

Article

The Impact of Dyslexia Box: A Case Study on Students in an Integration Class in Greece

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Abstract: This study evaluates the impact of a Greek intervention tool called Dyslexia Box, which is aimed at helping students with dyslexia acquire necessary language skills. It mainly focuses on the development of phonological awareness, reading, and writing. The sample comprises 13 students with dyslexia and other difficulties. The intervention program consists of 32 activities, which were applied twice to each student over 10 weeks (students who achieved excellent performance on the first implementation of an activity did not repeat the corresponding activity, as it was considered that the cognitive goal had already been achieved). In order to record student performance, an observation key was created for each activity. The results indicate that the specific tool is easy-to-use and achieves the proposed learning objectives. Specifically, it helps students with and without dyslexia overcome their learning difficulties concerning phonological awareness and/or manage their processing of the oral and written language, since they all achieved better performance at the second implementation of the tool.

Keywords: dyslexia; multisensory tool; Dyslexia Box; phonological awareness



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1. Introduction

The word “dyslexia”—in Greek, /δυσλεξία/—comes etymologically from the Greek words *δυσ* + *λέξη* (*λέξη* means word). The preposition ‘*δυσ*’ has a negative meaning indicating either a bad quality, for example, *δυσ-οσμία* (unpleasant smell), or a difficulty, for example, *δυσ-καμψία* (difficulty in bending the body). So, the word dyslexia can literally mean difficulty with words. The above literal depiction in terms of semantic completeness could be enriched as follows: difficulty in using, recording, and reading words. In this paper, dyslexia is used to denote the specific learning difficulty (SLD) of reading and spelling in students with normal intelligence quotient (IQ) and is not related to any genetic or sensory deficiencies [1]. The learning profile of students with dyslexia is heterogeneous. In their cognitive profile, there are difficulties in visual and auditory discrimination, phonological deficit, phonemic awareness, and memory problems [2]. Other findings reveal problems in executive functions [3] and in metacognitive strategies [4].

Each language, depending on its phonological, morphological, and orthographic peculiarities, affects the degree of difficulty cognitively processed by its users. The Greek language is an alphabetic language in which graphic symbols represent phonemes [5]. It belongs to the transparent or shallow languages as it has a simple syllabic structure and a one-to-one relationship between its graphic symbols and phonemes [6], with the peculiarity that some sounds can be presented with more than one letter [7]. For instance, the sound /o/ can be presented either as “ο” or “ω”.

There is no easy, quick or one-size-fits-all intervention that can alleviate dyslexia-originated academic skills difficulties. However, they can be reduced with systematic and intensive intervention—at least two hours weekly in a dyadic context [8]—or in small

groups. Typical education classes in Greece consist of an average of 20 students with a maximum of 25, so it is inevitable to teach one-to-one or at least in small groups. The role of the Integration Class (Note: Integration Class: The Integration Class (IC) is a structure of special education, which operates within the Typical School. The target of the IC is the educational support of students with disabilities or special educational needs, within school hours, using specialized educational programs provided to them. It is a separate class within the school unit, which students from all over the school can attend. Those students have a diagnosis from an official Differential Diagnosis Body approved by the Greek State [9]. If there is no diagnosis, students can still attend the IC if their teachers identify unspecified learning difficulties and suggest their enrollment in a short-term intervention program. After assessing their special educational needs, the special educator groups them. In the context of inclusion, one-to-one teaching is usually avoided. Every school hour, a group of students is withdrawn from the typical class and attends the Integration Class to have their educational needs strengthened and supported with differentiated teaching by the special educator) is considered highly significant, as it allows for one-to-one teaching for those students that need particular attention [10].

The use of phonological methods has been a pillar in the treatment of dyslexia in recent years. By the term ‘phonological awareness’, we refer to the individual’s ability to understand the sound structure of spoken language [11] and to encode and temporarily store sound-based representations [12]. Daily and systematic engagement in activities that emphasize rhyming, phrase, and word recognition, and the analysis, synthesis, subtraction, and substitution of syllables and phonemes enhances letter recognition, phonological analysis, and reading single words [13]. In this direction, Goswami 2015, refs [14,15], hypothesized that phonological awareness, as part of language acquisition, precedes the development of reading skills. Phonological awareness is also a condition of reading as through it, the reader carries graphophonemic mapping to access spoken lexical information stored in long-term memory [16].

The use of multisensory approaches may reduce the learning discrepancy between students with and without SLD [17,18]. Students with dyslexia often need activation of more senses than visual and auditory input in order to decode and master new knowledge [19]. A cornerstone of all multisensory methods and interventions is the Orton–Gillingham method, which is a flexible teaching approach [20]. According to the multisensory approach, the acquisition of basic skills related to oral and written language (recognition and organization of structural elements of language, etc.) does not happen automatically in dyslexic students; therefore, they need intervention [20,21]. A teaching method can be characterized as multisensory when it involves multiple sensory pathways, i.e., the student simultaneously receives audiovisual and kinesthetic stimuli [10].

Dyslexia Box is a tool based on the multisensory approach created by Fotis Papanastasiou, a Greek special educator, and it became available for purchase and use in 2020 [22]. This tool aims to help dyslexic students acquire the necessary skills for their academic courses, cope with difficulties that hinder their participation in the learning process and further develop phonological awareness. It contains a collection of many types of activities implemented with cards. According to its instructions, the tool is not aimed exclusively at students with dyslexia but at all students in kindergarten and the first grades of primary school. It is also based on the theory that children learn better when actively participating in the teaching process than being passive receivers of knowledge [22].

It consists of 238 cards, 5 pawns, 1 reading aid, and a manual with the instructions for the activities. The user manual describes which cards to use in each activity. More specifically, the Dyslexia Box consists of:

- Forty-five red cards containing pictures of two-syllable words;
- Forty-five blue cards containing pictures of three-syllable words;
- Forty-five yellow cards containing pictures of polysyllabic words;
- Twenty-four green cards with the alphabet letters;
- Twenty-eight numbered cards with purple markings containing reading lists;

- Six pink-marked cards containing words broken down into phonemes;
- Thirty-five numbered cards with black markings containing words and sentences for first reading;
- Six orange-marked cards containing word pairs for rhyming recognition;
- Four brown cue cards containing rhyming words;
- Five pawns;
- One reading assistant;
- Activity manual (AM).

Table 1 below presents the activities included in Dyslexia Box and their cognitive objectives. Clear cognitive goals have been set by the creator for activities 1 to 27. For activities 28–32, since there is not a clear cognitive goal, the researchers set their own.

Table 1. Cognitive objectives of activities.

Activities	Cognitive Objectives of Activities
1, 2	Segmenting word into syllables
3, 4	Composing syllables
5	Rhyming comprehension
6	Finding rhyme
7	Initial syllable identification
8	Final syllable identification
9	Initial syllable subtraction
10	Final syllable subtraction
11	Adding initial syllable
12	Adding final syllable
13, 14, 15	Distinction of initial phoneme
16, 17, 18, 19, 20	Distinction of final phoneme
21	Breaking down words into phonemes
22	Initial phoneme subtraction
23	Final phoneme subtraction
24	Addition of initial phoneme
25	Addition of final phoneme
26	Removing middle phoneme
27	Reversing phonemes
28, 29	Enhancing phonological awareness
30, 31	Improving reading skill
32	Improving reading and writing skill

The reasons for choosing to study this specific tool are that it is a new tool that claims to use the multisensory approach to overcome difficulties associated with phonological awareness, and there is not anything similar, cheap, and easy-to-use in Greece. Furthermore, in Greece, there are no books on differentiated teaching for students with learning difficulties provided by the Ministry of Education that teachers in the IC can use. Thus, an affordable tool like this, as long as it delivers what it promises, can be systematically used as a cognitive intervention tool for students attending the IC who face difficulties related to speech processing.

The purpose of this research is to investigate whether the Dyslexia Box supports and helps students with dyslexia and other mild disorders/difficulties to further understand

language/word structure, as it has already been acquired by many special educators, therapists, parents, etc., in Greece without, however, any existing evidence for its effectiveness.

Furthermore, this study investigates whether the specific tool can be characterized as multisensory. Special education covers a wide range of difficulties and disorders, and it is quite difficult to collect a sufficient sample (i.e., students with exactly the same difficulty) required to perform a different type of research [23]. Based on previous research showing that phonological awareness training would have particular benefits for dyslexic students, the present study examines the impact of an intervention on a sample of students with dyslexia and other types of learning difficulties.

2. Materials and Methods

2.1. Methodology

This research was conducted in the form of a case study. It followed a qualitative methodology, carried out in a specific context, as a case study, on an experimental basis. In this study, we applied and verified if a method specifically designed to treat dyslexia, i.e., the Dyslexia Box, is really effective for a group of school children with different learning difficulties. It was selected because of the limited number of participants who did not all face the same educational needs. For data collection, participant observation was used, since the main researcher is a teacher in an IC and works daily with these students. This is why an adaptation period prior to the observation was not required.

Daily data collection was carried out using a schedule designed ad hoc for this purpose, adapting to different observations for each of the scheduled activities. Thus, the observations made it possible to collect qualitative data to assess the results, in addition to other quantitative data, such as response time. Despite collecting both types of data, this research is descriptive and does not allow generalization to other contexts, but it does verify the effectiveness of the Dyslexia Box method.

The timing of the application and data collection in situ was carried out over 10 weeks, for 5 h per week, so that, in total, the samples represent 50 h.

2.2. Participants

The students who were chosen to participate in this research were the students studying in the IC where the first author worked. More specifically, they were all students with diagnosed learning difficulties or specific learning difficulties. The legal procedure as defined by the Greek legal framework for conducting research on students was followed consistently. More specifically, written approval from the parents of the students was obtained, as well as approval from the school unit.

Initially, 17 students from the 3rd to 6th grade participated (i.e., 9 to 12 years old). Due to COVID-19, some students were absent from school for several days or even weeks, so they could not complete their participation. Finally, there were 13 participants: 12 boys and 1 girl from the 3rd to 6th grade. From the beginning of the academic year, the students were divided into 6 groups (Note: The selected students were organized into small groups based on their educational needs, as defined by the informal initial evaluation conducted by the special educator, taking into account each student's diagnosis as well as the suggestions from the typical education teachers. This means that participation in each group is not determined by the student's age or class, but there are cognitive criteria in order to form relatively homogeneous groups) according to their learning difficulties and their cognitive level due to their attendance in the IC. The same groups were retained for this research.

The 1st group consisted of two students who had severe learning difficulties across the spectrum of speech, reading, speaking, and writing. The 2nd group (Note: Initially, group 2 consisted of three students. One of the three participants was removed from the study as, due to COVID-19, he was absent from school for more than a week. So, group 2 consisted of two students) consisted of two students, both of whom had difficulties in phonological awareness, reading, and writing. The 3rd group (Note: Initially, group 3 consisted of three students. One of the three participants was removed from the study as,

due to COVID-19, he was absent from school for more than a week. So, group 3 consisted of two students) consisted of two students, who faced severe difficulties in phonological awareness, which was a hindrance in the production of written speech. The 4th group (Note: Initially, group 4 consisted of three students. Two out of three participants were removed from the study as, due to COVID-19 and common flu, they were absent from school for more than a week. So, group 4 consisted of one student) consisted of a student with very severe learning difficulties in phonological awareness, writing, and reading. The 5th group consisted of three students, all of whom had mild reading and writing difficulties. The 6th group consisted of three students with severe reading and mild phonological awareness difficulties. Students with dyslexia are marked in the tables with bold text and an asterisk.

2.3. Procedure—Data Analysis

To assess student improvement as a percentage, student correct answers were divided into a percentage scale. Correct answers below 44% signified very poor performance, whereas 45–55% signified poor, 56–66% average, 67–77% good, 78–88% very good, 89–99% extremely good, and 100% excellent performance. This categorization was performed ad hoc.

The percentage and descriptive categorization were performed to make the results of our study easier to read. Furthermore, there is a correspondence between this way of categorization and the Greek student evaluation system. More specifically, in the 5th and 6th grades of primary school, grading is performed using a ten-point scale. Although we have not found research that clearly defines the range of student population scores as a percentage, we nevertheless consider it tentative to report empirically that in large elementary classes, even though the ten-point scale exists, teachers give a lower grade of 5. Using the middle of the ten-point scale, namely, 5, and converting it to a percentage, results in 50%. From this percentage, we estimated a $\pm 5\%$ range, where some answers may have been right by chance or wrong by extraneous factors. Thus, the poor performance of 45–55% was defined. Anything below that was considered significantly poor performance. The division of the remaining range was performed equally per category with 10% in each of them, i.e., 56–66, 67–77, 78–88, and 89–99. Perfect was only 100%, which required all correct answers. Data analysis was performed qualitatively, and the variation in student performance is descriptive. In the case that a student's performance was far below 44% and, during the second implementation of the tool, increased but remained below 44%, it is recorded verbally.

The activity manual was applied in each group, which is included in the tool. The 32 activities were implemented according to their respective instructions. All activities were completed twice over the period of ten weeks so that student performance could be compared. Students who achieved excellent performance on the first implementation of an activity did not repeat the corresponding activity, as it was considered that the cognitive goal had already been achieved. The implementation of the activities was performed serially as described in the manual. Each student had to complete one activity to move on to the next. The tool does not have its own scoring sheet, so an observation key in the form of a scoring sheet was created for each activity in order to measure the results. In some cases, the researcher simply recorded correct and incorrect answers by making additional comments, while in others, the researcher had to set a timer to record the time it took each student to complete the reading task correctly. Those students who initially achieved 'excellent' performance on the first implementation of an activity did not repeat it as it was considered that the requested learning objective had already been achieved.

Students were familiar with the researcher since she was also their teacher in the Integration Class from the beginning of the school year, and they did not feel anxious at any stage of the research. On the contrary, many times, they took the initiative to help in the process when, for example, she had to deal out the educational cards. This research was conducted with absolute respect for students' rights and in no case was there any

exploitation of them due to the unequal (teacher–student) relationship. As stated in the Code of Ethics in Research with Children issued by the Society for Research in Child Development (SRCD), the following were followed: (1) The rights of the children in all cases took precedence over the rights of the researcher and (2) the students were informed about the purpose of the research and written consent was obtained from their parents. Furthermore, the researcher in each activity informed the students in detail about what was going to follow as well as the fact that if they wished to stop the process, they had every right at any time.

2.4. Reliability

This research yielded highly reliable results, due to its repeatability. The observation key is easy to understand and can be used to retake measurements. Although the activities are structured in such a way that they cannot be memorized, it was also ensured that the second implementation of the activities took place during the second month, and only after the completion of all 32 activities, so that a reasonable period of time passed, and the students could not mechanically remember the answers.

In addition, as mentioned above, each activity is completed with different colored cards, as described in the manual. The red, blue, and yellow cards were used in most activities, and there were 45 cards per color. During each activity, each student randomly chose up to 5 cards per color. Therefore, it is considered extremely unlikely that a student on the second implementation of an activity chose exactly the same cards that he/she used the first time so that he/she could remember the answers. Furthermore, during the procedure, the students received only positive feedback without knowing whether they got the answer right or not.

2.5. Process

In activity 1 (Table A1), some cards of varying difficulty are given to the student, and he/she has to segment them into syllables as he/she pronounces each word. Each card contains a picture and has as many boxes as the syllables of the word at the bottom. In activity 2 (Table A1), the student must pronounce each syllable of the word and, at the same time, place a pawn on the designed boxes at the bottom of the card.

In activities 3 and 4 (Table A1), cards of varying difficulty are given to the student (two-syllable, three-syllable, multisyllabic) to compose syllables. In activity 3, the teacher places two cards with the same level of difficulty in front of the student and says the syllables on one card, one syllable per second. The student must find and show which card the teacher pronounced. Thereafter, the number of cards/possible answers are increased. In activity 4, the teacher chooses a card and pronounces one syllable per second, and the student, without seeing it, must understand and say the corresponding word. The observation key for activity 3 includes the student's performance on 6 red, 6 blue, 6 yellow, and 6 shuffled cards, and for activity 4, 2 red, 2 blue, 2 yellow, and 6 shuffled cards.

In activity 5 (Table A2), the teacher uses orange cards and articulates the word pairs that are in the card slowly and steadily. Then, the student must identify whether or not the two words rhyme. In activity 6 (Table A2), the teacher uses the brown cards and pronounces the words on each card one by one. The student must find a word that rhymes. The teacher may help the student to find the answer by placing the word inside a verse of a poem. The observation key for activity 5, includes the student's performance on 2 orange cards, each of which includes 5 words. The observation key for activity 6 includes 2 brown cards.

In activities 7 and 8 (Table A2), red, blue, and yellow cards are used. In activity 7, the teacher chooses 3 cards with the same level of difficulty, all of which start with the same syllable, and places them in front of the student. The student must name these cards and identify which syllable each card begins with and which word does not match the others. The cards are used from the easiest to the most difficult. In activity 8, the teacher places in front of the student three cards, two of which end in the same syllable. The student must name these cards and identify which syllable each card ends with and which word does

not match the others. For activities 7 and 8, the observation key includes the student's performance on 3 red, 3 blue, and 3 yellow cards. The students' main difficulties included a poor understanding of the object on the card or recalling its linguistic representation. Objects that the students did not know were considered correct when they were able to identify the initial and final syllable upon hearing the word.

In activities 9 and 10 (Table A3), red, blue, and yellow cards are used in turn. In activity 9, the teacher shows a card to the student and asks him/her to name it. The student must identify the first syllable of the word and pronounce the word without it. In activity 10, the student must pronounce the word without its last syllable. The observation key for activities 9 and 10 includes the student's performance on 3 red, 3 blue, 3 yellow, and 3 shuffled cards. Several students struggled with not understanding what the object on the card was and with recalling its linguistic representation. Objects that the students did not know were considered correct when they were able to identify the initial and final syllable upon hearing the word.

In activities 11 and 12 (Table A3), red, blue, yellow, and finally shuffled cards are used in turn. In activity 11, the teacher pronounces a word without its first syllable and pronounces the first syllable separately. Then, the student must locate the first syllable, place it at the beginning, and pronounce the whole word. In activity 12, the teacher pronounces a word without its last syllable, then pronounces its last syllable separately and asks student to put it at the end and pronounce the whole word. The observation key for activities 11 and 12 includes the student's performance on 3 red, 3 blue, 3 yellow, and 3 shuffled cards in turn.

In activities 13 and 14 (Table A4), red, blue, and yellow cards are used in turn, but in activity 13, the cards are also shuffled. In activity 13, the teacher shows a picture to the student. Then, the student must name and recognize its first phoneme. In activity 14, the teacher chooses three cards, two of which start with the same phoneme, and places them in front of the student. Afterward, the student must name the cards, recognize their first phoneme and indicate the one that does not match. The observation key for these activities includes the student's performance on 3 red, 3 blue, and 3 yellow cards, but in activity 13, 3 shuffled cards are also used.

In activities 15 and 16 (Table A4), red, blue, and yellow cards are used. In activity 15, the teacher shows a card to the student. Then, the student must name, identify its first phoneme, and find a word which starts with the same phoneme. In activity 16, the student must name and identify the last phoneme on the card. The observation key for these activities includes the student's performance on 2 red, 2 blue, 2 yellow, and 3 shuffled cards.

In activities 17 and 18 (Table A5), red, blue, and yellow cards are used. In activity 17, the teacher chooses three cards from each category and places them in front of the student, two of which end in the same phoneme. Then, the student must name them, identify their last phoneme, and the word that does not match the others. In activity 18, the teacher chooses four cards from each category, of which there are two pairs ending in a different phoneme, and places them shuffled in front of the student. Finally, the student must name them, identify their last phoneme, and pair them. For activity 17, the observation key includes the student's performance on two triads of red, blue, and yellow cards and three triads of cards with random difficulty. For activity 18, two red, two blue, two yellow and three cards with varying difficulty were used.

In activities 19 and 20 (Table A5), red, blue, and yellow cards are used. In activity 19, the teacher chooses three cards from each category, places them in front of the student, and then says the phonemes of a word one by one. Afterward, the student must guess which of the three words the teacher articulated and indicate it with her/his hand. In activity 20, the process is the same, but without a visual aid. For these, the observation key includes the student's performance on two sets of red, blue, and yellow cards and three sets of cards with varying difficulty.

In activity 21 (Table A6), pink cards with the suggested difficulty rating are used. The teacher says the words from each card one by one. Each time the teacher says a word, the student is asked to break it down into phonemes. The observation key for activity 21 includes the student's performance on 6 pink cards with varying difficulty, each of them containing 10 words.

In activities 22 and 23 (Table A7), red, blue, yellow, and finally shuffled cards are used in turn. In activity 22, the teacher shows the student a card, asks him/her to identify its initial phoneme, and then pronounce the word without it. In activity 23, the teacher asks the student to identify the final phoneme and pronounce the word without it. The observation key for these activities includes the student's performance on 2 red, 2 blue, 2 yellow, and 3 cards with varying difficulty.

In activities 24 and 25 (Table A7), red, blue, yellow, and finally shuffled cards are used in turn. In activity 24, the teacher removes the initial phoneme of a word and says the remaining to the student. The teacher then says the missing initial phoneme, and the student must pronounce the word as a whole by putting it at the beginning. In activity 25, the teacher removes the final phoneme, says it separately, and then asks the student to place it at the end and pronounce the word as a whole. For both activities, the observation key includes the student's performance on 10 red, 10 blue, 10 yellow, and 10 shuffled cards.

In activity 26 (Table A7), red, blue, yellow, and finally shuffled cards are used in turn. The teacher shows the student a picture, asks him/her to name the object, and then removes a middle phoneme. The student must pronounce the remaining word after removing the phoneme. For activity 26, the observation key includes the student's performance on 2 red, 2 blue, 2 yellow, and 3 shuffled cards.

In activity 27 (Table A8), pink cards are used in turn. The teacher says the words from the pink cards to the student one by one, and then student must pronounce the phonemes of the word one by one in reverse. For activity 27, the observation key includes the student's performance on 6 pink cards. Each pink card contains 10 words.

Activity 28 (Table A9) does not have a stated objective according to the AM. However, the researcher set the goal of enhancing phonological awareness. Green cards are used, and the teacher shows the student some letters placed in certain rows and positions, reads them as phonemes, and then student must point to them and read them. The activity is repeated by placing the phonemes randomly and then in alphabetical order. For activity 28, the observation key includes the student's performance on the 24 letters of the alphabet arranged in a structured way, the 24 letters arranged randomly, and finally, the 24 letters arranged alphabetically. In order to record the performance of the student, a stopwatch was additionally used to capture their accuracy combined with their speed.

Activity 29 (Table A10) does not have a stated objective according to the AM. However, the researcher set the goal of enhancing phonological awareness. In activity 29, green cards are used, and the teacher shows and tells the student some letters. Each time, the student has to say and write the corresponding capital letter. The observation key for activity 29 includes the student's performance on writing the 24 capital letters.

Activity 30 (Table A11) does not have a stated objective according to the AM. However, the researcher set the goal of improving reading skill. In activity 30, green cards are used. The teacher puts all the vowels in order (in Greek, some vowels have more than one written representation; for example, /o/ is written as /o/ and as /ω/). Then, by combining the letters, the teacher creates all possible combinations of the two-digit vowels. Then, the teacher randomly chooses a consonant and places it in front of all the vowels and vowel combinations and asks the student to read them as quickly as possible. The process is repeated by placing the consonant at the end of vowels and vowel combinations. The observation key includes the student's performance on reading accuracy and speed for the 26 possible combinations (13 with consonant at the beginning and 13 with consonant at the end).

Activity 31 (Table A12) does not have a stated objective according to the AM. However, the researcher set the goal of improving reading skill. In activity 31, purple cards are used.

The teacher reads the words from each card one by one (10 words on each card) to the student and then asks him/her to read them from top to bottom and bottom to top.

The words are divided into the following categories:

- C-V;
- V-C-V;
- C-V-C-V;
- C-V-C-V-C;
- V-C-V-C-V;
- C-V-C-V-C-V;
- V-C-V-C-V-C;
- C-V-C-V-C-V-C;
- Polysyllabic;
- Two-consonant clusters;
- Three-consonant clusters;
- Consonant with 2 letters;
- Vowels with 2 letters;
- Finally, /af/-/av/ and /ef/-/ev/ (Note: In Greek, there are words spelled with /αv/ and /εv/ which are pronounced either as /af/-/av/ or as /ef/-/ev/. If /αv/ or /εv/ is followed by one of the following phonemes /θ/-/κ/-/π/-/τ/-/σ/-/φ/-/χ/-/τσ/, then /αv/ and /εv/ are pronounced like /af/ and /ef/).

There is a total of 28 purple cards; however, in order not to exhaust the students, the researcher divided the cards into 2 piles of 14 cards each, as the cards in pairs were for the same type of word. For example, cards 1 and 2 were words of the consonant–vowel type. Thus, two piles of cards were formed:

- (i) Pile one: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, and 27;
- (ii) Pile two: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, and 28.

The stacks were randomly distributed among the students.

The observation key includes the student's performance on each card/word type top-down (10/10), bottom-top (10/10), and writing (10/10).

Activity 32 (Table A13) does not have a stated objective according to the AM. However, the researcher set the goal of improving reading and writing skill. Turquoise cards are used. The teacher shows five cards in turn to the student. The first card has one word, the second has two words, and so on. Each time, the student must read the word and place a pawn under the word at the same time. At the end, the student must write the complete sentence. For activity 32, the observation key includes the student's reading and writing performance on 3 sets of 5 cards. There are 6 sets of 5 cards, and each student was randomly dealt 3 sets of 5 cards. The same sets of fives were used during the second and repeated implementation of the activity.

3. Results

The observation key for activities 1 and 2 includes the student's performance on three red (low difficulty), three blue (moderate difficulty), three yellow (increased difficulty) and three shuffled cards.

Several students did not recognize the object they saw on the card. However, when the teacher told them the name of the object, all of them could respond. Answers were considered correct for objects that the students did not know but were able to parse correctly upon hearing the word. Mistakes were mainly detected when using the blue and yellow cards. Activity 1 was repeated by A, B, E, F, K, N*, O*, and P. During the second implementation, the two students with dyslexia achieved 'excellent' performance. As for the rest, four achieved 'excellent' and two achieved 'extremely good' performance. Activity 2 was repeated by F, G, K, P*, and Q*. The second time, students with dyslexia achieved 'excellent' performance. As for the rest, two achieved 'excellent' performance and one achieved 'extremely good'.

In activities 3 and 4, most students had 'excellent' performance the first time. Their mistakes were mainly detected when using the blue and yellow cards. Activity 3 was

repeated by D*, E, and K. All three achieved 'excellent' performance the second time. Activity 4 was repeated by D* and K. The second time, the dyslexic student maintained the same number of mistakes, while the other achieved 'excellent' performance.

In activities 5 and 6, there were students who were very late in understanding the concept of rhyming. There were quite a few who had high performance, but only five had 'excellent' performance in the first implementation. Activity 5 was repeated by A, B, D*, G*, K, N*, O*, and P. The second time, G*, N*, O*, and P maximized their performance, A, B, and K reduced the number of mistakes, and student D* made more mistakes than previously. In activity 6, no one achieved 'excellent' performance in the first attempt, so they all repeated the activity. During the first implementation, all students were helped by the teacher, but their performance remained quite poor. A, B, D*, E, K, M*, N*, and Q* achieved 'very poor' performance. During the second implementation, the students' performance was improved. The performance of A and D* continued to be 'very poor'; however, their number of mistakes was reduced. M* and O* maximized their performance and the rest of the students improved their performance. Student P was the only one who made more mistakes the second time, despite that in his first try he achieved the best score of all.

Students A, F, M*, N* repeated activity 7. During the second implementation, F, M*, and N* achieved 'excellent' performance, while A made the same number of mistakes. Activity 8 was repeated by A, B, D*, and E, who made only two mistakes. On the second implementation, all of them achieved 'excellent' performance, except for A, who made the same number of mistakes.

Activity 9 was repeated by A, D*, E, F, G*, K, L*, M*, N*, O*, P, and Q*. Although many students repeated the activity, they did not make many mistakes as most of them achieved 'extremely good' performance. During the second implementation, D*, E, F, G*, L*, N*, O*, and Q* achieved 'excellent' performance, K reduced their number of mistakes, M* and P made the same number of mistakes, and A made more mistakes than previously. Activity 10 was repeated by A, B, D*, E, F, L*, N*, and Q*. All of them achieved 'excellent' performance the second time except for A, who just improved his performance.

According to the results of activities 11 and 12, more difficulty occurs when adding the initial syllable. The performance of all students was very high when adding the final syllable. A, B, K, L*, M*, N*, O*, and P repeated activity 11 a second time. All students improved their performance the second time, and K, L*, N*, and P achieved 'excellent' performance. The improvement for A was significant, as he/she achieved 'very poor' performance the first time and 'very good' the second. Activity 12 was repeated by B, D*, F, N*, and P, who eliminated their mistakes.

Activity 13 was repeated by A, D*, E, F, K, L*, P, and Q*. Except for P, who slightly increased their number of mistakes, all the others improved their performance. Activity 14 was repeated by A, B, L*, and Q*. Except for B, who improved his performance, the rest made the same number of mistakes.

Students who repeated activities 15 and 16 improved their performance. In fact, student E scored 'very poor' the first time and 'excellent' the second. Activity 15 was repeated by A, B, and E. Activity 16 was repeated by A, B, D*, E, F, G*, and K. Student A improved his/her performance, and all the others achieved 'excellent' performance. All students with dyslexia scored 'excellent' performance on the first implementation of activity 15. Only the younger students had to repeat activity 16.

Activity 17 was repeated by A, D*, E, and Q*, and all students achieved better performance the second time it was applied. Activity 18 was repeated by A, B, D*, E, L*, and O*, of which B, D*, E, L*, and O* improved their performance on the second implementation, while A increased their number of mistakes.

The results of activity 19 indicate that all students achieved at least 'very good' performance, with most of them making no mistakes. This activity was repeated by B, D*, E, G*, and L*, who all eliminated their mistakes the second time. The findings from activity 20 show that most students, regardless their age, struggled significantly. It was also found that

no student managed to answer all the questions in activity 20 correctly the first time, so they all repeated the activity. B, D*, E, G*, N*, and Q* scored 'very poor' on the first application, but all of them managed to reduce their number of mistakes the second time. 'Excellent' performance was achieved by B, E, F, M*, and N*.

The results of activity 21 show that all of the students struggled as the level of difficulty increased. The first time, no student managed to get all the answers correct. Student F managed to answer all the questions correctly the second time, while the rest achieved a noticeable improvement.

Activity 22 was repeated by A, B, D*, E, F, G*, K, N*, O, and P*. All students improved their performance the second time. During the first time, D*, K, O*, and P, achieved 'very poor' performance, and then, during the second time, D* and K achieved 'extremely good', O* 'very good', and P* 'excellent' performance. Activity 23 was repeated by A, B, D*, E, K, O*, and P. Almost all students showed an improvement in their performance, but A made more mistakes than the first time.

Activity 24 was repeated by A, D*, E, K, O*, P, and Q*. All of them reduced their number of mistakes and, in fact, D*, E, O*, P, and Q* achieved 'excellent' performance. Activity 25 was repeated by D*, K, and L*, who all improved their performance.

Activity 26 was repeated by A, B, D*, E, F, K, N*, and P. All students greatly reduced their mistakes. A typical example is student A, who, firstly, did not give any correct answer, while the second time, this student answered 7 out of 9 questions correctly.

All students struggled a lot with activity 27, which assessed reverse auditory memory combined with phonemic awareness. No student managed to get all the answers correct the first time. Their poor performance was independent of the type of their learning difficulty. All students improved their performance the second time.

Activity 28 was repeated by all students, even those who had answered correctly the first time, in order to observe the speed of responses. In the table below, student performance is indicated in terms of accuracy and also speed. Two of the thirteen students showed a lower performance than their initial, while the rest maintained or improved their performance. In terms of their speed, five of the thirteen students took longer to complete the activity, regardless the type of card placement. All students maintained or improved their performance except for A, who made more mistakes than the first time in two out of the three letter placements. Regarding the completion time of each request, there was no general improvement or deterioration.

Activity 29 was repeated by A, B, D*, E, G*, L*, M*, O*, P, and Q*. Everyone reduced their number of mistakes except for B and E, who made more mistakes than the first time. Activity 30 was repeated by all students, even those who had answered correctly the first time, in order to observe the speed of responses. In the table below, student performance is indicated in terms of accuracy and also speed. All students maintained or improved their performance except for A, who made more mistakes the second time when placing a consonant after vowels. In terms of completion time for each item, the majority of students maintained or improved their performance. Furthermore, during the second time, the majority of the participants reduced their mistakes in their writing performance.

The results of activity 31 show that the written language for all students improved. However, it should be pointed out that with reference to reading, repetition of the first syllable and confusion of phonemes and consonants were considered as mistakes, whereas in relation to spelling, not all elements of correct writing were evaluated but only the phonological mistakes. For this reason, there is an asterisk in the writing column next to student performance, as the specific intervention program aims at phonological enhancement. Furthermore, a more general improvement in the reading process was observed for all students without exception. Regarding reading, the categories that involved two-consonant clusters, three-consonant clusters, two-letter consonants, two-letter vowels, /af/-/av/, and /ef/-/ev/ were particularly difficult for all students. Regarding writing, the two-letter vowel category was very difficult for all students, as

10 out of 13 achieved a 'very poor' performance. The repetition of the activity in both reading and writing appears to have benefited all students without exception.

In activity 32, most students improved their performance the second time. Specifically, B, D*, G*, K, L*, M*, N*, O*, and Q* maintained and/or improved their performance the second time both in reading and writing.

4. Conclusions

In the IC, as mentioned above, the special educator teaches a small group of students, so he/she focuses individually on their learning needs. Usually, multiple and different strategies are used depending on a student's difficulties. The use of multisensory approaches is often chosen as they may reduce the learning discrepancy between students with and without specific learning difficulties [17,18].

In Greece, there is no other structured program for dyslexia that can be used so easily without prior training of the person administering it to the students. Students attending the IC mostly have difficulties in reading and writing, so the interventions are oriented towards these areas. Traditional teaching includes sound and image; however, the literature states that experiencing multiple senses at the same time increases learning opportunities for all students [19,24], even for those who do not face any difficulty. A common point of the Dyslexia Box tool with the Orton–Gillingham (OG) method, which is the ancestor of all multisensory methods, is the fact that both rely on teaching and understanding the structure of language using direct examples and not simply using memorization of grammatical rules. A key axis is for the student to understand what, why, and how to learn something without trying to guess the rules that govern the language [10]. Furthermore, the OG method includes the fragmentation of the word into phonemes and its reconstruction from them [20], which is also present in some of the activities of the Dyslexia Box.

Some common mistakes made by dyslexic students in the first grades of primary school in Greece (7–9 years old) are problems in recognizing and handling phonemes as well as in reading syllables and/or frequently used words. In older classes (10–12 years old), the omission or alteration of part of polysyllabic words is observed when writing and reading. Very often, the reading process is the most difficult for students.

The implementation of Dyslexia Box to students 9 to 12 years old, appeared to have positive effects on all students and not only on those with dyslexia. Specifically, the results indicate that the specific tool has simple implementation and achieves the desired learning objectives. Specifically, it enhances the ability of students with or without dyslexia to overcome their learning difficulties and/or manage their processing of the oral and written language. Research by Galushka et al. in 2020 [25] emphasizes the importance of interventions targeting spelling in students with dyslexia. Findings revealed that students with dyslexia who received this type of intervention performed better in reading and spelling compared to children trained with standard educational practices [25].

Activities 1 and 2 were easy for the students. All students who had to repeat the activities improved their performance. Student K achieved 'extremely good' performance in both activities the second time, while the first time his performance was just 'good'. Student P made mistakes in both exercises the first time, and his initial performance in activity 1 was 'very good', whereas in activity 2, it was 'excellent'. Student K, compared to student P, had a greater deficit in the specific learning objective. However, both showed improvement. In activities 3 and 4, most students answered correctly the first time. The repetition of activity 3 seems to have achieved its goal, as all students maximized their performance. The learning objective of activity 4 seems to have been better achieved by students with other types of difficulties as they achieved the maximum result during the second implementation of the activity.

During the second implementation of activity 5, all students improved their performance, achieving more correct answers, and therefore, better mastering the learning objective, except for D* who made two more mistakes. Dyslexic students and students with other difficulties struggled with activity 6, which is reflected in their performance.

However, the results were clearly better the second time, and it seems that all students benefited from repeating the activity, regardless of the type of difficulty, except for P, who made more mistakes. Furthermore, despite significant deviation from the cognitive target when first implementing activity 6, M* and O* achieved 'excellent' performance and N* doubled his correct answers. Activities 7 and 8 appear to be equally difficult for all the students, as no significant quantitative difference in mistakes was observed between them. Furthermore, there was an improvement in their performance regardless of age and type of difficulty in activities 7, 8, 9, and 10.

Regarding activities 11 and 12, the data show that students performed better in activity 12. This could be explained by the fact that the words were familiar to them and, so, they could guess their continuation without the teacher having to say separately the last syllable they have to add. For example, upon hearing the syllables /ε/-/λε/-/φα/, they immediately recognized that the word was /ελέφαντας/. If pseudowords were used, the results might have been different as they would not have been able to use the technique "guess the word" but would have had to correctly recall the letters from their short-term memory. In activities 13 and 14, although the learning goal was common, the performances of students with dyslexia and with other types of difficulties had inhomogeneity. This can be explained by the fact that in activity 13, there is the requirement to discriminate the initial phoneme of an object/word, while activity 14 required the simultaneous categorization and discrimination of two of the three objects each student was presented. In activity 14, the amount of data the students had to manage increased, although their performance was better. All students who repeated activity 13 reduced their number of mistakes except for P, who made more mistakes. One out of four students who repeated activity 14 improved his performance, while the others maintained the same number of mistakes. No difference was observed between the performance of students with dyslexia and other difficulties. In activity 14, there is a multisensory element as the student simultaneously sees, says, and moves the cards in order to categorize them.

Regarding activity 15, none of the students with dyslexia made a mistake. Only students with other difficulties made mistakes; yet, all of them improved their performance during the second time. There is a relationship with age, as the three students who made mistakes were all 9 years old, while the older students did not make any mistakes. In activity 16, seven students aged 9 to 11 made mistakes. Of these, the two with dyslexia made only one mistake and all of them improved their performance the second time. Furthermore, there is a relationship between student performance and age, as the older students did not make any mistakes during the first implementation. Furthermore, students with other types of difficulties, such as A and E, particularly benefited the second time, as their mistakes were significantly reduced.

In activities 17 and 18, the performance of all the participants showed homogeneity. In both activities, there seems to be a relationship between student performance and their age. Student A, who had lower performance in the first implementation of activity 18, has many non-specific difficulties and ADHD, so his performance could be explained by a lack of concentration, although it cannot be ruled out that he did not fully understand the requested teaching objective. The large discrepancy in student performance between activities 19 and 20 is attributed to the presence of a visual aid. Furthermore, in activity 19, the students focused only on the first two or three letters that the teacher pronounced and answered without waiting to hear the remaining phonemes. So, they were completing a lot of "guess the word". In activity 20, in which they had to focus on all the letters of the word, and despite the fact that the words were familiar to them, their performance was significantly lower. Based on the above, the implementation of both activities helped all the students with learning difficulties, with an emphasis on younger students who had initially scored lower performances. The repetition of activity 21 shows that it helped all students without exception, regardless of difficulty and age.

Observing the students' performance in activities 22 and 23, it is concluded that more difficulty is encountered when a student must remove the initial phoneme. This could

be because it is more abstract to imagine how a word starts and pronounce it without the first phoneme (requiring the learner to identify which phoneme is first and mentally remove it). When it comes to removing the final phoneme, the process seems simpler as the student begins to pronounce the word normally as he/she knows it and just focuses on the end being careful not to pronounce the last phoneme (recognition of the final phoneme is not required, only the non-pronunciation of it). All students benefited from these activities regardless of difficulty and age. As student A is the only one who performed lower in activity 23 the second time, a general conclusion cannot be drawn. It is possible that, at that particular moment, he did not put in enough effort, his attention was distracted, or he did not sufficiently understand the cognitive goal.

Based on the students' performance in activities 24 and 25, it seems that they initially understood better how a phoneme is added to the end of the word. Probably, during the implementation of activity 25, they used the "guess the word" technique, as before the teacher finished the task, most of the students answered. For example, what will happen if I put the /ç/ at the end of the word /ελέφαντα/? In this case, even before the pronunciation was completed, the students, especially those in the older classes, answered /ελέφανταç/ as it was a familiar word to them, so they could imagine and pronounce it.

The students made more mistakes in activity 26 (removal of a middle phoneme) than in the activities for initial or final phoneme removal because, in this case, the remaining phonemes do not form a familiar word but a pseudoword. Thus, they could not apply other strategies or techniques to find the correct answer and had to mentally process the phonemes of the word, remove the requested phoneme, and then pronounce the remaining phonemes. Two out of the eight students who repeated the activity had dyslexia and the rest had other difficulties. It seems that older students can more easily process the word and remove the requested phoneme. All the students who repeated the activity performed better regardless of difficulty type.

Activity 27 appeared to be difficult for all students. The highest results were achieved by G* (10 years old). A significant improvement was achieved by students in higher classes who, despite the fact that during the first implementation, they achieved 'very low' performance, significantly reduced the number of their mistakes the second time. In this activity, student must make a conscious effort to answer correctly, as the answers cannot be obtained in an "easy" way. Many students used their fingers to count syllables or phonemes and said them backwards; others tapped their hands on the desk, symbolizing a phoneme with each tap; and others mentally processed the word without using any other senses in order to handle this activity. Students in this last category had the most correct answers. The rest seemed to be greatly helped by the involvement of other senses, as well.

Data obtained from the students' performance in activities 28 and 29 show that placing the letters structured, randomly, or alphabetically did not act as a pressure lever, as mistakes were not made exclusively in one style of placing the letters. Furthermore, several students and especially students of the middle classes have not mastered all the phonemes sufficiently, so one time they may answer correctly in the written recording and pronunciation of the phoneme, while another time fail in the graphophonemic matching. Thus, this may be the reason for the lower performance of B and E. Activity 29 has multisensory elements as the student sees, hears, repeats, and writes the requested phoneme at the same time.

For activity 30, it seems that younger students struggle the most. The older students improved their performance significantly during the second time. Only F needed significantly more time when the consonant was in front of the vowel, which is probably attributed to temporary confusion and not to a lack of the corresponding knowledge since, from the first time of performing the activity, the speed of the responses did not deviate from the average speed of the rest students. During the second time, when the consonant was placed after the vowel, he managed to improve his initial time.

In activity 31, all students made mistakes regardless of difficulty and age. However, the mistakes made by students in higher classes were mainly related to reading and writing words with two-digit vowels /αυ/ and /ευ/. The performance of all students was better

the second time. Writing the requested words, without exception, improved significantly (etymological and suffix type mistakes were not assessed, as the specific tool focuses on learning and distinguishing phonemes and not on correct writing in general) for all students. Activity 32 has multisensory elements as the student sees and reads each word, places a cube to represent it, and writes it simultaneously. Most mistakes in reading and writing were mainly made by younger students regardless of the type of difficulty, which can be explained by the prerequisite that, in order to increase the reading rate and ultimately to automate the reading process, the person must have full knowledge of the letters [26]. This activity seems to have benefited all students regardless of age and type of difficulty.

The current research included a small sample; therefore, general conclusions cannot be drawn. However, it was observed that even dyslexic students of the same age show inhomogeneities in relation to speech processing and their performance in each activity [27]. For example, if two students have dyslexia, it does not necessarily mean that they will have the same learning profile, as each one may have deficits in completely different areas of spoken and written language processing. The specific tool seems to do what it promises, that is, to improve the performance of students, even those who have other types of learning difficulties other than dyslexia. Still, it seems that most of its activities can be utilized and benefit students up to 12 years old and not only younger children 5–10 years old. Students in higher classes made fewer mistakes than the younger ones, yet their performance improved significantly when the activities were repeated. Furthermore, although some activities were initially considered easy by the students, at no point in this research did they show a decrease in effort or boredom. The activities in the Dyslexia Box do not contribute to any innovative approach to dealing with dyslexia, as well-known phonological awareness enhancement techniques are used. However, as they are accumulated and structured, they are easily applicable and can be characterized as a beneficial phonological intervention.

The Dyslexia Box cannot be described as a purely multisensory tool as there are activities that have multisensory elements, such as activity 2 (the student reads and simultaneously places pawns to symbolize the syllables) and activity 14 (the student says the picture/word and then discriminates and categorizes it), but on the other hand, several activities do not involve kinesthetic elements. A method is characterized as a multisensory when it involves multiple sensory pathways at the same time in order to achieve the best learning result, i.e., a student receives, at the same time, audiovisual and kinesthetic experiences [10]. There are activities that help students break the word down into phonemes and reconstruct it, but only few activities aim at graphophonemic matching.

The Dyslexia Box seems to be a useful and economical tool that can be used by educators, special educators, therapists, and parents with good results and without the need for prior specialization of the person providing it. Although the cards for the activities are specific, its systematic use is not boring as the requested tasks change each time.

More research could be performed in Greek Integration Classes to obtain more data in relation to the learning benefits for students with learning and specific learning difficulties. In addition, more research could be performed to find out which age group of students benefit most from using this tool. Moreover, the integration of pseudowords in the Dyslexia Box could be beneficial for the students and is left for future research. Finally, this tool could be translated and modified into other languages so that more research can be performed to obtain comparative data.

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Appendix A

Table A1. Activities 1, 2, 3, and 4.

Groups	Students	Activity 1		Activity 2		Activity 3		Activity 4	
		1st	2nd	1st	2nd	1st	2nd	1st	2nd
1	A	11/12	12/12	12/12	-	24/24	-	12/12	-
	B	10/12	11/12	12/12	-	24/24	-	12/12	-
2	D*	12/12	-	12/12	-	23/24	24/24	10/12	10/12
	E	11/12	12/12	12/12	-	23/24	24/24	12/12	-
3	F	11/12	12/12	10/12	12/12	24/24	-	12/12	-
	G*	12/12	-	11/12	12/12	24/24	-	12/12	-
4	K	9/12	11/12	9/12	11/12	23/24	24/24	10/12	12/12
	L*	12/12	-	12/12	-	24/24	-	12/12	-
5	M*	12/12	-	12/12	-	24/24	-	12/12	-
	N*	11/12	12/12	12/12	-	24/24	-	12/12	-
6	O*	11/12	12/12	12/12	-	24/24	-	12/12	-
	P	10/12	12/12	11/12	12/12	24/24	-	12/12	-
	Q*	12/12	-	11/12	12/12	24/24	-	12/12	-

Cognitive objectives of activities: Activities 1 and 2 involve segmenting word into syllables; activities 3 and 4 involve composing syllables.

Table A2. Activities 5, 6, 7, and 8.

Groups	Students	Activity 5		Activity 6		Activity 7		Activity 8	
		1st	2nd	1st	2nd	1st	2nd	1st	2nd
1	A	5/10	7/10	4/18	7/18	5/9	5/9	7/9	7/9
	B	6/10	9/10	6/18	10/18	9/9	-	7/9	9/9
2	D*	9/10	7/10	3/18	9/18	9/9	-	7/9	9/9
	E	10/10	-	9/18	14/18	9/9	-	7/9	9/9
3	F	10/10	-	10/18	14/18	7/9	9/9	9/9	-
	G*	8/10	10/10	15/18	17/18	9/9	-	9/9	-
4	K	8/10	9/10	4/18	10/18	9/9	-	9/9	-
	L*	10/10	-	12/18	17/18	9/9	-	9/9	-
5	M*	10/10	-	9/18	18/18	7/9	9/9	9/9	-
	N*	9/10	10/10	7/18	15/18	7/9	9/9	9/9	-
6	O*	9/10	10/10	13/18	18/18	9/9	-	6/9	9/9
	P	9/10	10/10	17/18	14/18	9/9	-	7/9	9/9
	Q*	10/10	-	7/18	10/18	9/9	-	7/9	9/9

Cognitive objectives of activities: Activities 5 and 6 involve rhyming comprehension/finding rhyme; activities 7 and 8 involve initial syllable identification/final syllable identification.

Table A3. Activities 9, 10, 11, and 12.

Groups	Students	Activity 9		Activity 10		Activity 11		Activity 12	
		1st	2nd	1st	2nd	1st	2nd	1st	2nd
1	A	6/12	5/12	7/12	9/12	4/12	10/12	12/12	-
	B	12/12	-	8/12	12/12	10/12	11/12	11/12	12/12
2	D*	11/12	12/12	11/12	12/12	12/12	-	10/12	12/12
	E	9/12	12/12	10/12	12/12	12/12	-	12/12	-
3	F	11/12	12/12	9/12	12/12	12/12	-	8/12	12/12
	G*	10/12	12/12	12/12	-	12/12	-	12/12	-
4	K	9/12	11/12	12/12	-	10/12	12/12	12/12	-
	L*	11/12	12/12	11/12	12/12	11/12	12/12	12/12	-
5	M*	11/12	11/12	12/12	-	11/12	11/12	12/12	-
	N*	11/12	12/12	11/12	12/12	11/12	12/12	11/12	12/12
6	O*	9/12	12/12	12/12	-	10/12	11/12	12/12	-
	P	11/12	11/12	12/12	-	10/12	12/12	11/12	12/12
	Q*	10/12	12/12	11/12	12/12	12/12	-	12/12	-

Cognitive objectives of activities: Activities 9 and 10 involve initial syllable subtraction/final syllable subtraction; activities 11 and 12 involve adding initial syllable-adding final syllable.

Table A4. Activities 13, 14, 15, and 16.

Groups	Students	Activity 13		Activity 14		Activity 15		Activity 16	
		1st	2nd	1st	2nd	1st	2nd	1st	2nd
1	A	7/12	11/12	5/9	5/9	5/9	8/9	5/9	8/9
	B	12/12	-	7/9	9/9	6/9	8/9	8/9	9/9
2	D*	9/12	11/12	9/9	-	9/9	-	8/9	9/9
	E	11/12	12/12	9/9	-	7/9	9/9	4/9	9/9
3	F	10/12	12/12	9/9	-	9/9	-	8/9	9/9
	G*	12/12	-	9/9	-	9/9	-	8/9	9/9
4	K	5/12	9/12	9/9	-	9/9	-	7/9	9/9
	L*	11/12	12/12	8/9	8/9	9/9	-	9/9	-
5	M*	12/12	-	9/9	-	9/9	-	9/9	-
	N*	12/12	-	9/9	-	9/9	-	9/9	-
6	O*	12/12	-	9/9	-	9/9	-	9/9	-
	P	11/12	10/12	9/9	-	9/9	-	9/9	-
	Q*	10/12	12/12	7/9	7/9	9/9	-	9/9	-

Cognitive objectives of activities: Activities 13,14, and 15 involve the distinction of the initial phoneme; activity 16 involves the distinction of the final phoneme.

Table A5. Activities 17, 18, 19, and 20.

Groups	Students	Activity 17		Activity 18		Activity 19		Activity 20	
		1st	2nd	1st	2nd	1st	2nd	1st	2nd
1	A	7/9	8/9	7/9	5/9	9/9	-	8/9	8/9
	B	9/9	-	7/9	9/9	8/9	9/9	4/9	9/9
2	D*	5/9	9/9	7/9	9/9	7/9	9/9	4/9	5/9
	E	7/9	9/9	5/9	9/9	8/9	9/9	4/9	9/9
3	F	9/9	-	9/9	-	9/9	-	5/9	9/9
	G*	9/9	-	9/9	-	8/9	9/9	4/9	8/9

Table A5. Cont.

Groups	Students	Activity 17		Activity 18		Activity 19		Activity 20	
		1st	2nd	1st	2nd	1st	2nd	1st	2nd
4	K	9/9	-	9/9	-	9/9	-	7/9	7/9
	L*	9/9	-	7/9	9/9	8/9	9/9	8/9	8/9
5	M*	9/9	-	6/9	-	9/9	-	8/9	9/9
	N*	9/9	-	6/9	-	9/9	-	4/9	9/9
	O*	9/9	-	8/9	8/9	9/9	-	7/9	8/9
6	P	9/9	-	9/9	-	9/9	-	7/9	7/9
	Q*	8/9	9/9	9/9	-	9/9	-	4/9	8/9

Cognitive objectives of activities: Activities 17, 18, 19, and 20 involve the distinction of the final phoneme.

Table A6. Activity 21.

Groups	Students	Level of Difficulty	Activity 21	
			1st	2nd
1	A	1	6/10	10/10
		2	1/10	9/10
		3	3/10	10/10
		4	5/10	5/10
		5	5/10	8/10
		6	2/10	5/10
	B	1	10/10	10/10
		2	10/10	9/10
		3	3/10	6/10
		4	4/10	8/10
		5	4/10	9/10
		6	4/10	5/10
	D*	1	10/10	10/10
		2	8/10	10/10
		3	7/10	10/10
		4	8/10	7/10
		5	8/10	10/10
		6	7/10	10/10
2	E	1	10/10	10/10
		2	10/10	10/10
		3	10/10	10/10
		4	8/10	10/10
		5	9/10	10/10
		6	7/10	9/10
	F	1	10/10	10/10
		2	10/10	10/10
		3	8/10	10/10
		4	5/10	10/10
		5	9/10	10/10
		6	4/10	10/10
3	G*	1	10/10	10/10
		2	10/10	10/10
		3	9/10	10/10
		4	7/10	10/10
		5	8/10	9/10
		6	7/10	9/10

Table A6. Cont.

Groups	Students	Level of Difficulty	Activity 21	
			1st	2nd
4	K	1	9/10	10/10
		2	5/10	10/10
		3	6/10	8/10
		4	5/10	9/10
		5	5/10	10/10
		6	9/10	10/10
	L*	1	10/10	10/10
		2	10/10	10/10
		3	9/10	10/10
		4	10/10	10/10
		5	10/10	9/10
		6	7/10	9/10
5	M*	1	10/10	10/10
		2	10/10	10/10
		3	10/10	10/10
		4	9/10	10/10
		5	8/10	9/10
		6	7/10	9/10
	N*	1	10/10	10/10
		2	9/10	10/10
		3	4/10	10/10
		4	5/10	10/10
		5	5/10	8/10
		6	5/10	7/10
O*	1	10/10	10/10	
	2	10/10	10/10	
	3	10/10	10/10	
	4	7/10	10/10	
	5	8/10	9/10	
	6	10/10	9/10	
6	P	1	10/10	10/10
		2	10/10	10/10
		3	8/10	10/10
		4	2/10	10/10
		5	5/10	10/10
		6	3/10	7/10
	Q*	1	10/10	10/10
		2	5/10	10/10
		3	10/10	10/10
		4	8/10	9/10
		5	8/10	10/10
		6	8/10	10/10

Cognitive objectives of activities: Activity 21 involves breaking down words into phonemes.

Table A7. Activities 22, 23, 24, 25, and 26.

Groups	Students	Activity 22		Activity 23		Activity 24		Activity 25		Activity 26	
		1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
1	A	5/9	6/9	7/9	4/9	32/40	35/40	40/40	-	0/9	7/9
	B	7/9	8/9	8/9	7/9	40/40	-	40/40	-	2/9	6/9
2	D*	4/9	8/9	5/9	8/9	39/40	40/40	38/40	39/40	7/9	9/9
	E	8/9	8/9	8/9	9/9	39/40	40/40	40/40	-	7/9	7/9

Table A7. Cont.

Groups	Students	Activity 22		Activity 23		Activity 24		Activity 25		Activity 26	
		1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
3	F	5/9	9/9	9/9	-	40/40	-	40/40	-	7/9	9/9
	G*	7/9	9/9	9/9	-	40/40	-	40/40	-	9/9	-
4	K	3/9	8/9	7/9	8/9	36/40	37/40	36/40	40/40	8/9	9/9
	L*	9/9	-	9/9	-	40/40	-	39/40	40/40	9/9	-
5	M*	9/9	-	9/9	-	40/40	-	40/40	-	9/9	-
	N*	8/9	7/9	9/9	-	40/40	-	40/40	-	4/9	7/9
	O*	4/9	7/9	7/9	9/9	37/40	40/40	40/40	-	9/9	-
6	P	1/9	9/9	7/9	9/9	32/40	40/40	40/40	-	6/9	8/9
	Q*	9/9	-	9/9	-	36/40	40/40	40/40	-	9/9	-

Cognitive objectives of activities: Activity 22 and 23 involve initial phoneme subtraction/final phoneme subtraction; activity 24, 25, and 26 involve the addition of the initial phoneme/addition of the final phoneme/removing the middle phoneme.

Table A8. Activity 27.

Groups	Students	Level of Difficulty	Activity 27	
			1st	2nd
1	A	1	6/10	9/10
		2	2/10	8/10
		3	0/10	5/10
		4	2/10	3/10
		5	1/10	3/10
		6	0/10	1/10
	B	1	10/10	10/10
		2	5/10	10/10
		3	5/10	10/10
		4	5/10	8/10
		5	9/10	8/10
		6	3/10	8/10
2	D*	1	9/10	9/10
		2	0/10	7/10
		3	3/10	8/10
		4	5/10	6/10
		5	4/10	5/10
		6	8/10	5/10
	E	1	9/10	10/10
		2	9/10	9/10
		3	9/10	9/10
		4	6/10	9/10
		5	10/10	7/10
		6	9/10	8/10
3	F	1	10/10	10/10
		2	10/10	10/10
		3	6/10	10/10
		4	6/10	10/10
		5	7/10	8/10
		6	5/10	9/10
	G*	1	10/10	10/10
		2	10/10	10/10
		3	10/10	10/10
		4	8/10	9/10
		5	9/10	10/10
		6	8/10	10/10

Table A8. Cont.

Groups	Students	Level of Difficulty	Activity 27	
			1st	2nd
4	K	1	8/10	10/10
		2	9/10	10/10
		3	9/10	8/10
		4	7/10	8/10
		5	4/10	4/10
		6	6/10	8/10
	L*	1	9/10	10/10
		2	10/10	10/10
		3	7/10	10/10
		4	9/10	9/10
		5	7/10	7/10
		6	10/10	7/10
5	M*	1	10/10	10/10
		2	10/10	10/10
		3	8/10	9/10
		4	6/10	9/10
		5	10/10	8/10
		6	8/10	9/10
	N*	1	9/10	10/10
		2	10/10	10/10
		3	6/10	10/10
		4	5/10	6/10
		5	3/10	7/10
		6	2/10	5/10
6	O*	1	4/10	10/10
		2	6/10	10/10
		3	9/10	10/10
		4	6/10	10/10
		5	8/10	8/10
		6	8/10	7/10
	P	1	8/10	10/10
		2	6/10	10/10
		3	8/10	10/10
		4	2/10	10/10
		5	2/10	9/10
		6	3/10	7/10
Q*	1	10/10	10/10	
	2	4/10	10/10	
	3	9/10	10/10	
	4	3/10	6/10	
	5	4/10	10/10	
	6	4/10	6/10	

Cognitive objectives of activities: Activity 27 involves reversing phonemes.

Table A9. Activity 28.

Groups	Students	Position of Cards	Activity 28			
			1st	Seconds	2nd	Seconds
1	A	Structured	22/24	31.02	18/24	23.65
		Randomly	24/24	18.56	21/24	21.65
		Alphabetically	22/24	38.87	23/24	19.07
	B	Structured	20/24	22.27	22/24	17.73
		Randomly	24/24	13.77	24/24	12.17

Table A9. Cont.

Groups	Students	Activity 28				
		Position of Cards	1st	Seconds	2nd	Seconds
2	D*	Alphabetically	24/24	11.42	24/24	10.74
		Structured	23/24	15.81	23/24	24.55
		Randomly	24/24	14.85	24/24	14.15
	E	Alphabetically	24/24	14.16	23/24	19.29
		Structured	23/24	19.70	24/24	13.17
		Randomly	22/24	17.47	22/24	18.65
3	F	Alphabetically	24/24	17.58	24/24	12.55
		Structured	24/24	13.80	24/24	14.00
		Randomly	22/24	14.04	24/24	14.21
	G*	Alphabetically	22/24	11.59	24/24	11.25
		Structured	23/24	15.00	24/24	12.33
		Randomly	24/24	11.76	24/24	14.10
4	K	Alphabetically	24/24	12.20	24/24	14.89
		Structured	20/24	23.98	24/24	14.73
		Randomly	23/24	14.78	22/24	12.86
	L*	Alphabetically	24/24	10.68	24/24	12.16
		Structured	24/24	14.19	24/24	13.39
		Randomly	24/24	15.55	24/24	13.54
5	M*	Alphabetically	20/24	17.12	24/24	13.89
		Structured	24/24	9.70	24/24	8.83
		Randomly	24/24	11.07	24/24	8.88
	N*	Alphabetically	24/24	9.17	24/24	9.34
		Structured	23/24	13.23	24/24	11.32
		Randomly	22/24	14.84	24/24	11.19
6	O*	Alphabetically	24/24	10.57	23/24	13.07
		Structured	24/24	12.54	23/24	12.06
		Randomly	24/24	10.46	24/24	10.05
	P	Alphabetically	24/24	9.58	24/24	10.04
		Structured	22/24	18.51	23/24	16.65
		Randomly	22/24	15.24	24/24	12.57
Q*	Alphabetically	22/24	14.95	24/24	16.06	
	Structured	23/24	15.33	24/24	20.27	
	Randomly	24/24	11.49	24/24	11.57	
		Alphabetically	24/24	11.71	24/24	9.62

Cognitive objectives of activities: Activity 28 involves enhancing phonological awareness.

Table A10. Activity 29.

Groups	Students	Activity 29	
		1st	2nd
1	A	18/24	20/24
	B	20/24	19/24
2	D*	20/24	22/24
	E	24/24	17/24
3	F	24/24	-
	G*	23/24	23/24
4	K	24/24	-
	L*	23/24	24/24
5	M*	22/24	22/24
	N*	24/24	-
6	O*	23/24	23/24
	P	22/24	22/24
	Q*	23/24	23/24

Cognitive objectives of activities: Activity 29 involves enhancing phonological awareness.

Table A11. Activity 30.

Groups	Students	Activity 30						
		Position of Cards	1st	Seconds	In Writing	2nd	Seconds	In Writing
1	A	Consonant ahead	10/13	58.20	8/13	6/13	47.79	6/13
		Consonant behind	8/13	30.53	8/13	8/13	24.29	6/13
	B	Consonant ahead	11/13	25.23	11/13	13/13	19.07	13/13
		Consonant behind	13/13	30.14	13/13	12/13	20.90	13/13
2	D*	Consonant ahead	10/13	25.25	13/13	11/13	26.27	13/13
		Consonant behind	11/13	25.25	11/13	10/13	25.36	13/13
	E	Consonant ahead	4/13	37.81	13/13	13/13	17.27	13/13
		Consonant behind	13/13	21.89	13/13	13/13	20.46	13/13
3	F	Consonant ahead	13/13	20.45	11/13	11/13	40.49	13/13
		Consonant behind	13/13	23.16	13/13	13/13	16.69	13/13
	G*	Consonant ahead	13/13	17.00	13/13	13/13	19.00	13/13
		Consonant behind	13/13	19.34	12/13	13/13	16.79	13/13
4	K	Consonant ahead	12/13	33.36	12/13	13/13	13.86	13/13
		Consonant behind	10/13	36.02	12/13	12/13	15.46	13/13
	L*	Consonant ahead	13/13	20.27	13/13	13/13	14.13	13/13
		Consonant behind	13/13	27.59	13/13	13/13	21.35	13/13
5	M*	Consonant ahead	13/13	19.55	13/13	13/13	16.89	13/13
		Consonant behind	11/13	21.47	13/13	13/13	14.34	13/13
	N*	Consonant ahead	13/13	19.16	13/13	13/13	15.48	13/13
		Consonant behind	12/13	23.73	13/13	13/13	14.67	13/13
	O*	Consonant ahead	10/13	18.00	11/13	11/13	18.54	13/13
		Consonant behind	10/13	20.94	11/13	12/13	16.22	13/13
6	P	Consonant ahead	13/13	16.56	13/13	13/13	14.80	13/13
		Consonant behind	13/13	20.21	13/13	13/13	17.36	13/13
	Q*	Consonant ahead	11/13	19.67	13/13	13/13	14.46	13/13
		Consonant behind	13/13	20.14	13/13	13/13	15.18	13/13

Cognitive objectives of activities: Activity 30 involves improving reading skill.

Table A12. Activity 31.

Groups	Students	Activity 31							
		Pile of Cards	Type of Word	1st from Top to Bottom	1st from Bottom to Top	1st in Writing	2nd from Top to Bottom	2nd from Bottom to Top	2nd in Writing
1	A	i	C-V	8/10	9/10	10/10*	10/10	8/10	-*
			V-C-V	6/10	8/10	10/10*	8/10	9/10	-*
			C-V-C-V	6/10	5/10	9/10*	8/10	9/10	10/10*
			C-V-C-V-C	5/10	5/10	9/10*	7/10	9/10	10/10*
			V-C-V-C-V	7/10	6/10	8/10*	8/10	8/10	9/10*
			C-V-C-V-C-V	8/10	7/10	5/10*	9/10	9/10	7/10*
			V-C-V-C-V-C	2/10	5/10	8/10*	5/10	5/10	10/10*
			C-V-C-V-C-V-C	7/10	5/10	7/10*	4/10	4/10	7/10*
			Polysyllabic	6/10	7/10	7/10*	10/10	10/10	10/10*
			2 consonant clusters	7/10	6/10	7/10*	6/10	7/10	10/10*
			3 consonant clusters	3/10	5/10	7/10*	9/10	9/10	8/10*
			Consonant with 2 letters	7/10	8/10	4/10*	9/10	9/10	4/10*

Table A12. Cont.

Groups	Students	Pile of Cards	Type of Word	Activity 31					
				1st from Top to Bottom	1st from Bottom to Top	1st in Writing	2nd from Top to Bottom	2nd from Bottom to Top	2nd in Writing
2	B	ii	Vowels with 2 letters	6/10	9/10	3/10*	9/10	9/10	3/10*
			/af/-/av/ and /ef/-/ev/	2/10	8/10	1/10*	4/10	5/10	1/10*
			C-V	10/10	10/10	10/10*	10/10	10/10	-*
			V-C-V	10/10	9/10	10/10*	8/10	10/10	-*
			C-V-C-V	10/10	10/10	10/10*	10/10	10/10	-*
			C-V-C-V-C	3/10	9/10	9/10*	10/10	10/10	10/10*
			V-C-V-C-V	7/10	9/10	9/10*	9/10	10/10	10/10*
			C-V-C-V-C-V	7/10	8/10	9/10*	8/10	10/10	10/10*
			V-C-V-C-V-C	8/10	9/10	8/10*	9/10	9/10	9/10*
			C-V-C-V-C-V-C	6/10	4/10	6/10*	7/10	8/10	8/10*
			Polysyllabic	7/10	7/10	8/10*	7/10	8/10	8/10*
			2 consonant clusters	6/10	7/10	8/10*	7/10	8/10	8/10*
			3 consonant clusters	3/10	6/10	2/10*	5/10	6/10	6/10*
			Consonant with 2 letters	3/10	6/10	3/10*	6/10	3/10	4/10*
	D*	ii	Vowels with 2 letters	5/10	3/10	1/10*	8/10	1/10	1/10*
			/af/-/av/ and /ef/-/ev/	9/10	8/10	0/10	7/10	8/10	8/10*
			C-V	7/10	8/10	10/10*	9/10	8/10	-*
			V-C-V	6/10	9/10	9/10*	7/10	9/10	10/10*
			C-V-C-V	9/10	10/10	9/10*	9/10	9/10	10/10*
			C-V-C-V-C	10/10	7/10	10/10*	8/10	10/10	-*
			V-C-V-C-V	7/10	7/10	8/10*	7/10	7/10	9/10*
			C-V-C-V-C-V	9/10	9/10	9/10*	9/10	10/10	9/10*
			V-C-V-C-V-C	6/10	7/10	8/10*	7/10	6/10	9/10*
			C-V-C-V-C-V-C	6/10	7/10	10/10*	7/10	9/10	-*
			Polysyllabic	7/10	9/10	8/10*	7/10	9/10	10/10*
			2 consonant clusters	4/10	8/10	6/10*	6/10	7/10	9/10*
E	i	3 consonant clusters	7/10	6/10	5/10*	7/10	9/10	6/10*	
		Consonant with 2 letters	7/10	8/10	7/10*	9/10	9/10	8/10*	
		Vowels with 2 letters	8/10	9/10	3/10*	9/10	10/10	3/10*	
		/af/-/av/ and /ef/-/ev/	7/10	8/10	7/10*	7/10	8/10	7/10*	
		C-V	9/10	9/10	8/10*	9/10	9/10	10/10*	
		V-C-V	9/10	9/10	10/10*	10/10	10/10	-*	
		C-V-C-V	7/10	6/10	10/10*	6/10	7/10	-*	
		C-V-C-V-C	6/10	6/10	10/10*	8/10	8/10	-*	
		V-C-V-C-V	6/10	6/10	10/10*	8/10	7/10	-*	
		C-V-C-V-C-V	8/10	8/10	8/10*	8/10	8/10	10/10*	
		V-C-V-C-V-C	9/10	8/10	9/10*	10/10	8/10	10/10*	
		C-V-C-V-C-V-C	8/10	8/10	10/10*	8/10	9/10	-*	
		Polysyllabic	9/10	10/10	9/10*	9/10	10/10	10/10*	
		2 consonant clusters	5/10	8/10	8/10*	6/10	9/10	10/10*	

Table A12. Cont.

Groups	Students	Pile of Cards	Activity 31						
			Type of Word	1st from Top to Bottom	1st from Bottom to Top	1st in Writing	2nd from Top to Bottom	2nd from Bottom to Top	2nd in Writing
3	F	ii	3 consonant clusters	7/10	8/10	7/10*	7/10	9/10	8/10*
			Consonant with 2 letters	7/10	8/10	8/10*	10/10	9/10	10/10*
			Vowels with 2 letters	9/10	8/10	4/10*	9/10	9/10	5/10*
			/af/-/av/ and /ef/-/ev/	8/10	9/10	6/10*	8/10	9/10	9/10*
			C-V	10/10	10/10	9/10*	10/10	10/10	10/10*
			V-C-V	6/10	8/10	10/10*	8/10	10/10	10/10*
			C-V-C-V	10/10	9/10	9/10*	10/10	9/10	10/10*
			C-V-C-V-C	9/10	9/10	10/10*	9/10	10/10	10/10*
			V-C-V-C-V	9/10	9/10	10/10*	10/10	10/10	10/10*
			C-V-C-V-C-V	10/10	10/10	9/10*	10/10	9/10	10/10*
			V-C-V-C-V-C	4/10	8/10	8/10*	7/10	7/10	10/10*
			C-V-C-V-C-V-C	7/10	8/10	8/10*	9/10	9/10	10/10*
			Polysyllabic	7/10	8/10	10/10*	9/10	10/10	10/10*
			2 consonant clusters	8/10	10/10	10/10*	9/10	10/10	10/10*
	3 consonant clusters	6/10	10/10	6/10*	9/10	10/10	10/10*		
	Consonant with 2 letters	6/10	8/10	9/10*	7/10	8/10	10/10*		
	Vowels with 2 letters	9/10	8/10	2/10*	8/10	8/10	5/10*		
	/af/-/av/ and /ef/-/ev/	7/10	8/10	9/10*	10/10	10/10	10/10*		
	G*	i	C-V	8/10	8/10	9/10*	8/10	9/10	10/10*
			V-C-V	8/10	9/10	10/10*	9/10	10/10	-*
			C-V-C-V	7/10	8/10	10/10*	9/10	7/10	-*
			C-V-C-V-C	8/10	8/10	10/10*	8/10	8/10	-*
			V-C-V-C-V	6/10	7/10	10/10*	6/10	8/10	-*
			C-V-C-V-C-V	9/10	9/10	7/10*	7/10	8/10	10/10*
			V-C-V-C-V-C	7/10	8/10	10/10*	7/10	8/10	-*
			C-V-C-V-C-V-C	8/10	8/10	9/10*	8/10	9/10	10/10*
			Polysyllabic	6/10	7/10	10/10*	7/10	7/10	-*
			2 consonant clusters	8/10	7/10	10/10*	9/10	9/10	-*
3 consonant clusters			6/10	8/10	7/10*	8/10	9/10	8/10*	
Consonant with 2 letters			7/10	10/10	8/10*	7/10	10/10	8/10*	
Vowels with 2 letters			6/10	9/10	5/10*	8/10	10/10	5/10*	
/af/-/av/ and /ef/-/ev/			5/10	5/10	5/10*	7/10	7/10	8/10*	
4	K	i	C-V	10/10	9/10	10/10*	10/10	10/10	-
			V-C-V	8/10	8/10	10/10*	9/10	8/10	-
			C-V-C-V	8/10	9/10	10/10*	10/10	9/10	-
			C-V-C-V-C	7/10	6/10	9/10*	9/10	9/10	10/10*
			V-C-V-C-V	7/10	7/10	10/10*	7/10	7/10	-
			C-V-C-V-C-V	9/10	8/10	7/10*	8/10	9/10	10/10*
			V-C-V-C-V-C	5/10	7/10	9/10*	7/10	6/10	9/10*
			C-V-C-V-C-V-C	7/10	7/10	9/10*	5/10	7/10	10/10*

Table A12. Cont.

Groups	Students	Pile of Cards	Type of Word	Activity 31					
				1st from Top to Bottom	1st from Bottom to Top	1st in Writing	2nd from Top to Bottom	2nd from Bottom to Top	2nd in Writing
5	L*	i	Polysyllabic	10/10	10/10	8/10*	10/10	9/10	10/10*
			2 consonant clusters	6/10	6/10	2/10*	9/10	8/10	8/10*
			3 consonant clusters	6/10	5/10	0/10*	6/10	8/10	3/10*
			Consonant with 2 letters	9/10	10/10	6/10*	10/10	9/10	9/10*
			Vowels with 2 letters	10/10	10/10	5/10*	10/10	10/10	8/10*
			/af/-/av/ and /ef/-/ev/	8/10	5/10	1/10*	8/10	8/10	7/10*
			C-V	9/10	8/10	10/10*	10/10	10/10	-*
			V-C-V	7/10	7/10	10/10*	10/10	9/10	-*
			C-V-C-V	8/10	8/10	10/10*	10/10	10/10	-*
			C-V-C-V-C	9/10	9/10	10/10*	8/10	10/10	-*
			V-C-V-C-V	9/10	9/10	10/10*	9/10	8/10	-*
			C-V-C-V-C-V	10/10	10/10	10/10*	10/10	9/10	-*
			V-C-V-C-V-C	8/10	10/10	8/10*	10/10	10/10	10/10*
			C-V-C-V-C-V-C	7/10	8/10	9/10*	10/10	10/10	10//10*
			Polysyllabic	7/10	9/10	10/10*	7/10	9/10	-*
	2 consonant clusters	10/10	8/10	10/10*	10/10	10/10	-*		
	3 consonant clusters	8/10	8/10	6/10*	9/10	10/10	10/10*		
	Consonant with 2 letters	10/10	9/10	9/10*	9/10	10/10	10/10*		
	Vowels with 2 letters	10/10	10/10	4/10*	10/10	10/10	7/10*		
	/af/-/av/ and /ef/-/ev/	8/10	8/10	6/10*	10/10	10/10	7/10*		
	C-V	9/10	10/10	10/10*	9/10	10/10	-*		
	V-C-V	9/10	9/10	10/10*	10/10	10/10	-*		
	C-V-C-V	10/10	9/10	10/10*	10/10	10/10	-*		
	C-V-C-V-C	8/10	9/10	9/10*	9/10	9/10	10/10*		
	V-C-V-C-V	7/10	8/10	10/10*	8/10	9/10	-*		
	C-V-C-V-C-V	10/10	10/10	10/10*	10/10	10/10	-*		
	V-C-V-C-V-C	8/10	9/10	10/10*	9/10	10/10	-*		
	C-V-C-V-C-V-C	10/10	10/10	10/10*	10/10	10/10	-*		
	Polysyllabic	10/10	10/10	10/10*	10/10	10/10	-*		
	2 consonant clusters	9/10	10/10	7/10*	10/10	10/10	9/10*		
3 consonant clusters	8/10	8/10	7/10*	9/10	10/10	10/10*			
Consonant with 2 letters	9/10	10/10	5/10*	10/10	10/10	9/10*			
Vowels with 2 letters	10/10	10/10	3/10*	10/10	10/10	7/10*			
/af/-/av/ and /ef/-/ev/	9/10	9/10	8/10*	9/10	9/10	9/10*			
C-V	9/10	9/10	10/10*	10/10	10/10	-*			
V-C-V	8/10	8/10	10/10*	9/10	9/10	-*			
C-V-C-V	8/10	5/10	10/10*	8/10	7/10	-*			
C-V-C-V-C	7/10	9/10	9/10*	9/10	9/10	10/10*			
V-C-V-C-V	6/10	8/10	10/10*	10/10	10/10	-*			

Table A12. Cont.

		Activity 31							
Groups	Students	Pile of Cards	Type of Word	1st from Top to Bottom	1st from Bottom to Top	1st in Writing	2nd from Top to Bottom	2nd from Bottom to Top	2nd in Writing
6	O*	i	C-V-C-V-C-V	7/10	9/10	10/10*	10/10	8/10	-*
			V-C-V-C-V-C	6/10	7/10	10/10*	6/10	8/10	-*
			C-V-C-V-C-V-C	8/10	8/10	10/10*	9/10	9/10	-*
			Polysyllabic	8/10	8/10	10/10*	8/10	7/10	-*
			2 consonant clusters	5/10	7/10	10/10*	10/10	9/10	-*
			3 consonant clusters	7/10	9/10	8/10*	9/10	9/10	8/10*
			Consonant with 2 letters	6/10	7/10	6/10*	9/10	9/10	10/10*
			Vowels with 2 letters	9/10	10/10	5/10*	10/10	10/10	10/10*
			/af/-/av/ and /ef/-/ev/	5/10	8/10	4/10*	9/10	9/10	10/10*
			C-V	9/10	8/10	10/10*	9/10	10/10	-*
			V-C-V	7/10	7/10	10/10*	8/10	8/10	-*
			C-V-C-V	8/10	8/10	10/10*	8/10	8/10	-*
			C-V-C-V-C	7/10	9/10	10/10*	8/10	8/10	-*
			V-C-V-C-V	7/10	9/10	9/10*	7/10	7/10	10/10*
			C-V-C-V-C-V	10/10	10/10	10/10*	10/10	10/10	-*
			V-C-V-C-V-C	7/10	8/10	8/10*	6/10	8/10	10/10*
			C-V-C-V-C-V-C	7/10	8/10	10/10*	8/10	10/10	-*
			Polysyllabic	9/10	9/10	10/10*	9/10	10/10	-*
	2 consonant clusters	7/10	8/10	10/10*	7/10	8/10	-*		
	3 consonant clusters	5/10	7/10	6/10*	8/10	9/10	10/10*		
	Consonant with 2 letters	8/10	9/10	9/10*	9/10	10/10	10/10*		
	Vowels with 2 letters	6/10	8/10	4/10*	9/10	9/10	7/10*		
	/af/-/av/ and /ef/-/ev/	7/10	7/10	7/10*	9/10	8/10	7/10*		
	C-V	10/10	10/10	10/10*	10/10	10/10	-*		
	V-C-V	5/10	6/10	10/10*	8/10	8/10	-*		
	C-V-C-V	8/10	9/10	10/10*	10/10	10/10	-*		
	C-V-C-V-C	9/10	9/10	3/10*	9/10	9/10	10/10*		
	V-C-V-C-V	7/10	6/10	9/10*	9/10	10/10	10/10*		
	C-V-C-V-C-V	6/10	8/10	10/10*	9/10	9/10	-*		
	V-C-V-C-V-C	7/10	8/10	6/10*	7/10	7/10	10/10*		
	C-V-C-V-C-V-C	6/10	5/10	7/10*	6/10	8/10	9/10*		
	Polysyllabic	7/10	7/10	8/10*	8/10	10/10	9/10*		
	2 consonant clusters	3/10	7/10	9/10*	7/10	7/10	9/10*		
	3 consonant clusters	4/10	5/10	6/10*	7/10	9/10	8/10*		
	Consonant with 2 letters	6/10	8/10	6/10*	7/10	8/10	6/10*		
	Vowels with 2 letters	7/10	8/10	0/10*	9/10	8/10	1/10*		
/af/-/av/ and /ef/-/ev/	5/10	7/10	5/10*	8/10	9/10	8/10*			
C-V	9/10	9/10	10/10*	10/10	10/10	-*			
		ii							

Table A12. Cont.

Groups	Students	Pile of Cards	Type of Word	Activity 31					
				1st from Top to Bottom	1st from Bottom to Top	1st in Writing	2nd from Top to Bottom	2nd from Bottom to Top	2nd in Writing
			V-C-V	8/10	8/10	10/10*	7/10	9/10	-*
			C-V-C-V	8/10	5/10	10/10*	10/10	10/10	-*
			C-V-C-V-C	7/10	9/10	10/10*	10/10	10/10	-*
			V-C-V-C-V	6/10	8/10	10/10*	10/10	10/10	-*
			C-V-C-V-C-V	7/10	9/10	10/10*	10/10	10/10	-*
			V-C-V-C-V-C	6/10	7/10	10/10*	8/10	8/10	-*
			C-V-C-V-C-V-C	8/10	8/10	9/10*	8/10	10/10	10/10*
	Q*		Polysyllabic	8/10	8/10	10/10*	9/10	9/10	-*
			2 consonant clusters	5/10	7/10	9/10*	7/10	10/10	10/10*
			3 consonant clusters	7/10	9/10	9/10*	9/10	10/10	10/10*
			Consonant with 2 letters	6/10	7/10	6/10*	8/10	7/10	7/10*
			Vowels with 2 letters	9/10	10/10	3/10*	10/10	10/10	6/10*
			/af/-/av/ and /ef/-/ev/	5/10	9/10	4/10*	8/10	10/10	9/10*

Cognitive objectives of activities: Activity 31 involves improving reading skill.

Table A13. Activity 32.

Groups	Students	Group of Cards	Number of Cards	Activity 32			
				1st	In Writing	2nd	In Writing
1	A	i	i1	1/1		1/1	
			i2	2/2		2/2	
			i3	3/3	2/5	1/3	3/5
			i4	3/4		2/4	
			i5	3/5		4/5	
		ii	ii1	1/1		1/1	
			ii2	2/2		2/2	
			ii3	3/3	0/5	2/3	1/5
			ii4	4/4		4/4	
			ii5	5/5		4/5	
	iii	iii1	1/1		1/1		
		iii2	2/2		2/2		
		iii3	3/3	2/5	3/3	3/5	
		iii4	4/4		4/4		
		iii5	5/5		5/5		
	B	i	i1	1/1		1/1	
			i2	2/2		2/2	
			i3	3/3	2/5	3/3	3/5
			i4	4/4		4/4	
			i5	5/5		5/5	
ii		ii1	1/1		1/1		
		ii2	2/2		2/2		
		ii3	2/3	3/5	3/3	4/5	
		ii4	4/4		4/4		
		ii5	5/5		5/5		

Table A13. Cont.

Groups	Students	Activity 32					
		Group of Cards	Number of Cards	1st	In Writing	2nd	In Writing
2	D*	iii	iii1	1/1		1/1	
			iii2	2/2		2/2	
			iii3	3/3	2/5	3/3	3/5
			iii4	4/4		4/4	
			iii5	5/5		5/5	
		i	i1	1/1		1/1	
			i2	2/2		2/2	
			i3	2/3	3/5	3/3	4/5
			i4	4/4		4/4	
			i5	5/5		5/5	
	ii	ii1	1/1		1/1		
		ii2	2/2		2/2		
		ii3	3/3	4/5	2/3	4/5	
		ii4	4/4		4/4		
		ii5	5/5		5/5		
	E	iii	iii1	1/1		0/1	
			iii2	2/2		2/2	
			iii3	2/3	1/5	3/3	5/5
			iii4	4/4		4/4	
			iii5	4/5		5/5	
i		i1	1/1		1/1		
		i2	2/2		2/2		
		i3	3/3	5/5	3/3	5/5	
		i4	4/4		4/4		
		i5	5/5		5/5		
F	ii	ii1	1/1		1/1		
		ii2	2/2		2/2		
		ii3	3/3	5/5	3/3	5/5	
		ii4	4/4		4/4		
		ii5	5/5		5/5		
	iii	iii1	1/1		1/1		
		iii2	2/2		2/2		
		iii3	3/3	4/5	3/3	3/5	
		iii4	4/4		4/4		
		iii5	5/5		5/5		
3	i	i1	1/1		1/1		
		i2	2/2		2/2		
		i3	3/3	5/5	3/3	5/5	
		i4	4/4		4/4		
		i5	5/5		5/5		
	ii	ii1	1/1		1/1		
		ii2	2/2		2/2		
		ii3	3/3	4/5	3/3	3/5	
		ii4	4/4		4/4		
		ii5	5/5		5/5		
iii	iii1	1/1		1/1			
	iii2	2/2		2/2			
	iii3	3/3	4/5	3/3	4/5		
	iii4	4/4		4/4			
	iii5	5/5		5/5			
i	i1	1/1		1/1			
	i2	2/2		2/2			
	i3	3/3	5/5	3/3	5/5		
	i4	4/4		4/4			
	i5	5/5		5/5			

Table A13. Cont.

Groups	Students	Activity 32					
		Group of Cards	Number of Cards	1st	In Writing	2nd	In Writing
4	G*	ii	ii1	1/1		1/1	
			ii2	2/2		2/2	
			ii3	3/3	3/5	3/3	4/5
			ii4	4/4		4/4	
			ii5	5/5		5/5	
		iii	iii1	1/1		1/1	
			iii2	2/2		2/2	
			iii3	3/3	3/5	3/3	4/5
			iii4	4/4		4/4	
			iii5	5/5		5/5	
	K	i	i1	1/1		1/1	
			i2	2/2		2/2	
			i3	3/3	3/5	3/3	5/5
			i4	4/4		4/4	
			i5	5/5		5/5	
		ii	ii1	1/1		1/1	
			ii2	2/2		2/2	
			ii3	3/3	3/5	3/3	4/5
			ii4	4/4		4/4	
			ii5	5/5		5/5	
L*	iii	iii1	1/1		1/1		
		iii2	2/2		2/2		
		iii3	3/3	3/5	3/3	5/5	
		iii4	4/4		4/4		
		iii5	5/5		5/5		
	i	i1	1/1		1/1		
		i2	2/2		2/2		
		i3	3/3	5/5	3/3		
		i4	4/4		4/4		
		i5	5/5		5/5		
M*	ii	ii1	1/1		1/1		
		ii2	2/2		2/2		
		ii3	3/3	4/5	3/3		
		ii4	4/4		4/4		
		ii5	5/5		5/5		
	iii	iii1	1/1		1/1		
		iii2	2/2		2/2		
		iii3	3/3	5/5	3/3		
		iii4	4/4		4/4		
		iii5	5/5		5/5		
5	i	i1	1/1		1/1		
		i2	2/2		2/2		
		i3	3/3	5/5	3/3		
		i4	4/4		4/4		
		i5	5/5		5/5		
	ii	ii1	1/1		1/1		
		ii2	2/2		2/2		
		ii3	3/3	4/5	3/3		
		ii4	4/4		4/4		
		ii5	5/5		5/5		
iii	iii1	1/1		1/1			
	iii2	2/2		2/2			
	iii3	3/3	5/5	3/3			
	iii4	4/4		4/4			
	iii5	5/5		5/5			

Table A13. Cont.

Groups	Students	Activity 32					
		Group of Cards	Number of Cards	1st	In Writing	2nd	In Writing
6	N*	i	i1	1/1		1/1	
			i2	2/2		2/2	
			i3	3/3	1/5	3/3	
			i4	4/4		4/4	
			i5	5/5		5/5	
		ii	ii1	1/1		1/1	
			ii2	2/2		2/2	
			ii3	3/3	4/5	3/3	
			ii4	4/4		4/4	
			ii5	5/5		5/5	
		iii	iii1	1/1		1/1	
			iii2	2/2		2/2	
			iii3	3/3	4/5	3/3	
			iii4	4/4		4/4	
			iii5	5/5		5/5	
	O*	i	i1	1/1		1/1	
			i2	2/2		2/2	
			i3	3/3	3/5	3/3	
			i4	4/4		4/4	
			i5	5/5		5/5	
		ii	ii1	1/1		1/1	
			ii2	1/2		1/2	
			ii3	3/3	3/5	3/3	
			ii4	4/4		4/4	
			ii5	5/5		5/5	
		iii	iii1	1/1		1/1	
			iii2	2/2		2/2	
			iii3	3/3	3/5	3/3	
			iii4	4/4		4/4	
			iii5	5/5		5/5	
P	i	i1	1/1		1/1		
		i2	2/2		2/2		
		i3	3/3	4/5	3/3		
		i4	4/4		4/4		
		i5	5/5		4/5		
	ii	ii1	1/1		1/1		
		ii2	2/2		2/2		
		ii3	3/3	4/5	3/3		
		ii4	4/4		4/4		
		ii5	5/5		5/5		
	iii	iii1	1/1		1/1		
		iii2	2/2		2/2		
		iii3	3/3	3/5	3/3		
		iii4	4/4		4/4		
		iii5	5/5		5/5		
Q*	i	i1	1/1		1/1		
		i2	2/2		2/2		
		i3	3/3	5/5	3/3		
		i4	4/4		4/4		
		i5	5/5		5/5		
	ii	ii1	1/1		1/1		
		ii2	2/2		2/2		
		ii3	3/3	5/5	3/3		
		ii4	4/4		4/4		
		ii5	5/5		5/5		

Table A13. Cont.

Groups	Students	Activity 32					
		Group of Cards	Number of Cards	1st	In Writing	2nd	In Writing
			iii1	1/1		1/1	
			iii2	2/2		2/2	
		iii	iii3	3/3	5/5	3/3	
			iii4	4/4		4/4	
			iii5	5/5		5/5	

Cognitive objectives of activities: Activity 32 involves improving reading and writing skills.

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