



MULTILINGUAL ACADEMIC JOURNAL OF EDUCATION AND SOCIAL SCIENCES



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To Link this Article: <http://dx.doi.org/10.46886/MAJESS/v5-i1/2427>

DOI: 10.46886/MAJESS/v5-i1/2427

Received: 04 June 2017, **Revised:** 08 July 2017, **Accepted:** 07 September 2017

Published Online: 13 October 2017

In-Text Citation: (Avloniti et al., 2017)

To Cite this Article: Avloniti, O., Zafiri, M., & Pliogou, V. (2017). Early Detection of Dyslexia in the First Grade of Primary School. *Multilingual Academic Journal of Education and Social Sciences*, 5(1), 29–43.

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Vol. 5, No. 1, 2017, Pg. 29 - 43

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Early Detection of Dyslexia in the First Grade of Primary School

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Abstract

The countervailing role of early detection and intervention for dyslexia has been particularly highlighted recently. The aim of this paper is to examine the attitude of teachers, on the island of Corfu, concerning the detection of dyslexia in the first grade of primary school through the teaching of First Reading and Writing Skills. We applied the quantitative approach. Questionnaires were used to explore the views of teachers, regarding teaching tools and their application in the teaching of First Reading and Writing Skills. Teachers' knowledge regarding issues, dealing with language teaching as well as their knowledge on Dyslexia was also examined. The results concerning the early detection of dyslexia were positive, as was teachers' knowledge on literacy issues. Nevertheless, all teaching tools were considered mediocre. At last, teachers' participation in training programs and postgraduate studies on relevant issues was moderate, although their attitude to training was positive.

Keywords: Dyslexia, Early Identification, First Grade, Language Teaching, Teachers.

Introduction

Reading and writing are two of the most important social skills in modern society. Nowadays children's right to education and thus reading and writing has been established by international organizations such as UNESCO, the OECD, the European Union and all the democratic nations of the world, which take action to combat illiteracy, which in 2013 swept over 796 million people (World Literacy Foundation, 2013).

Given the importance of reading, in connection with the fact that reading difficulties constitute the leading cause of school failure (International Dyslexia Association, 2010), during the last decades, researchers have focused their attention upon the development and understanding of teaching reading, as well as the problems which are associated with it, such as dyslexia (Moats, 2009). This paper will probe into the knowledge, which teachers should have concerning first reading and writing skills, as well as grapheme-phoneme correlations, which students ought to be taught (Borg, 2003; Bos & Babur, 2001; Crandall, 2000; Freeman & Johnson, 2012; Goswami & Bryant, 1999).

Regarding the educational policy at an international level, we see that special emphasis has been placed on literacy programs, such as the U.S. No Child Left Behind Act (2001). Furthermore, research data shows that early detection and intervention alleviates the signs of reading difficulties or dyslexia, thus leading to a need for high quality instruction for students (Torgesen, 2004).

A major step which should be taken by the Greek Educational System is to map the needs of Greek teachers, as to what they already know and what they should still learn, thus obliging the state to create target training programs. Therefore, considering the aforementioned and perceiving the key role played by teachers in the teaching of reading and writing skills, the researchers will identify the positive or negative impact of teaching practices on students with reading difficulties and the significant role of dyslexia screening and early childhood intervention.

The research was conducted on the island of Corfu, which is an area of enormous research interest, because according to studies (Katsikas & Stafrinadis, 2001) in the last decade, Corfu is one of the prefectures of Greece with the highest dropout rates in the field of compulsory education, followed by failure in attending higher education (Kavadias & Raptis, 2005). Additionally, the economic activities on the island, which focus upon the tourism business and upon making a quick profit, act as an inhibitory factor on the education of young people (Institute for Youth, 2008). This leads to the conclusion that tourism regions such as Corfu make an interesting research study concerning school failure.

Defining Dyslexia

Dyslexia is a specific learning disability; therefore, it is a disorder that manifests itself in the non-acquisition of reading and writing and dysgraphia skills, despite the normal mental and psychological level of the individual (Shaywitz & Shaywitz, 2005). According to the definition, given by the International Dyslexia Association in 2003, "Dyslexia is a specific learning disability which is neurological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can

impede the growth of vocabulary and background knowledge" (Reid-Lyon et al, 2003:2).

The Etiology of Dyslexia

There have been various assumptions concerning the etiology of dyslexia. More specifically, theories deriving from the medical field support the heritability and the genetic nature of dyslexia (Peterson & Pennington, 2012; Stanovich, 1994; Scerri & Schulte-Körne, 2009) and consider dyslexia a neuro-developmental syndrome.

Literature review (Ramus et al, 2003; Snowling, 2000; Wagner & Torgesen, 1987; Shaywitz, 2003; Ziegler & Goswami, 2005) highlights poor phonological processing as the main cause of dyslexia. More particularly, many researchers suggest that poor phonological awareness is the main risk factor of dyslexia and reading difficulties. The aforementioned studies as well as the study conducted by Joshi et al (2009) have probed into the relationship between dyslexia and adverse environmental factors, such as the use of ineffective teaching methods and teachers reduced knowledge concerning the structure of language, as well as the absence of individualized instruction.

The Importance of Early Detection

In the case of dyslexia, there has been a shift towards prevention through early detection and intervention (Cakiroglu, 2015). For this reason, early detection of dyslexia is considered a key objective among students, parents and teachers. More specifically, with regard to reading difficulties two main areas of interest have been identified, firstly, early detection and intervention for students with reading difficulties or for those in "high risk" (low socio-economic level) counteract the diagnosis of learning disabilities (Fletcher et al, 2007; McCutchen et al, 2002). Secondly, if the diagnosis is not "locked" by the first class of primary school, then elementary reading difficulties will accompany the student for life (Torgesen, 1998), as intervention at an older age is more difficult (Torgesen et al, 2001). Vellutino et al (1996) demonstrated that early detection and systematic teaching helped students to catch up and improve on their first reading and writing skills.

The Teaching of First Reading and Writing Skills

In contrast to the spoken language, which is acquired by youngsters automatically, reading and writing require systematic teaching in order for the child to gain a positive attitude towards literacy. Although there are many methods of teaching, this study focuses upon those that are applied to the Greek Educational System.

The Curriculum

The Curriculum, introduced by the Greek state, portrays the level of the institutional framework of the particular educational system. This Curriculum acts as a "compass" for teachers guiding them in their teaching process. The modern curriculum is an "action plan" involving the general and specific objectives of each course, the strategies used to achieve them and the methods, which are used to assess students (Gerogiannis & Bouras, 2007).

The Language Curriculum

The Language Curriculum consists of three subsections: goals, themes and pilot activities. The

content consists of the following learning domains: Speaking, Reading and Writing, Literature, Grammar and Information Management. The program is characterized by its target-based approach. On the one hand, the program leads to the prevalence of a technocratic stance in education and a fragmentation of the holistic approach to language teaching and its globalization in teaching (Stogiannidis, 2013). On the other hand, it contributes to the consistency of the curriculum, as it clearly describes the cognitive skills and knowledge which it seeks to develop through the application of a particular course (Nynan, 1991; Seedhouse, 1999; Ministry of Education and Life Long Learning, 2011).

The aim of the Greek Curriculum is to teach language through a communicative approach to language teaching. Students are encouraged to develop their creative control of the spoken and written language in order to "*actively participate in the classroom and in the society as whole*" (Ministry of Education and Life Long Learning, 2003:14).

In terms of language teaching in the first grade of primary school the Curriculum focuses on the learning of first reading and writing skills, and more particularly on the student's phonological and phonemic awareness. More specifically, an Inductive and Deductive approach to language teaching is applied. It also proposes supplementary approaches to language teaching such as the Holistic approach and Emergent Writing Skills (Ministry of Education, 2003).

In terms of students with special educational needs (SEN), it is up to the teacher to create a supportive environment, as well as to be able to carry out learning assessments and elaborate upon individualized programs designed for language teaching, so that students with SEN can participate in the learning process (Ministry of Education and Life Long Learning, 2003).

The latest educational reform of 1999-2007 introduced the most recent theories of language teaching such as Emergent Writing, and the Functional approach in connection with the Inductive and Deductive approach to language teaching (Timpa, 2009). However, in reality language teaching today is not communicative and interactive for Greek students (Michael, 2007). The language textbooks, used today, are based upon an Inductive and Deductive approach to language teaching, which contrasts with all modern learning theories (Korres, 2010). Once the Inductive and Deductive approach to language teaching is proposed as the main teaching approach, it substantially reduces the enforcement of other approaches, which have been proposed, such as for example emergent writing (Aidinis & Grollios, 2007). Finally, after considering the aforementioned, language teaching in the first grade, aims at understanding the language system rather than learning about the communicative use of the language (Aidinis & Grollios, 2007).

Methodology

In Social Sciences, the basic methodological approaches to the gathering of research data are the quantitative and qualitative approach to research, the hallmark of which lies in collecting and analyzing the aforementioned data. The research methodology which we applied in this study is the quantitative and more specifically sampling descriptive research questionnaires. The results are presented as the Alpha coefficient, which takes a value equal to 0.801 for the scale "Evaluation of educational tools". A 0.789 for the scale "Responsiveness of educational tools", a 0.649 for the scale "Knowledge of dyslexia", and a 0.899 for the scale "Familiarity with phonological and phonemic rules". Regarding the research, this is primarily an ad hoc research, implemented in order to meet specific objectives. It is based on information and data collected

from primary sources, and involves solving an immediate problem.

Research Tools

A standardized questionnaire was used in order to collect data from a large sample. The analysis was facilitated through the Statistical Package for Social Sciences 20.0. The questionnaire consisted of 20 questions including the biographical data of teachers.

The Participants

Data collection took place in Corfu in a period of one month (May-June, 2015) as the teaching of reading and writing skills is usually completed in the third semester of the school year and teachers have formed a comprehensive view on the performance of their students. Researchers made use of the census method which addresses 100% of the population selected (Bell, 2001) in order to increase the reliability of the results and to decrease the non-sampling error (Rondos & Papanis, 2006). The total number of teachers, who taught in the first grade of primary school in Corfu and participated in the study in the school year 2014-2015, was sixty-four (64).

The participants consisted mainly of women (86.4%), while the percentage of men was only 13.6%. It is observed that the average age of the respondents is 34.05 ± 8.69 years, with an average length of service in education, equal to 10.16 ± 7.45 years. The respondents have taught in the First Grade 3.5 times on average, which increases the validity of the responses due to the high degree of experience in teaching first reading and writing skills.

Findings

Teacher's Qualifications

Regarding the teacher's education, 6.7% of the respondents have received a Master's degree and only a 1.7 % has received a PhD. Therefore, the percentage of teachers who have continued their studies appears quite small. This is associated with a number of adverse factors that negatively influence the implementation of lifelong learning. Some of these factors are financial reasons, lack of career evolution in the public sector and lack of permission for educational leave.

Teacher's Training in Special Needs Education

Regarding the modules on special needs which the respondents attended during their studies, the number appears low. More specifically, on average they attended 1.73 mandatory and 1.15 elective classes. The low number of special education courses is confirmed by a research conducted by Lampropoulou & Panteliadou (2000), the results of which showed that the nine Departments of Education in Greek universities only offer one required course for special needs education and 2-3 electives, while in some departments the number in both categories is zero.

Moreover, it is observed that the majority of respondents (30.0%) did not receive training in special education, which can be explained by the small percentage of training programs for special education and the small number of students enrolling in retraining programs (Panteliadou & Patsiodimou, 2000).

Teacher's Pupils

According to the teachers who participated in this research, the average number of pupils, in their classroom is 18.47 ± 4.39 students, while the number of students who are experiencing

difficulties in reading and writing is on average slightly less than 3. Teachers, who participated in this research, believe that approximately one student, in every class, will eventually be diagnosed with dyslexia and/or reading difficulties. Studies estimate the prevalence of specific reading difficulties to approximately 10-16% of the school population, with 80% being associated with dyslexia (Panteliadou & Botsas, 2007; Shaywitz & Shaywitz, 2008). As the official diagnosis of students in Greece with reading difficulties takes place in the third grade of primary school there was no formal diagnosis of dyslexia for any of the students. This formal diagnosis of dyslexia is an official document certifying that the student has dyslexia. The teachers were nevertheless able to understand the signs from as early as the first grade.

Teacher's Assessment on Language Books

We asked teachers to assess the student's book, the workbook and the teacher's book, through a five-degree Likert scale. It was observed that all tools were assessed as moderate, by all the teachers who participated in the research, with an average score very close to 3.00. The teacher's book has an average score of 2.68. The average scores concerning the aforementioned were very close to 2.00. Therefore, we reached the conclusion, through the answers which we received from the teachers, that the curriculum and the textbooks do not take into account the theories concerning learning difficulties, despite the fact that it is clear in the 'Introduction Section' of the curriculum that they have been formally incorporated (Ministry of Education and Life Long Learning, 2003).

Finally, according to the teacher's responses, the student's textbook offers limited help to students with difficulties in their first stages of reading and writing, while it is observed, from the answers obtained from the questionnaire, that the size of the syllabus of the language course restrain students with learning difficulties to keep pace with the rest of the students.

Teaching Methods

Regarding the language teaching approaches, we observed that the Inductive and Deductive Approach to language teaching is widely used (mean 4.08), followed by the Communicative-Functional Approach (mean 3.58), and to a lesser extent the Holistic Approach. A Combination or Balanced Approach to language teaching and Emergent Literacy is also enforced. The precedence of the Inductive and Deductive Approach to language teaching is due to the fact that teachers are more familiar with it as it has been the main language teaching approach of the Greek educational system for more than one hundred years (Aidinis, 2006).

The fact that the Inductive and Deductive Approach to language teaching is obligatory in the teaching of first reading and writing skills (mean 3.83) shows the conformity of teachers to the demands of the curriculum. This, nevertheless, disrupts the smooth transition of children from nursery school to first grade, as the Inductive and Deductive Approach to language teaching comes into contrast with the Emergent Literacy Approach, applied in nursery school. Therefore, although the teacher's book states that teachers should adopt a "*combination of teaching methods and approaches such as the Inductive and Deductive Approach to language teaching and Emerging Writing as well as a Total and Functional Approach to language teaching*" (Karantzola et al, 2006:12), in practice, according to the results of this research, teachers find it difficult to apply supplementary approaches to language teaching. This is because they are in contrast with the rational of the Inductive and Deductive Approach to language teaching.

Teacher's Knowledge on Dyslexia

In terms of the causes of dyslexia teachers consider the coding deficits as the main factor for dyslexia (mean 3.93), followed by phonological awareness deficits and visual deficits (mean 3.85 and 3.70 respectively). As mentioned above, research proves that the main cause of dyslexia is phonological awareness deficits (Snowling, 2000; Ramus et al, 2003; Shaywitz, 2003; Ziegler & Goswami, 2005). However, research has also shows that coding deficits play a key role in the onset of dyslexia (Vellutino, 1987; Mody, Studdert, Brady, 1997). One of the most important risk factors, in this research, seems to be the presence of acoustic deficits (mean 3.52), while less important ones are hereditary factors, poor teaching and lack of exposure to written texts in the classroom, as well as emotional and psychological factors. Also, teachers' knowledge on modern research is scanty thus they are unable to link literacy problems and dyslexia to a poor teaching environment and to the non-exposure of young learners to written texts (Vellutino et al, 2003; National Reading Panel, 2000; Joshi et al, 2009).

The poor knowledge of teachers is also perhaps due to the fact that they do not attend training programs concerning dyslexia. Similarly due to the aforementioned we can explain the low response rate on the influence of hereditary factors, which are considered key risk factors of dyslexia and have been verified and highlighted through a plethora of research which has been conducted in the field (Pennington & Lefly, 2010; Peterson & Pennington, 2012).

Teachers' Knowledge on Teaching Reading and Writing Skills

The knowledge of teachers in the teaching of first reading and writing skills to students with reading difficulties seems to be adequate in this research (mean 3.10). Nevertheless, other researches have shown that (Brady & Moats, 1997; Hill, 2000; IDA, 2010) teachers do not feel adequately prepared to teach students with reading difficulties. In addition, teacher's knowledge on children's development of reading skills in the first grade of primary school appears more than sufficient, despite the fact that their knowledge on modern research findings concerning the aforementioned issue appears to be limited (2.77). Here there is a discrepancy between the knowledge teachers have, concerning the reading and writing skills of their students, and their knowledge of modern research findings, which concern the issue of dyslexia. This discrepancy often exists between the actual knowledge and the perceived knowledge of the participants (Fielding-Barnsley & Purdie, 2005).

We observed that respondents agree that teachers must have knowledge of how to teach phonological awareness. Teachers in this research do not fully agree that poor phonological awareness contributes to early failure in reading, unlike teachers who participated in other research (Joshi et al, 2009) and who all agreed that the lack of phonological awareness contributes to early reading and writing failure. This may be because the participants of this research are less familiar with the term phonological awareness (mean 3.80) and learning to read. Additionally, we found the following contradiction, which was highlighted in Joshi's research (Joshi et al., 2009) and which showed that while teachers strongly agree that they need to know how to teach phonemic awareness, their knowledge is nonetheless inadequate.

Identification of Dyslexia

As noted, respondents believe that dyslexia can be identified early in a student's life (mean 3.93), and that they are aware of the characteristics of dyslexia. Furthermore, they appear to be able

to detect students with dyslexia from as early as the first grade (mean 3.23).

They also agree that teachers should be well informed about dyslexia (mean 4.92), and about its interventions (mean 4.95). However, teachers' knowledge on dyslexia intervention, in terms of creating an individualized curriculum for the language, is very scant (mean 2.12), as the results of this research show a moderate knowledge of the definition of dyslexia (mean 3.68) and this is something which raises concerns.

Therefore, there is a discrepancy in a teacher's actual knowledge on the one hand and his or her attitude towards dyslexia. This result reveals that although teachers want to acquire training, there are financial, personal and work parameters, which do not allow this to happen. Additionally, moderate knowledge on dyslexia, as mentioned above, is due to the low rate of participation in training and postgraduate studies, as well as doctoral studies, in connection with the number of courses concerning special education the teachers have attended at an undergraduate level. Finally, all teachers agree that they should be aware of the cognitive functions of young learners and the learning strategies, which they employ in reading and writing (mean 4.87 and 4.92 respectively).

Correlation-hypotheses

The factors tested through a hypothesis testing are four. This testing took place in order to determine whether there are statistically significant differences, on the averages of variables grouped by gender, teacher training in general and teacher training in special needs education. To perform a hypothesis testing based on the research objectives of the study, it is necessary to measure the degree of internal consistency of the variables that make up each scale. As mentioned above, in this study, the results are presented as the Alpha coefficient, which takes a value equal to 0.801 for the scale "Evaluation of educational tools". A 0.789 for the scale "Responsiveness of educational tools", a 0.649 for the scale "Knowledge of dyslexia", and last but not least a 0.899 for the scale "Familiarity with phonological and phonemic rules", thus suggesting that it is more than satisfactory in all four cases.

Citing the descriptive statistics of each pooled scale and interpreting the averages of their scores, we observe the following. Firstly that teachers assess the educational tools used for language teaching in the first grade, as a measure of value (average 2.94). Secondly, they describe that the aforementioned educational tools do not meet the needs and capabilities of students with difficulties in reading and writing (average 2.03).

Concerning the knowledge and information teachers have or should have on dyslexia, it was observed that the corresponding variable takes an extremely high average rating equal to 4.59. Therefore, it is clear that teachers are very versed to issues that relate to the disorder. Finally, teachers tend to be less familiar with phonological (3.80) and phonemic rules as is shown in the research (mean 3.67). The very good performance of teachers is associated less with their training and expertise in the specific areas, but more with their experience and practical involvement in the teaching of reading and writing skills as well as with the presence of students with dyslexia and reading difficulties in their classroom.

Moving on to the testing of the initial hypothesis it is not determined whether there is a statistically significant difference, or not, in the averages of the scores of the four scales on the basis of the controlled difference between men and women using the t-test for independent samples. The following results were observed:

1. The average scores of both genders appear to be close, in other words there is no statistically significant difference. This is also confirmed by the t-test results for independent samples, where the p-value is higher than the level of significance $\alpha=0.05$, signifying the absence of statistically significant differences in the averages of the scores of the four scales examined. This may be due to several factors such as the limited percentage of male participants and the similar educational and professional background of both sexes. However, this comes into contrast with Singer's (1996) research, which suggests that the beliefs of male and female teachers may vary as concerning the aforementioned factors.
2. Based on the linear correlation coefficient of Pearson, we observe that there is no clear statistically significant relation between the four test ranges and the variables that determine the age of the teachers, their teaching experience and the number of times they have taught in the first grade. The p-value in all cases is above the significance level of $\alpha=0.05$. This is probably due to the fact that there have not been many changes in language teaching, as in the previous textbooks the main language teaching method which was used was the Inductive and Deductive approach to language teaching. Also, due to teachers' lack of training in modern teaching methods and dyslexia, there are fixed perceptions, which prevail in the Greek educational community. These perceptions show that teachers have no difference of opinion on the subject. It is worth mentioning that other research, conducted in the field, has also presented similar results (Fielding-Barnsley & Purdie, 2005; Piasta et al, 2009).
3. There are no statistically significant differences in the averages of the scores of the test scales concerning the studies of the participants. More specifically based on the ANOVA testing and the evaluated p-value in each case ($>0,05$), there is no difference in the mean scores of the four scales under examination. This is probably because all teachers have acquired a similar higher educational training and that reading and writing skills have only been moderately broached upon in Greek universities. These results are in line with the research conducted by Piasta et al (2009).
4. Completing the process of the hypothesis testing we applied a t-test for independent samples, which attempts to answer the question as to whether respondents have received training in special education. Our results present the absence of statistically significant differences in the mean scores of the four scales of the study. More specifically the p-value was above the level of significance $\alpha = 0.05$ in all cases. This was associated with the low rate of teacher participation in teacher training programs and postgraduate studies in Corfu.

Discussion

This research was inspired by the assumption that teaching plays a key role in children's learning and that targeted and individualized instruction in reading and writing to students who have difficulties, results in the avoidance of children being diagnosed with dyslexia in the future (Scanlon et al., 2005). Therefore, recognition of the important role played by teachers who have students with reading difficulties, leads to a need to investigate whether these teachers also possess the knowledge which will enable them to recognize the risk factors of dyslexia and to employ the appropriate teaching methods so as to help students with dyslexia.

Summarizing the results of the present research, we conclude that teachers consider both the student's textbook and workbook mediocre. Furthermore, the teachers consider the aforementioned books as inadequate in facilitating the needs of students with reading difficulties or dyslexia. More specifically, the student's textbook bears the lowest score in terms of usability and responsiveness in relation to all other educational tools. The textbooks used in the teaching of language, in the first grade, were considered appropriate for students without learning disabilities, but have failed to facilitate students with reading and writing difficulties.

In terms of teachers' knowledge on dyslexia, they tend to exhibit a high score and appear informed about the issue. Nevertheless, their level of training in special needs education is low. This contradiction is probably because dyslexia exists amongst approximately 10-15% of the student population (Temple et al., 2003), thus many teachers have encountered numerous cases. Therefore, practical experience and a personal interest in the phenomenon explain the large number of teachers who have knowledge on the subject.

On the other hand, teachers feel insufficiently trained to provide individualized instruction to students with dyslexia. This is explained by the small number of teachers who participate in dyslexia training programs (Panteliadou & Patsiodimou, 2000).

To round off, it is clear that teachers in Corfu are reportedly capable of detecting dyslexia, through the signs that children present in their reading and writing. We reached this conclusion firstly, because of the fact that teachers are able to recognize the problems encountered by these students in reading and writing and secondly because, on average, one student in every first-grade class will most likely be formally diagnosed with dyslexia in the future.

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