



Enhancing Reading Fluency through Smart Board-Assisted Compensation Strategies: Identifying the Most Effective Strategies among Iraqi EFL secondary School Students

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ABSTRACT

Developing fluency in reading requires effective strategies, especially in contemporary language learning environments .Smart Board technology with compensatory strategies offers interactive encourage students to interact and helps them develop reading fluency. This study aims to examine the effect of smart board-assisted compensation strategies on the reading fluency of EFL privet secondary school by comparing the performance of the experimental and the control groups .In addition to that , Identify the types of reading compensation strategies that mostly utilized by EFL privet secondary school students during the implementation of smart –board assisted compensation strategies .

The sample of this experimental study consists of 58 female students, divided into two equal groups control and experimental from the 5th secondary school students for girls (Al-Furat private Secondary School) in Baghdad. The study instruments are observational checklist for compensation strategies prepared by the researcher and pre-posttest of reading fluency. The results of study indicate that smart board-based compensation strategies have a considerable positive impact on enhancing reading fluency of EFL students. The experimental group did better than the control group. Moreover, the findings showed that not all compensation strategies are equally effective, the most frequently and successfully applied strategies were guessing intelligently and getting help, whereas adjusting the message and selecting the topic were less effective.

Keywords:

adjusting the message, using a circumlocution or synonym, compensation strategies, getting help, guessing intelligently, reading fluency, selecting the topics, smart board, and technology.

تعزيز الطلاقة القرائية من خلال استراتيجيات التعويض المدعومة بالسبورة الذكية: تحديد أكثر الاستراتيجيات فاعلية لدى طلبة المرحلة الثانوية العراقية الدارسين للغة الإنجليزية بوصفها لغةً أجنبية

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المخلص



'لتطوير الطلاقة في القراءة يتطلب استراتيجيات فعالة لا سيما في بيئة تعلم اللغات المعاصرة. توفر تقنية السبورة الذكية، مع استراتيجياتها التعويضية، دعمًا تفاعليًا، مما يزيد من تفاعل الطلاب ويساعدهم على تطوير طلاقة القراءة. تهدف هذه الدراسة إلى فحص أثر استراتيجيات التعويض المدعومة بالسبورة الذكية في الطلاقة القرائية لدى طلبة المدارس الثانوية الأهلية الدارسين للغة الإنجليزية كلغة أجنبية، وذلك من خلال مقارنة أداء المجموعة التجريبية بالمجموعة الضابطة. بالإضافة إلى ذلك، تهدف الدراسة إلى تحديد أنواع استراتيجيات التعويض في القراءة الأكثر استخدامًا من قبل طلبة المدارس الثانوية الأهلية الدارسين للغة الإنجليزية كلغة أجنبية أثناء تطبيق استراتيجيات التعويض المدعومة بالسبورة. تتكون عينة هذه الدراسة التجريبية من 58 طالبة، تم تقسيمهن إلى مجموعتين متساويتين، ضابطة وتجريبية، من طالبات الصف الخامس الإعدادي للبنات (ثانوية الفرات الأهلية) في بغداد. أدوات الدراسة هي قائمة مراجعة للملاحظة لاستراتيجيات التعويض أعدها الباحث، واختبار قبلي وبعدي لطلاقة القراءة. تشير نتائج الدراسة إلى أن استراتيجيات التعويض القائمة على السبورة الذكية لها أثر إيجابي كبير على تعزيز طلاقة القراءة لدى طالبات اللغة الإنجليزية كلغة أجنبية. وقد تفوقت المجموعة التجريبية على المجموعة الضابطة. علاوة على ذلك، أظهرت النتائج أن استراتيجيات التعويض ليست جميعها فعالة بنفس القدر، وأن الاستراتيجيات الأكثر شيوعًا ونجاحًا في التطبيق كانت التخمين الذكي والحصول على المساعدة، في حين أن إستراتيجية تعديل النص واختيار الموضوع كانا أقل فعالية.

الكلمات المفتاحية: تعديل النص، استخدام أسلوب الالتفاف أو المرادف، استراتيجيات التعويض، الحصول على المساعدة، التخمين بنكاء، طلاقة القراءة، اختيار المواضيع، السبورة الذكية، والتكنولوجيا.

1. Introduction

1.1 Problem of the Study and its Significance

Compensation strategies are language learning strategies that help students understand or produce language even when they have limited vocabulary or grammar knowledge. Students can rely on contextual and linguistic clues to infer meaning, ask for help from the teacher, peers, or digital tools, express their ideas approximately to maintain communication, replace difficult words with simpler ones or synonyms, and select familiar topics to overcome comprehension difficulties (Panchana & Barreiro, 2022, pp. 296–299).

Reading is an essential component of any language instruction curriculum, whether for a foreign or native language (Flaifil & Alsalihi, 2026, p. 2). Reading fluency, which is characterized by accurate decoding, automatic word recognition, appropriate reading speed, and prosody and expression, is fundamental to successful reading comprehension and plays a vital role in developing learners' linguistic competence and academic achievement. Research has shown that less fluent readers often experience greater comprehension difficulties than fluent readers, indicating a strong relationship between reading fluency and reading comprehension (Anaktototy & Lesnussa, 2022, p. 246).

Based on classroom experience, Hussein (2022, p. 489) observed that many Iraqi secondary school students regularly participate in weekly reading comprehension activities but continue to experience considerable difficulty in understanding English texts. Although reading is a major requirement in

the Iraqi educational system, many students struggle with unfamiliar vocabulary and text comprehension. Furthermore, teachers often rely on traditional instructional practices that emphasize reading passages and memorizing unfamiliar vocabulary rather than developing strategic reading skills (Obeid, 2018, p. 54). These practices may limit students' ability to read fluently and independently.

Moreover, Torgesen et al. (2001, p. 39) and Torgesen et al. (2003, p. 11) reported that struggling readers typically demonstrate slow, inaccurate, and disconnected reading despite having acquired basic phonics skills. Such reading behaviors hinder comprehension and reduce reading fluency. To overcome these difficulties, compensation strategies have been recommended as effective instructional approaches that enable learners to deal with unfamiliar vocabulary, maintain the flow of reading, and construct meaning from context (Panchana & Barreiro, 2022, p. 298). These findings highlight the importance of incorporating strategic instruction into reading lessons to enhance students' reading fluency.

Technology has also become an important element in supporting language learning. It makes learning more interactive, increases students' participation, and improves their motivation and retention of information (Rashid, 2022, p. 69). According to Kamil (2021, p. 3), modern technology motivates students to improve their language skills through its interactive features. Among these technologies, the smart board provides visual support, touch interaction, immediate feedback, and multimedia resources that facilitate the teaching of reading skills, vocabulary, and pronunciation in a more engaging learning environment (Min & Siegel, 2011, p. 39).

Although previous studies have investigated compensation strategies and other studies have examined the educational value of smart board technology, limited attention has been given to integrating both variables to improve reading fluency, particularly in the Iraqi EFL context. Furthermore, few studies have attempted to identify the types of reading compensation strategies that students mostly utilize during smart board-assisted instruction. This indicates a gap in the existing literature regarding the combined role of smart board technology and compensation strategies in developing reading fluency among Iraqi EFL learners.

Based on the researcher's classroom experience in Iraqi private secondary schools, it was observed that many EFL students still experience difficulties in reading fluency, which negatively affects their academic performance. Although smart boards are available in many private schools, they are often used merely to present instructional content rather than to promote strategic reading practices.

Consequently, students rarely employ compensation strategies while performing reading tasks, which limits their ability to read fluently and independently.

Therefore, the present study attempts to fill this gap by investigating the effect of smart board-assisted compensation strategies on the reading fluency of Iraqi EFL private secondary school students and by identifying the types of reading compensation strategies most frequently utilized during the implementation of smart board-assisted instruction.

1.2 Objectives

This study aims to:

1. Examine the effect of smart board-assisted compensation strategies on the reading fluency of EFL private secondary school students by comparing the performance of the experimental and the control groups .
2. Identify the types of reading compensation strategies that mostly utilized by EFL private secondary school students during the implementation of smart –board assisted compensation strategies .

1.3 Hypotheses

To achieve the study objectives, the following hypotheses have been set:

1. There are no statistically significant differences between the main scores of the experimental group and the control group in overall reading fluency on the posttest .
2. There are no statistically significant differences in the usage rates of the various types of reading compensation strategies among EFL private secondary school students in the experimental group during the implementation of smart –board assisted instruction .

1.4 Scope

The study is limited to:

1. The 5th secondary school students for girls (Al-Furat private Secondary School) in Al-Kaarkh second sector in Baghdad / Al-Jihad neighborhood.
2. The academic year 2025–2026.
3. The prescribed textbook entitled English for Iraq for the fifth secondary students (Student's Book and Activity Book) was issued by the Ministry of Education in 2021.
4. Pre-posttests for reading fluency.

5. Reading fluency rubric by Rasinski, 2004.
 6. Compensation strategies observational checklist
- 1.5 Value

It is hoped that the results of this study will be valuable to:

1. Enhancement of Educational Practices: the results can help teachers on how to successfully incorporate Smart Board technology and pay attention to increase reading fluency among EFL students.
2. Improvement of Student Outcomes: the study is expected to help students improve their reading comprehension and language proficiency, which can help them deal with reading difficulties and improve their overall academic performance.
3. Future Research Framework: the results can be applied in carrying out more research on the usefulness of technology in the teaching process, and thus facilitate the ongoing improvement of language education practices.

1.6 Definition of Basic Terms

1.6.1 Compensation Strategies: Compensation strategies are methods employ by language learners to overcome obstacles caused by limitations in the field of knowledge With the use of these strategies, learners can employ the new language for comprehension or production (Fatine & Yousra, 2022, p.27). According to Oxford (1990) compensation strategies are expected to compensate for the learners' deficit in grammar and vocabulary.

1.6.2 Smart Board-Assisted Technology: According to Al-Saleem (2012, p. 128), a smartboard is a computer system that is connected to a data projector, a board, and other relevant tools that display and represent educational information with its multimedia elements to the students in an interactive and collaborative manner.

1.6.3 Reading Fluency: Meyer and Felton (1999, p.293) define reading fluency as the ability to read related content quickly, smoothly, fluently, and naturally while paying minimal attention to reading mechanisms like decoding. Reading fluency includes:

- Accuracy: is the capacity to read words accurately without making errors (Paige et al., 2012, p.67).
- Speed: is the reading rate at which learners read a text without losing understanding (Samuels, 2007).
- Prosody and Expression: refers to the ability to read with appropriate expression. The reader understands when to slow down or speed up, increase or decrease their voice, and express the meaning of the text (Gunning, 1998, p29).

2. Theoretical Framework

2.1 Compensation Strategies

Over the last twenty-five years, language learning strategies have become increasingly important in the acquisition of second and foreign languages, with a noticeable shift in focus from the teacher to the student (Abid Ali, 2021, p.117). Several scholars have conceptualized compensation strategies (CpS) in various ways. Oxford (1990, p. 47) pointed out that CpS enable students to utilize the target language in meaning making and production even when there are gaps in their knowledge. It is with these strategies that the shortcomings in vocabulary and grammar can be counterbalanced and the learner would be able to overcome the lexical constraints and maintain communication. Equally, as explained by Dornyei (1995, p.55), CpS can be defined as the strategies that students use to address gaps in knowledge (especially lexical knowledge), indicating how students cope with their linguistic weaknesses (especially vocabulary weaknesses). Moreover, Faerch and Kasper (1980, p 1189) give a detailed definition of CpS that considers it as methods adopted by language students to express their intended meaning after having identified problems in the planning phase of an utterance due to the limited linguistic resources.

The theory by Faerch and Kasper (1980, p 1189) focuses on the fact that compensation strategies (CpS) are as a result of students being aware of their poor knowledge of lexical information. Consequently, language users devise different strategies to by-pass or evade these lexical limitations. In addition, compensatory strategies enable students to enhance their reading comprehension as effectively as possible. The strategies, including rehearsal, especially recognition and emphasis of the key points of a text, help the students process and memorize the information. In terms of these

views, CpS can be interpreted as providing the ways through which language learners cope with their challenges particularly those involving vocabulary to continue with the communication process.

Oxford (1990, pp49-50) provides categories for CpS in relation to reading skills which include the following

1. Guessing Intelligently

Guessing, often referred to as inferencing, is a popular technique among language learners .It is a process where linguistic and non-linguistic signals are used in interpreting unknown words. Linguistic hints are based on the knowledge of the learner of the target language. According to Oxford (1990), these clues may be based on similarities between the target language, the learner's first language, or other languages with which the learner is familiar. As an example, students can understand the meaning of the French term, association sans but lucratif, (nonprofit association) by relying on its similarity to English words. In contrast, the non-linguistic indications provide more general supports. These are contextual information, personal experience, text organization, general knowledge in the world or the topic being discussed. To illustrate, in the sentence, she finally made the peak after hours of climbing, although the word summit is new to the learner, the phrase after hours of climbing makes the learner deduce that the sentence is about the top of a mountain.

2. Getting Help

The Getting Help strategy consists of seeking the help of other people, including the teacher, peers, or digital tools, to find an unknown word in the target language. This can be through indirect or direct means of students. As an illustration, students may pose questions such as "What is it?", "What is...in English?", to get the required vocabulary.

3. Adjusting or Approximating the Message

In order to implement this strategy, students reduce their use of language by using simple or less specific words, ideas or phrases. They can also twist around their message to provide the same meaning slightly differently. As an example, when the learner does not have the exact word, he or she may mention pencil in place of pen.

4. Using a Circumlocution or Synonym

Circumlocution is the explanation or description of a concept without the proper word, whereas synonyms are words that have similar meanings. As an example, a learner may use the term, “what you wear when you are cooking”, rather than say apron.

5. Selecting the Topics

Students can also choose subjects that they know. In this case, they select topics on which they possess adequate vocabulary and grammar to be able to communicate well. As an example, students may start a discussion on football since it is a well-known subject, and they can confidently talk about it.

In this study, the researcher applies the strategies mentioned above to identify which compensation strategies, when supported by smart board technology, are most effective in enhancing students' reading fluency. This objective corresponds to the second objective of the current study.

2.2 Reading Fluency

Reading is a fundamental language skill that involves the interaction of linguistic knowledge, cognitive processes, self-awareness, and background knowledge to construct meaning from written texts (Saalh & Kadhim, 2020). Reading also assists the reader to know the core topic and changes of ideas, depending on their language knowledge as well as the background knowledge. Also, learners read with the aim of extracting information, messages, and insights out of texts, including knowing more about the author, or answering certain questions. The last step of reading includes the process of decoding bigger linguistic units, i.e. phrases and sentences (Nunan, 2003, p 105; Murcia and Ohlstein, 2002).

Reading fluency is a multidimensional construct that enables readers to read accurately, at an appropriate speed, and with comprehension, allowing them to process increasingly complex texts (Rasinski, 2014; Kuhn & Schwanenflugel, 2019). They further point out that fluency is not only a requirement of young learners but also adolescents and adults. Moreover, they indicate that in cases where readers are forced to spend considerable amount of time on word recognition, there are limited cognitive resources to build meaning.

As pointed out by Rasinski et al., (2009, p 354), comprehension is largely dependent on three key components of reading fluency. These components include accuracy, speed (automaticity), and prosody/expression. Accuracy is a skill that involves the ability to read and decode written words correctly by translating grapheme to phoneme. It relies on the knowledge of alphabetic principles, sound blending, and a good command of high-frequency words (Basso et al., 2018, p.19-33). Learners need to be able to recognize letter sounds, phoneme, and apply both phonetics and meaning clues to accurately read and comprehend words. Lack of word recognition affects comprehension in a bad way and can cause the use of the wrong language and misinterpretation of what the author meant that causes misinterpretation (Hudson et al., 2005, p. 703).

Speed (automaticity) in reading is the capacity to perform reading tasks fast, correctly and with the minimum amount of conscious control due to large-scale practice. According to Basso et al. (2018, p19-33), the process of fluent reading is highly founded on automatic word recognition that is described as fast, independent, effortless, and less conscious. The more learners practice decoding skills, the more accustomed they are to word patterns and can more easily and accurately identify words. Even though, the increase in reading speed is usually large at the initial levels of learning, it becomes more stable with practice (Basso et al., 2018, pp. 19-33.; Puliezi and Maluf, 2014, p. 472; O'Connor, 2018, p. 126-127).

Automaticity entails less mental effort as well whereby the reader can concentrate more on meaning than on breaking down of words. Word recognition is not automatic and hence it takes up mental resources, which should otherwise be used in understanding the text, making the text to be poorly understood. Moreover, automatic reading mechanisms are not controlled consciously, i.e., fluent readers are able to perceive words without consciously thinking about the steps. They do not usually know the decoding strategies they employ as opposed to less fluent readers who have to think about the words they read and this slows down their reading (Basso et al., 2018, p.19-33; Kuhn et al., 2010, p.240).

Prosody and expression are an important component of reading fluency that goes beyond automatic word recognition. It means expressive attributes of oral reading such as intonation, rhythm, stress and emotional tone which in combination provide speech with its natural melodic quality. Prosodic reading is used to deliver meaning in a clear manner using the right expression, punctuation and tone.

Other features also convey pragmatic meanings (e.g. certainty, doubt, or surprise), but not merely the literal meaning of the text (Kuhn et al., 2010; Basso et al., 2018). Intonation, such as changes in pitch, can indicate whether a sentence is incomplete or complete, with an upward-pitch implying continuation and a downward-pitch indicating completion.

In addition, although expression is conceptually linked to prosody, it was measured separately to provide a more comprehensive assessment of students' reading fluency. Study has shown that "as proficient readers attend to meaning during reading, their oral reading expression demonstrates their understanding," in addition to "those who read with good expression also tend to have better reading comprehension abilities than can be explained by reading rates alone" (Morrison & Wilcox 2020, p.59). Furthermore, "their lack of expressive reading demonstrates their poor understanding," emphasizing its diagnostic utility. As a result, differentiating expression inside the rubric provides

for a more comprehensive assessment of reading performance as well as exact evaluation of students' performance.

Moreover, accent, intensity, duration, and pauses are important components of prosody that contribute to effective reading expression. Stress patterns vary between languages, and can shift meaning as in the case of a word where the stress of a word can yield different meanings when spelled identically. Duration is associated with duration of speech sounds, and is affected by the speed of reading where the faster the reader is, the shorter the sound units. Pauses are also important, both to have a physiological purpose, i.e. to take a breath, and to be able to make a real segmentation of ideas. False or omitted pauses would alter the sentence structure and meaning, making the text more difficult to comprehend (Puliezi & Maluf, 2014, p. 467-475).

2.3 Integration of Smart Boards in EFL Classrooms

Technology has become a necessity in contemporary learning, since it can be applied in the learning process anywhere. It has been used in numerous applications in supporting the teaching and learning of a number of subjects, including language learning. It is also advisable to teachers that they use technological tools to ensure that they are in constant interactive contact with their students and to also assist in their personal development. As a result, the high rate of development of technological techniques has provided a lot of opportunities to be used in language classrooms

and changed the old methods of teaching, as well as the organization of the classroom (Ishtaiwa & Shana, 2011, p. 17-34.).

Smart boards have elicited a lot of interest among the scholars in the global community in their application in language education. Generally, there is evidence that smart boards have numerous benefits in school. Among the top advantages is that they help to improve language teaching in the classroom (Chapell, 2003). They are applicable in making learning more interesting, imaginative and fun both to teachers and students. (Min and Siegel ,2011, p. p. 38-43) found that interactive whiteboards may affect education in a number of beneficial ways, especially in terms of fluently while also comprehending. On the whole, smart boards can be used in different educational settings and can enhance the learning outcomes.

The use of smart boards in language classrooms has been found to have different experiences in different countries. Research conducted in the United Kingdom shows that students benefit physically and visually in using smart whiteboards directly. This technology is also used in different learning environments whereby teachers are able to introduce new cultures and language whilst promoting natural interaction and communication. In addition, it can enhance inclusiveness, collaboration and student engagement in the classroom. Smart boards not only make the learning process more enjoyable but also can encourage the learners to be more active. They are used in English as a Foreign Language (EFL) teaching to assist in brainstorming, correcting errors, and editing texts with the help of digital tools to analyze grammar, syntax, and vocabulary. They may also be applied to group writing activities, including planning, revising and proofreading of drafts, and to the analysis of sentence structure, taking notes and practicing grammar (Bettsworth, 2010, p. p. 216-224).

Language teachers must take into account how students perceive effective language education before it can be adopted, developed, and maintained among students throughout the academic year in a way that encourages learning (Alsalihi, 2023, p.317). There are three ways in which smart boards can support support foreign language teaching . First, they promote more classroom participation and interaction. Second, they help teachers to introduce new forms and structures of language. Third, they are able to enhance oral abilities especially fluency in reading. Despite the fact that teachers have not yet shifted their focus to technology at the expense of learning goals, smart boards can be used as a valuable tool in a foreign language classroom. They facilitate the easy flow of interaction in the target language because all students are able to concentrate on the same visual content at the same time which enhances discussion and engagement (Al-Saleem, 2013, p. p. 126-134).

The ability of smart boards to enhance communication in the classroom is one of its main benefits. Teachers are able to direct conversations and navigate through points without wasting time on technical activities and hence concentrate more on the production of languages among students. Smart boards also make it easier to interact during reading or speaking activities when utilized with wireless keyboards. As an example, when students come across some unknown words, the teacher can easily define them immediately on the board without the students having to write them down.

This makes the learning process more continuous, and also supports the vocabulary development by highlighting, underlining or circling the main words (Walker, 2005, p. p. 86-100).

3. Methodology

3.1 Experimental Design of the Study

It is worth to mentioning that this study is a quasi-experimental design, specifically a non-randomized pre-test/post-test control group design. Two groups are selected: an experimental group and a control group. The experimental group is taught compensation strategies supported by smart board technology (independent variable), whereas the control group is taught using the conventional method. The results of the dependent variable, represented by students' reading fluency, are measured and compared between the two groups to determine whether there are statistically significant differences

Table (3.1)

Experimental Design of the Study

Groups	Pre-test	Treatment	Post-test
Exp.	Reading fluency	Teaching using assisted compensation strategies supported by smart board technology	Reading fluency
Con.	Teaching using the conventional method		

3.2 Population and Sample of the Study

The population represents Iraqi secondary female students in private schools in Al -Karkh second sector in Baghdad. The total number of private secondary schools is (49). In current study the sample is randomly selected from Al-Furat Private Secondary school for girls. The total number of 5th secondary students is (58) distributed in two sections; section A, which includes (30) students to be the control group and section B, which includes (28) to be the experimental one during the academic year 2025-2026.

3.3 Equalization of Testees (Two Groups)

Various factors should be taken into consideration, as they may influence the outcomes of the test and, consequently, the study's results. Therefore, prior to administering the exam, the two groups should be matched in terms of selected variables, including parental educational level, students'

previous achievement in the methodology subject, age, and pretest performance (Good, 1973, p 43). The researcher equalized the two groups based on the variables mentioned above.

3.4 The Instruments of the Study

The study employed several instruments to collect the required data and achieve its objectives. The main instrument was a reading fluency test, which was administered as both a pre-test and a post-test to assess students' reading fluency. The test consisted of reading passages that were carefully selected to match the students' proficiency level. The same testing procedures were followed for both the experimental and control groups to ensure consistency and fairness. Students' reading performance was evaluated using the Reading Fluency Rubric developed by Rasinski (2004, p. 352). The rubric assessed the four components of reading fluency: accuracy, speed, prosody and expression.

Additionally, the researcher constructed a Compensation Strategies Observation Checklist based on Oxford's (1990) classification of compensation strategies to identify the types of reading compensation strategies utilized by students during reading activities. The checklist focused on five strategies: Guessing Intelligently, Getting Help, Adjusting/Approximating the Message, Using Synonyms or Circumlocution, and Selecting the Topic. These strategies were observed during smart board-assisted reading instruction and were rated according to four levels of frequency: consistently, sometimes, rarely, and not observed. This instrument enabled the researcher to observe students' use of compensation strategies systematically and consistently throughout the instructional period.

3.5 Validity of the Instruments

To assess the validity of an instrument, it is important to consider various factors. Validity is not an absolute value because it varies based on the purpose of that instrument, the population in which it is applied and whether it is a general or specific instrument. A valid instrument used in the evaluation of one attribute is not necessarily the appropriate instrument to use in the evaluation of another attribute. Validity in essence is the degree to which a certain instrument measures what it is supposed to measure (Harrison, 1983, p.11), the validity of the instrument is established by relying on the following:

3.5.1 Face Validity

This type of validity deals with how well an instrument represents the particular domains to which it is designed to be applicable. It stands to reason that what is being measured must be the content of the instrument; therefore, it is commonly known as logical validity. To construct such kind of validity, one has to clearly define the target behavior, identify the importance of every element,

create suitable items and present them to the panel of experts to evaluate whether they were adequate to represent the intended content (Ghiselli et al., 1981, p.p. 45-52). The apparent validity of the reading fluency test and checklist are achieved when experts specializing in the English language agree (92%) on the validity of the items in measuring reading fluency.

3.5.2 Construct Validity

This type of validity is used to represent the degree to which a psychological scale can measure a given hypothetical construct or psychological concept. When the findings are consistent with the theoretical assumptions behind it, then it would indicate that the tool is actually measuring the desired characteristic that it was created to measure. Construct validity is experimentally verified through certain assumptions and indicators. Differences in individuals' traits appear in their test performance and responses, and this affects construct validity (Allen and Yen, 1979).

In the current study construct validity can be calculating by the difficulty index and the discriminatory power of the items in the reading fluency test, and the absence of any non-discriminatory items, is an indicator of the validity of the construct. Therefore, the construct validity of checklist was verified through the ability of its items to distinguish between the responses of the two extreme groups on each item, as all of them were statistically significant.

3.6 Statistical Analysis of Compensation Strategies Observational Checklist and Reading Fluency Test

3.6.1 Items Discriminationof Compensation Strategies Observational Checklist

After obtaining the total scores of the individuals in the statistical analysis sample, and after excluding the forms that do not have accuracy in the answer, the scores were arranged in descending order from the highest total score to the lowest total score on the current research scale. Then the two extreme groups were identified, and after using the t-test for two independent samples to test the significance of the statistical differences between the means of the scores of the upper and lower groups for each of the items of the scale, which numbered (5) items, since the calculated t-test value indicates the discriminatory power of the item. table (3.2) show that.

Table (3.2)

The Discriminatory Power for Compensation Strategies Observational Checklist

Strategies	Group	Mean	St. deviation	t.test		Degree of freedom	Level of Sig.
				Computed	Tabulated		
Guessing Intelligently	Upper	3.786	0.426	6.810	2.000	52	0.05
	Lower	2.571	0.514				
Getting Help	Upper	3.500	0.519	4.837	2.000	52	0.05
	Lower	2.429	0.646				
Adjusting / Approximating Message	Upper	2.000	0.322	13.000	2.000	52	0.05
	Lower	1.071	0.2267				
Using a Synonym / Circumlocution	Upper	2.929	0.467	8.771	2.000	52	0.05
	Lower	1.571	0.514				
Selecting the Topic	Upper	1.786	0.579	5.078	2.000	52	0.05
	Lower	1.000	0.459				

Table (3.2) shows that all items of compensation strategies observational checklist have the ability to distinguish between the individuals of the upper and lower groups, as the calculated t-values were greater than the tabulated t-value at a significance level of (0.05) and a degree of freedom of (52).

3.6.2 Item Discrimination of Reading Fluency Test

After applying the discriminatory power equation for each item, this is done by subtracting the number of individuals in the lower group who answered the item correctly from the number of individuals in the upper group who answered the item correctly, then dividing the result by half the sum of the individuals in the upper and lower groups, and the resulting value is the discriminatory power coefficient for each item of the test , table (3.3) show that.

Table (3.2)

Discriminatory Power Coefficient of the Items in the Reading Fluency Test

N of Item	Group	Scores	Items discriminatory	Level of Items discriminatory
		1.00 2.00		
Accuracy	Upper	9 41	0.41	Very good
	Lower	50 0		
Speed	Group	1.00 2.00		
	Upper	26 24	0.24	borderline
	Lower	50 0		
Prosody	Group	1.00 2.00 3.00		
	Upper	1 23 26	0.50	Very good
	Lower	50 0 0		
Expression	Group	1.00 2.00		
	Upper	7 43	0.43	Very good
	Lower	50 0		

The evaluation criteria for the Reading Fluency Test items were based on their discriminatory power. The researcher used this criterion to assess item discrimination, which is based on four levels: (0.19 and below: weak discrimination, item removed from test; between 0.20 and 0.29: borderline discrimination, item must be improved; 0.30 and 0.39: good discrimination, item improvement is recommended; 0.40 and above: very good discrimination) (Eble, 1972).

It is clear from Table (3.2) that the items of the Reading Fluency Test, consisting of (4) items, did not include any item with weak discrimination, and the discrimination ranges of the items of the achievement test prepared by the researcher ranged between (0.24 - 0.50) with a very good discrimination of (0.40).

3.6.3 Items Difficulty of Reading Fluency Test

To calculate the difficulty coefficient of the items in the Reading Fluency Test, after applying it to the study sample, the researcher relied on the two extreme groups, the upper and lower, where the difficulty coefficients for each item of the tests were calculated by applying the difficulty equation, which indicates determining the number of individuals with correct answers in the upper group, adding the number of its individuals with the individuals with correct answers in

the lower group, and then dividing by the number of individuals in the upper and lower groups, table (3.3) show that. Table (3.3)

Items Difficulty Coefficient of the Items in the Reading Fluency Test

The researcher relied on Ebel's criterion to judge the difficulty level of the items, which was adopted in most previous studies that dealt with the construction of achievement tests, and which divided the difficulty levels into five levels, which are (0.19 and less very difficult, 0.20 –

0.29 difficult, 0.30 – 0.69 medium difficulty, 0.70 – 0.79 easy, 0.80 and more very easy, and the adopted range for the difficulty levels ranges between (0.20 – 0.80) (Eble , 1972) . It is clear from Table (3.3) that the Reading Fluency Test items for the subject, consisting of (4) items, did not include any single item that was very difficult or very easy. The difficulty ranges of the achievement test items prepared by the researcher ranged between (0.58 – 0.71) with a medium difficulty of (0.66).

3.7 Reliability of the Instruments

Reliability can be defined as the consistency of an instrument and stability of its components. The goal of measuring reliability is to distinguish measurement error and how this error can be reduced. It is also a measure of consistency of the total scores of the items on the instrument implying that it yields reliable scores when it is used to measure what it is supposed to measure (Murphy, 1988).

Hence, in this study, the Alpha-Cronbach is used to measure the reliability of the pre-posttest and the checklist. Alpha Cronbach's coefficient for the reading fluency test, after being administered to a sample of (50) female students, was (0.86). Additionally, Alpha Cronbach's equation for the checklist was (0.868), which indicates a good level of reliability. This suggests that the internal consistency among the items of both instruments is considered highly reliable.

4. Results

4.1 Result of First objective

To achieve the first objective, which states "Examine the effect of smart board-assisted compensation strategies on the reading fluency among EFL secondary school students," the mean score of the experimental group was calculated and found to be (9.714) with a standard deviation of (0.809), whereas the mean score of the control group was (4.767) with a standard deviation of (1.331). To verify the homogeneity of variance between the two groups, the variance of the experimental group was found to be (0.654), while that of the control group was (1.772). Using the F-ratio equation, the calculated value was (2.709), which is less than the tabulated value of (4.185) at the (0.05) level of significance and degrees of freedom (1,56), indicating the homogeneity of variance between the two groups. As illustrated in Table (4.1), the t-test for two independent samples was then applied. The calculated t-value was (16.953), which is greater than the tabulated value of (2.000) at the (0.05) level of significance and a degree of freedom of (56). This indicates that there is a statistically significant difference between the experimental and control groups in favor of the experimental group. Therefore, smart board-assisted compensation strategies had a positive effect on the reading fluency of EFL secondary school students. Accordingly, the first null hypothesis, which states that "There are no statistically significant differences between the mean scores of the experimental group and the control group in overall reading fluency on the post-test," is rejected because statistically significant differences were found between the two groups in favor of the experimental group. Table (4.1) shows the statistical results, and Figure (4.1) illustrates the difference between the mean scores of the two groups.

Table (4.1)

T-test Results for the Two Study groups (Experimental and Control) on the Effect of Smart Board-assisted Compensation Strategies on the Improvement of Reading Fluency

Group

N

Mean

S . D

Variance

F . Ratio

t. test Degree of freedom

Level of significance

Computed

Tabulated

Computed

Tabulated

Experimental

28

9.714

0.809

0.654

2.709

4.185

16.953

2.000

56

0.05

Control

30

4.767

1.331

1.772

The tabulated t-value at a significance level of (0.05) and a degree of freedom (56) = (2.000). Table (4.1) show the t-test for two independent samples was used, and the calculated value was (16.953), which is bigger than the tabulated value of (2.000) at a significance level of (0.05) and two degrees of freedom (56). This indicates the existence of statistically significant differences and the influence of the independent variable (smart board-assisted compensation strategies) on the dependent variable (reading fluency), figure (4.1) shows that.

Figure (4.1)

The influence of the independent variable (smart board-assisted compensation strategies) on the dependent variable (reading fluency)

4.2 Result of Second objective

To achieve the second objective, which states "Identify the types of reading compensation strategies that were mostly utilized by EFL private secondary school students during the implementation of smart board-assisted compensation strategies," the researcher administered the compensation

strategies observation checklist to the experimental group. After rating the students' performance according to the checklist, the means and standard deviations were calculated for each compensation strategy separately. The results are presented in Table (4.2).

To determine whether there were statistically significant differences in the extent to which the five compensation strategies were utilized, the researcher applied one-way ANOVA. The calculated F-value was (37.481), which is greater than the tabulated F-value of (2.450) at the (0.05) level of significance and degrees of freedom (4,135). This indicates that there were statistically significant differences in the extent to which the five compensation strategies were utilized by the students.

To determine where these differences occurred, Scheffé's post-hoc test was conducted, and the results are presented in Table (4.3).

Table (4.2)

Means and Standard Deviations were Calculated for Each Strategy Separately

Strategies	Mean	Standard deviation
Guessing Intelligently	3.318	0.772
Getting Help	2.964	0.793
Adjusting / Approximating Message	1.535	0.508
Using a Synonym / Circumlocution	2.250	0.799
Selecting the Topic	1.393	0.567

Table (4.2) shows that the calculated F-value of (37.481) is greater than the tabulated F-value of (2.450) at a significance level of (0.05) and two degrees of freedom (4, 135). This indicates that there are statistically significant differences in the use of the five strategies.

To determine which strategy was the difference, Scheffé's post-hoc test was used, and the results appeared as shown in Table (4.3).

Table (4.3)

Results of Scheffé's post-hoc Comparison Test Between the Five Strategies

Strategy 1	Strategy 1	Mean difference	Std. Error
Guessing Intelligently	Getting Help	0.214	0.187
	Adjusting / Approximating Message	1.643*	0.187
	Using a Synonym / Circumlocution	0.929*	0.187
	Selecting the Topic	1.786*	0.187
Getting Help	Guessing Intelligently	-0.214	0.187
	Adjusting / Approximating Message	1.429*	0.187
	Using a Synonym / Circumlocution	0.714*	0.187
	Selecting the Topic	1.571*	0.187
Adjusting / Approximating Message	Guessing Intelligently	-1.643*	0.187
	Getting Help	-1.429*	0.187
	Using a Synonym / Circumlocution	-0.714*	0.187
	Selecting the Topic	0.143	0.187
Using a Synonym / Circumlocution	Guessing Intelligently	-0.929*	0.187
	Getting Help	-0.714*	0.187
	Adjusting / Approximating Message	0.714*	0.187
	Selecting the Topic	0.857*	0.187
Selecting the Topic	Guessing Intelligently	-1.786*	0.187
	Getting Help	-1.571*	0.187
	Adjusting / Approximating Message	-0.143	0.187
	Using a Synonym / Circumlocution	-0.857*	0.187

* Scheffé's critical value was (0.414) at a significance level of (0.05).

Table (4.3) show that:

- There is no statistically significant difference between the Guessing Intelligently strategy and the Getting Help strategy. Therefore, the observed difference may be attributed to chance.
- There is a statistically significant difference between the Guessing Intelligently strategy and the Adjusting / Approximating Message strategy. The difference was in favor of the Guessing Intelligently strategy.
- There is a statistically significant difference between the Guessing Intelligently strategy and the Using a Synonym / Circumlocution strategy. The difference was in favor of the Guessing Intelligently strategy.
- There is a statistically significant difference between the Guessing Intelligently strategy and the Selecting the Topic strategy. The difference was in favor of the Guessing Intelligently strategy.
- There is a statistically significant difference between the Getting Help strategy and the Adjusting / Approximating Message strategy. The difference was in favor of the Getting Help strategy.
- There is a statistically significant difference between the Getting Help strategy and the Using a Synonym / Circumlocution strategy. The difference was in favor of the Getting Help strategy.
- There is a statistically significant difference between the Getting Help strategy and the Selecting the Topic strategy. The difference was in favor of the Getting Help strategy.
- There is a statistically significant difference between the Adjusting / Approximating Message strategy and the Using a Synonym / Circumlocution strategy. The difference was in favor of the Using a Synonym / Circumlocution strategy.
- There is no statistically significant difference between the Adjusting / Approximating Message strategy and the Selecting the Topic strategy. Therefore, the observed difference may be attributed to chance.
- There is a statistically significant difference between the Using a Synonym / Circumlocution strategy and the Selecting the Topic strategy. The difference was in favor of the Using a Synonym / Circumlocution strategy.
- Overall, the results of Scheffé's post-hoc test indicated that the five compensation strategies were not equally utilized by the students. The Guessing Intelligently strategy demonstrated the

highest level of use, followed by the Getting Help strategy. Significant differences were found among most of the strategy pairs, whereas no statistically significant differences were found between the Guessing Intelligently and Getting Help strategies, or between the Adjusting / Approximating Message and Selecting the Topic strategies. These findings indicate that students tended to rely more frequently on the Guessing Intelligently and Getting Help strategies than on the other compensation strategies during the implementation of smart board-assisted compensation strategies. Figure (4.3) illustrates these differences.

Figure (4.3)

Differences in the Use of the Compensation Strategies

4.3 Discussion of Results

The findings of the current study revealed that smart board-assisted compensation strategies had a statistically significant positive effect on the reading fluency of EFL secondary school students. The experimental group outperformed the control group, indicating that integrating smart board technology with compensation strategies can effectively improve students' reading fluency. This improvement can be attributed to the interactive features of the smart board, which increase students' engagement and provide immediate visual, auditory, and contextual support during reading activities.

Moreover, the findings showed that the five compensation strategies were not equally utilized by the students. The Guessing Intelligently and Getting Help strategies were the most frequently utilized, whereas Adjusting/Approximating the Message and Selecting the Topic were the least frequently utilized. These findings suggest that students tended to rely more on strategies that encouraged contextual inference and interaction while performing reading tasks. Such strategies enabled learners to maintain the flow of reading despite unfamiliar vocabulary or comprehension difficulties, thereby supporting better reading fluency.

Overall, the findings demonstrate that integrating smart board technology with compensation strategies creates an interactive learning environment that encourages students to apply strategic reading behaviors more frequently. This instructional approach contributes to improving students' reading fluency while promoting active participation during reading lessons.

4.4 Conclusions

Based on the findings of the study and in light of its objectives and hypotheses, the following conclusions are drawn:

- The study concludes that smart board-assisted compensation strategies play an important role in improving the reading fluency of EFL preparatory school students. The statistically significant differences between the experimental and control groups confirm the effectiveness of integrating smart board technology with compensation strategies in reading instruction. This improvement may be attributed to the interactive features of smart board technology, including visual support, multimedia resources, immediate feedback, and contextual presentation, which facilitate students' active engagement and enable them to apply compensation strategies more effectively during reading activities. As a result, students become more fluent, confident, and engaged readers.
- The study also concludes that the effectiveness of compensation strategies varies according to the nature of each strategy. Guessing Intelligently and Getting Help are found to be the most frequently and effectively utilized strategies because they encourage learners to infer meaning from context and seek immediate support without interrupting the reading process. In contrast, strategies such as Adjusting/Approximating the Message and Selecting the Topic are used less frequently, possibly because they require more advanced strategic awareness and greater language proficiency. These findings emphasize the importance of providing systematic instruction and sufficient classroom practice that enable students to employ a wider range of compensation strategies effectively through smart board-supported instruction.

4.5 Recommendations

In light of the conclusions drawn, the following recommendations are proposed:

1. Teachers should integrate smart board technology with well-planned compensation strategies during reading lessons to improve students' reading fluency and classroom engagement.
2. EFL teachers should receive continuous professional training on the effective integration of smart board technology and compensation strategies in reading instruction.
3. Curriculum designers are encouraged to incorporate activities that promote the use of compensation strategies, particularly Guessing Intelligently and Getting Help, within technology-supported reading lessons.

4.6 Suggestions for Further Studies

Based on the findings of the present study, the following suggestions are recommended for future research:

1. Future studies may investigate the effect of smart board-assisted compensation strategies on other language skills, such as writing, speaking, and listening.
2. Future research may compare the effectiveness of different language learning strategies, such as cognitive, metacognitive, social, and compensation strategies, in technology-enhanced EFL classrooms.
3. Similar studies may be conducted at different educational levels, such as primary schools or universities, to examine the generalizability of the findings.

4. Future researchers are encouraged to investigate the effectiveness of other educational technologies, such as mobile learning applications or virtual learning environments, in developing reading fluency.

5. Future studies may employ more specialized assessment instruments for individual reading fluency components, particularly accuracy and speed, to obtain a more comprehensive evaluation of students' reading performance.

References

Abid Ali, Z. (2021). Direct language learning strategies in EFL. *Alustath journal for human and social sciences*, 60(1), 115-132. DOI: <https://doi.org/10.36473/ujhss.v60i1.1296>

Allen, M. J., & Yen, W. M. (1979). *Introduction to measurement theory*. Brooks/Cole Publishing Company.

Al-Saleem, B. I. A. (2012). The interactive whiteboard in English as a foreign language (EFL) classroom. *European Scientific Journal*, 8(3).

Al-Saleem, B. I. A. (2012). The interactive whiteboard in English as a foreign language (EFL) classroom. *European Scientific Journal*, 8(3).

Alsalihi, H. D. A. (2023). Essential Traits of Influential Professors in Virtual Teaching from EFLLs' Perspectives. *Arab World English Journal*, 14(1). DOI: <https://dx.doi.org/10.24093/awej/vol14no1.20>

Anaktototy, K., & Lesnussa, I. (2022). Improving EFL students' reading comprehension and critical thinking skill through directed reading thinking activity. *Eralingua: Jurnal Pendidikan Bahasa Asing Dan Sastra*, 6(1), 244-255.

Basso, F. P., Alves, L. M., Miná, C. S., Piccolo, L. D. R., Salles, J. D., Basso, F. P., ... & Salles, J.

F. (2018). Pressupostos teóricos que embasaram o desenvolvimento do instrumento Avaliação da Fluência de Leitura Textual (AFLeT). *Avaliação da fluência de leitura textual (AFLeT)*, 19-33.

- Bettsworth, B. (2010). Using interactive whiteboards to teach grammar in the MFL classroom: A learner's perspective. In T. Glover & D. Miller (Eds.), *Interactive whiteboards for education: Theory, research and practice* (pp. 216–224). IGI Global.
- celce-Murcia, M., & Olshtain, E. (2000). *Discourse and context in language teaching: A guide for language teachers*. Cambridge University Press.
- Chapelle, J. (2003). How is the interactive whiteboard being used in primary school? Becta Research Bursary.
- Dornyei, Z. (1995). On the teachability of communication strategies. *TESOL quarterly*, 29(1), 55-85.
- Ebel, R. L. (1972). *Essentials of educational measurement*. Prentice Hal.
- Faerch, C., & Kasper, G. (1980). Processes and strategies in foreign language learning and communication. *Interlanguage studies bulletin*, 47-118.
- Fatine, B., & Yousra, L. (2022). the role of learning strategies in enhancing students achievements (Doctoral dissertation, university center of abdalhafid boussouf-MILA). <http://dspace.centre-univ-mila.dz/jspui/handle/123456789/2310>
- Flaifil, A. M., & Alsalihi, H. D. (2026). Critical Reading Competencies in Short Stories Among Iraqi EFL Female Students in Colleges of Education for Women. *Alustath Journal for Human and Social Sciences*, 65(1), 1-14. DOI: <https://doi.org/10.36473/2518-9263.2448>
- Ghiselli, E. E., Campbell, J. P., & Zedeck, S. (1981). *Measurement theory for the behavioral sciences*. Freeman.
- Good, C. V. (1973). *Dictionary of Education*, (2nd ed.). New York: McGraw-Hill.
- Gunning, T. G. (1998). *Assessing and correcting reading and writing difficulties*. Order Processing, Allyn and Bacon, PO Box 11071, Des Moines, IA 50336-1071.
- Harrison, A. (1983). *A language testing handbook*. London: Macmillan.
- Hudson, R. F., Lane, H. B., & Pullen, P. C. (2005). Reading fluency assessment and instruction: What, why, and how? *The Reading Teacher*, 58(8), 702–714.
- Hussein, M. T. Y. (2022). The effect of reciprocal teaching strategy on the fourth secondary preparatory school students' reading comprehension performance and retention. *Alustath Journal for Human and Social Sciences*, 61(2), Article 28. DOI: <https://doi.org/10.36473/ujhss.v61i2.1291>

- Ishtaiwa, F. F., & Shana, Z. (2011). The use of interactive whiteboard (IWB) by pre-service teachers to enhance Arabic language teaching and learning. *Learning and Teaching in Higher Education: Gulf Perspectives*, 8(2), 17–34.
- Kamil, S. A. (2021). Exploring the role of updated technology in university English language classrooms. *Psychology and Education Journal*, 58(1), 5647-5655.
- DOI: 10.17762/pae.v58i1.1969
- Kuhn, M. R., & Schwanenflugel, P. J. (2019). Prosody, pacing, and situational fluency (or why fluency matters for older readers). *Journal of Adolescent & Adult Literacy*, 62(4), 363–368.
- Kuhn, M. R., Schwanenflugel, P. J., & Meisinger, E. B. (2010). Aligning theory and assessment of reading fluency. *Reading Research Quarterly*, 45(2), 230–251.
- Meyer, M. S., & Felton, R. H. (1999). Repeated reading to enhance fluency: Old approaches and new directions. *Annals of dyslexia*, 49(1), 283-306.
- Min, K., & Siegel, C. (2011). Integration of SMART board technology and effective teaching. *Imanager's Journal on School Educational Technology*, 7(1).
- Morrison, T. G., & Wilcox, B. (2020). Assessing expressive oral reading fluency. *Education Sciences*, 10(3), 59.
- Murphy, K. R. (1988). *Psychological testing: Principles and applications*. Nunan, D. (2003). *Practical English language teaching*. McGraw-Hill.
- O'Connor, R. E. (2018). Reading fluency and students with reading disabilities. *Journal of Learning Disabilities*, 51(2), 124–136.
- Obeid, R. S. (2018). The effect of collaborative reading on Iraqi EFL intermediate school pupils' reading comprehension. *Alustath Journal for Human and Social Sciences*, 1(224). DOI: <https://doi.org/10.36473/ujhss.v224i1.247>
- Oxford, R. L. (1990). *Language learning strategies: What every teacher should know*. Heinle & Heinle.
- Paige, D. D., Rasinski, T. V., & Magpuri-Lavell, T. (2012). Is fluent, expressive reading important for high school readers? *Journal of Adolescent & Adult Literacy*, 56(1), 67-76.
- Panchana, A. A. G., & Barreiro, M. P. R. (2022). Application of reading comprehension strategies to improve reading fluency. *Polo del Conocimiento*, 7(12), 274-303.

- Puliezi, S., & Maluf, M. R. (2014). Fluency and its importance to reading comprehension. *Psico-USF*, 19, 467–475.
- Rashid, M. (2022). Investigating the Use of Google Meet and Face-to-Face in Teaching Conversation. *International Journal of Language and Literary Studies*, 4(2), 67-76. <https://doi.org/10.36892/ijlls.v4i2.903>
- Rasinski, T. (2014). Fluency matters. *International Electronic Journal of Elementary Education*, 7(1), 3–12.
- Rasinski, T., Rikli, A., & Johnston, S. (2009). Reading fluency: More than automaticity? *Literacy Research and Instruction*, 48(4), 350–361.
- Saalh, S. M., & Kadhim, S. H. (2020). The EFL students' academic buoyancy in reading and listening skills. *Asian EFL Journal*, 27(4.4), 226-253.
- Samuels, S. J. (2007). The DIBELS tests: Is speed of barking at print what we mean by reading fluency?
- Torgesen, J. K., Alexander, A. W., Wagner, R. K., Rashotte, C. A., Voeller, K. K., & Conway, T. (2001). Intensive remedial instruction for children with severe reading disabilities: Immediate and long-term outcomes from two instructional approaches. *Journal of learning disabilities*, 34(1), 33-58.
- Torgesen, J. K., Rashotte, C., Alexander, A., Alexander, J., & MacPhee, K. (2003). Progress towards understanding the instructional conditions necessary for remediating reading difficulties in older children. *Preventing and remediating reading difficulties: Bringing science to scale*, 275-298.
- Walker, R. J. (2005). Teaching and learning with interactive whiteboards. In *Learning to teach using ICT in the secondary school* (pp. 86–100). Routledge.