have finished the text, have a look at the choices given on the next page.

Just Like Humans
WE NAME THEM, RAISE them, clothe them and spoil them. We describe them as manipulative, grumpy, sensitive and caring. And they're not even human – they're our pets. It's in our nature to ascribe human characteristics to animals even if they don't really exist. For this reason, in the interests of remaining objective observers of nature, scientists have **–1—-** anthropomorphizing animals. To talk about a dog's having a swagger or a cat's being shy would invite professional sneers.
In recent years, however, evidence has begun to show that animals have personalities after all. Chimps, for example, can be conscientious: they think before they act, plan and control their impulses, says Samuel Gosling, a Texas based psychologist**.... 2....** The implications of these findings for research on human personality are powerful. Scientists can look to animal studies for insight into humans the same way they now look to animal testing for insight into drugs. Animal research has already begun to shed light on how different types of people respond to medications and treatments – aggressive and passive rats respond differently to antidepressants, for example. The hope is that animals can illuminate the murky interplay of genes and the environment on**... 3....** The research may even lead to predictions about what people will do, based on their personalities, when they're stressed out or frightened. Putting personality testing – already a thriving business – on a firm footing could uncover a wealth of knowledge about where personality comes from.
Ivan Pavlov did his famous work with dogs in the early 1900s, but animal personality studies then languished for decades. Now the field is making a comeback. In one study of fruit flies, researchers in the North Carolina State University genetics department found some flies to be consistently more aggressive than others – they made more threats and dished out more physical abuse, going so far as to kick and push others (yes, flies can kick)**... 4....** research from the University of Guelph, in Ontario, looked at differences in rainbow trout; they found some to be consistently bolder in looking for food than the others. New research, including

a paper published last month in the journal Nature, asserts that observations of more than 60 animal species, from birds to squids to spiders, clearly show the presence of what can only be called personality.

Animals have obvious advantages as test subjects. Humans are difficult to study over an entire lifetime and are more complicated – psychologists must take into account a person's goals, values, abilities and attitudes, as well as physical and bodily states, moods and life stories. By putting animals with specific personalities (aggressive or passive, for example) into specific situations (isolation or a social setting) and testing them, scientists could help determine how personality traits **...5...** to disease and medications. Recent research on stress-related personality disorders like posttraumatic stress, chronic fatigue and depression has already begun to rely on animal models, says Jaap Koolhaas, a Netherlands-based behavioral physiologist. Placing a dominant male rat in a situation of social defeat (perhaps by introducing it in the territory of a stronger rat) will bring on behaviors characteristic of human depression.

The big payoff may come down the road, as scientists begin to use animals to figure out how genes and environment interact to influence personality. Currently, scientists rely on observations of identical twins brought up in different environments – which doesn't happen often. Animals, however, can be cloned in large numbers and brought up in systematically varied environments. In experiments on monkeys suffering from the animal equivalent of AIDS, sociable monkeys fared better when they interacted more with other monkeys, while those **...6...** like humans in a hospital – fared worse, says Gosling. That's the kind of effect scientists may now be able to study more widely. Perhaps that's the**...7...** finding out humans aren't as unique as we'd thought.

Choose for each gap (1–7) in the text which of the alternatives is the correct answer

1
a. become less skeptical about
b. investigated the reasons behind
c. taken pains to avoid
d. taken to

2
a. Gosling offers a new explanation why personality traits have evolved in humans and other species
b. Gosling's animal research thus explains the interaction between animals and humans
c. Other psychologists, however, question whether even human personality is definable at all
d. Research has identified similar personality traits in many other species

3
a. aggression and violence
b. human genetic make-up
c. people's personalities
d. the use of drugs

4
a. As a result
b. Conversely
c. For example
d. Similarly

5
a. change due
b. enable resistance
c. influence responses

6
a. kept in isolation
b. suffering from AIDS-like symptoms
c. who could not look after themselves

7
a. final word in
b. main reason for
c. paradox in
d. upside to

How did you do? Was this strategy an effective one for you?
_____
_____
_____

A

Appendix D

D1 Reading Strategy Course Teacher Observation Rubric

Date of observation: **Week:**

Teacher observed: **Time:**

Class: **Number of students in class:**

Observed by:

Reading strategy/strategies taught:

Teacher activity	This activity was observed and executed according to the module description	This activity was executed well	This activity was executed to some extent	This activity was not executed at all	Observer Comments
During lesson warm-up					
Awareness: Teacher first found out whether students knew of this reading strategy.					
Introducing: Teacher introduced the strategy to the class.					
During core reading lesson					
Explaining the strategy: -Teacher explained what the strategy was -Teacher explained why it was important -Teacher explained when it can be used.					
Teacher modeled and worked with the strategy aloud to the class.					
Individual practice: Teacher gave students an opportunity to practice the strategy individually after sufficient guided practice.					
During core reading lesson					
Collaborative practice: Teacher gave students the opportunity for collaborative practice with the strategy.					

Continue

Continued

Teacher activity	This activity was observed and executed according to the module description	This activity was executed well	This activity was executed to some extent	This activity was not executed at all	Observer Comments
Feedback: Teacher gave students feedback on strategy use.					
Scaffolding: Teacher gave structured scaffolding to students (when required) to those who had difficulty with the strategy/ reading.					
End of reading lesson					
Benefits of strategy use: -Teacher reminded students of the benefits of strategy use -Teacher asked them to explain how they would use this strategy in a similar text.					
Further practice: Teacher gave students suggestions for further reading practice with the strategy.					
Any other reading activities used in class during this observation:					

A

D2 Teacher Reading Strategy Log and Activity Book

Name of teacher :
Group:
Academic block:

Week Two

Reading Strategy Week two:
Connecting new information to what you already know.
<u>Suggestions for class warm-ups:</u>
1. Brainstorm what your students already know about the topic being discussed
2. Ask them questions about the topic that they would like answered
3. Present a specific problem on the topic to the class, gather the reactions
4. Help your students put what they know on the topic into categories
5. Help your students clarify what they know about the topic
<u>Suggestions for student collaborative practice:</u>
In small groups get students to:
1. Share ideas on what the main idea of the text is
2. Decide on a line or small paragraph from the text that is critical to the understanding of it
3. Decide on a phrase or sentence that highlights the main idea of the text
4. Compose a list of 10 words or phrases that they didn't know before reading and what they think they might mean

Teacher activity **Week** 2	Fully	To some extent	Not at all	Teacher's Comments
During lesson warm-up	**This week's strategy;** **Connecting new information to what you already know**			
Awareness: I first found out whether my students were aware of this reading strategy.				
Introducing: I introduced the strategy to the class.				
During core reading lesson				
Explaining the strategy: -I explained what the strategy was				
-I explained why it was important.				
-I explained when it can be used.				
I made a point of linking new information to what my students already knew.				
Individual Practice: I gave my students an opportunity to practice the strategy individually after sufficient guided practice.	Fully	To some extent	Not at all	Teacher's Comments
During core reading lesson				
Collaborative practice: I gave my students the opportunity for collaborative practice with the strategy.				
Feedback: I gave my students feedback on their strategy use.				
Scaffolding: I gave structured scaffolding for students (when required) to those who had difficulty with the strategy/reading.				
End of reading lesson **Benefits of Strategy Use**: -I reminded my students of the benefits of strategy use				
-I asked them to explain how they would use this strategy in a similar text.				
Further practice: I gave my students suggestions for further reading practice with the strategy.				
Any other reading activities that I used in class this week:				

A

Week Three

Reading Strategies Week three:

Asking yourself questions and predicting what will happen next.

Suggestions for class warm-ups: Ask your students:

1. What makes sense in a text?

2. When you are reading do you ever ask yourself 'what will happen next'?

3. When you are reading do you notice specific things like events or actions?

Suggestions for student collaborative practice:

In small groups get students to:

1. Share ideas about what the main idea of the text is.

2. Decide on a line or small paragraph from the text that is critical to the understanding of it

3. Decide on a phrase or sentence that highlights the main idea of the text.

4. Compose a list of 5 questions about the text that readers should be asking themselves.

Teacher activity Week 3	Fully	To some extent	Not at all	Teacher's Comments
During lesson warm-up	This week's strategy; Asking questions and predicting what will happen next			
Awareness: I first found out whether my students were aware of this reading strategy.				
Introducing: I introduced the strategy to the class.				
During core reading lesson				
Explaining the strategy: -I explained what the strategy was				
-I explained why it was important.				
-I explained when it can be used.				
I made a point of linking new information to what my students already knew.				
Individual Practice: I gave my students an opportunity to practice the strategy individually after sufficient guided practice.	Fully	To some extent	Not at all	Teacher's Comments
During core reading lesson				
Collaborative practice: I gave my students the opportunity for collaborative practice with the strategy.				
Feedback: I gave my students feedback on their strategy use.				
Scaffolding: I gave structured scaffolding for students (when required) to those who had difficulty with the strategy/reading.				
End of reading lesson **Benefits of Strategy Use**: -I reminded my students of the benefits of strategy use				
-I asked them to explain how they would use this strategy in a similar text.				
Further practice: I gave my students suggestions for further reading practice with the strategy.				
Any other reading activities that I used in class this week:				

A

Week Four

Reading Strategy Week four:

Visualization

Suggestions for class warm-ups:

1. Ask your students to brainstorm words or phrases that invite visualization

2. Do all your students picture the same thing when they hear a word or phrase? Why do they think this is?

3. Are some visualizations universal? Why would this be?

4. Help your students categorize their knowledge on the topic

Suggestions for student collaborative practice:

In small groups get students to:

1. Share ideas about what the main idea of the text is.

2. Decide on a line or small paragraph from the text that is critical to the understanding of it.

3. Decide on a phrase or sentence that highlights the main idea of the text.

4. One student reads a passage from the text two times: the first time the other listens without visualization and the second time with visualization; which one was more powerful?

Teacher activity Week 4	Fully	To some extent	Not at all	Teacher's Comments
During lesson warm-up	**This week's strategy; Visualization**			
Awareness: I first found out whether my students were aware of this reading strategy.				
Introducing: I introduced the strategy to the class.				
During core reading lesson				
Explaining the strategy: -I explained what the strategy was				
-I explained why it was important.				
-I explained when it can be used.				
I made a point of linking new information to what my students already knew.				
Individual Practice: I gave my students an opportunity to practice the strategy individually after sufficient guided practice.	Fully	To some extent	Not at all	Teacher's Comments
During core reading lesson				
Collaborative practice: I gave my students the opportunity for collaborative practice with the strategy.				
Feedback: I gave my students feedback on their strategy use.				
Scaffolding: I gave structured scaffolding for students (when required) to those who had difficulty with the strategy/reading.				
End of reading lesson **Benefits of Strategy Use**: -I reminded my students of the benefits of strategy use				
-I asked them to explain how they would use this strategy in a similar text.				
Further practice: I gave my students suggestions for further reading practice with the strategy.				
Any other reading activities that I used in class this week:				

A

Week Five

Reading Strategy Week five:

Paying attention to structure

Suggestions for class warm-ups:

1. Brainstorm what signal words your students know

2. Ask your students what the main components of a text are

3. Share helpful tips from other students for solving gap texts

4. As class put a short simple one-page story that has been cut up into paragraphs back together again (for example: Red Riding Hood)

Suggestions for student collaborative practice:

In small groups get students to:

1. Put a short simple one-page story that has been cut up into paragraphs back together again in the correct order (for example The Ugly Duckling).

2a. Using the text studied in class, each member of the group takes a paragraph and makes a summary.

2b. Group then collects the summaries and puts them in the correct order.

2c. Group then puts the text back together in the correct order.

Teacher activity Week 5	Fully	To some extent	Not at all	Teacher's Comments
During lesson warm-up	**This week's strategy;** **Paying attention to structure**			
Awareness: I first found out whether my students were aware of this reading strategy.				
Introducing: I introduced the strategy to the class.				
During core reading lesson				
Explaining the strategy: -I explained what the strategy was				
-I explained why it was important.				
-I explained when it can be used.				
I made a point of linking new information to what my students already knew.				
Individual Practice: I gave my students an opportunity to practice the strategy individually after sufficient guided practice.	Fully	To some extent	Not at all	Teacher's Comments
During core reading lesson				
Collaborative practice: I gave my students the opportunity for collaborative practice with the strategy.				
Feedback: I gave my students feedback on their strategy use.				
Scaffolding: I gave structured scaffolding for students (when required) to those who had difficulty with the strategy/reading.				
End of reading lesson **Benefits of Strategy Use**: -I reminded my students of the benefits of strategy use				
-I asked them to explain how they would use this strategy in a similar text.				
Further practice: I gave my students suggestions for further reading practice with the strategy.				
Any other reading activities that I used in class this week:				

A

Week Six

Reading Strategies Week six:

Skimming and Scanning

Suggestions for class warm-ups:

1. Brainstorm what your students do when they are looking for specific information on (for example) a website

2. Get your students to think of a few synonyms for key words in the text

3. Share helpful tips from other students for finding information quickly in a text.

Suggestions for student collaborative practice:

In small groups get students to:

1. Take it in turns framing a question for information from the text; the other students must scan the text as quickly as possible to find the information that was asked for

Teacher activity Week 6	Fully	To some extent	Not at all	Teacher's Comments
During lesson warm-up	This week's strategy; **Skimming and Scanning**			
Awareness: I first found out whether my students were aware of this reading strategy.				
Introducing: I introduced the strategy to the class.				
During core reading lesson				
Explaining the strategy: -I explained what the strategy was				
-I explained why it was important.				
-I explained when it can be used.				
I made a point of linking new information to what my students already knew.				
Individual Practice: I gave my students an opportunity to practice the strategy individually after sufficient guided practice.	Fully	To some extent	Not at all	Teacher's Comments
During core reading lesson				
Collaborative practice: I gave my students the opportunity for collaborative practice with the strategy.				
Feedback: I gave my students feedback on their strategy use.				
Scaffolding: I gave structured scaffolding for students (when required) to those who had difficulty with the strategy/reading.				
End of reading lesson **Benefits of Strategy Use**: -I reminded my students of the benefits of strategy use				
-I asked them to explain how they would use this strategy in a similar text.				
Further practice: I gave my students suggestions for further reading practice with the strategy.				
Any other reading activities that I used in class this week:				

A

Week Seven

Reading Strategies Week seven:

All the strategies covered

Suggestions for class warm-ups:

1. Ask your students to list which strategies they have been taught and why they are useful.

2. Repair any gaps in understanding of the strategies.

3. Go through the different parts of the exam and brainstorm which strategies would be best for each part.

Suggestions for student collaborative practice:

In small groups get students to:

1. Decide which strategies would be best for the different parts of the practice exam.

2. Scaffold where necessary.

Teacher activity Week 7	Fully	To some extent	Not at all	Teacher's Comments
All the strategies During lesson warm-up				
I asked my students to name and explain the reading strategies they have learned. During core reading lesson				
Explaining the strategy: -I explained what the strategies were -I explained why they were important -I explained when they can be used. I gave examples of the reading strategies in different reading contexts.				
Individual Practice: I gave my students an opportunity to practice the strategies individually after sufficient guided practice.	Fully	To some extent	Not at all	Teacher's Comments
During core reading lesson				
Collaborative practice: I gave my students the opportunity for collaborative practice with the strategies.				
Feedback: I gave my students feedback on their strategy use.				
Scaffolding: I gave structured scaffolding for students (when required) to those who had difficulty with the strategy/reading.				
End of reading lesson				
Benefits of Strategy Use: -I reminded my students of the benefits of strategy use				
-I asked them to explain how they would use these strategies in a similar text.				
Further practice: I gave my students suggestions for further reading practice with the strategy.				
Any other reading activities that I used in class this week:				

A

Appendix E

E1 Student Interview Rubric

Part One.

General background questions

1. What is your student number? _____ Male or female _____

2. Which class are you in? _____

[Student is following: A. Communications B. Commercial Economics C. Law

D. Human Management Resources E. Social Juridical Services]

[Student's English teacher is:]

5. Is Dutch your native language (mother tongue)? Yes _____ No, it's _____

6. What did you score on: a) the control test, and b) the benchmark test?

Control test _____ Benchmark test _____

7. What was your previous completed full-time academic programme? (VWO – HAVO- MBO-

other)

8. How often do you read in Dutch?

9. What do you read?

10. How often do you read in English?

11. What do you read?

12. Are there items that you read more often in English than in Dutch? Can you give

examples?

13. Do you prefer to use English or Dutch when you go online, talk to friends, watch movies.

[allow time for response and follow up questions: how often?, why is that? etc.]

Part Two.

Reading strategy questions

14. How would you rate your own reading skills in Dutch and English? Scale 1–10

15. What did you do to improve your reading skills before this course?

16. Before you started the reading course, had you ever heard of reading strategies?

Yes _____ No _____

17. If so, which reading strategies did you use in the past while reading?

Part Three

The Reading comprehension task (see E2):

18. Please first read this short English text and comprehension questions. When you are

ready, please tell me the following:

A. What are your answers to the two questions?

B. Do you think that these are the correct answers? Why?

C. What did you do to obtain the (correct) answers?

D. Did you use any specific reading strategies to find the (correct) answers? Which ones?

For each of the following reading strategies please answer these questions	I knew this strategy before the course	I did not know this strategy before the course	I used this strategy before following the course. How?	I did not use this strategy before following the course	I find this strategy useful	I do not find this strategy useful	I will use this strategy when reading in the future, in which situation?	I will not use this strategy in the future.
1. Connecting what you already know to what you do not yet know.								
2. Asking oneself questions.								
3. Predicting what will happen next.								
4. Visualizing.								
5. Paying attention to structure								
6. Skimming								
7. Scanning.								

Part Four.

19. If you don't understand a text in English, what do you do? What kind of problems do

you have when reading? How do you solve them?

20. In your opinion, do you think this course helped improve your reading ability in English?

In what way? What improved, in your opinion? What did not improve?

21. What has been your experience in following this reading course?

22. Have you any suggestions for how we can improve this reading course?

Thank you very much for your time and good luck with your studies.

A

E2 Reading Comprehension Task

You are going to read an extract which is concerned with digital games. For questions **1–2**, choose the answer (**A, B, C, or D**) which you think fits best according to the text.

It's Only a Game

Labelling someone a 'video-gamer' conjures up images of obsessed teenagers sitting in darkened rooms, faces illuminated only by the glow of displays, and yet young enough for repetitive strain injury to heal quickly. Yet, despite there being a grain of truth in it, the stereotype belongs to a bygone age. The fact is that video games are no longer the exclusive domain of the young male population. Young females are playing in growing numbers, but so too are adults.

More mature adults who've left behind the 18–34 age bracket so cherished by conventional games marketers, are often simply early gamers who have grown up. They want to keep on playing, but have evolved beyond first-person shooter games, such as *Doom* and its descendants. "Fun shouldn't be difficult," says George Harrison, Nintendo's senior vice president of marketing and corporate communications. "People are looking for 15 minutes of diversion, often with their family." It's this realisation that has the veteran video-game firm rethinking its hardware and software offerings.

1. In the first paragraph, the writer suggests that the stereotype of the 'video-gamer'
A. was to a certain extent accurate
B. harmed the image of the games
C. was always damaging to teenagers
D. became outdated almost immediately

2. In the second paragraph, the writer is
A. criticising certain attitudes
B. predicting long-term trends
C. reporting a change of policy
D. justifying a continued interest

(Answers: 1. A. 2. C.)

Nederlandse Samenvatting

Achtergrond

Bij leesvaardigheid in een tweede taal (T2) zijn veel cognitieve processen betrokken, waarbij de lezer een scala aan meta-cognitieve vaardigheden inzet om de tekst te verwerken. De lezer gebruikt hierbij mogelijk leesstrategieën. Dit zijn mentale hulpmiddelen die bewust en doelmatig worden ingezet om doelen op het gebied van leesvaardigheid te behalen. Leesstrategieën kunnen zowel meta-cognitief als cognitief zijn. Bij het lezen van een tekst in een tweede taal kan er niet zomaar vanuit worden gegaan dat kennis, leesvaardigheden en -strategieën van de eerste taal (T1) automatisch bij de tweede taal (T2) kunnen worden toegepast. Daarom moeten T2-leesstrategieën expliciet worden onderwezen om de T2-leesvaardigheid te ondersteunen.

De opkomst van Engels als een tweede taal in het onderwijs en de maatschappij heeft voor studenten in het hoger onderwijs de noodzaak van Engelse leesvaardigheid enorm vergroot. Studenten in het hoger onderwijs lezen academische teksten in het Engels als onderdeel van hun academische opleiding, persoonlijke groei en professionele ontwikkelingsdoelen, of om later internationaal te kunnen concurreren, of dit nu academisch, economisch of beroepsmatig is. De druk om actief en succesvol te zijn in de hedendaagse gedigitaliseerde wereld vereist van onze studenten goede leesvaardigheden in de tweede taal. Het is daarom essentieel dat we onze studenten in het hoger onderwijs de best mogelijke kans geven om vaardige T2-lezers te worden. Ze zullen hier niet alleen tijdens hun opleiding profijt van hebben, maar ook in hun latere loopbaan en leven.

Onderzoekscontext

De onderliggende motivatie voor dit proefschrift betrof voornamelijk de praktische noodzaak van het verbeteren van de T2-leesvaardigheid van eerstejaarsstudenten op het opleidingsinstituut van een hbo. De meeste studenten die beginnen aan dit soort hoger onderwijs hebben al vijf jaar verplicht Engels gehad in het voortgezet onderwijs, maar ongeveer 30% komt uit een vorm van beroepsonderwijs, en deze studenten hebben nauwelijks ervaring met academische teksten in het Engels. Deze studenten hebben moeite met de complexiteit, lengte en moeilijkheidsgraad van deze teksten en met T2-leesvaardigheid in het algemeen, waardoor zij vaak hun examens Engels niet halen.

De onderzoeken die worden beschreven in dit proefschrift zijn ontworpen als antwoord op de praktische noodzaak om bestaand T2-leesonderwijs in het hoger onderwijs te verbeteren door expliciet onderwijs in T2-leesstrategieën op te nemen in het curriculum. Bovendien wordt een bijdrage geleverd aan het onderzoek naar de impact van expliciet onderwijs in T2-leesstrategieën op resultaten op het gebied van T2-leesvaardigheid van studenten in het hoger onderwijs. Op dit gebied werd tot nu toe niet genoeg onderzoek gedaan. Deze onderzoeken zijn bedoeld om inzicht te krijgen in het effect van expliciet onderwijs in T2-leesstrategieën op de T2-leesvaardigheid van studenten in het hoger onderwijs. In dit proefschrift is ten eerste een meta-analyse uitgevoerd van 46 internationale onderzoeken op het gebied van T2-leesstrategieën. Ten tweede is een interventie op het gebied van T2-leesstrategieën ontwikkeld om in het curriculum te implementeren als een verplicht vak voor eerstejaarsstudenten. Als laatste zijn drie verkennende onderzoeken uitgevoerd naar de implementatie van de interventie, de effectiviteit van de interventie en het daadwerkelijke gebruik van leesstrategieën door studenten na het voltooien van de interventie.

De onderzoeken die worden beschreven in dit proefschrift vloeien voort uit de wens om bij te dragen aan het bestaande kader van onderwijs in T2-leesstrategieën. Als zodanig vullen deze onderzoeken bestaande educatieve methoden aan met theoretische academische deskundigheid door het samenbrengen van de praktijk en de theorie in een samenwerkingsproject. Het doel van dit project is het ontwerpen, ontwikkelen, en implementeren van een expliciet onderwezen interventie op het gebied van T2-leesstrategieën en het onderzoeken van de effecten hiervan op de T2-leesvaardigheid binnen het hoger onderwijs.

Meta-analyse

In hoofdstuk 2 is het doel van de meta-analyse om systematisch de algehele effectiviteit van onderzoeken op het gebied van T2-leesstrategieën te beoordelen. En specifiek om te bepalen hoe effectief de leesstrategieën opgenomen in de onderzoeken waren. Met andere woorden, het doel was om zo de meest effectieve leesstrategieën te kunnen selecteren, aangezien bepaalde leesstrategieën effectiever bleken dan anderen. Uiteindelijk werden 46 onderzoeken van een hoge kwaliteit geselecteerd tijdens een systematische online zoektocht, uit meer dan 1400 onderzoeken op het gebied van T2-leesstrategieën. De geselecteerde onderzoeken voldeden aan een aantal strenge criteria op het gebied van inhoud, ontwerp en methode. De algehele effectgrootte voor het onderwijzen van T2-leesstrategieën was *0,91, (Hedges' g)*. Dit is een groot effect en het geeft aan dat T2-leesstrategieën duidelijk prestaties op het gebied van T2-leesvaardigheid lijken te verbeteren.

Er waren duidelijke verschillen tussen de leesstrategieën, waarbij sommige leesstrategieën zoals *Nieuwe kennis aan bestaande kennis koppelen*, *Jezelf vragen stellen tijdens het lezen* en *Achtergrondkennis activeren* effectiever bleken te zijn dan andere strategieën, zoals *Visualiseren*.

Het effect van de leesstrategie leek ook afhankelijk te zijn van de didactische manier waarop deze werd onderwezen. Sommige methoden leken bij bepaalde leesstrategieën effectiever te zijn dan bij anderen. De methode met opdrachten waarbij de studenten moeten samenwerken was bijvoorbeeld effectief in combinatie met de leesstrategie *Nieuwe kennis aan bestaande kennis koppelen*, en de methode van het introduceren van strategieën was effectief in combinatie met de leesstrategie *semantische verbindingen zoeken*.

Ontwerp

In hoofdstuk 3 en 4 worden de gezamenlijke inspanningen van het ontwerpteam van docenten Engels aan een Nederlandse instelling voor hoger onderwijs (Hogeschool Leiden) gepresenteerd. Deze inspanningen resulteerden in de ontwikkeling van een vak voor T2-leesstrategieën. Tijdens de implementatie van het vak werd gemeten hoe succesvol het vak werd geïmplementeerd door docenten. Docenten hielden logboeken bij en volledige lesuren werden geobserveerd. Er werd onderzocht of deze metingen met elkaar overeenkwamen om zo het geïmplementeerde curriculum van het vak voor T2-leesstrategieën te bepalen. Ook werd zo geverifieerd of het geïmplementeerde curriculum overeenkwam met het beoogde curriculum. Beide doelen werden behaald, aangezien veel overeenkomsten werden gevonden tussen de logboeken en de observaties en omdat het geïmplementeerde curriculum grotendeels overeenkwam met het beoogde curriculum. Met andere woorden: docenten deden ze wat zeiden dat ze deden, en wat ze deden was grotendeels in overeenstemming met de uitgangspunten van het vak.

Belangrijke Bevindingen

In hoofdstuk 5 wordt de leesvaardigheidsmodule (van zeven weken) gepresenteerd en geëvalueerd. Deze module omvatte zeven effectieve leesstrategieën. Er werden verschillende onderwijsmethoden gebruikt en de cursus werd gedurende drie opeenvolgende collegeperioden aangeboden. In totaal namen 801 eerstejaarsstudenten deel tijdens hun verplichte propedeutische fase. Studenten voltooiden drie toetsen met dezelfde moeilijkheidsgraad. Hierbij waren de studenten hun eigen controlegroep. De resultaten laten zien dat de introductie van de leescursus een substantieel effect had op de ontwikkeling van de scores voor begrijpend lezen. De eerste onderzoeksvraag was

beantwoord: het vak was bewezen effectief in het verbeteren van de T2-leesvaardigheid van studenten in alle drie de collegeperioden waarin het vak werd aangeboden.

De impact van het vak werd beïnvloed door de vooropleiding van elke student. Studenten die eerder een beroepsopleiding hadden voltooid (mbo) verbeterden hun T2-leesvaardigheid wel, maar minder dan studenten die niet van een beroepsopleiding kwamen (havo). Dit beantwoordde de tweede onderzoeksvraag: of verbeteringen van de T2-leesvaardigheid werden beïnvloed door het niveau van de vorige opleiding.

In hoofdstuk 6 werden, tijdens een diepgaand onderzoek, 55 studenten in het hoger onderwijs geïnterviewd om te bepalen welk genres ze lazen en of hoe vaak ze lazen in de eerste en tweede taal invloed had op hun resultaten op het gebied van T2-leesvaardigheid. Ook werd onderzocht of hun kennis en gebruik van de tijdens het vak geleerde T2-leesstrategieën invloed had op de verbetering van hun T2-leesvaardigheid. Tijdens het interview werd getracht om inzicht te krijgen in het denkproces van de student door deze "hardop te laten denken" tijdens het oplossen van een T2-leesvaardigheidsopdracht. De conclusie was dat het gebruik van leesstrategieën door deze studenten afhankelijk was van de opdracht. Studenten leken dus de specifieke leesstrategieën te gebruiken die zij geschikt achtten voor de opdracht waaraan zij werkten. Bij deze opdracht gaven studenten de voorkeur aan bepaalde leesstrategieën, wat hen hielp de leesvaardigheidsopdracht op te lossen.

Verder toonden de resultaten aan dat een waarneembaar verschil bestond tussen het kennen van een strategie en het daadwerkelijk gebruiken van de strategie. Studenten die strategieën kenden maar deze niet gebruikten, presteerden minder goed op de T2-leesvaardigheidsopdracht dan de studenten die de leesstrategieën kenden en ook gebruikten. Studenten die geen leesstrategieën gebruikten behaalden lagere scores op alle drie de meetmomenten. Op grond hiervan lijkt het daadwerkelijke gebruik van T2-leesstrategieën de bepalende factor voor het verbeteren van prestaties op het gebied van T2-leesvaardigheid. Studenten gebruikten gemiddeld drie leesstrategieën bij de "hardop-denk-opdracht," en hoe meer leesstrategieën een student gebruikte, hoe hoger zijn of haar score op het gebied van T2-leesvaardigheid was.

De resultaten toonden ook aan dat studenten die vaak in de tweede taal lazen, grotere vooruitgang boekten op het gebied van T2-leesvaardigheid. Met andere woorden, hoe meer studenten in de tweede taal lezen, hoe groter hun T2-leesvaardigheid. Studenten die vaak (elke dag) lazen in de tweede taal hadden betere gemiddelde testresultaten dan studenten die niet vaak Engels lazen. Als studenten het nieuws in de tweede taal lazen of voor hun plezier in het Engels lazen, verbeterden zij bovendien hun gemiddelde T2-

leesvaardigheid sterker. Vaak in de T2 lezen en het juiste genre lezen lijkt een positief effect te hebben op prestaties op het gebied van T2-leesvaardigheid.

Conclusies en Discussie

Dit onderzoek heeft aangetoond dat onderwijs in T2-leesstrategieën effectief is voor het verbeteren van T2-leesvaardigheid. Studenten moeten niet alleen leren welke leesstrategieën zij kunnen toepassen, maar moeten ook worden onderwezen in hoe en wanneer zij deze kunnen toepassen.

De resultaten van de onderzoeken die zijn beschreven in dit proefschrift, geven aan dat studenten die bekend zijn met leesstrategieën *en* deze daadwerkelijk gebruiken, hogere resultaten op het gebied van T2-leesvaardigheid behalen dan studenten die wel bekend zijn met deze leesstrategieën maar ze niet gebruiken. Vaak lezen in de tweede taal lijkt een positief effect te hebben op de T2-leesvaardigheid.

De studenten van het instituut waar T2-leesstrategieën werd onderwezen, verbeterden hun gemiddelde resultaten op het gebied van T2-leesvaardigheid significant. Dit succes onderstreept de voordelen van expliciet onderwijs in T2-leesstrategieën in deze specifieke context van hoger onderwijs. Maar meer onderzoeken in verschillende educatieve contexten zouden nuttig zijn. Het is van belang om te onderzoeken of de voordelen van dit programma op het gebied van T2- leesstrategieën ook kunnen worden bereikt in andere onderwijsomgevingen.

Aanbevelingen voor de Onderwijspraktijk

Onderwijs in T2-leesstrategieën in het hoger onderwijs werkt. Aangezien het niet kan worden aangenomen dat vaardigheden op het gebied van leesstrategieën die voor de T1 zijn aangeleerd in het basis- of voortgezet onderwijs, worden overgedragen naar de T2, moeten T2-leesstrategieën bij voorkeur op elk niveau van educatieve ontwikkeling worden onderwezen: voortgezet en hoger onderwijs. Bovendien moeten instituten voor hoger onderwijs specifieke educatie op het gebied van T2-leesstrategieën opnemen in hun standard curriculum vanwege de toenemende vraag naar academische T2-leesvaardigheid. Het lezen in de tweede taal zou een vaardigheid moeten zijn die wordt ondersteund, gefaciliteerd en aangemoedigd in het voortgezet en hoger onderwijs.

Dit onderzoek naar leesstrategieën heeft laten zien hoe een toegewijd team van docenten succesvol een vak voor T2-leesstrategieën kan ontwerpen, ontwikkelen en uitvoeren

dat is gericht op het verbeteren van de T2-leesvaardigheid van studenten. Daarom hoeven deze bevindingen niet beperkt te blijven tot dit onderzoek, maar kunnen ze ook soortgelijke resultaten opleveren voor andere instituten. De inhoud van dit proefschrift heeft bijgedragen aan de manier waarop T2-leesvaardigheden worden onderwezen in het hoger onderwijs. Wij hopen dat andere onderzoekers op het gebied van T2-leesvaardigheid zullen voortbouwen op dit onderzoek en dit belangrijke aspect van de ontwikkeling van studenten blijven verbeteren.

Acknowledgments

They say it takes a whole village to raise a child; in that case, it took many kind people to help write this book. It is no understatement to say that this dissertation would not have happened were it not for some incredibly generous, supportive, and inspiring people. Some of them were towers of strength on whom I could lean, others were there at just the right moment with just the right advice. When I was finding the going hard, they knew what to say to make it easier, and for that I am eternally grateful.

First of all, I am extremely thankful for the funding I received from the Dutch Research Council (NWO) as a recipient of the "Promotiebeurs voor leraren." Stella and Uwe, your guidance during the first year of the EdD was tremendous, I am so grateful for your support at the start of my PhD journey. A tremendous thank you to my employers at Hogeschool Leiden for your support and all the wonderful students at HSL for making this research project both productive and meaningful. Thank you Ruby for giving me the green light and for having the insight to steer this project toward our own first-year students. When I was preparing for the NWO interview, Gerdo and Cilia were my sparring partners; your help was very much appreciated, thank you. Thank you to Tanja and Erik for your help and support, I will do my very best to deserve the faith you both have had in me. Simone and Leonie, thank you for your kind support during our 'after OC meeting' conversations. Jolijn, Saskia, Christine, and Marjan, goddesses, that you are! Your unwavering encouragement, support, help, kindness, love and laughter have been a constant guiding light and source of strength for me, and a reminder of the real force behind "girl power," thank you so much. Also, to the other members of the English team for all your help and support: Nu, Eliane, Anne, Don, Sairoen, and Didem, (Caroline and Sunny), and the other English teachers from HSL, thank you. I was not able to be as involved as I would have liked in the promovendi groups at Utrecht University, but I valued the support of the Language and Education (T & E) group, and I am especially grateful to Jacqueline, Suzanne, and Maaike, for all your help: thank you.

Like other promovendi before me, I came to Rick de Graaff via Gerard Westhoff, and right from the start Rick was the kind of promotor you can only dream of having. He was a dedicated and enthusiastic guide through the whole application process; patient, kind, supportive, positive, knowledgeable , and every now and then, he could administer just the right kind of "push" when it was required. Rick, thank you for all your kindness, support and guidance during our journey together. Five years ago, after meeting with Rick in Trans 10, Rick called downstairs to Huub van den Bergh and told him about our research plan: L2 reading strategies in L2 reading comprehension. "Wat leuk!" said Huub, and just like that, we were three. Huub's talents as promotor were nothing short of phenomenal. He

had a laser-like precision for the idea, but was always kind to "the man." Always cheerful, always with humor, always thoughtful and supportive, and he had the patience of a saint during our sessions with SPSS, and R studio. Some of Huub's ideas, such as the Regression Discontinuity design, were simply genius. Huub, thank you, it was a true pleasure and honor to have walked this road with you. Gentlemen, you are the ultimate dream team, both tremendous academics, scientists, teachers and human beings, and I am so incredibly fortunate and grateful for everything I have learned and experienced with you. Thank you.

Being a promovendus means you are in the lucky position to present your research at conferences, some of them international. During these occasions, I was fortunate to meet and befriend some wonderful fellow researchers; some like Sandra have become friends, thank you. This brings me to thank my family and friends. I am so very grateful to my amazing friend and paranymph Mirjam, who has been a loyal and constant source of encouragement and support from the very beginning of this project: Mirjam, thank you for all your help. My dear friends, Lou and Ian, Josine, Emrim, Jose and Koos, I have neglected our friendship and yet you have stood by me. Thank you. My dear uncle Richard, who sadly passed away three years ago, was always interested in how I was doing with my research project; he promised to be with us "in spirit." A shout-out to my English family who followed my progress from afar; Steve, Anne, Ruth, Rick, Chris, Deb and Robbie. And now, to my own "Dutch" family: Jeff, Dara, Christy (paranymph supreme), you put the spring in my step and the joy in my heart. I have watched you grow and take your place in the world with so much admiration and pride. This is all for you. Finally, Arno, who never understood why I did this to myself, but was there for me anyway, thank you sweetie, I promise to take it a bit more easy now.

Curriculum Vitae

Deborah Yapp-Raphael

The author of this dissertation was born in The Midlands, Great Britain, on the 7th of April 1962. After earning her bachelor's degree in economics and psychology from Oxford Brookes University, she taught English for a year at a girl's school in The Sudan, as part of a voluntary service overseas program. She moved to the Netherlands in 1986, in one of the coldest "Elfstedentocht" winters for years. Like many other Brits coming to the Netherlands, she started teaching at The British Language Training Centre in Amsterdam, moving on to the International School of Amsterdam and Hogeschool Alkmaar. During this time, she finished a two-year Licentiate Diploma in Teaching English as a Second Language from Trinity College in London.

Over the years, she taught English in the upper schools of a number of secondary schools in Haarlem, and in the weekends she was an examiner for The *University of Cambridge ESOL Examinations*. For six years, she worked for the national examinations board (CITO) as part of the construction team making the national "A" level (vwo) English written examination, which is a test of English reading comprehension. During a short break from secondary schools, she taught English to Dutch engineers on K14, a gas platform in the North Sea.

In 2011, she completed her Master's degree in English Language and Culture from the University of Leiden and a Master's degree in Education from the University of Leiden Graduate School of Teaching. In 2013, she started working as an English teacher at Hogeschool Leiden. Her curiosity as to how her students could be encouraged to improve their reading comprehension of difficult texts in English drove her to draft and submit a research proposal to the Dutch Ministry of Scientific Research. In 2016, she was awarded a research grant and appointed as a PhD candidate at the University of Utrecht, with Rick de Graaff and Huub van den Bergh as promotors, while continuing to teach English at Hogeschool Leiden. This dissertation explores the effects of a second language reading strategy intervention on second language reading comprehension of first-year higher education students, and was made possible by this five-year research grant.