

## Investigating the Effectiveness of “Classwide Peer Tutoring” (CWPT) Strategy in a Mixed Learning (Dis)Abilities Primary School Classroom: A case study

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### Abstract

The purpose of this article is to discuss ClassWide Peer Tutoring (CWPT) strategy as an effective educational procedure in including students with learning disabilities in general education classroom. In addition to describing CWPT, this article mainly presents a case study in which a primary educator teacher worked collaboratively with an educational researcher in a second grade Greek classroom to examine the impact of CWPT on students' word-spelling performance, as monitored on curriculum-based assessments. Data were collected by applying pre- and post-tests. Results indicated that all students, including those being at risk of having learning disabilities, improved their performance. The article concludes with a discussion of the procedure and areas of future research and application.

*Keywords:* ClassWide Peer Tutoring, learning disabilities, inclusion, word-spelling ability.

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## **“Sınıf Genelinde Akran Öğretimi” (SGAÖ) Stratejisinin Karma Öğrenme Yeterlilikleri / Yetersizlikleri Olan Öğrencilerin Devam Ettiği İlkokul Sınıfında Etkililiğinin İncelenmesi: Bir Vaka Çalışması**

### **Öz**

Bu araştırmanın amacı öğrenme güçlükleri olan öğrencilerin genel eğitim sınıflarına bütünleştirilmesinde etkili bir eğitim yöntemi olan Sınıf Genelinde Akran Öğretimi (SGAÖ) stratejisini tartışmaktır. SGAÖ'nün tanıtılmasına ek olarak, bu makale Yunanistan'da bir ilkokulun ikinci sınıfında sınıf öğretmeninin öğretici bir araştırmacı ile işbirliğine dayalı olarak çalışarak SGAÖ'nün öğrencilerin sözcük okuma performanslarına etkisinin programa dayalı değerlendirmeler ile incelendiği bir vaka çalışmasını sunmaktadır. Araştırmanın sonuçları, öğrenme güçlüğü tanısı alma riski olan öğrenciler de dahil tüm öğrencilerin performanslarının arttığını göstermektedir. Makale, yöntemin tartışılması ve ileride yapılacak araştırma ve uygulamalara ilişkin öneriler ile son bulmaktadır.

*Anahtar Sözcükler:* Sınıf Genelinde Akran Öğretimi, öğrenme güçlükleri, bütünleştirme, sözcük okuma becerisi.

Difficulties of defining and diagnosing learning disabilities may lead to problems of determining their prevalence. According to the American Psychiatric Association (APA, 2010, 2013; Cortiella & Horowitz, 2014; Kakouros & Maniadaki, 2006) the rate of learning disabilities in the global educational context is estimated between 2% and 10%, but varies depending on the sample of children and the diagnostic criteria. Recent research in Greece (Vlachos et al., 2013), showed a 2:1 ration in dyslexia for boys versus girls, while the overall incidence of dyslexic students in Greece seems to agree with the existing literature (World Health Organization [WHO], 2010).

The conflicts among scientists about the etiology of learning disabilities (Davis & Deponio, 2013) create additional confusion among teachers about the optimal methods of dealing with these students in mainstream education. As mentioned by Fergusson (2008) many teachers are unsure on how to implement inclusion for students with disabilities in their general education classes. In some educational systems, it is common to use individualized educational programs and resource rooms within mainstream schools for students with special needs (Twomey, 2006).

In Greece, these individualized educational practices are provided to students with learning disabilities (Ministry of Education, 2008). However, according to Westwood (2007) students with learning disabilities often experience social and emotional problems, therefore questions can be raised about whether an individualized program or integration classes should be used to help them. Ellis (2005) attempted to provide a solution to the above question by stating that most strategies effective for students with learning disabilities were also beneficial for the rest of the students, therefore including students in the mainstream classroom could probably be the solution to the social and emotional problems mentioned above.

Such a strategy is ClassWide Peer Tutoring (CWPT) (Greenwood, 1997; Maheady, Harper, & Mallette, 2003; Ministry of Education, 2013) in which all students in a class are divided into pairs, in order to teach each other and work using material prepared by the teacher. One student explains the task to another student, they ask questions and then discuss together if the answers are correct (Ministry of Education, 2013).

According to Snowling (1987) students with specific learning disabilities tend to be poor spellers, often regardless of the frequency of a particular word in writing, while sometimes the spelling reveals phonological deficits and vocal spelling errors. On the other hand, studies by Maniou-Vakalis (2002) showed that specific spelling difficulties appeared also among students of first and second grade of Greek primary schools, without learning disabilities. Moreover, there is a raising issue on early detection and intervention of learning disabilities (Botsas & Panteliadou, 2007) in Greece. There is often a significant delay in identifying the ‘disability’, either due to incorrect specialists’ approaches, or parental hesitations. As a result, there is a significant delay in applying individualized educational interventions in primary schools, so that some students do not benefit from any educational intervention (Botsas & Panteliadou, 2007).

### **Inclusion and ClassWide Peer Tutoring**

It seems that in Greece there is no previous analysis of CWPT, although it can be used across different subject areas and on students with or without disabilities varying by gender, age, race and academic achievement level (Maheady & Gard, 2010). Moreover, according to surveys successful integration depends on the design and development of programs that focus on both academic achievement and social needs of students (Gaylord-Ross, 1989; Pedagogical Institute, 2011). Indeed, CWPT helps not only students’ cognitive skills but also the social development of the child (Greenwood, 1997; Maheady et al., 2003; Maheady, Sacca, & Harper, 1987; Plumer & Stoner, 2005). The question is whether CWPT can be effective in teaching spelling in a mixed-disabilities learning setting, considering teacher’s key role as well as the application this particular setting may face. With decreasing revenues and rising costs, school districts are forced to make tough decisions if they are to balance their budgets and still meet the needs of their students (European Trade Union Committee for Education [ETUCE], 2012).

The aim of this paper is to specifically investigate the effectiveness of CWPT strategy in a mixed-learning (dis)abilities Greek primary school classroom, in order to improve students’ spelling performance. The current study is part of a larger study of CWPT’s effectiveness, results of which are still in progress; therefore, this paper includes and answers the following research questions: “Is CWPT academically effective for students with learning disabilities in a Greek mainstream classroom?” and “Is CWPT academically effective for students without learning disabilities in a Greek mainstream classroom?”.

### **ClassWide Peer Tutoring**

**Characteristics of the strategy.** According to research, CWPT is a strategy that seems to benefit students with and without learning disabilities (Greenwood, 1997; Maheady et al., 2003; Ministry of Education, 2013; Sideridis et al., 1997). Following the CWPT strategy, all students in a class are divided into teams and pairs to teach each other and work using material prepared by the teacher. Unlike other forms of peer tutoring, CWPT refers only to same-age students, not involving upper-grade tutors from other classrooms and is usually used to measure the already taught knowledge (Lee, 2003).

In further detail, CWPT students participate in a team based game, working in pairs for about 20 minutes. Teams and pairs within the teams are randomly chosen. The first ten minutes one student of each pair has the role of the tutee while the other being the tutor. The following ten minutes the students interchange roles, keeping the same pairs (Harper, Maheady, Mallette, & Karnes, 1999; Martel, 2009). The aim is for each pair to collect as many points as possible for the whole team to which it belongs to. Collection of points occurs through correct responses of the given task. Each correct answer equals to one point. When a student misspells a word he has to write it down three times in the given space. The game can take place two to four times in a week while a quiz is administered (before and after its time; pre-test, post-test) to measure the students’ knowledge. During the strategy implementation, the class’s teacher supervises the students and gives extra points as a reward for good behavior and cooperation (Lee, 2003). The winning team is announced when all points have been collected and reported (Harper et al., 1999; Martel, 2009).

**Advantages and disadvantages of CWPT.** According to research (Lee, 2003), CWPT may have positive effects on students, teachers, as well as to the administration systems at schools. As far as the students are concerned, it has been established that beside improving their learning approach (Greenwood, 1991; Maheady et al., 1987) they benefit by taking more participation initiatives in the classroom. They are given more opportunities to respond to questions thus increasing self-esteem (Greenwood, 1999). CWPT emphasizes on students' active involvement (Lee, 2003) showing them to help and support each other through strengthening cooperation and diversity understanding (Maheady, 1998; Martel, 2009). All of the above, render CWPT a particularly useful and effective strategy (Martel, 2009; Mortweet et al., 1999), facilitating integration practices for students with disabilities (McDonnell, Mathot-Buckner, Thorson, & Fister, 2001).

CWPT can also ease or enhance the teachers' everyday practices. For example, when students play the tutor's role, they are more able to understand the requirements and difficulties their negative behavior can cause to the class teacher. Consequently, some undesirable behavior traits become limited, thereby assisting the teaching process in the classroom (Lee, 2003). In addition, CWPT gives teachers the opportunity to more effectively observe students and provide them detailed feedback regarding their academic and interpersonal behavior (Maheady, 1998).

Considering the CWPT's benefits on the school administration system, the model exploits the already existing educational material and school framework (Maheady, 1998), hence avoids additional costs. Moreover, the strategy's implementation requires the teacher to be well trained and prepared as it embeds specialized delivery and handling information (Utley et al., 2001). This latter may potentially increase the educational profile of the school supporting further education and continuous professional developments outreach.

However, despite the aforementioned advantages associated with CWPT, there are still several opposing opinions concerning the CWPT's performance. Some of them focus on the teachers' performance being worried about their observation skills as incorrect student responding may go undetected (Maheady, 1998). A risk of improper learning process then emerges. It has been reported that the pace at which new content can be introduced and covered can be slow-downed.

**Effectiveness of CWPT in spelling.** The literature review showed that there are no current studies which have analyzed the impact of CWPT in spelling performance in the last ten years. As a result, this study aims to examine the current impact of CWPT on students' word-spelling performance in a Greek educational environment and discuss the results with the previous research conducted in other countries. Research by Greenwood, Delquadri and Hall (1984) on a sample of 211 students of 1st and 2nd grade, showed a statistically significant improvement in their spelling ability, when using CWPT strategy, regardless of cognitive performance level. Prior to this, another research by Delquadri, Greenwood, Stretton and Hall (1983) investigated 24, 3rd grade students, including 6 students who had learning disabilities. The results of this research showed an improvement of the sample's spelling performance as students with learning disabilities from 9 errors on average before the educational intervention, only had 2.5 errors on average after the CWPT strategy implementation.

Effective results by the strategy implementation have been also seen in other related research. A study by Maheady and Harper (1987) reached positive results showing effectiveness of the strategy on low economic status students in a secondary education setting. A research inquiry by Harper, Mallette and Moore (1991) showed a spelling improvement of the investigated words on about 60% of the total class sample, involving students with mild cognitive impairments, too. Another research by Maniou-Vakalis (2002), showed that in Greek educational system, several spelling mistakes are made by students with or without learning disabilities. This fact, combined with the obstacles identified in Greek educational system for the students with learning disabilities in the general education classroom, triggered the preparation of this research.

Teaching methods play a key role in students' learning progress (Scanlon, Gelzheiser, Vellutino, Schatschneider, & Sweeney, 2008). Therefore, recognizing the important role of teaching in students' spelling

performance and the need for students’ inclusion in general education, led to the investigation of the effectiveness of a teaching method-strategy, which has been proved effective.

### Method

To address the aforementioned research questions, a case study was designed and implemented during the academic year 2013 – 2014.

The investigation process involved students in the 2nd grade of a Greek primary school, during the delivery of a Greek language course. The application of the strategy was based on previous week’s words taught by the teacher as defined by the Greek curriculum’s textbook for that particular academic period (Ministry of Education, 2014). A non-participating observation was employed to collect data. To ensure validity and reliability of collected data and results, a training on CWPT (Maheady, Harper, Mallette, & Karnes, 2004) was provided by the first researcher to the teacher. The training session was performed on site before the first strategy’s implementation in the classroom and involved a two-hour workshop.

### Participants

Twenty ( $n = 20$ ) students from Alexandroupolis, Greece participated in this study; 11 girls and 9 boys. The average age was 7.3 years ( $SD = 5$  months) based on the school archives obtained from the school’s administration office. In the particular sample, four students (one girl and three boys) were evaluated by a special education teacher in collaboration with the class teacher for the students at risk of developing learning disabilities. The evaluation-observation process included (non-standardized) tests recommended by the Ministry of Education. Their content was ranging from phonological awareness exercises to behavioral observation and evaluation of mathematical skills. It should be noted however that the particular evaluation was not officially conducted by a specialist. This was due to the ground factor that the sample used in this study belonged to an age range that it could not be either officially nor ethically asked to be performed such an evaluation.

### The Strategy Implementation

**Before the CWPT implementation.** As soon as the teacher’s necessary training on CWPT was completed, a gradual description and presentation of the strategy to the students (Martel, 2009) was delivered by the teacher. This took place before the practical implementation of CWPT, and was completed in four consecutive days as shown in the following schedule:

Day 1: Introduction of the CWPT strategy, establishment of a goal for increasing skills, set up of expectations for teams, definition of winning and losing, and clear explanation of fair play and of good cooperation. This was necessary because some ethical considerations seem to emerge (Lee, 2003) debating the development of competitiveness among students (Maheady, 1998).

Day 2: Explanation of procedures for partnering.

Day 3: Explanation and practice of the worksheets use (The worksheet included a table, which consists five columns and a number of lines according to the number of words, is used; students write the word on the first column. If they make a mistake they write down the word three more times in the next columns. In the fifth column they mark their points); gradual progression from teacher support to autonomous student pairs and whole class practice.

Day 4: Discussion of the point system and reporting procedures. Demonstration of the total points calculation.

**During the CWPT implementation.** The application of the strategy (CWPT) lasted five weeks, including a pre-test on students’ spelling performance in detail for each individual week, four days of practical implementation of CWPT in the classroom and finally a post-test similar in content and delivery process to the pre-test. The intervention was decided to conclude in 5 weeks’ time in order to ensure that students would have

on the one hand enough time to learn how to use CWPT strategy, while on the other hand to deploy their performance at a convenient level for the study's needs.

During the 5 weeks period, students were divided into two teams (blue and red), including ten students each according to the teacher's guidance. The separation was conducted in such a way that each team could include students with and without disabilities in spelling. The aim was for the teams to be equivalent in their ability to spell. Pairs were then formed in each team, so that three types of pairs may exist: homogeneous pairs of students without learning disabilities, homogeneous pairs of students with learning disabilities and heterogeneous pairs with and without learning disabilities. During the research process, a cross-mixing of pairs in the same team was attempted in each week for cross-balancing and cross-referencing data minding reasons (Cohen, Manion, & Morrison, 2008; Russell & Purcell, 2009).

### Data Collection Process

The aforementioned pre- and post-tests were developed using procedures described by Greenwood, Delquadri and Carta (1997). The tests were adapted to the requirements of the Greek curriculum, as proposed by the Ministry of National Education and Religious Affairs (Pedagogical Institute, 2003). For example, Figure 1 shows the weekly tutoring spelling list (words that students learned to spell from Day 1 until Day 4 according to the Greek curriculum) used for the first week's application of CWPT.

Words in Greek	Words in English
καιρό	weather
μην	don't
συνέχεια	consecutively
μεγάλος	big
εκατομμύρια	million
άνθρωποι	people
μάλωνα	argued
χελώνα	tortoise
ποιος	who
γρήγορος	fast
κοίταζε	looked
κατάλαβε	understood
λυπημένος	sad
σινεμά	cinema
φαντασία	fantasy
ταινία	movie
ερωτηματικό	question mark
συνέπεια	consistency
βιάζεσαι	rush
πλύνεις	wash

Figure 1. First week's tutoring spelling list (in Greek – alphabet consists of 24 letters – & in English).

On a school week's last day (Friday) and before the CWPT's first application, students were pretested on the wordlist of the following week. The teacher read words from the already taught list (Figure 1) while students noted their answers on an answering sheet (pre-test). Completing this pre-test, the answering sheets were collected and reviewed by the teacher. The following school week students learned-repeated gradually these words using CWPT for 4 days and after this educational intervention, on the 5th day of the school's week, students were post-tested on the same words as on the pre-test (Figure 2).

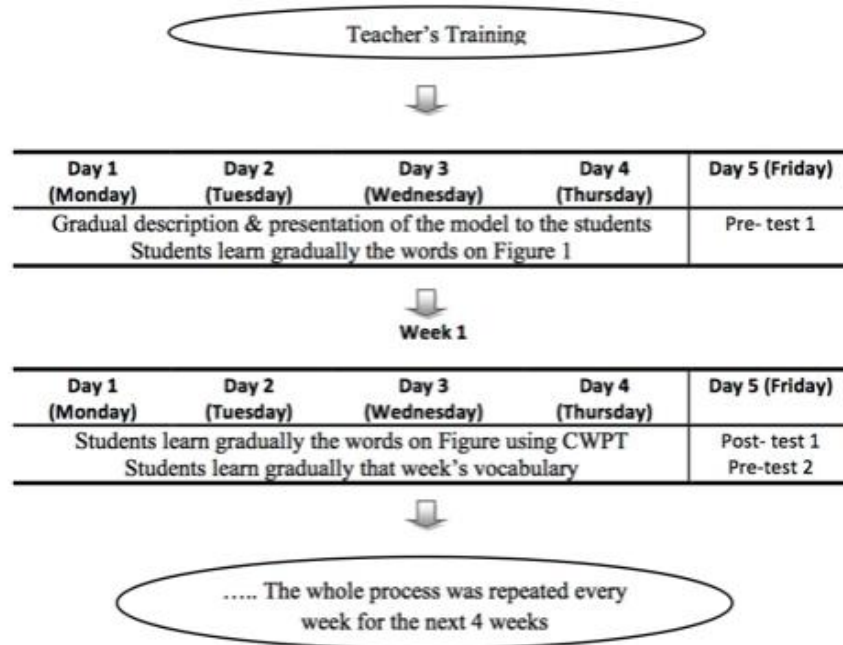


Figure 2. Example of intervention's schedule according to Greenwood, Delquadri and Carta (1997).

### Data Analysis

In this research, the average number of errors on the total class, on each test was chosen as central tendency indicator of student performance. That way, it was investigated if the class students' performance has been improved on average (individually) after the educational intervention. Also, in each case were calculated the errors' standard deviations, which form a dispersion index, expressing the variation of a group of values from the average.

To check whether the possible association of variables due to the model used (in this case the CWPT strategy), the coefficient of determination were calculated ( $R^2$ ). The  $R^2$  is the percentage of the variability in a data set explained by our statistical model and takes values from 0% to 100%. Finally, scatter plots were designed to provide information on the students' performance in the post-tests (Y) in relation to the corresponding pre-tests (X), while identifying the quality of this relationship (i.e. positive, negative and static) through the regression line, too. For example, if the data show an upward regression line pattern as we move from left to right, then a positive relationship between X and Y is merely indicated; whereas, if the data show a downward pattern (left to right) a negative relationship exists. In these particular figures, the calculation of  $R^2$  indicates how well the given data sets outcomes fit and could be replicated by the specific model; the implementation of the CWPT strategy that is (Roussos & Tsaousis, 2011; Steel & Torrie, 1960). The term “data set” expresses in this case a whole class' pre- and post-test performance, while the closer to 1 this is, the more coherent the relationship between the dependent and independent variables is, too.

## Results

In order to answer the research question ‘whether the CWPT strategy is effective for students with and without learning disabilities in the specific class’, a preliminary descriptive statistical analysis was performed on the collected data for these 5 weeks.

The average number of errors made by the students was initially calculated for every pre- and post-test. Comparing the weekly results, information was provided for the whole class’ performance, counting the existing errors in every word. This approach was deemed more efficient than counting the correct answers, as there were more than one errors in every single word presented in the pre- and post-tests. Regarding the codification and homogeneity of the data, it should be mentioned that the number of words the students were examined in each week was different. For example, the first week 20 words were examined while the second week 21 words were examined. Therefore, the number of errors were converted to decimal numbers having as basis the percentage points with two decimal digits, keeping statistical precision in mind: for example, 7 out of 21 possible errors were recorded as 33.33 (Table 1).

Table 1

*Number of Errors (%) in Each Pre- and Post-Test per Week*

Student (S)	1 <sup>st</sup> Week		2 <sup>nd</sup> Week		3 <sup>rd</sup> Week		4 <sup>th</sup> Week		5 <sup>th</sup> Week	
	Pretest (%)	Posttest (%)	Pretest (%)	Posttest (%)	Pretest (%)	Posttest (%)	Pretest (%)	Posttest (%)	Pretest (%)	Posttest (%)
S1	55.00	10.00	9.52	.00	35.00	10.00	59.29	40.9	11.11	5.55
S2	.00	.00	.00	.00	15.00	.00	.00	.00	5.55	.00
S3	55.00	30.00	23.80	9.52	.00	.00	22.72	4.54	22.22	16.66
S4	5.00	.00	14.28	4.76	15.00	5.00	9.09	4.54	55.55	.00
S5	100.00	absent	absent	absent	100.00	30.00	100.00	50.00	80.00	80.00
S6	30.00	25.00	38.09	23.80	25.00	20.00	95.45	31.81	66.66	22.22
S7	50.00	40.00	33.33	23.80	45.00	35.00	54.54	45.45	27.77	11.11
S8	45.00	25.00	28.57	14.28	20.00	5.00	27.27	13.63	33.33	11.11
S9	25.00	5.00	14.28	9.52	15.00	10.00	36.36	18.18	16.66	5.55
S10	absent	50.00	47.61	38.09	50.00	40.00	63.63	45.45	66.66	27.77
S11	65.00	45.00	47.61	38.09	60.00	45.00	100.00	92.97	61.11	44.44
S12	100.00	50.00	70.00	40.00	80.00	40.00	40.00	20.00	40.00	.00
S13	50.00	20.00	38.09	28.57	55.00	30.00	81.81	27.27	38.88	11.11
S14	75.00	40.00	47.61	28.57	60.00	40.00	68.18	45.45	88.88	55.55
S15	20.00	15.00	9.52	.00	5.00	.00	22.72	13.63	16.66	.00
S16	25.00	15.00	4.76	9.52	15.00	10.00	36.36	13.63	11.11	5.55
S17	20.00	20.00	14.20	9.52	20.00	15.00	54.54	40.90	66.66	16.66
S18	25.00	20.00	19.04	4.76	25.00	15.00	27.27	4.54	22.22	5.55
S19	20.00	10.00	9.52	4.76	10.00	5.00	18.18	4.54	11.11	0.00
S20	20.00	10.00	14.28	9.52	10.00	5.00	40.90	18.18	11.11	5.55

At the end of the first week CWPT implementation, all students’ performance improved at post-test ( $M = .23$ ,  $SD = .16$ ) as compared to the pre-test ( $M = .41$ ,  $SD = .29$ ) (Table 2).



Table 2

*Mean (M) and Standard Deviation (SD) of Students' Performance on 1<sup>st</sup> Week*

1 <sup>st</sup> Week (n=20)	
Tests	M (SD)
pretest	.41 (.29)
posttest	.23 (.16)

Similar were the results in the following four weeks as shown on Figure 3.

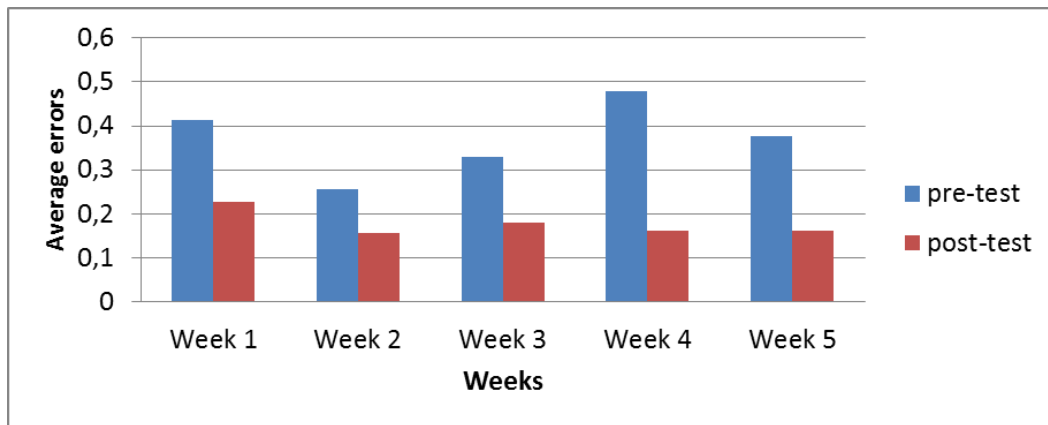


Figure 3. Average errors at pre- and post-test by week.

However, the number of pre- and post-test average errors shown on Figure 3, cannot explain in detail whether the strategy's implementation can directly impact the students' performance. No explicit connection is really shown for the students' performance and the strategy's efficiency, as other exogenous interfering parameters-variables may also contribute towards the observed outcome. Thus, controlling for an active relation between these two, the whole class's performance regression in these five weeks was studied in relation to the strategy's pre- and post-test efficiency by designing scatter plots and calculating  $R^2$  (coefficient of determination). The scatter plots were specifically structured by using the number of errors in the pre-test as the independent variable (X) and the number of errors in the post-test as the dependent variable (Y) (Stockburger, 1996).

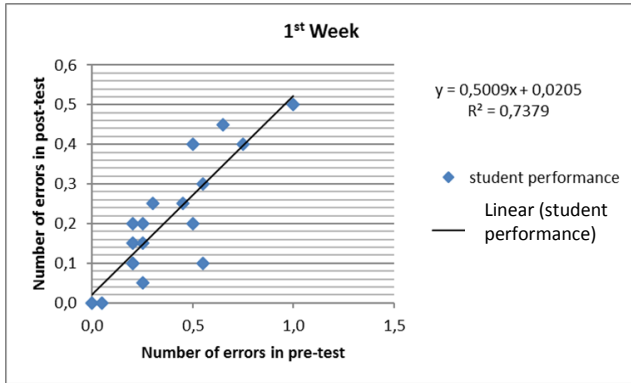


Figure 4. 1<sup>st</sup> Week's Scatter Plot.

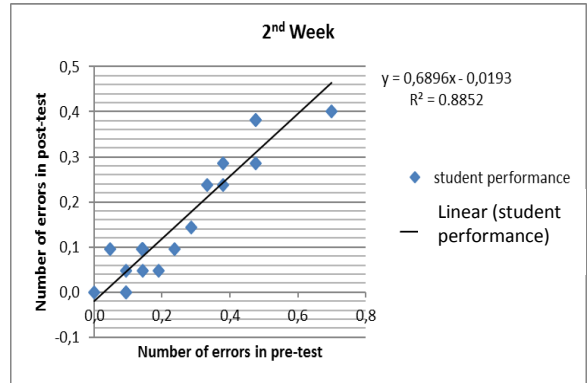


Figure 5. 2<sup>nd</sup> Week's Scatter Plot.

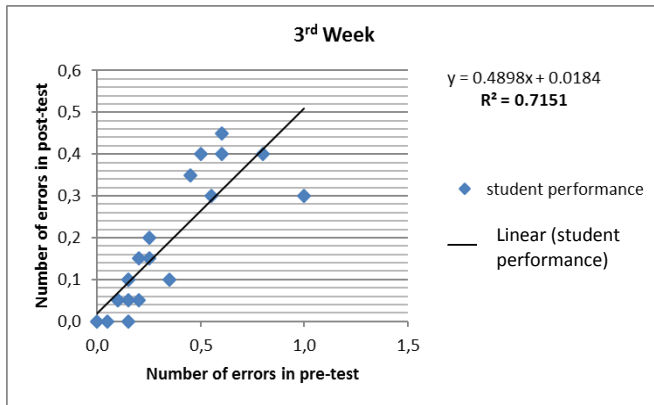


Figure 6. 3<sup>rd</sup> Week's Scatter Plot.

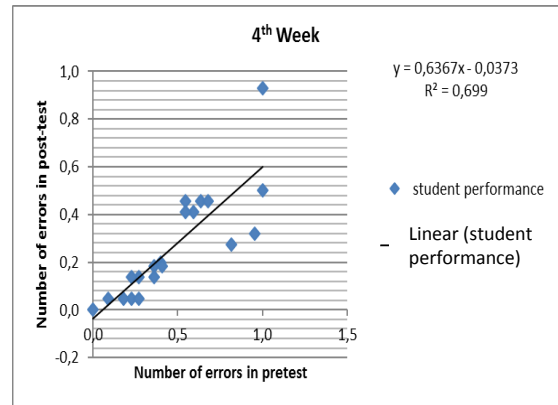


Figure 7. 4<sup>th</sup> Week's Scatter Plot.

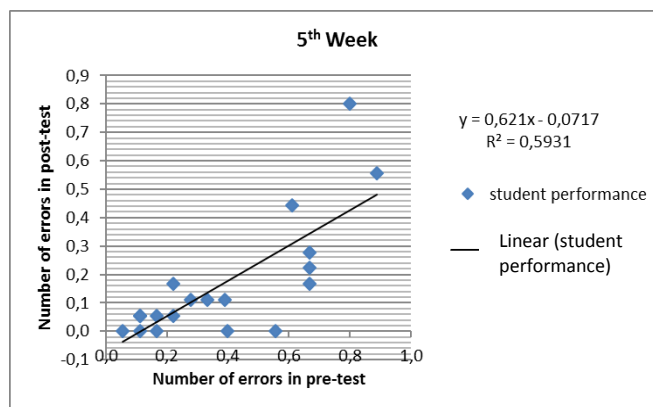


Figure 8. 5<sup>th</sup> Week's Scatter Plot.

Following the scatter plots (Figures 4-8) a probable positive influence of CWPT is shown. This fact confirms a high proportion of the performance data collected for each student separately (Table 1), as well as their performances' grand averages for each week (Figure 3). It is evident that students with zero errors in the pre-tests maintained their performance in the post-tests, while the majority of the negatively performing students reduced their errors after the implemented educational intervention. Moreover, both students with and without learning disabilities in the post-test each week conducted made in average less errors than in the pre-test (Figure 9).

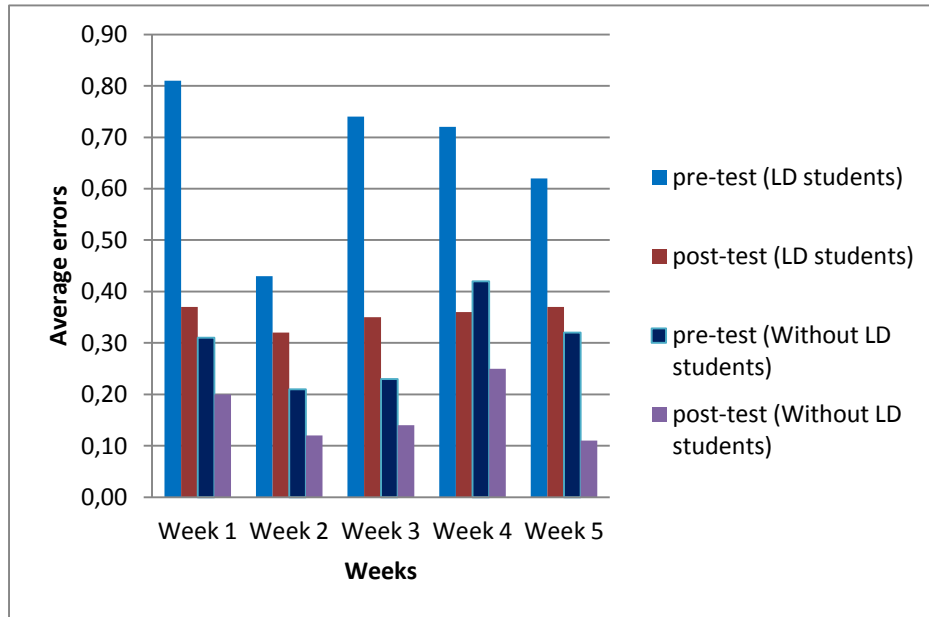


Figure 9. Average errors of students with and without learning disabilities (LD) at pre- and post-test by week.

Information, concerning the relationship between the variables - thus the strategy's efficiency - is also given from the analysis of the correlation coefficient ( $R$ ), which is closely connected to  $R^2$ . For example, in the first week, as shown on Figure 1 and in Table 4, a dispersion of the values around the regression line and value of the correlation coefficient ( $R = .86$ ) is observed, thus indicating a strong positive correlation between the variables. The coefficient of determination  $R^2 = .74$  (Table 3) strengthens this fact, appearing to explain approximately 74% of the variability existing in the sample as the strategy's (CWPT) application outcome.

Table 3

*R-Squared, R & Regression Line per Week*

	1 <sup>st</sup> Week	2 <sup>nd</sup> Week	3 <sup>rd</sup> Week	4 <sup>th</sup> Week	5 <sup>th</sup> Week
Regression line	.5	.69	.49	.64	.62
R	.86	.94	.85	.84	.77
R <sup>2</sup>	.74	.89	.71	.47	.59

Note. R: correlation coefficient; R<sup>2</sup>: coefficient of determination.

For the following 3 weeks, excluding week 5 (Table 3) which shows a moderate positive correlation ( $R = .77$ ) as there is greater dispersion of values around the regression line, the conclusions seem to be similar to the previous ones. On top of that, only 59% of the overall data set variability was explained by the strategy (Table 3). This low value (close to .5) of  $R^2$ , does not necessarily mean a negative fit of the strategy's implementation, since the overall performance of the sample has shown a clear improvement. The average of students' errors was decreased indeed by about 0.2 units (Table 2). This low value of  $R^2$  can be explained, as coefficient of determination' values (less than 50%) in certain fields of research are commonplace, as an effort to anticipate human behavior in psychology and education (Frost, 2013).

### Discussion

The calculation of the grand averages, the coefficients of determination and correlation, indicated that CWPT strategy is effective for second-grade-students with and without learning disabilities, in a Greek mainstream educational setting. This seems to agree with previous studies (Delquadri et al., 1983; Greenwood et al., 1984) in which second and third grade students showed improvement in their spelling ability, when using the CWPT strategy. Furthermore, other studies (Greenwood, 1997; Ellis, 2005; Maheady et al., 2003; Ministry of Education, 2013) also indicated CWPT as an effective strategy in co-educating students with and without learning disabilities. This view is reinforced by the current study, since the majority of the errors conducted in pre-tests by both students in risk or not of learning disabilities, were reduced in weekly post-tests.

Moreover, the collected data showed a uniform statistical projection (see Table 3) of spelling errors for all students taking part in the study, a fact that comes in accordance with past studies on the subject (Maniou-Vakalis, 2002). This positively indicates that the Greek educational system needs to adopt more effective teaching strategies than the currently applied ones, improving the overall structure of teaching delivery and practice. Also, all the aforementioned elements reinforce in principle the need for more studies like this one. The low value of  $R^2$  can be explained as an effort to anticipate human behavior in psychology and education (Frost, 2013). This is due to the fact that coefficient of determination values (less than 50%) in certain fields of research are commonplace.

In our case, the difficulty of isolating other external factors that can affect the response of a human being, as well as unpredictability of human behavior (Frost, 2013), is shown. External factors may be environmental or emotional; for example the announcement of a forthcoming trip or a precedent to the strategy's application fight between students. Therefore, a univariate relationship between the students' performance and the respective educational tool is suspected, which cannot be fully explained at this point, suggesting further analysis on the study's data.

Moreover, since Greenwood, Delquadri and Hall (1984) in their research showed a statistically significant difference between pre- and post-tests, further analysis needs to be conducted, in order to see if in the current study there is a statistically significant difference too between students' performance in the pre- and post-tests, as well as how the specific strategy works - according to the collected data - among the different types of student pairs. More specifically, an analysis of Coefficient of Variation (CV) could be useful, since the data correlation variability presented in the different weeks'  $R^2$ , indicates a possible degree of a prior learning basis in our sample. Namely, this question is raised: whether the errors made by the students do have the same origin and

computational basis in this study. A t-test analysis may help to clarify if the subjects behave homogeneously under identical parameters (vocabulary). A Multivariate Analysis of Variance (MANOVA) on the other hand could show whether there is a pattern of effectiveness in homogeneous groups of students without learning disabilities, in homogeneous groups of students with learning disabilities and heterogeneous groups of students in the specific class under investigation.

Regarding the educational environment and class’ qualitative characteristics in which the strategy was applied, it was observed that high-skill level spellers are able to help those who are lower and probably this helps teachers to create pairs in groups based on the cognitive level and relations observed. Also the changes in the pairs every week, seemed to help students to work with different people, reducing the risks of unfair competition such as those found in previous studies (Lee, 2003; Maheady, 1998). However, all these are informal observations and were not investigated. Nevertheless, they were attainable in the process and it would be good approach to empower the teaching process through CWPT strategy.

It should not be forgotten that several limitations apply in this study, also pointing to future research. Initially, limitations arise with respect to the quality of the sample, which in this case was not randomly selected from a wider and bigger school population. The participants were just 20 students of an already uniformed - in character and collaboration habits - class, making it thus difficult to accurately approach the level of the strategy’s impact in this context. In addition, the composition of the sample did not contain cases of students that were officially diagnosed with learning disabilities. In this study, four students were evaluated by a special education teacher and found to be at risk of a learning disability. An investigation on a larger sample, where students with a formal diagnosis are included, could counterbalance the statistical power of the study, while also provide clearer results. Finally, in this study there was no control group to cross-check the results. All students homogeneously used the same strategy to learn a vocabulary list, without controlling whatsoever for learning efficiency on the same vocabulary content and difficulty through another learning approach or a strategy. Last but not least, it should be said that successful educational integration depends on the design and development of programs, focusing not only on academic performance but also on students’ social needs (Gaylord-Ross, 1989; Pedagogical Institute, 2011). Consequently, apart from the quantitative analysis of data in this research, a more systematic and qualitative analysis of behavior would be also important. That way we could compare the quantitative results with those of other research studies (Greenwood, 1991; Greenwood, 1999; Lee, 2003; Maheady, 1998; Martel, 2009; Maheady et al., 1987; McDonnel et al., 2001; Utley et al., 2001).

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Charikleia Ntoliou worked for several years as a teacher in primary education. She graduated from the Department of Primary Level Education of the Democritus University of Thrace and holds a Master degree in Special Education (Metropolitan College/University of East London).

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## Özet

# “Sınıf Geneline Akran Öğretimi” (SGAÖ) stratejisinin karma öğrenme yeterlilikleri / yetersizlikleri olan öğrencilerin devam ettiği ilköğretim sınıfında etkililiğinin incelenmesi: Bir vaka çalışması

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Öğrenme güçlüğü olan öğrencilerin kaynaştırma sınıflarında eğitim almasının gerekli olup olmadığı sorusu son yıllarda çokça tartışılmıştır (Davis ve Deponio, 2013). Buna karşın, öğrenme güçlüğü tanımı ve tanılanmasındaki güçlükler, araştırmacılar arasında anlaşmazlıklara yol açmış (Kakourous ve Maniadaki, 2006) kaynaştırma ortamlarında belirli eğitimsel yaklaşımların uygulanması gerektiği vurgulanmıştır. Buna ek olarak, birçok öğretmen kaynaştırma sınıflarında öğretimin nasıl sunulması gerektiğine ilişkin kararsız kalmakta (Fergusson, 2008), öğrenme güçlüğü olan çocukların sık sık sosyal ve duygusal sorunlar yaşadığı bilinmektedir (Westwood, 2007).

Bu sorunları tartışan Ellis'in (2005) çalışmaları, öğrenme güçlüğü olan çocuklar için genel olarak etkili olan çoğu öğretim stratejisinin, diğer öğrenciler için de yararlı olduğunu göstermektedir. Bu stratejilerden biri de “Sınıf Geneline Akran Öğretimi”dir (SGAÖ) (Greenwood, 1997; Maheady, Harper ve Mallette, 2003; Eğitim Bakanlığı [Ministry of Education], 2013). Bu stratejide, öğrenciler bire bir akran ortamlarına yerleştirilmekte, akranlar yönetime uygun geliştirilmiş çalışma kağıtları kullanarak birbirine yaklaşık 20 dk öğretim yapmaktadırlar. Başka bir deyişle, ilk birkaç dakika (10 dk.) bir öğrenci “eğitici” rolünü üstlenirken diğeri “öğrenci” olmaktadır. İlk 10 dk. geçtikten sonra roller değiştirilmektedir (Eğitim Bakanlığı [Ministry of Education], 2013).

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Bu araştırmanın amacı, SGAÖ'nün kaynaştırma uygulamalarının yürütüldüğü bir ilkokul sınıfında 7 yaşındaki öğrencilerin sözcük okuma düzeyleri üzerindeki etkilerinin incelenmesidir. SGAÖ'nün belirli bir sınıfta okuyan öğrenme güçlüğü olan ve olmayan öğrenciler için etkili olup olmadığını incelemek için nicel bir araştırma desenlenmiştir. Araştırmanın verileri, dördü öğrenme güçlüğü tanısı alma riski taşıyan 20 öğrenciyle beş haftalık bir zaman diliminde toplanmıştır. Bu nedenle, ön-testi izleyen sözcük okuma öğretimi sunulmuş ve son-test uygulanmıştır. Tüm ölçümler Greenwood, Delquadri ve Carta (1997) tarafından yayınlanmış olan SGAÖ el kitapçığına uygun olarak geliştirilmiş ve Milli Eğitim ve Din İşleri Bakanlığı'nın önerdiği Yunanistan'da uygulanan programın gerekliliklerine uygun olarak (Eğitim Bakanlığı [Ministry of Education], 2014) uyarlanmıştır. Veriler, bireysel analizlere ek olarak sınıfa ve öğrenci gruplarına ilişkin ayrıntılı ve derinlemesine bilgi alabilmek için nicel istatistik yöntemleri (ortalama, standart sapma ve regresyon analizleri) ile analiz edilmiştir.

Araştırmanın sonuçları, beş haftalık SGAÖ uygulamasının ardından gerçekleştirilen son-testte tüm öğrencilerin performanslarının arttığını göstermiştir. Buna karşın, ön-test ve son-test ortalama hata sayısı stratejinin uygulanmasının doğrudan öğrencilerin performansını etkileyip etkilemediğini ayrıntılı olarak açıklayamamıştır. Bu nedenle, stratejinin ön-test-son-test etkililiğine ilişkin tüm sınıfın bu beş hafta içerisindeki performans regresyonu incelenmiş, saçılım diyagramları (Scatter Plot) çizilmiş ve  $R^2$  (determinasyon katsayısı) hesaplamaları gerçekleştirilmiştir. Saçılım diyagramları, SGAÖ'nün olumlu etkisinin olabileceğine işaret etmiş, bu durum her öğrenci için ayrı ayrı toplanmış olan performans verilerinin yüksek dağılımını da doğrulamıştır. Ön-testte hiç hata yapmamış olan öğrenciler bu performanslarını son-testte de korumuşlar, performansları kötü olan öğrencilerin çoğunluğu için ise eğitimsel müdahalenin uygulanması ile hatalar azalmıştır. Son olarak, değişkenler arasındaki ilişkilere bir başka deyişle stratejinin etkililiğine ilişkin bilgi,  $R^2$  ile yakından ilişkili olan korelasyon katsayılarının (R) incelenmesi ile de ortaya konmuştur. Örneğin, ilk hafta değerlerin regresyon çizgisinin etrafında dağılım gösterdiği ve korelasyon katsayısının  $R=.86$  olduğu gözlenmiş, bu durum değişkenler arasında olumlu yönde güçlü bir korelasyon olduğuna işaret etmiştir. Determinasyon katsayısı  $R^2 = .74$  bu kanıyı güçlendirmiş bu durum stratejinin uygulanmasının örneklemeindeki varyansın yaklaşık %74'ünü açıkladığını göstermiştir. Sonraki haftalarda da benzer sonuçlar elde edilmiştir.

Araştırma bulgularının, SGAÖ'nün uygulanması ile ikinci ve üçüncü sınıf öğrencilerinin okuma becerilerinde artışlar görülen önceki çalışma bulguları görülmektedir (Delquadri ve diğ., 1983; Greenwood ve diğ., 1984) ile tutarlı olduğu Bu çalışmada, insanların davranışlarını etkileyebilecek diğer dışsal faktörleri araştırmanın zorluğuna ek olarak insan davranışlarının tahmin edilemezliği de (Frost, 2013) bir kez daha ortaya konmuştur. Dışsal faktörler, çevresel ya da duygusal olabilmekte; örneğin, yaklaşan gezinin duyurulması ya da stratejinin uygulanmasının hemen öncesinde öğrencilerin kavga etmesini içermektedir. Bu nedenle, öğrencilerin performansı ile ilgili eğitimsel araç arasında tek değişkenli bir ilişkiden kuşulanılmış, ancak bu durum eldeki verilerle tam olarak açıklanamamıştır, bu nedenle çalışmada ortaya konan verilerinin sonraki araştırmalarda daha ayrıntılı olarak incelenmesi gerekmektedir.

#### Önerilen Atıf Şekli

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