

MDPI

Article

Providing Access to Reading Comprehension for Greek Secondary Students with Mild Intellectual Disabilities

Georgios Ladias, Georgia Iatraki * and Spyridon-Georgios Soulis

Department of Primary Education, University of Ioannina, 451 10 Ioannina, Greece

* Correspondence: g.iatraki@uoi.gr

Abstract: All students should achieve improved outcomes in academic content within general classroom and access information through reading comprehension during their daily interactions. Several adaptations and recommendations should be required for students with intellectual disabilities to access information, such as adapted texts that can provide access to reading comprehension and help them participate equally in modern society. The current study shows promise for the use of easy to read (EtR) material combined with systematic instruction, task analysis, and prompting in facilitating Greek language lessons for students with mild intellectual disabilities. Researchers used an AB single-subject design to evaluate the effects of transcribed EtR texts for providing access to information regarding grade-aligned reading comprehension in Greek language lessons. Students with mild intellectual disabilities were assessed through baseline and intervention phases and their results showed a correlational relation between the intervention supported by EtR material and the number of students' correct responses on the comprehension probes. In addition, social validity indicated the teaching intervention through adapted EtR texts as being practical and useful. Discussion of results, future research, and limitations are provided with a focus of the importance of teaching interventions based on EtR language that positively contribute to the accessibility and equality of people with intellectual disabilities to information.

Keywords: easy to read; intellectual disabilities; Greek language lesson; comprehension



Citation: Ladias, G.; Iatraki, G.; Soulis, S.-G. Providing Access to Reading Comprehension for Greek Secondary Students with Mild Intellectual Disabilities. *Educ. Sci.* **2022**, *12*, 921. https://doi.org/ 10.3390/educsci12120921

Academic Editor: James Albright

Received: 12 November 2022 Accepted: 13 December 2022 Published: 14 December 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

1. Introduction

Federal laws such as the No Child Left Behind and the Individuals with Disabilities Education Improvement Act of 2004 mandate that all students should achieve improved outcomes in reading and comprehension [1,2]. To address general curriculum content, several adaptations and recommendations should be required for students with intellectual disabilities in order to access information through reading comprehension [3,4]. Regarding this importance, language instruction includes specific academic subjects in order for students to access school achievement, as well as to increase their chances in daily life [5]. For example, by providing effective reading instructions, students can enhance their reading skills, as well as increase their chances of being hired and holding a job, so as to gain independence, self-determinism, social involvement, and overall well-being [4]. Although students with intellectual disabilities may acquire reading or writing skills, they may struggle to construct meaning from text and face deficits in their interactions and information access [6]. Efficient practices in grade-aligned academic instruction would be helpful in order to support students' comprehension and their achievement in several settings, such as school or daily life [7].

Researchers and practitioners have developed modifications and adaptations based on teaching academic standards, including literacy standards, in order for students with intellectual disabilities to effectively access general education curriculum [3]. Recent research has shown that students with intellectual disabilities can acquire literacy skills using teaching strategies, including adapted text aligned to grade-appropriate text [8]. In

Educ, Sci. 2022, 12, 921 2 of 13

addition, systematic instruction and other supplemental strategies, such as task analysis, prompting, and time delay, may contribute to this challenge [8–10].

1.1. Easy to Read Language Supports Students with ID

One type of adapted text focuses on the use of easy to read (EtR) language, which is designed to meet the needs of people with cognitive and learning disabilities [11]. Texts in EtR language attempt to present the content in an understandable and effective way aligned to guidelines and recommendations made by international organizations, such as the Guidelines for EtR Materials by the International Federation of Library Associations and Institutions (IFLA) [12] or the Make It Simple Guidelines by the International League of Societies for Persons with Mental Handicap (ILSMH) [13]. Nomura, Nielsen, and Tronbacke [14] highlight the acquisition and stimulation of thoughts and emotions during reading, rather than emphasizing the decoding process. People with disabilities are able to effectively read while participating in a group or listening, which is an experience that can lead to a meaningful communication. A text adapted and transcribed in EtR language can be easy to read and understand by people with special educational needs. Specifically, avoiding abstract language and limiting metaphors modify the text to a logical and simple content without losing the pleasure of reading.

The factors of the EtR process are language and content, illustrations, design, and layout. Some previous research has indicated that the use of illustrations promotes reading comprehension in people with intellectual disabilities, but this is not a consistent finding. According to Strydom and colleagues [15], the use of pictures could improve written material for people with limited reading skills for them to access medication knowledge and information sources. The researchers designed a questionnaire with structured and semi-structured sections to optimize responsiveness from a small group of people with learning disabilities. The outcomes of the study indicated that specifically designed leaflets about medications contributed to higher levels of patients' comprehension in medication issues. In another study, Hurtado, Jones, and Burniston [16] compared the effectiveness of two different modalities of presenting visual information in an EtR leaflet: "text and pictures" or "pictures only". Forty-four adults with intellectual disabilities participated in the study, whose knowledge was assessed during the baseline and intervention phases. Although the knowledge of the leaflet was not significantly related to the participants' reading ability, the findings indicated that the use of a leaflet in medication improved comprehension knowledge.

1.2. Previous Research

The research literature on teaching literacy content with EtR language to students with intellectual disabilities is limited. Fajardo and colleagues [17] conducted a study to measure the effects of EtR language in improving comprehension, as well as the relationship between comprehension and various linguistic features of 16 students with mild intellectual disabilities. The participants presented low reading skills and completed a reading comprehension text after reading EtR texts [12,14]. The results confirmed that all 16 students increased comprehension after using adapted EtR texts. An important finding was that the number of the words and the size of the sentences of EtR texts affected the levels of comprehension. In following work, Yavena [18] investigated the compliance of the EtR documents available on the web with guidelines for EtR material and their suitability for people with several disabilities, including intellectual disabilities. The study concluded that the majority of EtR documents available on the web complied with the accessibility standard set in the EtR guidelines, but EtR documents did not address the different linguistic features of the participants.

In a review of the key components of comprehension, Sutherland and Isherwood [19] recorded the effectiveness of EtR information given to people with intellectual disabilities. The axes of the study were related to factors that confirmed the effectiveness of EtR language in enhancing reading comprehension. The researchers examined whether the publications

Educ, Sci. 2022, 12, 921 3 of 13

followed the recommendations and principles of adapted EtR texts. The findings were presented per subject, where people with intellectual disabilities acquired skills in questions answering about the literal use of language, as well as the sentence length and sentence density, which contributed to an increase in the level of comprehension. In addition, the use of high-frequency vocabulary as well as the rendering of the same meaning with synonyms or the accompaniment of interpretive conceptual content contributed positively to the comprehension level [20]. A significant correlation was not found between the use of picture contributions and the increase in comprehension level, making it difficult for people with intellectual disabilities to clearly connect the picture with the content of the speech.

Saletta, Kaldenberg, Rivera, and Wood [5] reported that it is important to teach people with intellectual disabilities not only functional skills, but also to continue developing their literacy skills. The researchers explored how adding illustrations (colored photographs, black and white drawings, or images) to "easy read" stories would impact reading comprehension in postsecondary students with intellectual disabilities. In all three cases, the results indicated that adding illustrations did not improve reading comprehension; however, there is a need to reevaluate the inclusion of pictures in reading materials for adolescents or adults with intellectual disabilities.

In a recent case study, Callus and Cauchi [21] investigated the interaction of multiple factors and their influence on the use of ETR documents to ensure meaningful access to information for people with intellectual disabilities. Regarding previous experimental studies, which demonstrated the benefits of EtR language to improve comprehension in literacy for students with intellectual disabilities, a gap related to the direction of interventions through EtR language aligned to improve reading comprehension for this population seems to exist.

1.3. Purpose of Current Study and Research Questions

The purpose of this study was to evaluate an intervention with adapted EtR texts to teach grade-aligned language content to students with mild intellectual disabilities. This study adds to the established research base by demonstrating that adapted EtR texts can provide access to information through reading comprehension to students with intellectual disabilities.

The material was aligned with the Greek curriculum and was formed according to the rules of transcription of the EtR language [12,13]. Researchers designed the study on systematic instruction, with supplemental components of task analysis and prompting, which have been used successfully in studies with students with intellectual disabilities [8–10]. Evaluation of the reading comprehension intervention supported by adapted EtR texts centered on its effects on correct comprehension answers during the sessions across questions with students with mild intellectual disabilities. The following research questions will be answered:

- (1) What is the effect of the intervention supported using EtR material on the acquisition of grade-aligned comprehension skills of students with mild intellectual disabilities?
- (2) What are the students' and teacher's opinions about using adapted EtR texts to teach grade-aligned reading comprehension within a special education context?

2. Materials and Methods

2.1. Experimental Design

An AB single-subject design was used to examine the relation between the teaching intervention supported by EtR material and each participant's performance on gradealigned comprehension questions. The study was based on research ethics, as applicable in Greece. The interventionist forwarded the research project signed by the director of the Special Education postgraduate program by email to the director of the school, who gave permission for the study to be conducted. The timeline of the implementation of the study was three months and was conducted before the COVID-19 pandemic.

Educ. Sci. 2022, 12, 921 4 of 13

There were two experimental conditions of baseline (phase A) and intervention (phase B) for determining the existence of a correlational relation between the intervention and the dependent variable [22,23]. The intervention was introduced systematically across four specific topics ("Language and Communication", "Racism and Stereotypes", "European Union", and "Peace and War"). Each of the baseline and intervention conditions consisted of ten sessions with the participants involved. Withdrawn to baseline conditions, as well as maintenance and generalization phases, were not conducted for the students because of the COVID-19 pandemic.

2.2. Participants and Setting

Four students with mild intellectual disabilities (i.e., Aris, Helen, Vassiliki, and Chris) participated in this AB single-subject design [23]. The two male and two female participants ranged in age from 15 to 16 years. All of the students were selected based on the following criteria: (a) are enrolled in a secondary school, (b) have been diagnosed with mild intellectual disabilities, (c) have regular attendance, (d) have adequate vision and hearing to interact with materials, (e) have a consistent response mode, and (f) have parental consent.

All of the participants received special education services in a Special Education Secondary School at an eastern city of Greece. Although intellectual disabilities demonstrate a heterogeneous range of characteristics, the four participants in this sample were selected to present homogeneous profiles (Table 1). All students for whom parental permission was obtained were selected according to their personal diagnosis, as well as the profile their special educator provided. All of them demonstrated basic reading skills but did not yet fully comprehend narrative or informative text. Their deficits were presented in receptive and expressive skills. In addition, they had social-communicative challenges and required a high level of prompting and support to complete educational activities.

Student	Age	Gender	Ethnicity	Diagnosis	Level of Reading Skills
Aris	15	Male	Greek	MID	Very good
Helen	15	Female	Greek	MID	Adequate
Vassiliki	16	Female	Greek	MID	Very Low
Chris	16	Male	Greek	MID	Extremely low

Table 1. Participants' characteristics.

Aris was a 15-year Greek male who received special education services based on the diagnosis of mild intellectual disabilities. According to his most recent evaluation data, Aris received all academic instruction in a special education classroom with his classmates with mild intellectual disabilities. Aris' academic strengths included grade-level reading, although he struggled with comprehension outside of his curriculum. Searching for sentences inside a long text related to the comprehension was a demanding task for him. Other difficulties that were noted were poor writing skills in question answering and poor memorizing.

Helen was a 15-year Greek female who received special education services based on the diagnosis of mild intellectual disabilities. She demonstrated verbal communication after prompting. Helen's academic strengths included skills based on vocabulary acquisition and interesting arguments. In addition, she presented basic comprehension skills, as she could identify explicit formulated information.

Vassiliki was a 16-year Greek female with mild intellectual disabilities and healthrelated problems. Vassiliki's academic strengths included memory skills and fluently oral communication. She demonstrated deficits especially in writing tasks, including understanding critical questions. Her writing skills were low, emphasizing very low writing velocity and unrecognized letters. Educ. Sci. 2022, 12, 921 5 of 13

Chris was a 16-year Albanian male diagnosed with mild intellectual disabilities. Compared with his similar age peers, the results from his recent evaluation indicated very limited basic reading skills and very low reading comprehension skills.

The study was conducted in a special education classroom within the Integrated Special Vocational Gymnasium–Lyceum School at an eastern city of Greece. The formal special education within the specific type of school was separated into two substages: the compulsory gymnasium or lower secondary school, which lasted four years, and the non-compulsory lyceum, which lasted four years. The participants of the study were enrolled in the third grade of the gymnasium. The class consisted of eight students with a range of disabilities, including intellectual disabilities. Regarding the physical layout of the classroom, there were four desks where the students were paired, and a teacher desk. All probe and intervention sessions occurred in the special education classroom in a one-to-one instructional format.

The first author was the interventionist for the study, as he implemented the teaching intervention with adapted EtR texts to provide access to information for several main topics to students with mild intellectual disabilities in the language lesson. He was a philologist with a Master's degree in special education. In addition, the special education teacher was a female with 10 years of teaching experience. She also had a Master's degree in special education. The interventionist with the collaboration of the special education teacher and one paraprofessional administered all assessments in a one-to-one format in the participants' classroom.

2.3. Intervention and Assessment Materials

The researchers considered EtR language in order to adapt the content of four texts from the Greek Language textbook of the third grade of gymnasium. The textbooks were aligned with the general education curriculum in order for students with intellectual disabilities to access academic content equal to their peers without disabilities.

The texts were adapted and transcribed according to the guidelines of IFLA, fully following the general rules of the Guidelines for EtR materials [13,14]. This material adapted the following: (a) content, emphasizing literal interpretation of words; (b) vocabulary, using more usual vocabulary; (c) difficult words, which were explained through simple definitions to help students to understand the content; (d) syntactic structure, where active syntax was preferred; (e) the length of the sentences, which were broken off; and (f) the format of the text, which included a clear typeface (Times Roman, 12 points).

The text content included four domains, namely: "Language and Communication", "Racism and Stereotypes", "European Union", and "Peace and War". An excerpt of the text referring to the "European Union" is presented in Figure 1. The research team in cooperation with the special education teacher, evaluated the adapted EtR texts, as well as the assessments of the content, to ensure the similarity of the material, as well as to strengthen the reliability of the process (see Figure 1). The grade-aligned comprehension tests were developed to assess student knowledge of comprehension on four texts in the language lesson. Ten questionnaires with seven target multiple choice comprehension questions per subject were developed for each text. Specifically, the assessments included wh-questions (who, where, when, and what). In reading comprehension tests, students were engaged in (a) identifying specific information (persons, space, time, setting, and social context), (b) participating in communication context (regarding current communication situation—this is for an article published in the press, interview, oral speech, travel guide, or official government text), and (c) giving explanations/interpretation and critical thinking. Being in contact with the text, students were asked to express their own thoughts, feelings, interpretations, and evaluative judgments.

Educ. Sci. 2022, 12, 921 6 of 13

Theotokas, G. (1973). Free Spirit. Hermes Publications.

Original text: Walk in Europe

an excerpt Europe is like a garden that gathers the most different flowers, the

most mismatched colors. Every time we cross the borders of a

European country, we feel that everything changes around us. The

language changes, the social conventions too, the air we breathe,

the land we set foot on, as well as the character of people we

meet. Entering a European country, we immediately feel a unique

and inimitable expression. That is a special physiognomy, which

is alive, as a creation of nature, of centuries and genius of nation.

Easy to Read

Walk in Europe

Europe consists of many countries.

It looks like a garden,

with too different flowers.

The countries are separated by borders.

Every time we cross the borders,

everything changes around us,

the language, the society, and people's character.

Each European country is unique,

as it is made of its nature, its history, and its people.

Definition

The **borders** separate one country from another.

Figure 1. An excerpt of the text referring to the "European Union".

Educ. Sci. 2022, 12, 921 7 of 13

2.4. Variables and Data Collection

The independent variable included the intervention supported by adapted EtR text per subject. The dependent variable included the number of reading comprehension questions answered correctly. The example of one reading comprehension question was "What does it change when someone cross the borders?", representing content presented inside the adapted EtR text aligned to "walk in Europe". Each question was accompanied by three multiple-choice short answers (answers to the question above included (a) nothing is changing; (b) the language, the society, and people's character; and (c) everything is the same). The first author and the special education teacher reviewed all of the questions and answer choices to ensure their comparability and appropriateness for the participants' ability levels, as well as their alignment with the texts' content. The comprehension test included seven questions formed according to the rules of transcription of the EtR language as well. Data were also taken on comprehension at the end of each session to determine students' performance progress toward mastery of skills before introducing the next instructional unit.

2.5. Procedures

Throughout the study, the participants received reading comprehension instruction addressing language lesson by the first author and their respective special education teacher. Prior to the implementation of each intervention phase, the teacher received training in the upcoming lesson plans, which consisted of a preview of the plans, researcher demonstration, and teacher role-playing, until 100% fidelity was demonstrated.

2.5.1. Baseline

The comprehension test was administered during each baseline session for 10 sessions. To ensure student performance did not differ across the researcher and special education teacher, problem solving tests were administered by both. During each comprehension test, the teacher or researcher provided the participant with the task analysis and prompting, and said the instructional cue, "choose your answer", as they laid the comprehension test on the participant's answer sheet. Students were instructed to answer the comprehension questions on the assessment and were told they could skip questions they did not know the answers to.

2.5.2. EtR Intervention

The interventionist directed each student to the instructional setting by saying "It's time to read an interesting text!". Then, the interventionist waited until the student was ready for instruction. Regarding reading comprehension of the text per subject, the interventionist encouraged each student to (a) identify specific information, such as persons ("who?"), space ("where?"), time ("when?"), setting, social context ("what?"), and (b) understand the context of the current situation. For example, the condition presented was referred a publication of an article (e.g., newspaper, journal), an interview, a travel guide, or an official text, or (c) an exploratory text or a critical review. All of these types of texts were included in grade-aligned textbooks for language lessons addressing the third grade of gymnasium.

The process guided the students to express their own thoughts, feelings, interpretations, and evaluative judgments. Using the script, the interventionist provided (a) specific positive feedback for an independent correct response, (b) the system of least prompts if the student did not respond, or (c) error correction in the form of a model retest for an incorrect response. The interventionist used a three-level prompting hierarchy: (a) a gesture paired with a verbal prompt where the interventionist pointed to the step on the student's task analysis and read it aloud, (b) a specific verbal prompt where the interventionist stated the step and what to do, and (c) model retest where the interventionist showed the student what to do and then gave the participant a chance to redo. For correct responses, the interventionist provided general praise (e.g., "Great" and "Good job"). For incorrect or

Educ, Sci. 2022, 12, 921 8 of 13

no responses, the interventionist provided praise for attending and remaining on-task (e.g., "Good job keep going reading the small text"). The total duration of each lesson lasted approximately 30 min for a total durance of two weeks.

Mastery criterion was set at seven out of seven answers performed independently correct for two consecutive sessions. During the discrimination phases, the participant was required to get both discriminations correct to meet mastery.

2.5.3. Maintenance

A member of the research team collected IOA data for the dependent variable. She had prior experience collecting data for other research projects and was obtaining Master's degree in special education with a focus on students with intellectual disabilities from a local university. She collected reliability data once per week for each student across conditions for a total of 75% of all sessions. IOA was calculated using the item-by-item method by dividing the number of agreed items by the total number of agreements plus disagreements and multiplying by 100.

2.6. Interobserver Agreement

A member of the research team collected IOA data for the dependent variable. She had prior experience collecting data for other research projects and was obtaining a master's degree in special education with a focus on students with intellectual disabilities from a local university. She collected reliability data once per week for each student across conditions for a total of 75% of all sessions. IOA was calculated using the item-by-item method by dividing the number of agreed items by the total number of agreements plus disagreements and multiplying by 100.

2.7. Social Validity

The social validity of an intervention for the students is an important factor to measure [22,23]. Following the conclusion of the intervention phase, each participant was asked to complete a four-item Likert type survey to ascertain their opinions and acceptability of using the EtR material to comprehend texts in the Greek language lesson. In addition, they were interviewed whether or not they liked participating in the intervention, and whether they liked the EtR language in order to be taught other subjects, such as science content. The teacher also completed a social validity survey.

3. Results

3.1. Visual Analysis of Reading Comprehension Assessment Results

As shown in Figure 2, all students increased the number of correct answers on the comprehension probe trials from the baseline condition to intervention when systematic instruction was added to comprehend adapted EtR texts in the Greek language lesson. The four students met the criterion of 100% (7/7 answers correct) for two consecutive sessions, requiring a mean of nine sessions (range = 8-10 sessions).

Baseline scores on the comprehension assessments for the students indicated that they had very low to low levels related to reading comprehension of original texts without adaptations or transcriptions. Correct responses during the baseline period generally appeared to be random chance. The effectiveness of EtR language on reading comprehension by students with mild intellectual disabilities was determined through visual analysis and percent of nonoverlapping data (PND) [24]. Comprehension skills, as well as access to information regarding each topic discussed during the intervention supported by EtR material, was improved for all of the students. As can been seen in Figure 2, both consistent changes in mean lines and trend slopes and magnitudes were evident from the visual inspection of data between the baseline and intervention phase. The overall PND for all students was 87.5%, indicating a high effectiveness of intervention [25].

Educ. Sci. 2022, 12, 921 9 of 13

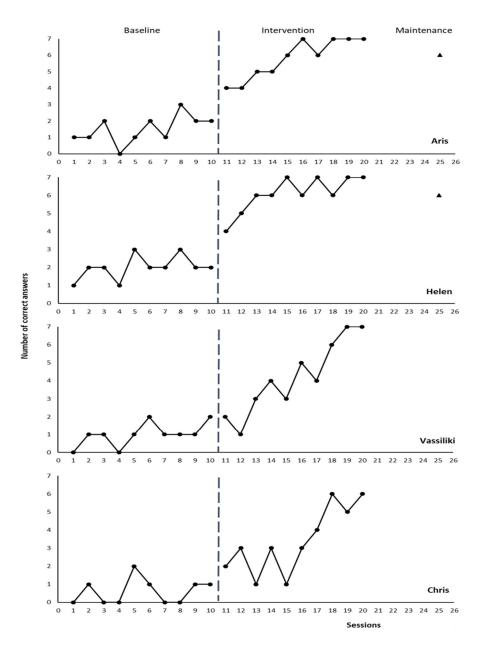


Figure 2. Number of correct answers to the comprehension probes for students.

The visual analysis of each individualized graph is as follows:

Aris. During the baseline probes, Aris completed an average of 1.5 correct answers in baseline (range 0–3) and 5.8 correct answers in the intervention (range 4–7). His baseline data had a variance and demonstrated an unstable trend. Upon the introduction of the intervention, there was an immediate and abrupt change in level and an accelerating trend. Aris maintained the targeted comprehension skills in the follow-up session after the intervention. In addition, Aris' PND was 100%, which indicated a highly effective intervention.

Helen. During the baseline probes, Helen completed an average of 2 of the answers in comprehension (range 1–3), while in the intervention she completed an average of 6.1 (range 4–7). There was an immediate change in level from baseline, which was stable, to the intervention conditions after the intervention phase. As the intervention sessions continued, Helen's scores continued to increase in level and trend and soon reached the mastery criteria. Helen also maintained the targeted skills in the follow-up session. Helen's PND was 100%, which indicated a highly effective intervention.

Vassiliki. Vassiliki's baseline data were low and had a wide variance. During the baseline condition, Vassiliki completed an average of 1 (range 0–2), while in the intervention

Educ. Sci. 2022, 12, 921 10 of 13

she completed an average of 4.2 (range 1–7). The baseline data were low, there was a later change in level when the intervention was introduced and an accelerating trend. Vassiliki's PND was 80%, which indicated an effective intervention.

Chris. Chris' baseline scores were very low and had the most variance. During the baseline probes, Chris completed an average of 0.6 of the answers in comprehension (range 0–2), while in the intervention he completed an average of 3.4 (range 1–6). There was not an immediate change in level from baseline to intervention conditions after the intervention phase and his data were overlapping. Chris' PND was 70%, which indicated an effective intervention.

3.2. Social Validity

After the completion of the intervention, the students answered a social validity questionnaire regarding the use of EtR language to acquire access to information in the Greek language lesson. All four students reported that using the EtR language to read and comprehend a text was socially important. The results indicated that the four students agreed strongly that they liked reading the text in the form and structure of the EtR language, as it helped them to increase their comprehension skills. They also reported that the adapted EtR text was easy to use "on my own" and they would like to use EtR material more to learn new content. They enjoyed EtR experience during the Greek language lesson teaching. The teacher agreed that the time the students engaged in the study was time well spent and the EtR language effectively supported the Greek language teaching. Several statements included "the adapted EtR texts were easy to read and understand", "I found intervention supported using EtR language easy to implement", and "my students benefited from this adaptation".

4. Discussion and Conclusions

Reading comprehension has an inherit value for all learners to help them understand and participate equally in the world around them. The purpose of this study was to examine the effects of adapted EtR texts on comprehension for students with mild intellectual disabilities in a special education classroom. Modifications to traditional instruction included adapted EtR texts aligned to the guidelines and recommendations of international organizations such as the Guidelines for EtR Materials by IFLA [12] or the Make It Simple Guidelines by ILSMH [13]. The researchers used a basic syntactical structure, following very clear sentence structures that aligned with the modifications stated above. Emphasizing one specific statement per sentence, they avoided difficult words in order to benefit students with mild intellectual disabilities to comprehend texts [19]. The study applied an AB single-subject design, which met Horner's et al. [22] seven criteria of acceptable quality studies, regarding participants' description and setting, independent and dependent variables, baseline, experimental control, external validity, and social validity.

All four students increased the number of correct answers addressing the reading comprehension of the targeted texts. Two of the students were assessed with a follow-up lesson and they maintained the comprehension skills. The visual analysis procedures revealed that the intervention supported by using the EtR language was an effective strategy for improving reading comprehension skills for the students with intellectual disabilities. A correlational relationship was demonstrated between the intervention in language content based on adapted EtR texts and the number of correct answers on the comprehension probes. The effect sizes and their average also indicated that systematic instruction during the Greek Language lesson with the use of adapted EtR texts was an effective strategy for enhancing reading comprehension for students with intellectual disabilities [25]. Thus, all students improved their reading comprehension skills.

The current results extend on the previous literature in several ways. The current study extends the study of Fajardo and colleagues [17], which examined the effects of EtR language on comprehension of students with mild intellectual disabilities. The results of our study agree that adapted EtR texts were comprehended well by all participants, as the

Educ. Sci. 2022, 12, 921 11 of 13

number of words and the size of the sentences affected the levels of reading comprehension. The findings support previous results using EtR language in daily life, where individuals with intellectual disabilities could easily access services by improving independence regarding health or information issues [16,21,26–31]. Several studies have examined the comprehension levels achieved in health issues for people with intellectual disabilities with an important need for designing leaflets based on EtR medication information [15,18,32–34]. In addition, wayfinding is difficult for individuals with intellectual disabilities who may not have the adequate reading skills necessary to navigate unknown spaces [35]. Teaching students with intellectual disabilities to acquire comprehension skills through EtR language may help them make decisions to help them be transported independently [36]. Media and internet sources require accessibility and equality regarding the human rights of all people, including people with intellectual disabilities, emphasizing current affairs, political life, and cultural events [37]. In this context, the EtR adaptations of information texts are considered crucial. Therefore, teaching interventions based on the EtR language can positively contribute to the accessibility and equality of people with intellectual disabilities to information, social involvement, and political life, as well as to the emerging digital technology, in order for them to go along with every fellow human being.

The practical knowledge and skills that this learning procedure can provide in the classroom is aligned with access to information for students with intellectual disabilities. The learning results could support all grade educational programs and promote inclusion through specific adaptations and modifications that EtR texts use. EtR texts can include basic but meaningful information for students with intellectual disabilities who usually struggle with reading comprehension. Several suggestions could include more texts written in the EtR language, even more school textbooks, such as history or literature, that already concern extensive texts. In inclusive settings, general and special educators usually modify and differentiate the instruction in order for all students with or without intellectual disabilities to be included and to reach the individualized characteristics and needs.

To fully interpret and apply the results of the study, there are several limitations to consider. As in all single subject research, a small number of students participated in this study (n = 4). Future research should consider the use of a larger sample size to increase the external validity and generalizability. Second, there was a limitation addressing the AB design. Maintenance and generalization phases were not assessed in this study because of the pandemic constraints. Future research should include examination of multiple assessments, such as designing a multiple probe across participant design. Another future study could measure the Tau-U effect size [38] or use a between-case effect size measure for comparison between three or more participants [39]. In conclusion, the effectiveness of EtR language on comprehension across other domains (e.g., science, history, or social subjects) could be examined in future studies.

Author Contributions: Conceptualization, G.L. and S.-G.S.; methodology, G.I.; software, G.I.; validation, G.L., G.I. and S.-G.S.; formal analysis, G.I.; investigation, G.L; resources, G.L; data curation, G.I; writing—original draft preparation, G.I.; writing—review and editing, G.I; visualization, S.-G.S.; supervision, S.-G.S.; project administration. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

Acknowledgments: The authors would like to acknowledge the students for their participation in this study.

Conflicts of Interest: The authors declare no conflict of interest.

Educ. Sci. **2022**, 12, 921 12 of 13

References

- 1. No Child Left Behind Act; Pub. L. No 107–110, 115 Stat. 1425, U.S.C.; Washington, DC, USA, §§ 6301; 2001.
- 2. Individuals With Disabilities Education Improvement Act; 20 U.S.C. §1400, H.R. 1350; U.S. Department of Education: Washington, DC, USA, 2004.
- 3. Afacan, K.; Wilkerson, K.L.; Ruppar, A.L. Multicomponent Reading Interventions for Students with Intellectual Disability. *Remedial Spec. Educ.* **2017**, 39, 229–242. [CrossRef]
- 4. Browder, D.M.; Wakeman, S.Y.; Spooner, F.; Ahlgrim-Delzell, L.; Algozzine, B. Research on Reading Instruction for Individuals With Significant Cognitive Disabilities. *Except. Child.* **2006**, 72, 392–408. [CrossRef]
- 5. Saletta, M.; Kaldenberg, E.; Rivera, K.; Wood, A. Do Illustrations Promote Reading Comprehension in Adults with Intellectual or Developmental Disabilities? *Educ. Train. Autism Dev. Disabil.* **2019**, *54*, 225–236.
- 6. Lundberg, I.; Reichenberg, M. Developing Reading Comprehension Among Students with Mild Intellectual Disabilities: An Intervention Study. *Scand. J. Educ. Res.* **2013**, *57*, 89–100. [CrossRef]
- 7. Fleury, V.P.; Hedges, S.; Hume, K.; Browder, D.M.; Thompson, J.L.; Fallin, K.; El Zein, F.; Reutebuch, C.K.; Vaughn, S. Addressing the academic needs of adolescents with autism spectrum disorders in secondary education. *Remedial Spec. Educ.* **2014**, *35*, 68–79. [CrossRef]
- 8. Hudson, M.E.; Browder, D.; Wakeman, S. Helping Students with Moderate and Severe Intellectual Disability Access Grade-Level Text. *Teach. Except. Child.* **2013**, 45, 14–23. [CrossRef]
- 9. Browder, D.; Ahlgrim-Delzell, L.; Spooner, F.; Mims, P.J.; Baker, J.N. Using Time Delay to Teach Literacy to Students with Severe Developmental Disabilities. *Counc. Rev.* **2009**, *75*, 343–364. [CrossRef]
- 10. Browder, D.M.; Trela, K.; Jimenez, B. Training Teachers to Follow a Task Analysis to Engage Middle School Students With Moderate and Severe Developmental Disabilities in Grade-Appropriate Literature. *Focus Autism Other Dev. Disabil.* **2007**, 22, 206–219. [CrossRef]
- 11. Vollenwyder, B.; Schneider, A.; Krueger, E.; Brühlmann, F.; Opwis, K.; Mekler, E.D. How to Use Plain and Easy-to-Read Language for a Positive User Experience on Websites. In *Computers Helping People with Special Needs*; Miesenberger, K., Kouroupetroglou, G., Eds.; Lecture Notes in Computer Science; Springer: Cham, Switzerland, 2018; Volume 10896, pp. 514–522.
- 12. Tronbacke, B. *Guidelines for Easy-to-Read Materials*; International Federation of Library Association and Institutions: The Hague, The Netherlands, 1997.
- 13. Freyhoff, G.; Hess, G.; Kerr, L.; Menzel, E.; Tronbacke, B.; Van der Veken, K. *Make It Simple, European Guidelines for the Production of Easy-to-Read Information for People with Learning Disability*; ILSMH European Association: Brussels, Belgium, 1998.
- 14. Nomura, M.; Nielsen, G.S.; Tronbacke, B.I.; International Federation of Library Associations and Institutions. *Guidelines for Easy-to-Read Materials/rev*; International Federation of Library Association and Institutions: The Hague, The Netherlands, 2010.
- 15. Strydom, A.; Forster, M.; Wilkie, B.M.; Edwards, C.; Hall, I.S. Patient information leaflets for people with learning disabilities who take psychiatric medication. *Br. J. Learn. Disabil.* **2001**, 29, 72–76. [CrossRef]
- 16. Hurtado, B.; Jones, L.; Burniston, F. Is easy read information really easier to read? J. Intel. Disabil. Res. 2014, 58, 822–829. [CrossRef]
- 17. Fajardo, I.; Ávila, V.; Ferrer, A.; Tavares, G.; Gómez, M.; Hernández, A. Easy-to-read texts for students with intellectual disability: Linguistic factors affecting comprehension. *J. Appl. Res. Intellect. Disabil.* **2014**, 27, 212–225. [CrossRef] [PubMed]
- 18. Yavena, V. Easy-read Documents as a Gold Standard for Evaluation of Text Simplification Output. In Proceedings of the Student Research Workshop Associated with RANLP 2015, Hissar, Bulgaria, 7–9 September 2015; pp. 30–36.
- 19. Sutherland, R.J.; Isherwood, T. The Evidence for Easy-Read for People With Intellectual Disabilities: A Systematic Literature Review. *J. Policy Pract. Intellect. Disabil.* **2016**, *13*, 297–310. [CrossRef]
- 20. Crossley, S.A.; Dufty, D.F.; McCarthy, P.M.; McNamara, D.S. Toward a new readability: A mixed model approach. *Proc. Annu. Meet. Cogn. Sci. Soc.* **2007**, 29, 197–202.
- 21. Callus, A.-N.; Cauchi, D. Ensuring meaningful access to easy-to-read information: A case study. *Br. J. Learn. Disabil.* **2020**, *48*, 124–131. [CrossRef]
- 22. Horner, R.H.; Carr, E.G.; Halle, J.; McGee, G.; Odom, S.; Wolery, M. The Use of Single-Subject Research to Identify Evidence-Based Practice in Special Education. *Except. Child.* **2005**, *71*, 165–179. [CrossRef]
- 23. Gast, D.; Ledford, J. Single Case Design Methodology: Applications in Special Education and Behavioral Sciences; Gast, D., Ledford, J., Eds.; Routledge: New York, NY, USA, 2014.
- 24. Scruggs, T.E.; Mastropieri, M.A.; Casto, G. The quantitative synthesis of single-subject research: Methodology and validation. *Remedial Spec. Educ.* **1987**, *8*, 24–33. [CrossRef]
- 25. Scruggs, T.E.; Mastropieri, M.A. How to Summarize Single-Participant Research: Ideas and Applications. *Exceptionality* **2001**, 9, 227–244. [CrossRef]
- 26. Bilgi, A.D.; Özmen, E.R. The effectiveness of modified multi-component cognitive strategy instruction in expository text comprehension of students with mild intellectual disabilities. *Educ. Sci. Theory Pract.* **2018**, *18*, 61–84. [CrossRef]
- 27. Channell, M.M.; Loveall, S.J.; Conners, F.A. Strengths and weaknesses in reading skills of youth with intellectual disabilities. *Res. Dev. Disabil.* **2013**, *34*, 776–787. [CrossRef]
- 28. Chinn, D. Talking to producers of Easy Read health information for people with intellectual disability: Production practices, textual features, and imagined audiences. *J. Intellect. Dev. Disabil.* **2019**, *44*, 410–420. [CrossRef]

Educ. Sci. 2022, 12, 921 13 of 13

29. Sermier Dessemontet, R.; de Chambrier, A.F. The role of phonological awareness and letter-sound knowledge in the reading development of children with intellectual disabilities. *Res. Dev. Disabil.* **2015**, *41*, 1–12. [CrossRef] [PubMed]

- 30. Karreman, J.; Van Der Geest, T.; Buursink, E. Accessible Website Content Guidelines for Users with Intellectual Disabilities. *J. Appl. Res. Intellect. Disabil.* **2007**, 20, 510–518. [CrossRef]
- 31. Leóna, J.A.; León-López, A. Reading performance in adults with intellectual and developmental disability (IDD) when they read different kinds of texts. *Psych Russ. State Art* **2019**, *12*, 148–158. [CrossRef]
- 32. Chinn, D. An empirical examination of the use of Easy Read health information in health consultations involving patients with intellectual disabilities. *J. Appl. Res. Intellect. Disabil.* **2020**, *33*, 232–247. [CrossRef]
- 33. Poncelas, A.; Murphy, G. Accessible information for people with intellectual disabilities: Do symbols really help? *J. Appl. Res. Intellect. Disabil.* **2007**, 20, 466–474. [CrossRef]
- 34. Pothier, L.; Day, R.; Harris, C.; Pothier, D.D. Readability statistics of patient information leaflets in a Speech and Language Therapy Department. *Int. J. Lang. Commun. Disord.* **2008**, 43, 712–722. [CrossRef]
- 35. Salmi, P. Wayfinding design: Hidden barriers to universal access. *Implications* 2005, 5, 1–6.
- 36. Trautendorfer, G.; Peböck, B.; Pühretmair, F.; Karlinger, M. Easy-to-Read enables Participatory Social Research. In DSAI 2016: Proceedings of the 7th International Conference on Software Development and Technologies for Enhancing Accessibility and Fighting Info-Exclusion, New York, NY, USA, 1–3 December 2016; Association for Computing Machinery: New York, NY, USA, 2016; pp. 194–199.
- 37. Chinn, D.; Homeyard, C. Easy read and accessible information for people with intellectual disabilities: Is it worth it? A meta-narrative literature review. *Health Expect.* **2017**, 20, 1189–1200. [CrossRef] [PubMed]
- 38. Vannest, K.J.; Ninci, J. Evaluating intervention effects in single-case research designs. J. Couns. Dev. 2015, 93, 403–411. [CrossRef]
- 39. Ledford, J.R.; Gast, D.L. Single Case Research Methodology, 3rd ed.; Routledge: New York, NY, USA, 2018.