



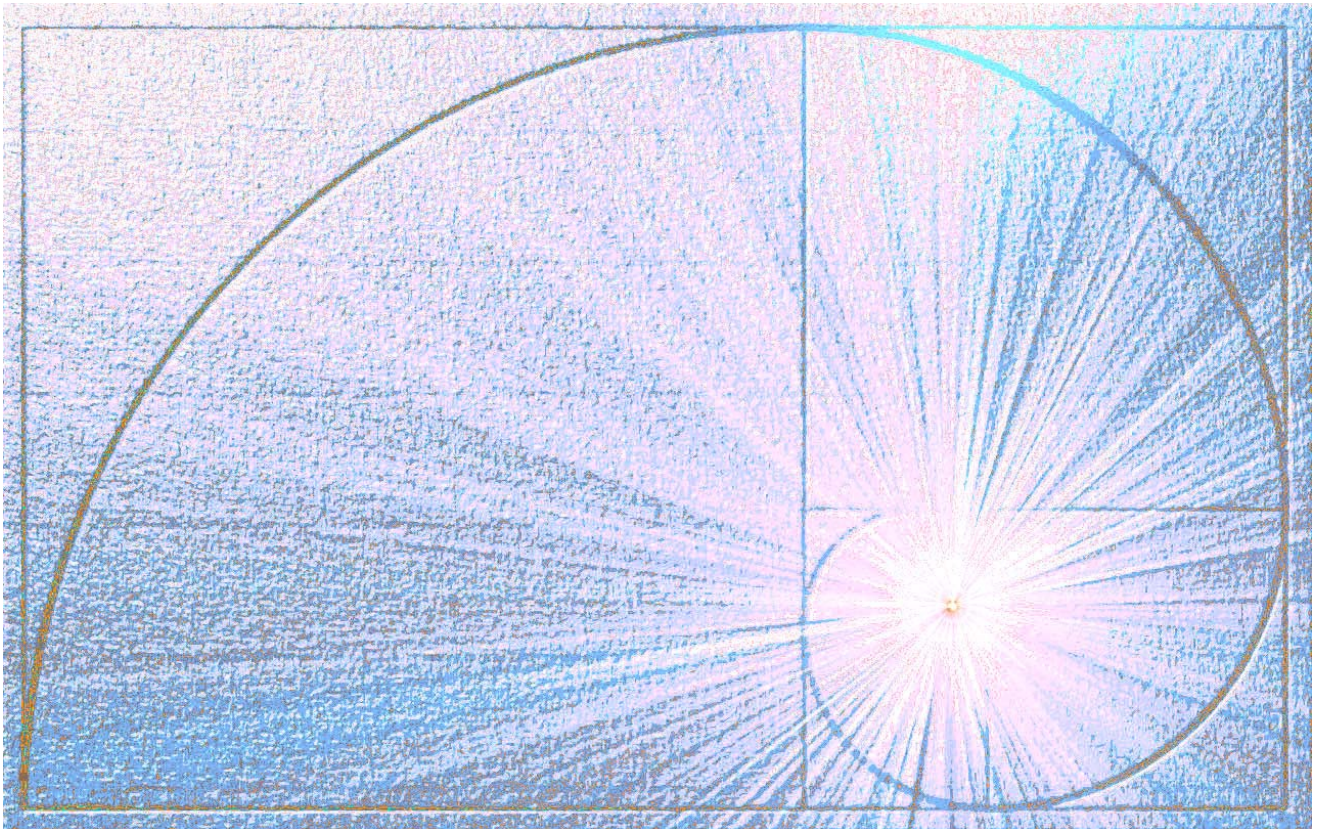
ΕΕΠΕΚ

ΕΠΙΣΤΗΜΟΝΙΚΗ ΕΝΩΣΗ ΓΙΑ ΤΗΝ
ΠΡΟΩΘΗΣΗ ΤΗΣ ΕΚΠΑΙΔΕΥΤΙΚΗΣ ΚΑΙΝΟΤΟΜΙΑΣ

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EDITORIAL

The first issue of the International Journal of Educational Innovation (I.J.E.I.) of the Scientific Union for the Promotion of Educational Innovation (EEPEK), within 2023 is available, thus, reflecting primarily the great interest in it by the educational community. Particular reference is made to the colleagues-members of the reviewing committee of this journal - for their outstanding work and ongoing effort to establish this journal as a valid means of knowledge contribution to the educational communities of all levels. Colleagues' response to the journal's invitation to participate in the journal processes, as members of the scientific and editorial committee or as authors of research papers, was particularly great and provided the educational community with another form of constructive interaction other than that of conferences, training seminars and other actions implemented. In this way, we come one step closer to our central strategic aim: the creation of a large Learning Community, which will include all teachers, at all levels of education.

Therefore, once more, this issue presents a variety of topics related to education, and educational practices. The aim of every teacher is to find the best way possible to achieve the goals set in any subject taught and/or target group/s addressed. These goals include conveying knowledge, enhancing the cultivation of attitudes and values, such as self-confidence, self-esteem, or empathy, and the cultivation of skills such as interaction, communication or the ability to learn how to learn. However, the main objective of education is to help students meet challenges throughout their lives. Thus, this issue presents innovative suggestions, tools and techniques related to teaching and learning, as well as issues related to education and educational innovation, thereby highlighting both the need for research in education and the need for education to apply research results to practice. In order for teachers to achieve these goals and objectives, the importance of sharing good practices and knowledge are principal. Our goal then is to disseminate teachers' suggestions and ideas as well as their research findings.

We hope that this issue will help all those, educators and non-educators, who dream of effective education through innovation to provide ideas for a better future for all students. We will keep on with the same passion ...

Dr. Charilaos Tsichouridis, Chief Editor, University of Patras
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Cooperative Creative Writing in Greek and English; Writing Poetry in the Language Classroom

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Abstract

In this paper, we present classroom Action Research during the last two school years 2020–2021 and 2021–2022 in a Senior High School (Greece) based on creative writing. The action was implemented in two target languages, Modern Greek as first (L1) and English as a foreign language (L2), during the corresponding language classes. On the occasion of an International Poetry Competition, students participated in groups and cooperated in writing poems in both languages. During the first year, the teamwork output was by a restricted number of students whereas in the second year among students of whole classes. Each year's project was from September to December. Both the outcomes of this teaching action and the students' responses in a questionnaire show that in L1 and L2 classes: a) creative poetry writing and b) teaching practices, such as co-teaching, student's collaboration, translation, and brainstorming are effective ways of teaching and learning.

Keywords: co-teaching methods, collaborative creative writing, poetry, translation, first language (L1), foreign language (L2), Action Research

Introduction

Creative writing poetry is an effective way of language teaching and learning. Many teaching practices have been suggested, i.e. in L2, namely, English as a Foreign Language, in Advanced Placement and Composition lessons, and in Greek as a first language (Hanauer 2012; Seale 2015; Souliotis 2012, among others). These strategies include brainstorming, practicing different writing types of poetry, creative writing, and collaborative writing. More specifically, Fithriani (2021) suggests strategies like (a) using popular poem templates as idea starters, (b) creating a vocabulary bank for writing rhyming poems, and (c) building emotions through personal story sharing and later channeling them through poetry writing.

On the other hand, co-teaching (the presence of more than one teacher in the classroom) has been suggested as a teaching strategy in the classroom, with 6 different structures; (a) One teach One observe, (b) One teach One drift, (c) Parallel Teaching, (d) Station teaching, (e) Alternative teaching, (f) Team teaching (see, Cook 2004, Cook & Friend 1995, Friend & Bursuck 2005), as it is presented in Table 1 and Figure 1. All the strategies present variations based on the subject taught, the age group, the maturity of the students and the creativity of the cooperating teachers. None of the strategies is considered better or worse compared to the others, since each of them holds a unique position in the "co teaching" classroom.

Table 1: Co-teaching models (Cook 2004)

Co-teaching model	Description
One teach, One observe	One teacher observes specific characteristics while the other teaches
One teach, One drift	One teacher presents material to the class while another circulates through the room and provides assistance to students
Parallel Teaching	Two teachers present material to the class simultaneously by dividing the class group
Station Teaching	Teachers divide the class group and content, and teach one group first, then the other.
Alternative Teaching	One teacher instructs the larger group while another works with a smaller group needing more specialized attention
Team Teaching	Both teachers work together to deliver content to the class simultaneously

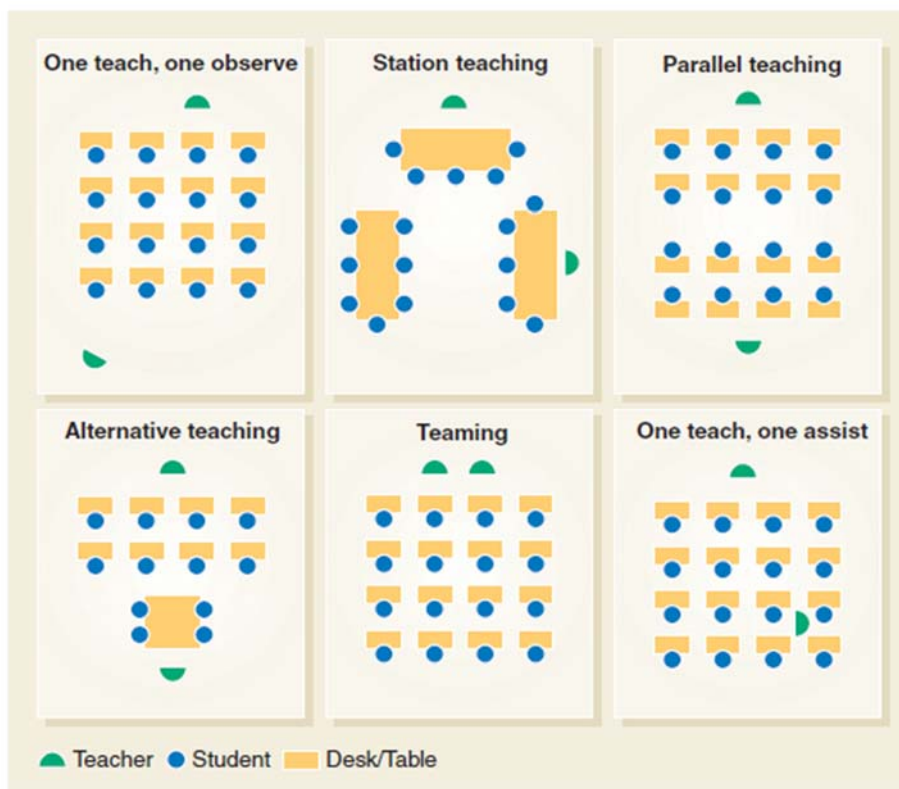


Figure 1: Co-teaching models (Friend & Bursuck 2012:77)

Over the course of the last three decades, teachers have been particularly interested in the possibilities created by two teachers who share the same classroom. Since 1960 (Trump, 1960), co-teaching was proposed as a strategy for the reorganization of secondary schools in

the USA as well as in England (Warwick, 1971). Accordingly, the variation of co-teaching, team teaching, during which teachers share the responsibility of planning while they continue to teach separately, was adopted by many schools during the 1970's (Easterby-Smith & Olive, 1984). More recently, the interest in co-teaching was rekindled as part of the middle school reform as well as other efforts for school reform (Maclver, 1990). In the current project, the different subjects taught (Greek language as L1 and English language as L2) through creative writing poetry have been taken into consideration, with both "Team Teaching" and "One teach One drift" models being employed. Basically, this is suggested by the curriculum, for core and elective courses, as well (Pitsaki et al, 2015, Faridou & Drougka 2017, Athanasopoulou, & Georgoudas 2019, among others). More precisely, this is suggested now only for students with special needs, for kindergarten English, and for Modern Greek Language and Mathematics in Vocational Senior High Schools (Ministerial Decisions 80378/2021, 109083/2021).

On the other hand, it is worth saying that the Action Research approach is a cyclical-spiral procedure (O'Leary, 2004) and each cyclical process consists of four steps: a) planning, b) acting, c) observing and d) reflecting-evaluating (Messiou, 2019). In our project, the initial planning and acting took place in the first year of our action and students participated in activities after the core curriculum. Meanwhile, in the second school year, based on the 1st year's observation and reflecting, we focused on learning outcomes (participation in the International Poetry and Theater Competition Castello di Duino and being awarded special mention) and we decided to involve the whole class during the Modern Greek and English Language lessons.

Methodology

In both school years, the preparation was based on students' participation in groups and writing cooperatively poems in two languages. The teaching objectives were basically: (a) the encouragement of students in creative writing (in Greek and English), (b) learning by students, through the collaborative method: to cooperate, to write collaborative poems, and to deepen the vocabulary of both the mother tongue and the foreign language, (c) familiarity with translation techniques from Greek to English and vice versa.

All the above mentioned are connected with the core curriculum, both in the Modern Greek Language and Literature lessons and in the English Language lesson. More analytically, in the Modern Greek Language and Literature lesson, the main objectives are that: (a) groups clusters of texts that talk to each other are presented to students, (b) the oldest texts are chosen with the newest ones and vice versa, so the students are presented as modern readers, and (c) Literature is approached in such a way that the classroom becomes a creativity laboratory (Ministerial Decision 110050/2021). Furthermore, in English lessons, one of the tasks is the practice of the first and foreign language simultaneous use through mediation techniques. It provides motivation to develop specialized interpreting and translation skills (Document by Ministry of Education 134183/2020).

In the first year (2020-2021), the cooperation was among students in a restricted number of groups. 17 students -from the 3 grades- participated in the International Poetry Competition Castello di Duino, working extra hours after the main school schedule (Table 2). They worked together with three (3) teachers (2 Greek Language teachers and 1 English Language teacher) from September to December 2020-2021.

Table 2: Participants' profile, 2020-2021

participants in the school year 2020 - 2021	number of students
A Grade (15-16 y)	4
B Grade (16-17 y)	4

C Grade (17-18y)	9
Amount	17

The three teachers divided the students into small groups of 2-4 members. They organized appointments with them after the core curriculum hours. Usually, the first meetings were among the two (2) Greek Language teachers and each student group. In the first meeting, there was a presentation of the different kinds of poetic writing (haiku, free verse, rhymes, acrostic poems, 15-syllable rhyming couplets in Cretan dialect called *mantinades* etc) by the Greek Language teachers. The topic of the Poetry Competition was “**Là, dove nasce la musica**” (*There, where music is born*), so the next step was a brainstorming activity about what music meant to them (a sound, a color, a season etc). Based on the word list that students made in brainstorming techniques, and the various kinds of poetry writing, each group started creating a cooperative poem and uploaded it as a common word file on the drive. When the poems were ready in Greek, the next meetings were between the English teacher and each student group, in order to translate or recreate their poem into English. The students were motivated to use dictionaries during this activity (Bampiniotis 2008, Stafylidis 1998, Interactive Terminology of Europe, Merriam-Webster Thesaurus, WordReference English-Greek Dictionary). These poems were uploaded on the common word file on the drive, as well. Since our school got a Special Mention for its participation and our students were excited about the result, we decided to extend the project the following year.

In the second year (2021-2022) ninety-three (93) students of whole classes worked within groups, during the core curriculum. More analytically, five (5) classes and three (3) teachers participated in this year’s project, from September to December 2021-2022 (Table 3). The classes were from grades A and B. No class grade C students participated due to the time limitations that the Panhellenic exams demand and the heavy workload on specific subjects.

Table 3: Participants’ profile, 2021-2022

attending classes in the school year 2021 - 2022	number of students
A Grade (15-16 v) (1 class)	22
B Grade (16-17 y) (4 classes)	71
C Grade (17-18y)	0
Amount	93

During the lessons, brainstorming was applied as an initiating teaching technique for groups to write cooperative poems. Furthermore, translation (from Greek to English and vice versa) and co-teaching were used in two ways: Greek teacher -Greek teacher and Greek Teacher-English Teacher using the “Team Teaching”, and the “One teach, One drift” model. One class of students experimented on writing first in their L2, in our case English, and then translated or more accurately rendered the poems in their first language (L1). The steps of each intervention are presented more analytically below.

Co-teaching: Greek teacher-Greek teacher

What followed before the co-teaching lesson was a parallel preparation of the students by the two teachers, each in their respective classrooms. The students were divided into mixed groups of 4-5 people. They were given a specific theme around which the students would create their poems. The topic was ‘Nostalgia’, since it was the topic of the International Poetry Competition for the year 2021-2022. What followed next was the interpretation and analysis of similar poems (Greek poetry of 1920-1930 by Kostas Kariotakis and Kostas Ouranis). The students had time to ponder over the topic of nostalgia and share what it meant for them

through brainstorming. (What color is nostalgia? How does nostalgia smell? If it were a sound, what sound would it be? What kind of music is nostalgia?) The words that came out of the brainstorming session formed the basis of the group's poetic creations that followed. The students practised different types of poetic writing (Cretan rhyming couplets-mantinades, Acrostic Poems, Haiku, Limerick, and Freestyle poems).

The co-teaching lesson started with a revision of different kinds of poetic writing presented by the two teachers using PowerPoint. Afterwards, each group presented the cooperative Greek poem they wrote on the classroom projector and their classmates helped them with suggestions for changes or improvements, such as (a) suggested collocations for the most accurate rendering of the students' thoughts and feelings, (b) Reciting the poems in the appropriate style by students of different groups and (c) suggestions by students for correct punctuation, poems' titles and linguistic rendering of the content. The coordination of the teams was made by the two teachers following the "One teach, One drift" co-teaching model. At the end of the teaching hour, the students expressed their thoughts and worries about the translation of their poems into English.

Co-teaching: Greek teacher-English teacher

During the Literature lesson, the Greek teacher read and presented poems with the theme of "Nostalgia" (Greek poetry of 1920-1930 by Kostas Kariotakis and Kostas Ouranis). Students discussed their thoughts and feelings about nostalgia, and were then divided into groups of 4-5 members in preparation for the next co-teaching lesson. In the first co-teaching hour, both teachers were present and the students worked in groups, brainstorming answers to questions related to nostalgia (e.g. colour, smell, type of weather, sound, person, music). A "One teach, One drift" co-teaching model was implemented. Then, both teachers presented different types of poetic writing to familiarize the students with different poetic expressions (e.g. haiku, acrostic poems, Cretan rhyming couplets-mantinades and free verse). The students then created different forms of poetic expression in Greek and wrote them down on a shared document. At the end of the teaching hour, the groups presented their poems in class using the overhead projector. During the second teaching hour, the students translated or rendered their poems into English with guidance from the English language teacher, while both teachers were overseeing and assisting the groups.

Co-teaching: English teacher-Greek teacher

During the 1st teaching hour, in the English lesson, the students had already been divided into groups by the English language teacher based on their linguistic competence and sex to form balanced groups with male and female students and stronger and weaker ones in terms of language skills. They were given a worksheet in English with questions to facilitate their brainstorming session. This time the students started writing their poems in English. Meanwhile, they were guided by the Greek language teacher into the different types of poetic expressions (**Cretan rhyming couplets-mantinades**, Acrostic Poems, Haiku, Limerick, freestyle poems) ("Team teaching"). In the second teaching hour, the students in groups wrote their poems in Greek with the assistance of both teachers ("One teach, One drift").

Table 4: Guided Questions Worksheet

How do I write my own stuff in POETRY?

I suggest two steps.

#1 -- respond to the questions below...you can choose whichever ones you want and skip those you don't like, but try to do at least half.

#2 -- put everything else down on the page and then fill in the gaps

How should I turn it in?

- Give it a title
- Type it
- Use a readable font
- Hand it in by ...

Questions to start writing a poem:

What color is nostalgia?

What does nostalgia smell like?

If you met nostalgia, what would it do?

If you could touch it, what would it feel like on your fingertips?

If nostalgia were a kind of weather, what would it be? (ex: a bright sunny day)

How would nostalgia move...slowly? Jerkily?

If nostalgia made a sound, what would it be?

If nostalgia turned into a physical object, what would it be?

Questionnaire and results

At the end of the second school year 2021-2022, 92 out of 93 students filled in a questionnaire. 21 students attend Grade A and 71 are in Grade B. No students from Grade C participated in the project. The data was collected with a questionnaire which consisted of 4 close-ended questions and a 1-5 scale Likert evaluation (1=not at all, 5= a lot) (Table 5). The students were asked to complete an open-ended question and express their impressions and thoughts about their participation in the International Poetry Competition as well as the preparatory creative process. It should be mentioned that the school project won the 3rd Special Jury Prize in the International Poetry Competition.

Table 5: the questionnaire given to the students at the end of the second year's project

QUESTIONNAIRE

Dear student, the following questionnaire is anonymous and aims to explore the impressions from your participation in the International Poetry Competition during the 2021-2022 school year.

1. What grade were you during the 2021-2022 school year?

1st grade of Senior High School

2nd grade of Senior High School

3rd grade of Senior High School

2. How satisfied are you from the process of your participation in the International Poetry Competition?

Not at all A little Quite A lot Very much

1 2 3 4 5

3. Did you enjoy the process of preparation for participation in the International Poetry Competition Castello di Duino?

Not at all A little Quite A lot Very much

1 2 3 4 5

4. Are you satisfied with your involvement in the group for the creation of poems using creative writing in order to participate in the International Poetry Competition?

Not at all	A little	Quite	A lot	Very much
1	2	3	4	5

5. Did you like the presence and cooperation of 2 teachers in the classroom for the creation of poems in Greek and English language?

Not at all	A little	Quite	A lot	Very much
1	2	3	4	5

6. Write your feelings about your participation and the distinction of your class in the International Poetry Competition.

Thank you for your time and your cooperation

Based on students' responses to the question of satisfaction with their participation in the International Poetry Competition, 60 out of 92 reported that they were satisfied. No students reported that they were not at all satisfied (Figure 2):

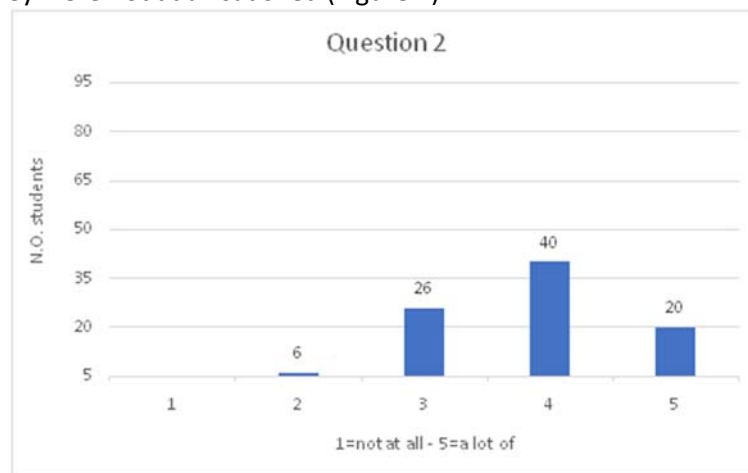


Figure 2: Students' responses to the question "How satisfied are you by the process of your participation in the International Poetry Competition?" (Question 2)

The results of the survey show that the majority of students (35 out of 92) liked the preparation process for the International Poetry Competition a lot, with another 25 liking it very much. No students reported not liking the preparation process at all (Figure 3):

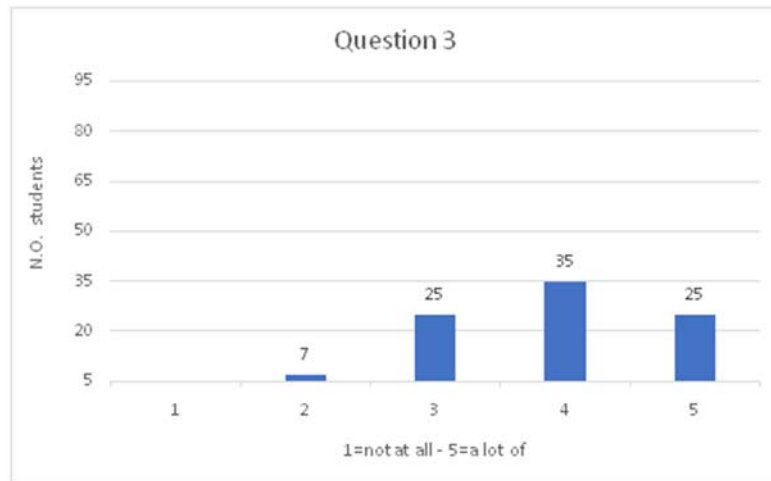


Figure 3: Students' responses to the question "Did you like the preparation process concerning your participation in the International Poetry Competition?" (Question 3)

In the question, how satisfied are the students with their involvement in the group for the creation of poems using creative writing, 50 out of 92 students were satisfied. No student answered that they weren't at all satisfied by their involvement in the group (Figure 4):

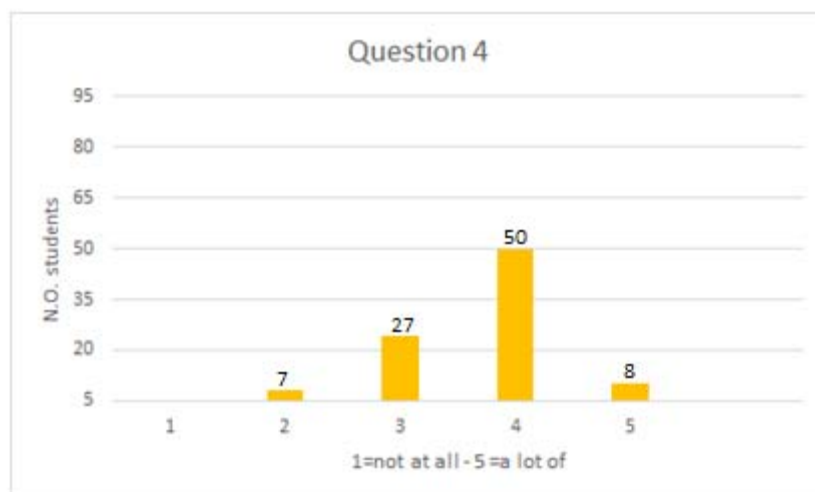


Figure 4: Students' responses to the question "Are you satisfied with your involvement in the group for the creation of poems using creative writing in order to participate in the International Poetry Competition?" (Question 4)

The majority of students (44 out of 92) reported that they liked the presence and cooperation of two teachers in the classroom while creating group poems in Greek and English. No students reported that they disliked this arrangement. (Figure 5):

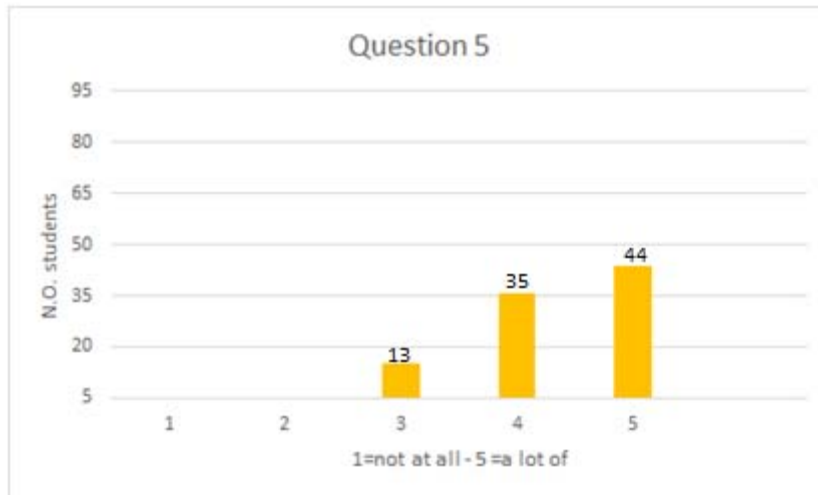


Figure 5: Students' responses to the question "Did you like the presence and cooperation of 2 teachers in the classroom for the creation of poems in Greek and English language?" (Question 5)

The open-ended question (Question 6) asked students to describe their feelings about their participation and distinction in the International Poetry Competition. Their reactions were overwhelmingly positive, as evidenced by the following responses: Student #1 said they "enjoyed the process, [felt] happy, and [enjoyed] working with [their] classmates"; Student #5 noted that they "enjoyed the cooperation and team spirit, [felt] good, [liked] that [they] did something different, and [were] awarded"; Student #16 remarked that they "felt very good and happy throughout the preparation" and appreciated the fact that "two female teachers taught together; it was original and interesting. And the distinction was a nice award"; Student #17 stated that the process was "very good, [they] felt good and creative" and liked "that [they] expressed [themselves] and [that they] did something different from the usual lesson"; and Student #38 concluded that it was "good, different from usual" and they would "do it again". In conclusion, the students clearly enjoyed the process, preparation, and felt proud of their distinction.

Conclusion

The reflection on student work and the evaluation of lessons via questionnaire demonstrate that a whole-class approach to creative writing activities allows students to effectively express themselves and create poems in two languages. The students were pleased with their engagement and preparation for the Poetry Competition, even though co-teaching is not a standard teaching approach in Greek mainstream classes and is not included in the core curriculum. Preparing the class to write poetry in groups was an innovative step towards creative writing and language excellence.

The evaluation and external assessment of the quality of student work indicate that co-teaching practices foster cooperation and inclusivity among students and teachers. Similarly, techniques such as brainstorming, translation, mediation, group work and experimental writing in various poetic styles (e.g. haiku, rhyme, acrostic poems) enable students to express themselves in both languages, while also improving their language skills.

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CLILING environmentally to develop students' productive skills

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Abstract

Content and Language Integrated Learning (CLIL) and interdisciplinarity go hand in hand in foreign language classrooms because language becomes the tool of communication, collaboration, expression and creativity in diverse contexts, addressing numerous topics and learners' interests. By using a foreign language, learners are able to learn about current issues, act as global citizens and participate in real or simulated social, cultural or political events. To that end, the paper focuses on CLIL lessons about environmental issues, and esp. the issue of energy, through the collaboration of language and subject teachers. More specifically, it describes the practices implemented at the 2nd Model Senior High School of Thessaloniki during the school year 2021-2022 by the teachers of English language, Modern Greek Language, Chemistry and Math. By being exposed to a lot of relevant authentic material, and by using digital content and tools and alternative assessment practices, learners simulate real-life events, presenting, analyzing, discussing and writing about the issue of energy and climate change. By doing so, they develop a lot of language and soft skills, and perform as active citizens.

Keywords

Content and Language Integrated Learning (CLIL), environmental issues, digital tools, alternative assessment

Introduction: Why CLIL?

"CLIL is defined as an approach in which a foreign language is used as a tool in the learning of a non-language subject, in which both the language and the subject have a joint role" (Marsh, 2002). In literature (Coyle, 2013; Coyle et al., 2010; Gierlinger, 2015; Marsh, 2002, 2008; Pérez-Cañado, 2012; Soler et al., 2016), CLIL is described as an umbrella term, a dual-focused educational approach, in which an additional language is used as a medium in the teaching and learning of non-language content, with emphasis on both content and language, and it is underpinned by a set of flexible but theoretically robust principles that support teacher practices across a range of different contexts (Cross, 2013).

Content and Language Integrated Learning (CLIL) is thus a teaching and learning approach, which offers a motivating and authentic communicative framework of learning that improves foreign language competence (Mattheoudakis, Alexiou & Laskaridou, 2011), fosters communication and collaboration, supports interdisciplinary practices (Kofou & Tzortzis, 2021), and promotes innovation and research in the classroom (Craen et al., 2007). As Gabillon

(2020) aptly sets it, CLIL is not only about using an additional language in order to teach any subject content; on the contrary, it aims “to build and reinforce learners’ knowledge of other disciplines while using the language to solve problems and develop critical thinking”. Learners’ confidence and self-esteem are enhanced (Mattheoudakis & Alexiou, 2017) while dealing with several topics not necessarily strictly-based on the Curriculum, whereas language and subject teachers employ innovative methods and alternative resources and develop professionally (Calviño, 2012; Lasagabaster, 2008; Smit in Dalton-Puffer, 2007).

A variety of models, approaches, and methods of CLIL, such as collaborative and experiential learning, have been implemented all over Europe, while in Greece CLIL is rather limited to a few schools, mainly experimental or model schools (see Kofou & Philippides, 2017; Kofou, Philippides & Gavriilidou, 2016; Kofou & Tzortzis, 2021). In that view, CLIL serves the educational and linguistic objectives not only of a country but of a particular school (Eurydice, 2006). Therefore, CLIL needs to be adapted each time to the local context, needs, and objectives, depending on the stakeholders, goals, and methods. So teachers need to think about three major stages: planning, implementation, and assessment. This means that they have to take into account the class they are going to teach, the subject matter they are going to focus on, and the objectives they are going to set. Then they have to select the content, plan the tasks, according to the emphasis they want to place on the language skills, and finally select the assessment forms, i.e. traditional tests or alternative assessment forms, or both (Kofou & Tzortzis, 2021).

Based on the content, methodology and practices of the present study, we define and apply CLIL as an interdisciplinary, cross-curricular approach, in which the foreign language becomes the medium to respond to lifelike situations in written and oral form, and deal with current issues of general interest.

All the above reveal a demand for effective teachers, able to collaborate (Mattheoudakis & Alexiou, 2017), plan lessons accordingly, use the foreign language proficiently, and integrate technology and alternative assessment forms.

Why deal with environmental issues and climate change?

The UK hosted the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow in 2021, aiming at bringing climate change under control and at reaching an agreement, the Glasgow Climate Pact.

The problem is that extreme weather events linked to climate are intensifying (Semerjian, El-Fadel, Zurayk & Nuwayhid, 2004). On the other hand, the world is warming because of emissions from fossil fuels used by humans, like coal, oil and gas. So, 200 countries were asked for their plans to cut emissions by 2030. Under the Paris Agreement of 2015, countries were also asked to make changes to keep global warming "well below" 2°C -and to try to aim for 1.5°C- in order to prevent a climate catastrophe. This is a target world leaders agreed to work towards in 2015 in order to avoid the worst climate impacts. The goal is to keep cutting emissions until they reach net zero in 2050, a rather ambitious goal, esp. after the war in Ukraine, which also intensifies the problem of energy across Europe. As regards methane, a scheme to cut 30% of current methane emissions by 2030 has been agreed by more than 100 countries. This is really important because methane is one of the most potent greenhouse gases, and is currently responsible for one third of human-generated warming. The majority comes from a range of activities, such as cattle production and waste disposal (European Commission, 2021).

The above goals -related to Sustainable Development Goals- and generally any issues related to the environment could not be overlooked in any educational context (UNESCO, 2011), since today’s students are tomorrow’s citizens who will have to cope with energy shortages and natural disasters, develop environmental awareness and adopt a more environmentally-friendly lifestyle.

Materials and Methods

Taking all the above into account and aiming to raise students' awareness of the environment and its sustainability, 3 CLIL practices were developed at the 2nd Model Senior High School of Thessaloniki during the school year 2021-2022 regarding methane emissions and energy issues. In particular, in the 1st CLIL practice, related to methane emissions and climate change, implemented by the EFL and the Chemistry teachers, the participating students of the experimental group had to propose a policy about how methane emissions can be reduced. The 2nd CLIL practice, implemented by the EFL and the Greek Language teachers, related to the issue of energy in the European Union. The students participated in a De Bono's 6-thinking-hats debate and in a simulation of the European Youth Parliament. Finally, the 3rd CLIL practice, implemented by the EFL and Mathematics teachers, involved Statistics and simulated the IELTS 1st writing task by using figures related to energy consumption and reduction in the EU.

The research hypothesis was if EFL learners are benefited regarding their learning, cognitive and cultural development and to what extent CLIL practices can develop their productive and soft skills, e.g. higher-order thinking skills, critical thinking, digital literacy, creativity, motivation and commitment to the task, active participation, communication and collaboration in a non-competitive learning environment.

To that end, the learning theories applied were:

- The theory of social constructivism (Vygotsky, 1978)
- Group Work with students' active participation, collaboration and experiential learning (Dewey, 1916).
 - Problem-solving, in which students formulate hypotheses, do research, collect and analyze findings (Dewey, 1916).
 - Exploratory teaching and learning, linked to the students' daily experience, and thus having positive effects on the teaching-learning process (Friesen & Scott, 2013; Pathway, 2012).

The data of the methane emissions practice were analyzed by using the statistical programs Excel and SPSS, whereas those of the other two practices, which concerned a writing product, were cross-referenced to the assessment criteria of writing of well-established EFL examinations, such as Cambridge and IELTS. The writings were also marked by two assessors in order to achieve interrater reliability, a common practice in formal language exams.

Methane emissions

The present teaching practice, concerning methane emissions, which is the second-largest cause of global warming, according to the European Commission, was carried out in December 2021 for 4 teaching hours in English, using the e-me educational platform, in Chemistry and English language courses, to 26 2nd graders of the 2nd Model Senior High School of Thessaloniki, acting as an experimental group, while the other 2nd Grade class acted as a control group.

The areas of knowledge involved studying methane (history, physical properties, chemical reactions, information about atmospheric methane, uses), the importance of Chemistry in scientific research, technology and society with thematic units and subsections of Energy and Climate Change, and the role of society in shaping energy policies.

The teaching material included: (1) course presentations with interactive exercises, with reference to the history, chemical structure, physical and chemical properties and uses of methane and information on methane emissions into the atmosphere and their impact on global warming, compared to those of carbon dioxide, (2) a worksheet concerning "Methane emissions vocabulary", (3) a worksheet entitled "Problem-solving presentation" in which students had to propose a policy about how methane emissions can be reduced, which was evaluated by both the students and teachers, (4) videos. The material used touched not only

the scientific point of view but also the political one. First, the students watched an interactive course presentation on the e-me platform including the speeches delivered by the President of the European Commission and by the President of the U.S.A. on the 26th UN Climate Change Conference of the Parties (COP26), and 9 dual-choice questions (fig. 1). Another interactive course presentation about methane included 6 multiple-choice questions (fig. 2). The students were given a text about the human activities that produce methane and its impact on the environment, humans and livestock, as well as a gap-filling activity on the e-me platform and a matching activity on learning apps (fig. 3).

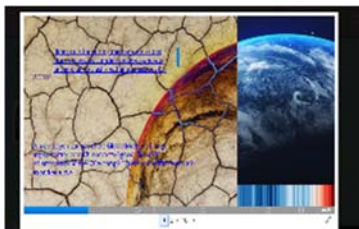


Figure 1. Interactive language course presentation

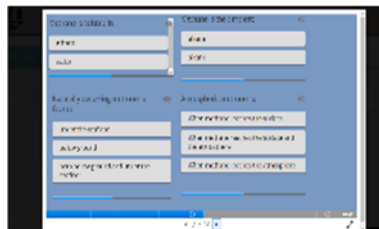


Figure 2. Interactive Chemistry course presentation



Figure 3. Matching activity

All the aforementioned activities gave the learners the opportunity to acquaint themselves with the policy and theory about methane, participate, be active and get instant feedback through this self-assessment method (Griva & Kofou, 2017). Finally, the participating students were given a mind map with the main issues to be discussed, a plan and useful phrases, and worked in groups to participate in a problem-solving activity and take part in a panel discussion about climate change and methane emissions. They had to use the information given to them and deliver a short speech proposing a policy about how methane emissions can be reduced. Voting would follow and the best policy would be selected to be put in action.

EU energy issues

This CLIL practice, related to energy, was implemented to a class of 26 2nd graders (the control group of the previous CLIL practice) and simulated in a way the European Youth Parliament (E.Y.P.) procedure.

First, the learners watched a video about the key issues of a debate, then they were introduced to De Bono's 6 Thinking hats and the questions to be answered, and finally to the way a resolution is written.

Afterwards they were divided in 6 groups, each one assigned with a different hat and a short text from the European Union about energy in order to discuss and keep notes according to the attitude each hat represented. The debate, following De Bono's pattern (fig. 4 & 5), took place in class, with each group represented by a spokesperson, and then the whole class, representing the Committee of Industry, Research and Energy (ITRE), used their notes and wrote a resolution which was voted at the end.

The whole practice was to a great extent a simulation of the European Youth Parliament aiming to discuss a current European issue, and help the participants discover and develop their skills, understand the principles of dialogue, co-operation and respect as well as prepare them to take charge of Europe's future.



Figure 4. Class discussion



Figure 5. Class discussion

Writing about environmental issues by using Statistics

This CLIL practice simulated one of the IELTS writings and aimed to acquaint students with statistics reading and writing.

It was implemented to 3rd graders by the teachers of Mathematics and English. The students were provided with a lot of relevant material, including the structure of the IELTS Academic Writing Task 1, Model IELTS Academic Writing, a model essay, a sample writing with a gap-filling activity of statistics expressions, useful vocabulary and the criteria of assessment: Task Achievement, Coherence and Cohesion, Lexical Resource, Grammatical Range and Accuracy. IELTS is trusted by individuals and organizations worldwide for its fairness, reliability and high-quality standards (<https://www.ielts.org/-/media/pdfs/writing-band-descriptors-task-1.ashx>).

They were also given figures and short texts about the European Union and a corresponding True/False/Not Mentioned activity to help them understand numbers, proportions, fractions, rates and relations. Finally, they produced a writing in groups, based on a figure about environmental issues, specifically about energy, and assessed it upon the criteria mentioned above.

Results

Regarding the CLIL practice in Chemistry and English, the results are the following.

The experimental group scored 100% in the course presentations (15/15 correct answers), and almost all managed to do the vocabulary gap-filling activity to 100%. Only two students scored 70% and 90%. As for the control group (the other 2nd year class), which was not taught but only asked to do the activities, the scores were lower both in the course presentations and the vocabulary quiz, and in a wider range (fig. 6 & 7).

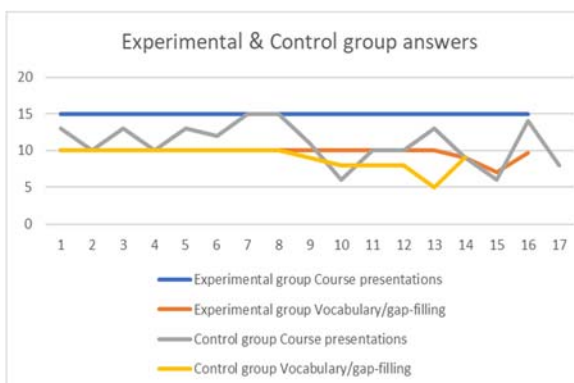


Figure 6. Comparison of the 2 groups answers

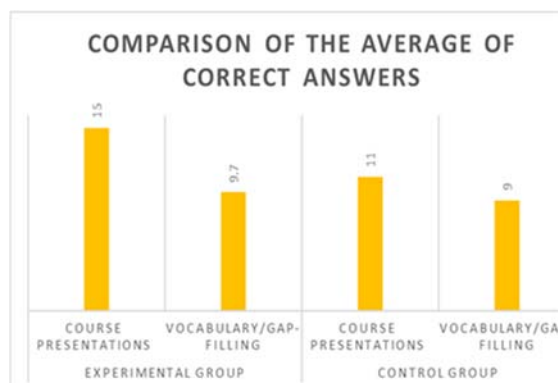


Figure 7. Comparison of the correct answers' averages

The statistical analysis indicated statistically significant difference between the experimental and the control group for the course presentation activities. The Mann Whitney test compares two conditions when different participants take part in each condition and the resulting data violate an assumption of the independent t-test (sig. .000) (Field, 2005). On the

other hand, the participants in the experimental group didn't seem to differ in vocabulary activities from the members of the control group (sig. .254).

As for the speeches delivered by the experimental group, students were assessed by the other groups and by the teachers upon the following criteria: Content analysis, Originality of ideas and suggestions, Presentation skills & pronunciation, Cohesion & linking words, Vocabulary & structure from 1 to 4 (1=weak; 2=quite good; 3=very good; 4=excellent). All the scores were added and compared to the teachers', and feedback was provided. It is interesting to mention that the students were stricter assessors than the teachers (Table 1).

Table 1. Assessment of the experimental group speeches

	TOTAL SCORE				STUDENTS' AVERAGE	T1	T2	TEACHERS' AVERAGE
GROUP 1	13	12	8	13	11.5	13	17	15
GROUP 2	15	11	16	13	13.75	18	18	18
GROUP 3	16	15	18	17	16.5	19	19	19
GROUP 4	17	15	16	15	15.75	17	18	17.5

As regards the discussion about the energy issue, by using De Bono's 6 Thinking Hats, the participating students managed to collaborate successfully, have an active role in the debate and develop their thinking and communicative skills. Each group represented their hat effectively, since they presented the facts they had kept notes about, talked about the strengths and weaknesses, expressed their feelings and innovative ideas in an immaculately coordinated discussion.

The final product, i.e. the resolution by the Committee of Industry, Research and Energy (ITRE), was rated by both teachers upon the criteria of Task achievement/Impact, Content, Coherence/Cohesion, Lexical resource, Grammatical range/accuracy, each one from 1 to 4, in an attempt to achieve inter-rater reliability, which is very high (Table 2), but also to provide feedback to the class.

Table 2. Assessment of the learners' resolution

EARNERS' RESOLUTION	Task achievement	Content	Coherence/ cohesion	Lexical resource	Grammatical range	Total score
TEACHER 1	4	3	4	4	4	19
TEACHER 2	4	4	4	4	4	20

The criteria correspond to the points that assessors consider when marking a piece of writing in proficiency testing, such a Cambridge and IELTS examinations (<https://www.cambridgeenglish.org/Images/600977-teacher-guide-for-writing-c2-proficiency.pdf>) (fig. 8).

Understanding the Cambridge English Writing Assessment Scale

Every Cambridge English Qualification targets a specific level of the CEFR and includes a range of tasks that are suitable for learners at this level.

The detailed descriptors in the Writing Assessment subscales are slightly different for each exam and are based on its target CEFR level. However, all Cambridge English Qualifications are designed to test a learner's ability to understand and use English effectively in real-life contexts, so the descriptors for different exams have some things in common.

For example, candidates at every level are expected to demonstrate good organisation in their written work, but examiners will expect to see progression and different levels of ability in each exam:

Organisation			
	B2 First for Schools	C1 Advanced	C2 Proficiency
Descriptor	The text is generally well organised and coherent, using a variety of linking words and cohesive devices.	Text is well-organised, coherent whole, using a variety of cohesive devices and organisational patterns with flexibility.	Text is organised impressively and coherently using a wide range of cohesive devices and organisational patterns with complete flexibility.

Cambridge English examiners consider these points when marking a piece of work:

Content	✓ The candidate answered the task. They have done what they were asked to do.
	✗ The candidate did not include everything they were asked to. They have written something irrelevant.
Communicative Achievement	✓ The writing is appropriate for the task. The candidate used a style which is appropriate for the specific communicative context.
	✗ They have written in a way that is not suitable – for example, using a very formal style in an email to a friend or ending an article with 'best wishes'.
Organisation	✓ The writing is put together well. It is logical and ordered.
	✗ It is difficult for the reader to follow. It uses elements of organisation which are not appropriate for the genre, like beginning an email with a title or forgetting to include a title for an article.
Language	✓ There is a good range of vocabulary and grammar. They are used accurately. Collocations are used appropriately.
	✗ There are mistakes that could make the text difficult or confusing for the reader. Some mistakes are unproblematic. Examiners focus on whether the reader is still able to understand the text.

Figure 8. Cambridge writing marking criteria

Hence, the resolution the students wrote is C2 level, according to the Cambridge examination scale (<https://www.cambridgeenglish.org/exams-and-tests/cambridge-english-scale/>) and band 9 according to the IELTS scale (fig. 9).

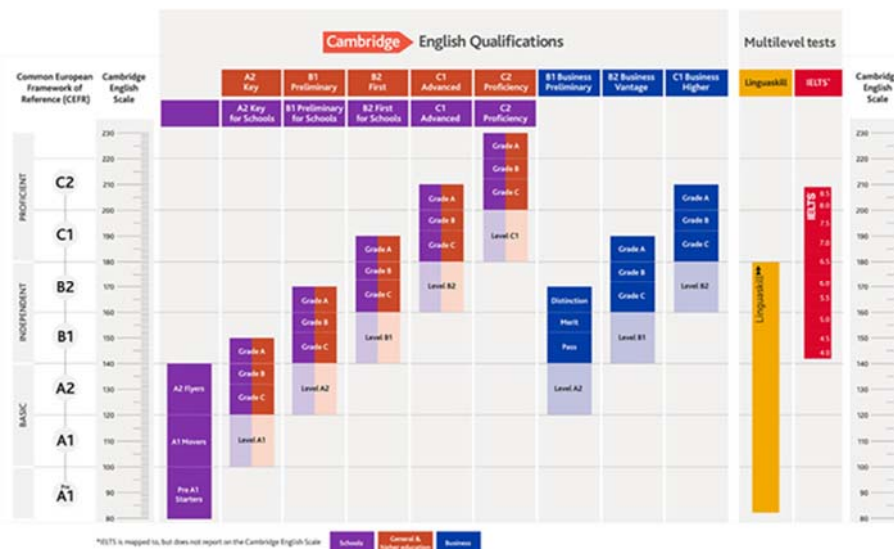


Figure 9. Cambridge examination scale

As far as the writing task simulating the IELTS writing task 1 is concerned, both teachers graded the group writings using the rubric of the IELTS band descriptors (Table 3). Using a rating scale like this, as a form of alternative assessment, gives a clearer picture of what a student can do with the language and describes their performance more accurately (Griva & Kofou, 2017). In the table below, we can see the marks allocated by the teachers to each group writing for each criterion and their average. It is quite interesting that the marks allocated by the Math teacher are a bit higher in many cases than those allocated by the English teacher, probably because the emphasis given by the English teacher is more on language, while by the Math teacher is more on the completion of the task and the successful description of the figure.

Table 3. Assessment of the IELTS writings

LEARNERS' WRITINGS	ENGLISH TEACHER					MATH TEACHER				
	Task achievement	Coherence & cohesion	Lexical resource	Grammatical range & accuracy	Average score	Task achievement	Coherence & cohesion	Lexical resource	Grammatical range & accuracy	Average score
Group 1	7	7	7	6	6.75	8	7	7	7	7.3
Group 2	6	7	7	7	6.75	9	8	7	9	8.3
Group 3	5	5	6	6	5.5	6	6	7	8	6.8
Group 4	9	8	9	8	8.5	9	9	9	9	9
Group 5	8	8	7	8	7.75	8	8	9	9	8.5

According to IELTS test statistics published in 2016, the average IELTS writing band score worldwide is 6.0. This average is taken from a 2016 sample of 3 million test-takers in over 140 countries (<https://blog.e2language.com/why-do-test-takers-keep-on-failing-ielts-writing/>). In our case, we can see (Table 4) that the means of all groups' writings are over 6, and most of them are between 8 and 9 in the IELTS band.

Table 4. Means of the IELTS writings

GROUPS	English Teacher	Math Teacher	MEANS
1	6.75	7.3	7.0
2	6.75	8.3	7.5
3	5.5	6.8	6.1
4	8.5	9	8.5
5	7.75	8.5	8.1

Discussion

The discussion should be twofold, i.e. revolve around the teachers' collaboration and professional development, and the students' learning and soft skills.

Throughout the stages of the CLIL practices, the teachers' collaboration was excellent as they shared a similar mindset, they discussed the idea and the process, and they worked together in shared documents and tools, in order to plan the lessons, prepare the material and assess the students in a non-competitive way for the benefit of their students. Each one contributed to the practices by transferring their motivating techniques, knowledge and discipline, which made the practices more scientifically robust. Their collaboration led to shared expertise and empowered them professionally. It is of great importance to mention that teachers had to alter their teaching methodology and find ways to help students learn in different and exciting ways.

As for the students and the research hypothesis which concerns them, it is obvious from the results that the students had multiple benefits regarding their language learning,

cognitive, and cultural development. Specifically, they developed team spirit, received the practices enthusiastically, and developed a number of skills. Their digital literacy was enhanced, esp. in the methane practice (CLIL and Chemistry), since they had to deal with digital content and do a variety of carefully assessed digital tasks. Furthermore, they familiarized themselves with chemical terminology, which is of great importance in their academic studies. More specifically, they were able to identify fossil fuels as important sources of energy, be aware of the natural causes and anthropogenic activities that cause methane emissions, enumerate the effects of the greenhouse effect on the climate, report on the impacts of climate change on the natural environment, ecosystems and society, propose a policy about reducing methane emissions, and raise their ecological awareness. The results confirm other similar research and studies on CLIL teaching practices, according to which, “CLIL programmes may offer the necessary conditions for effective learning” (Naves & Victori, 2010), language proficiency is developed through content learning (Ruiz de Zarobe & Jimenez-Catalan, 2009), and significant differences were detected in spoken production and interaction, writing, reading and “global comprehension” and “identification of details” in listening (Dalton-Puffer, 2011; Moreno de Diezmas, 2016; Ruiz de Zarobe, 2011). On the other hand, there are CLIL studies that “showed greater increases in English listening comprehension but not general English skills” (Dallinger, Jonkmann, Hollm & Fiege, 2016), or studies in classes in which teachers failed to consider the three dimensions of this approach (content, language, and procedures) simultaneously (Argudo, Abad, Fajardo-Dack, & Cabrera, 2018), therefore students did not develop them.

However, in the present CLIL practices all students approached the topics and tasks critically and creatively, were highly motivated and engaged to participate actively, work together and achieve a common goal, and they developed their writing and speaking skills in non-competitive, real-life scenarios. Finally, they acquired positive attitudes towards the English language and improved their self-image.

The whole experience was thus positive and rewarding for both the teachers and the students, and confirms our assumption that CLIL can be successfully implemented in interdisciplinary, cross-curricular contexts, if it is planned, implemented and assessed accordingly. Moreover, the results contribute to adding a 5th ‘C’ to the 4 Cs of CLIL, that of active citizenship, an indisputable skill for 21st century students.

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A case study research on perception and attitudes of parents of adolescents with Autism Spectrum Disorder regarding the language teaching of their children

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Abstract

Autism spectrum disorder (ASD) as a lifelong neurodevelopmental disorder puts a significant strain on the family. During secondary education, when the brain is rewired, language learning becomes a challenge for ASD students and their parents. Using this as a foundation, this article's main objective is to know the opinions and attitudes that characterize the parents of adolescents with ASD regarding the teaching of the Greek language to their children. Through a descriptive qualitative study, with a semi-structured interview of 32 items (n=30 parents) and an in-depth analysis, this goal has been accomplished. The main conclusion that has been reached is that participants-parents applaud their own assistance in the educational process, claiming though for special education teachers' cooperation, support from the Greek State and availability of specialized staff and resources to carry out smoothly the language learning process, with the aim of optimal outcomes in the linguistic competencies for their ASD adolescents.

Keywords: Autism Spectrum Disorders, Teaching of the Greek language, Adolescents, Special Education Teachers, Parents.

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder with central symptoms, the reduced social interaction and communication, the presence of limited interests and recurrent behaviors, and has a lifelong impact on the life of the individual (Masi et al., 2017). According to APA (2013) the DSM-V classifies individuals with ASD in severity levels, depending on their need for support (need a lot of substantial support, need substantial support and need support), while ASD diagnosis is based on a pattern of impairments in two broad domains of behavior, characterized by extreme heterogeneity in symptom expression: a) Impaired social interaction and social communication and 2) Restricted, repetitive behaviors or interests (Kanner & Asperger, 2016). The present study does not focus on the severity levels of the ASD adolescents' need for support, as the children of the participating parents belong indiscriminately to all three categories, with diverse heterogeneity in the appearance of symptoms.

The etiology of ASD remains a topic under discussion and is sought in psychological, sociological and biological factors (Nadesan, 2020). Since ASD cannot be eliminated, it necessitates a constant support of the individual and his family throughout his life (Sussman et al., 2015). Often, education and support of people with ASD have the effect of mitigation of symptoms or even of improving behaviors. However, people with autism remain in the spectrum and in their adult life, while still experiencing difficulties in independent living, in their professional rehabilitation and in their mental health (Lord et al., 2020).

The upbringing of a child with ASD is a significant aggravating factor for the family (Smith & Anderson, 2014). Most researches have focused on the recording of the psycho-emotional difficulties of parents of children with ASD, while recent studies have examined the

effectiveness of psycho-educational programs for parents, focusing on individual factors, such as improving the symptoms of ASD in the child and increasing the parent's participation in the programs (Beaudoin et al., 2019).

Until this date, there is little research worldwide and in Greece that studies the difficulties encountered by parents of adolescents with ASD in relation to the educational process. The existing shortage justifies the relevance of this research (Sproston et al., 2017).

Family and ASD adolescents

Adolescence is for the western civilization a critical developmental stage, with special importance (Goodway et al., 2019). For children of typical development it is a period full of creativity, during which autonomy of the individual is developed. In contrast, the family of the person with ASD, while being a spectator of a normal physical development, also notices that the child is unable to fight for its independence. Although the child with ASD can acquire many and important skills through proper training, remains completely different from its' peers and requires continued monitoring on basic self-service areas (Samara & Ioannidi, 2019).

This situation makes clear the permanence of disability for parents (Jinks, 2019). They are now completely aware of their child's ever-dependency on them and have the unwavering sense of responsibility that will last for all of their life (Chen et al., 2019). The transitional changes, physical and psychological, to adolescence for a child with ASD cannot be perceived and the greater burden falls in the family (Burke et al., 2019). The needs of the adolescent and of the family create a reality that requires a careful planning and emotional acceptance, from the parents themselves.

Parents are still engaged with the suitable structure for their adolescent's education, yet it begins to be suggested the necessity of planning for the transition into adulthood. Their aim is their adolescent's inclusion in society and they seek understanding of their feelings from experts, relatives, friends, colleagues and society; support from specialists; not to feel helpless and to be able to protect all family members without exception; to be recognized for them the right to live (Finke et al., 2019).

Teaching of Greek language to ASD adolescents

Teaching of the Greek language at the Curriculum of General Education is directly related to communication, as it is based on the communicative approach that relies on meaning rather than form (Mitsis, 2015). Regarding the education of students with ASD, one of the primary objectives is the understanding of the meaning of communication, as well as the use of communication skills in different social contexts (Parish-Morris et al., 2019; Muskett, 2016).

The acquisition of reading and writing has communicative character, but the teaching of the language is separated from the oral speech, which many students with ASD don't possess and possibly will never acquire it. The cultivation of oral speech is included in the communication skills (Bak et al., 2019). It is noted that in the Curriculum of the Greek language remains as a goal the acquisition of phonemic awareness and the conquest of the mechanism of reading, which is based on graphic and phonic correspondence, wherever this is possible to occur (Georgali, 2017). However, the main objective of the Curriculum for students with ASD is the visual recognition of words or symbols, as an alternative way of learning and using the written word (Georgali, 2017).

Students with ASD belong to a wide range of differentiated skills. Therefore, they should also be offered a variety of writing approaches, such as the voice method and the visual recognition of words or symbols. Through elementary school some capable students with ASD, like the ones with Asperger's syndrome, may appear as if they have only specific learning disabilities, such as reading or language processing. But, as they enter high school, with its' higher social and communicative requirements, and as adolescence begins to rewire the brain, ASD reasserts its social communication difficulties, due to the higher levels of cognitive demand (Crothers et al., 2020). Generally, special emphasis is put on the visualized

presentation of activities, since in ASD students the visual channel is the predominant channel of pulse acquisition and processing (Kotsi & Fernández Robles, 2023; Kakouros & Maniadaki, 2015).

Methodology

In this interpretive qualitative study, a case study design was used. When the research interest is transferred to a specific, complex and functional situation, then the concept of Case Study is used to characterize the research strategy (Yin, 2017).

Necessity and usefulness of the educational research

This educational research contributes significantly to the development of the relevant educational scientific fields, as the use of its findings can lead to its further application both by the State itself as an educational policy, as well as by the teachers and the parents of adolescents with ASD. In reality, and given the very limited research activity in this specific area the usefulness of the current research is even bigger.

Research questions

In the present article a specific number of questions are presented, since the attention is focused on revealing these exact results. The study sought to determine specifically the opinions and attitudes that characterize parents of adolescents with ASD, regarding the teaching of the Greek language to their children. Subsequently, the following sub-themes emerge with their corresponding 16 questions:

- Family context factors that promote and prevent language learning in adolescents with ASD (mutual cooperation among family members, means of communication with the ASD adolescent and strategies applied, existence of a language program inside home, cooperation with the school context).
- Detection of the pedagogical needs and demands emerged from parents of adolescents with ASD (assistance from special education teachers for the adolescent's teaching, difficulties in adolescent's response to language learning, obstacles because of the working life, what pedagogical help is required).
- Value the role of the educational program within home (achievement of educational objectives set by special education teachers, language improvement of ASD adolescents, modifications in the family program and tools used inside home, effectiveness and improvements of the implemented educational program inside home).

Research design and data analysis

For the development of the research a semi-structured interview was created, as a research tool, designed to address a wide range of questions that ask why, what and how of the issue proposed and leading to exploration, explanation, description, evaluation and theorization in context (Harrison et al., 2017; Yin, 2017). After the initial design of the instrument and before its application, issues of relevance and clarity were examined. Thirteen experts on the fields of ASD, special education, and teaching validated the interview guide with these exact criteria being assessed. The numbers were estimated by using the Aiken V formula, frequently applied in educational research, such as Muliana's et al. (2020) and Ramadhan's et al. (2019), in order to calculate the content-validity coefficient of the items-questions of the instrument, based on the results of the experts' assessment (Aiken, 1985); the results showed a range between 0,92 - 1,00 for both criteria, according to experts' judgment.

Table 1. Aiken’s V values

Semi-structured Interview Item	Aiken’s V	
	<i>Relevance</i>	<i>Clarity</i>
6. Is there a mutual cooperation among family members (spouse, siblings, grandparents, etc.) regarding the communication with the autistic child?	0,98	0,98
7. If a member of the family is not willing to cooperate in the language learning of the child, what are your reactions to solve the problem?	0,98	0,97
8. What means of communication do you use with your autistic child?	0,98	0,98
9. Are you able to organize an everyday language learning program inside home, with all members taking part in it? How feasible is this?	0,98	0,98
10. Is it possible to follow at home the pedagogical directions given from the school context?	1	1
11. Do you have strategies at home for working with your child? What difficulties do you encounter in the language teaching of your child? How do you think they could be solved?	0,98	0,92
12. Do you receive help from special education teachers, in order to guide your child’s teaching? Is there collaboration between special education teachers and parents at home?	0,97	0,95
13. What difficulties do you encounter in child’s effort to respond to language learning?	0,98	0,98
14. If you, because of your working life, cannot apply educational techniques on your autistic child, what help would you need to facilitate the child’s progress?	0,98	0,98
15. What kind of pedagogical help would you appreciate, according to the needs of your autistic child? What information and training do you need to educate your child?	0,98	0,97
16. Are the educational objectives set by special education teachers achieved? Do you offer your collaboration inside home?	0,98	0,97
17. Does your child with your cooperation show signs of language improvement?	1	1
18. How is work done and promoted within the home?	1	1
19. In which ways have you modified your family program to facilitate your child’s language abilities?	1	1
20. What tools do you have at your disposal and which have you received to promote the educational program within the home?	1	1
21. Do you think the program you follow at home is effective? What improvements do you think could be made? What further difficulties appear in implementing the educational program within home?	0,95	0,92

The first sector of the semi-structured interview included seven questions of demographic interest, while the second one about the opinions and attitudes that characterize parents of

adolescents with ASD, regarding the teaching of the Greek language to their children consisted of sixteen questions, which were open.

The analysis of the data was qualitative, with the descriptive method used, providing the exact description of the phenomenon under consideration (Schratz, 2020; Mantoglou, 2015).

Sample and data collection

The type of sampling in this educational research is intentional, meaning that it involves selecting only a sample of people from the study population. Qualitative research typically uses *purposeful* sampling, as it does not seek to measure issues, make population level statements or extrapolate findings (Hennink et al., 2020).

The population participating in the study is a group of parents with ASD adolescents (belonging to charity non-profit organizations for parents and friends of autistic people with representation in Northern and Central Greece), with n=30, of which 70% were women. Their ages were from 39-62 years, all residents of northern and central Greece and 50% of the sample was divorced. All educational backgrounds were covered from high school graduates to PhD holders.

Table 2. Demographic Summary of Study Participants

Sample data			
Total Sample		n=30	100%
		n	%
Age		39-62	100%
Gender	Women	21	70%
	Men	9	30%
Residence	Northern Greece	19	63,3%
	Central Greece	11	36,6%
Marital status	Married	9	30%
	Divorced	15	50%
	Single parent	6	20%
Educational level	High school	14	40%
	Bachelor	12	46,6%
	PhD or MSc	4	13,3%

Limitations

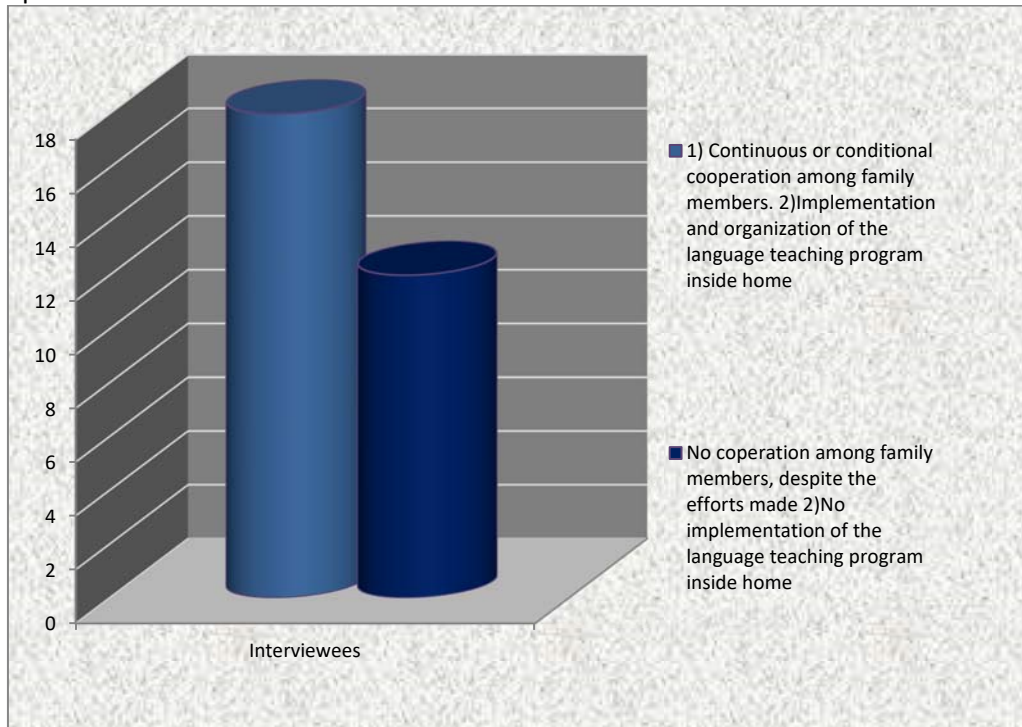
The research was carried out according to the original schedule without any serious problems. Covid-19 made the contact with the interviewees a little difficult, yet this was not insurmountable. Participants were informed about the research as well as about issues of anonymity and security of personal data. Semi-structured interviews were conducted on face to face meetings, according to participants’ availability. The data collection period started on the second semester of the academic year 2019-20 and ended the final days of the second semester of the academic year 2020-21.

The development of this research in the field of educational sciences involves a main handicap regarding the sample size. The initial virtues of this study were to put on the table the voice of parents with ASD adolescents who are not the object of constant studies in this field. The research was conducted in northern and central Greece and the results cannot be generalized to the total population concerned, since this is a qualitative approach with a relative percentage of participants. The small sample size does not permit generalizations to the entire population of parents with ASD adolescents for reliability reasons.

Findings

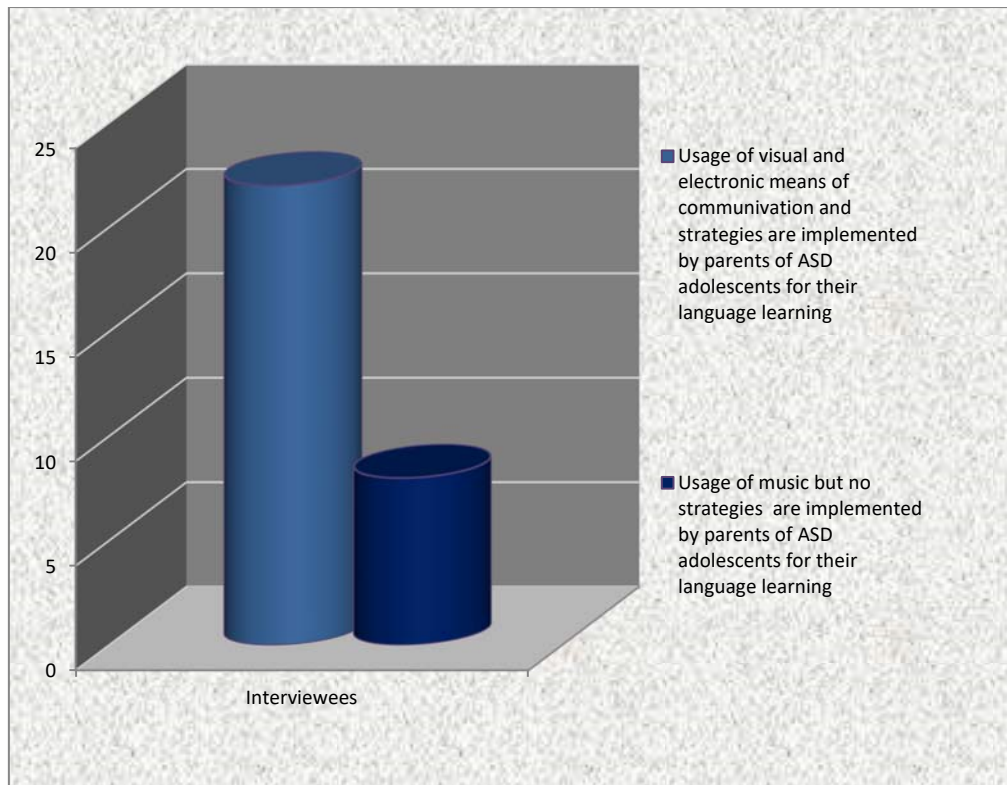
Family context factors that promote and prevent language learning in adolescents with ASD

The research data demonstrate that family environment is mostly presented as positive and collaborative inside home, trying constantly to promote language learning in their ASD adolescents. Mutual cooperation among family members regarding the communication with their ASD adolescent is continuous or sometimes conditional in most cases observed (60%, f=18), with the same percentages appearing in the implementation and organization of the language teaching program inside home. The percentage of 60% corresponds to 18 participants out of 30.



Graph 1. Cooperation among family members for the implementation of the language teaching program for their ASD adolescent inside home

The 30 interviewees were asked about the means of communication used with their ASD adolescent and the strategies they implement for their language learning. The vast majority of them apply certain strategies (as rewards and encouragement), visual and electronic means alone or complementary with written scripts (73,33%, f=22), and the rest do not apply strategies and use only music for their ASD adolescent language learning.



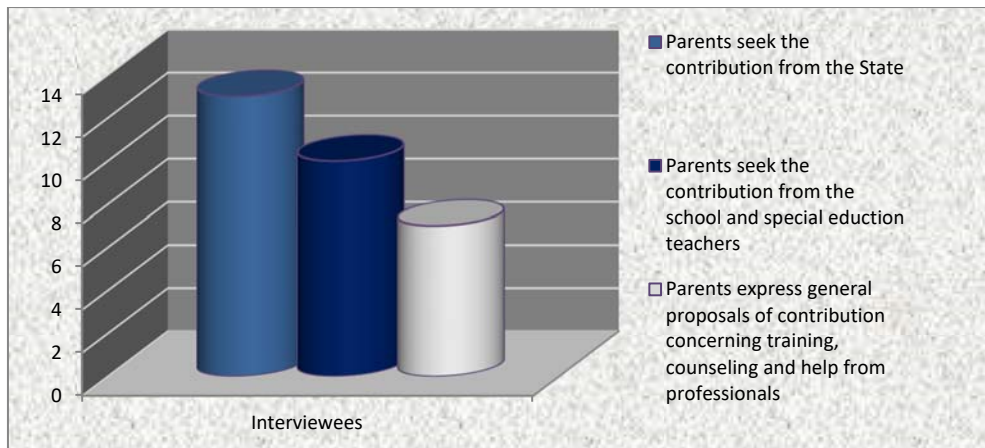
Graph 2. Means of communication and strategies used with their ASD adolescent for their language learning

The reaction of the participants to the possibility of following at home the pedagogical directions given from the school context is absolutely positive, with the 80%, $f=24$, to be in total agreement with this perspective and the rest arguing that this cannot happen, without specifying the exact reasons.

Detection of the pedagogical needs and demands emerged from parents of adolescents with ASD

The difficulties that parents-participants encounter in their adolescent's effort to respond to language learning reveal a clear separation among them according to the individual needs of each ASD adolescent. Thereby, parents whose children can speak and read adequately express mainly the deficiency of the misunderstanding of the real meaning (56,66%, $f=17$), while the rest, with ASD adolescents speechless or with limited vocabulary, argue that there is conditional or no communication at all (43,33%, $f=13$).

From the 30 interviewees, the vast majority (83,33%, $f=25$) recognize the crucial pedagogical assistance from special education teachers, in both guidance for their adolescent's language learning and their in-between collaboration. Yet, satisfaction levels are quite low since parents would appreciate more pedagogical help to facilitate their ASD adolescent's educational progress. From their own side the 80%, $f=24$, of parents, despite of their professional activities, apply educational techniques to facilitate their child's language learning, would require extra help though. They seek the contribution from the State (43,33%, $f=13$), the school and special education teachers (33,33%, $f=10$) and propose general suggestions concerning training, counseling and appropriate help from professionals (23,33%, $f=7$).

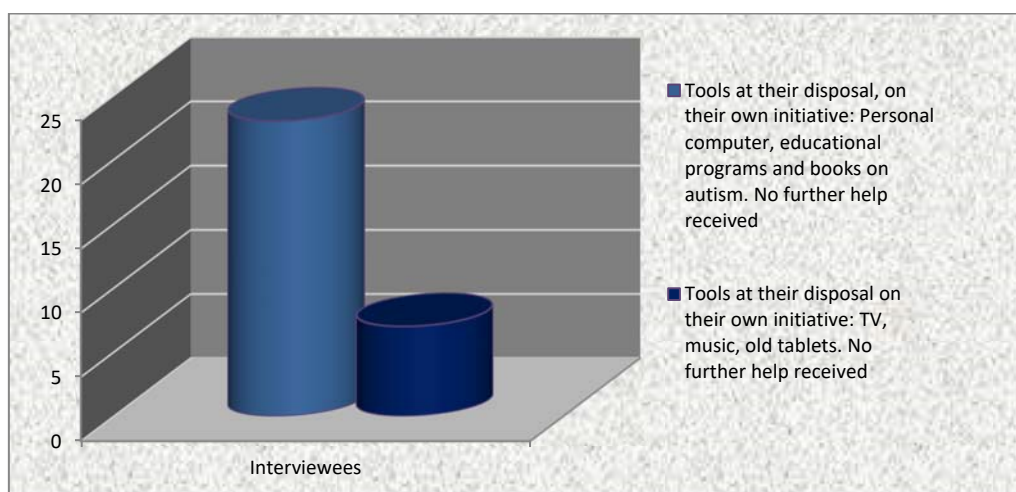


Graph 3. Pedagogical help that parents would appreciate to facilitate their ASD adolescent's educational progress

Value the role of the educational program within home

The educational objectives set by special education teachers for the in-home educational program, alongside with their in-between collaboration are achieved and unquestionable for the majority of the interviewees, since 76,66%, $f=23$, is confirmative. Additionally, work inside home is done through specific program and is completely or almost effective for the 73,33%, $f=22$, while the rest act spontaneously according to adolescent's needs and find the program ineffective or there is simply no program followed.

However, to facilitate ASD adolescents' linguistic capacity a lot of modifications are required for the family's program, with the 56,66%, $f=17$, of the interviewees to reschedule their working hours to comply and the rest of them, 53,33%, $f=13$, to be urged to stop working or get one day off from their work, during each week. Further, regarding the available tools parents have to promote the educational program inside home, almost all of them use their personal computer alone or combined with other tools they have gathered on their own initiative. In this case, their unanimous statement is that the State or the school context never provided them with any educational tools, nor further assistance is ever received.



Graph 4. Tools that parents have at their disposal to promote the educational program within home and which they have received

Discussion and conclusions

Greece presents a quite interesting example of a country where, despite supportive legislation, the provision of special education still faces obvious obstacles to its full implementation. From the obtained data, the classification of ASD adolescents into severity levels, combined with the diverse heterogeneity in their symptoms' appearance, is statistically insignificant, in terms of their parents' perception and attitudes regarding their language teaching. In short, and taking into account the objectives set, several aspects are concluded.

In relation to the objective family context factors that promote or prevent language learning for ASD adolescents, it can be argued that family environment is characterized as positive and mainly collaborative in most cases observed. These findings are consistent with the latest research of Ntre et al. (2018) in Greece who attributes these results to the strong ties in the extended family that are still observed in Greek communities. Concerning language learning and following a language teaching program for adolescents with ASD, this is implemented by visual and electronic means of communication, written scripts and music (Kotsi & Fernández Robles, 2023). This finding is fully in line with Knight & Sartini (2015), who maintain that visual supports are the first of the two evidence-based practices with a variety of forms, while using them is one of the most recommended practices in language teaching to students with ASD. The largest proportion of parents refer to considerable difficulties yet strive to apply an everyday language learning program inside home by implementing educational techniques, using learning strategies and endeavor hard to follow the pedagogical directions provided from the school context.

According to the objective detect the pedagogical needs and demands of parents of adolescents with ASD, it is admitted by the majority of the participants that collaboration at home between them and the special education teachers exists, yet satisfaction levels are quite low. Parents try to achieve the educational objectives set by special education teachers, but this is not always fulfilled (Kotsi, 2022). More often they try to apply a daily program in language learning with rewards, otherwise work inside home is progressed spontaneously according to adolescents' needs. Even when parents' cooperation helps their ASD adolescents show language improvement, there are serious exemptions. In this way, effectiveness of the implied educational programs at home is questioned and doubted. Parents seek for more collaboration and extra help from the school context, from special education teachers and from the State in general means. In accordance to the literature review in Greece of Kossyvakis (2021) it is apparent that legislation, policy and research have dealt with the parent-teacher collaboration to a certain extent. Syriopoulou-Delli et al. (2016) found that 100% of the parents and 96% of the teachers in their research sample consider the significant importance of parent-teacher collaboration. Additionally, the findings are fully in line with the research of Mavropalias et al. (2019), where parents do not seem satisfied with their collaboration with teachers, arguing that the information received from teachers on how to support their children on their education or guidance is not enough. As Veroni (2019) claims professionals need to respect parents' beliefs and provide appropriate information on the strategies to support ASD children and their families.

Regarding the objective evaluate the role of the educational program within home, the conclusion achieved is that parents mostly react positively and value its' role within home. Yet, according to the participants-parents, diversification and modification to the family program, in order to facilitate the adolescent's language abilities, is an essential factor. This includes shaping the working hours in such a way as to enable the engagement with the ASD adolescent and improve his linguistic skills. Whenever due to family reasons this cannot be achieved, then a day off during week or even quitting of job occurs, leading inevitably to financial burden. Findings are in complete consistency with Ntre et al. (2018), describing that 36,4% of families had a member who had to quit their job, in order to care for the child and that parents with a child with ASD were affected in their employment decisions by not taking

a specific job or greatly changing their current job or work extra hours, due to their availability to the proposed work hour-schedule. Ntre et al. (2018) claim that having a child with ASD is associated with a reduction in family income, with some parents obliged to modify their professional career, in order to be able to cover the high cost of their child's special education. In addition, participants claim that the available tools at their disposal, to promote the educational program within home are depending exclusively on their own initiative: such as the usage of computers, tablets, educational programs and books about ASD, etc. No further assistance is offered, leading to comply with Papadopoulos's research (2021), where participants expressed financial strain arising from the overall cost of care for their ASD children, for both current and future treatment expenses.

Concluding, in modern Greece parents of ASD adolescents are facing the lack of the necessary technical infrastructure, absence of suitable resources and no funding. These effects hinder the positive development and psychosocial well-being of people with disabilities and cause long-term disadvantages (Thomaidis et al., 2020). Papadopoulos (2021) claims that the lack of access to equal opportunities in education may occur as such services offered by the State are minimal and do not best cover the holistic needs of adolescents and their families. Some attempts have been made in recent years for the overall improvement of the Greek education system, with the aim of including children with disabilities, but progress remains slow compared to the average progress achieved in the European Union (Papadopoulos, 2021).

Limitations and Future Lines

The initial virtues of this research were to put on the table the voice of parents with ASD adolescents who do not present the project of constant studies in this field. Access is limited though to northern and central Greece and the results cannot be generalized to the total population concerned or provide an overall scope of responses, beyond the study parameters.

Further, the research was conducted in Greece during an austerity period with financial cuts and reduced state financial support that affected education provision, particularly for families with ASD adolescents, whose educational needs are not met adequately. Other countries with similar socio-political structures may not, comparatively, undergo austerity in the same way, regarding seamless educational provision to all equally.

A future line of research should be focused on extrapolating the findings of the present study to other countries around the world, through the systematic approach of the parents of adolescents with ASD. Additionally, it would be very interesting to link language learning research between both adolescents with ASD in secondary education and children with ASD in primary education.

The final statement of the research is the central role that parents could perform in improving the language skills of their ASD adolescents. Placing them at the center of future research and transform them into accompanying assistants in the educational process, should be explored further.

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Differentiated Instruction and provisions for students with special educational needs in STEM domains Curricula for Compulsory Education

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Abstract

Planning differentiated instruction (DI) aims at creating a learning environment, enriched with appropriate tools and materials, which allows students to pursue their personal, individualized learning path, through their participation in collaborative and interactive learning experiences. In the light of inclusive education catering for the needs of diverse learners, this paper presents how DI is gradually depicted within STEM domains Curricula for Compulsory Education in Greece. We examine the STEM domains Curricula since the Cross Thematic Curriculum Framework (CTCF) for Compulsory Education which came into effect from 2003. More precisely, we quoted any references made to DI in general and to teaching students with special needs and we illustrate how the concept of DI is increasingly represented in policy documents such as the “New Curricula” (2021). The study shows that in some curricula of the CTCF there are references to the special needs of students but not in the New Curricula and vice versa for the Differentiated Instruction, points that we think could be taken into account during the training of teachers.

Keywords: Curricula, STEM, Differentiated Instruction, Special Educational Needs

Introduction

Addressing students’ differences entails making changes that will enable students “to learn with their peers in an inclusive schooling system” and delivering the curriculum in various ways (Sherman, W., 2008, 2016: 7). Students may differ in terms of familial background, ethnicity, cognitive abilities, socioeconomic factors, readiness, learning style and pace, and so on (Heacox, 2014: 7-9). Planning the instruction for academically diverse students implicates content, process and product modification, as well as learning environment adjustment. For example, content is differentiated when students are given texts at varying levels of difficulty, or varied topics for research, or materials for several interests, or when the teacher meets small group of low or high achievers, aiming at the same instructional goal. Modifying process involves, e.g., allowing students to express their learning in different ways, encouraging group interaction and creative thinking or “involving students in evaluation of choice of topics, methods, products and environments (Sherman, 2008, 2016: 10). Differentiated instruction (DI) also includes a variation in students’ products; for instance, the student can set different

benchmark for success based on class-level readiness or an “audience” that is appropriate for the product in line with “real world criteria”, etc. (Sherman, 2008, 2016: 11). Lastly, a differentiated learning environment is flexible so that it incites and supports students’ initiatives, it includes “a rich variety of resources, media, ideas, methods and tasks” permitting new people, resources and ideas to be exploited in the learning procedures, etc. (Sherman, 2008, 2016: 9).

Vygotsky’s intervention theory, his socio-cultural theory of learning and the zone of proximal development as well as Gardner’s theory of multiple intelligence support differentiated learning (Bushie, 2015: 37, Taylor, 2017:57, Sherman, 2008, 2016: 3). However, there are various frameworks within which DI is diversely defined (Black, et al., 2004, National Center on Response to Intervention, 2010, Latz et al., 2008: 28, Betts, 2004, Dunn & Dunn, 1992) so that DI will ultimately “bring equity and quality in education effectiveness” (Valiande, et al., 2011: 3-4).

DI “as a concept evolved in part from instructional methods advocated for gifted students and in part as an alternative to academic ‘tracking,’ or separating students of different ability levels into groups or classes”. And although “in the 1983 book, *Individual Differences and the Common Curriculum*, Thomas S. Popkewitz discusses differentiation in the context of ‘Individually Guided Education’” (Sparks, 2015) it could be said that the term DI started being more widely used at the end of 1990s (Tomlinson 1995). According to Carol Ann Tomlinson (2000), an author and teacher regarded as a pioneer in DI, “differentiation means tailoring instruction to meet individual needs” and it involves differentiating content, process, products, and/or the learning environment.

Before this valuable 21st century approach to education, curriculum modifications mainly for the inclusion of SEN (special educational needs) students were incorporated in several curricula. We can track the increasing demand for special education regarding SEN students in several formal documents. The Declaration of the Rights of the Child (1959), the United Nations Declaration on the Rights of Disabled Persons (1975), the Sundberg Declaration on Actions and Strategies for Education, Prevention and Integration (1981), the Salamanca Statement and Framework for Action on Special Needs Education (1994) and the World Forum on Education in Dakar (2000) had stated the need to respect diversity and the right of SEN pupils to have access to inclusive education in the sense that all the children would be in the same classrooms and in the same schools. The Greek educational system was gradually adjusted to fit into these ideas. From the establishment of special schools, we moved to the creation of resource rooms in many state schools and to the development of special programs in the ordinary schools. The Directorate of Special Education was founded at the Ministry of Education and Religious Affairs and teacher training programs in special education were enacted.

It is evident that special education in an inclusive classroom is considered part of DI, although differentiation constitutes a broader concept (Tomlinson, 2000); teachers differentiate content, process, products and/or learning environment and adapt instruction to individual needs (cognitive, social, cultural, etc.) Thus, in this paper we will focus on both specific and explicit references to the specific needs of SEN students included in the National Curricula and extracts indicating the broader concept of DI.

Research Questions

Formal education policy is stated explicitly in legislative documents such as laws, ministerial decisions, etc., although we usually do not know exactly how this legislation comes into force in everyday teaching. In Greece the National Curricula for Primary and Secondary Education are published as ministerial decisions at the Government Gazette of the Greek Republic. In this paper we investigate either the standard curricula currently implemented or curricula applied in pilot implementation (curriculum program pilot) nowadays or in the past. We focus on Curricula in positivist STEM domains (i.e. mathematics, technology, physics,

chemistry, biology, computer science, geography, study of the environment, geography-geology) in Primary and Lower Secondary School and our research questions are:

- In which STEM domains curricula for Compulsory Education (Primary and Lower Secondary School) is DI mentioned and what are its characteristics?
- In which STEM domains curricula for Compulsory Education (Primary and Lower Secondary School) are the specific needs of SEN students recorded and which areas of their support are mentioned?
- How these references (to DI and special needs) help the teachers organize their teaching by subject matter?

The processing method of our data

The data of our research are included in the curricula for Compulsory Education (Government Gazette). We examine and compare three types of curricula in STEM domains: a) The currently implemented Curricula, which are in accordance with Cross Thematic Curriculum Framework (CTCF) for Compulsory Education since 2003, stated in our paper as "CTCF", b) the Curricula that were made into law in 2011 for pilot implementation (referred to in our paper as "New School (in pilot implementation)"), and c) the curricula that are being currently in pilot implementation, mentioned as "New Curricula (in pilot implementation)".

To draw our conclusions systematically and objectively we used content analysis (Holsti, 1969); to analyse the Curricula in STEM domains we developed thematic categories (Berelson, 1971) in DI and special needs of students using open-ended coding. Thus, in each Curriculum we identified references to a) DI and its characteristics, and b) the special needs of SEN students and the specific areas of their support.

Results

Differentiated Instruction

Table 1. References to DI in STEM domains Curricula

STEM domains Curricula Ministerial Decisions	Differentiated Instruction		
	CTCF	New School (in pilot implementation)	New Curricula (in pilot implementation)
Study of the Environment, Primary School	x	x	√
Exploring our natural world	x		
Physics		x	x
Geography, Primary School	x	x	√
Geology – Geography, Lower Secondary School	x	x	√
Physics, 1 st grade Lower Secondary School		x	
Physics, Lower Secondary School	x	x	√
Chemistry, Lower Secondary School	x	x	x
Biology, Lower Secondary School	x	x	√
Mathematics, Primary School	x	x	√
Mathematics, Lower Secondary School	x	x	√

New Technologies & Computer Science, Primary School	x	x	x
Computer Science, Lower Secondary School	x	x	x
Technology, Primary School	x	-	-
Technology, Lower Secondary School	x	-	√

* The above table does not include the Physics Curriculum of the 1st grade in Lower Secondary School (Government Gazette 2537, 2013) and Technology Curriculum of the 1st, 2nd and 3rd grade in Lower Secondary School (Government Gazette 2406, 2014), because they are not included in any of the three types of curricula in the teaching subjects we examine.

As Table 1 shows, there are no references to DI in CTCF and New School (in pilot implementation) (Government Gazette 2322, 2011· 2281, 2011· 2323, 2011 and 97, 2014) and in the Physics Curriculum of the 1st grade of 2013. However, such references are recorded in most teaching subjects in New Curricula (in pilot implementation). The references to DI in the New Curricula fall into two categories:

Teaching approaches (teaching framework and learning design)

In the Study of the Environment Curriculum in Primary school (Government Gazette 5939, 2021), Geography Curriculum in Primary school (Government Gazette 5815, 2021), Geology - Geography Curriculum in secondary school (Government Gazette 5518, 2021), Biology Curriculum in secondary school (Government Gazette 5286, 2021), Mathematics Curricula in Primary and Secondary School (Government Gazette 5814, 2021 and 5260, 2021) and Technology Curriculum (Government Gazette 5258, 2021), references to DI are made in the context Instructional Design. For example:

Mathematics Curricula in Primary and Lower Secondary School

"...d. Teaching framework - learning design

This Curriculum supports instructional strategies of inclusion and differentiation, as it acknowledges that students differ from one another in the way and pace of their learning, their interests, their prior knowledge and experiences, their culture and language. Therefore, each student, according to his/her cognitive or other needs, is encouraged to participate in learning tasks that lead to authentic mathematical activity. Such activities challenge the student to develop his/her mathematical thinking and contribute to the collective construction of mathematical meaning through his/her participation in classroom activities..."

Technology Curriculum (Lower Secondary School)

"...This Curriculum is also aligned with the principles of responsible research and innovation by linking the activities to the needs of the local community, by addressing contemporary and global issues of interest, and by encouraging inclusion and differentiated learning to include practices that strengthen democracy..."

Study of the Environment Curriculum

"...d. Teaching framework - learning design g) Differentiated learning: it is necessary for the teacher to take into account: i) factors related to students' learning process, such as the rate of learning, readiness, different rate of understanding, etc. and ii) factors related to social aspects and to the values and cultural characteristics of the groups affecting school life..."

Geography Curriculum (Primary School)

"...Nowadays, teaching in a constructive way means that teaching is based on: ... - the principles of differentiated teaching. The Curriculum is not applied undistinguishably to all

students; teaching is differentiated in terms of content, process and products so as to respond to the different students' readiness levels, the different ways they learn and their different interests..."

Geography - Geology Curriculum (Lower Secondary School)

"...Teachers are encouraged to adopt differentiated teaching strategies, experiential learning and to use alternative practices, various teaching tools and creative activities..."

Evaluation

In the Geography Curriculum (Government Gazette 5392, 2021), DI is referred as the basic principle of student assessment, and in the Physics (Government Gazette 5658, 2021) and Technology Curriculum of Secondary School (Government Gazette 5258, 2021) there are references to the use of DI tools and techniques in their assessment. The following quotations are some indicative examples:

Technology Curriculum (Lower Secondary School)

"...Finally, differentiated assessment rubrics will be included, especially concerning the field of structure making in relation to the interdisciplinary approach..."

Geography Curriculum (Primary School)

"...The assessment includes not only the cognitive domain, but also all the other (psychomotor, emotional) abilities (aptitudes) of the student, as knowledge is approached as a whole. Key principles of assessment include: differentiated instruction..."

Physics Curriculum (Lower Secondary School)

"...The diagnostic-predictive assessment, at the beginning of the school year or in between large subject areas, can be an important tool for the preparation of teaching practice, as it informs the teacher about pre-existing knowledge, attitudes and perceptions, performance and potential of his/her students, so that he/she can apply more targeted and possibly differentiated instruction tools and techniques in time..."

Biology Curriculum

"...The systematic evaluation of Curricula ... should include: ... The recommended teaching methodology in relation not only to providing students with knowledge, but also to developing critical and creative thinking through collaborative group processes, connection with the social environment, differentiated teaching, etc.')..."

Special educational needs of students

Table 2. Distribution of references to SEN students at Curricula *

STEM domains Curricula Ministerial Decisions	Special needs		
	CTCF	New School (in pilot implementation)	New curricula (in pilot implementation)
Study of the Environment, Primary School	√	x	x
Exploring our natural world	x		
Physics		x	x
Geography, Primary School	x	x	x

Geology – Geography, Lower Secondary School	√	x	x
Physics, 1 st grade Lower Secondary School		x	
Physics, Lower Secondary School	√	x	x
Chemistry, Lower Secondary School	√	x	x
Biology, Lower Secondary School	√	x	x
Mathematics, Primary School	x	x	x
Mathematics, Lower Secondary School	x	x	x
New Technologies & Computer Science, Primary School	√	x	x
Computer Science, Lower Secondary school	√	x	x
Technology, Primary School	x	-	-
Technology, Lower Secondary School	x	-	x

* The above table does not include the Physics Curriculum of the 1st grade in Lower Secondary School (Government Gazette 2537, 2013) and Technology Curriculum of the 1st, 2nd and 3rd grade in Lower Secondary School (Government Gazette 2406, 2014), because they are not included in any of the three types of curricula in the teaching subjects we examine.

As Table 2 shows most of the CTFC Science Curricula (Government Gazette 303, 2014 and 304, 2014) have references to SEN students which can be grouped into the following categories:

Teaching approaches

The curricula of Study of the Environment and Computer Science refer to students with special needs in the area of planning teaching activities. The following is an extract from the Study the Environment:

Technology Curriculum

"...The teacher should provide opportunities for participation and high-quality educational values to all pupils: boys and girls, people with special educational needs or difficulties, regardless of their social or ethnic origin and cultural background..."

Physics, Chemistry and Biology Curricula refer to flexible and multi-sensory approaches in the section "Teaching Methodology" taking into account the aptitudes and abilities of SEN students. For example:

"...In particular, for people with special needs, [teachers may consider the following]:

Teaching flexibility, so that there is a variety in the proposed activities to approach the [teaching] objective in different ways, which respond to each child's particular way of learning.

A multi-sensory approach to the objectives with a variety of teaching tools and materials. Utilization of the child's potential according to his or her cognitive level, with the implementation of personalised educational programmes, since the exclusive use of a specific teaching tool or method contributes to the creation of associations rather than concepts, drastically limiting the possibilities for generalising and transferring learning. Choosing the scientific model and scientific concepts that students should learn..."

Laboratory activities

The suggestions for Physics and Biology laboratory guide, which are included in the relevant Curricula, take into account accommodations and modifications to support SEN students through an individualized educational plan.

“...In addition to the lab activities that can be completed in the school laboratory, where necessary, [teachers may] include activities that can be conducted in the natural environment. For SEN students the lab guide needs to facilitate the teacher to develop a personalized program to meet the needs of the students, in order to ensure the participation of SEN students in the most effective way. Instructions for performing the experiments must be clear and informative and provide details about the safe use of devices and materials...”

[The lab guide needs to make provisions for SEN students so that they could] ... carry out alternative lab activities, while using appropriate devices and exploiting the full potential of new technologies...”

Evaluation

In the Computer Science Curriculum there is a reference to the assessment of SEN students:

“...Students with special educational needs must be assessed with the same criteria and principles as for all students. Among the purposes of the evaluation, in the case of students with special needs, special attention must be paid to the skills acquired and utilized by the student in relation to his/her daily life. Among the basic principles of the evaluation, in the case of students with special needs, emphasis must be placed on:

- 1) ... the comprehensive assessment of the student’s characteristics (profile), so that the evaluation result is not focused only on his/her weaknesses and
- 2) On encouragement (encouraging effort), following the relevant pedagogical principal. The assessment methodology should be flexible. The evaluation of the SEN students’ performance should consider the successful attendance of the class by the student; that is the degree of success of his/her integration [into the ‘mainstream class’]. So, the purpose of the assessment should also be to gather information so that [the teacher may decide] the kind of additional teaching support the SEN students need (for example tutoring courses, communication or language courses)...”

Instructional Material

In the Physics, Chemistry, Biology and Computer Science Curricula there are references to teaching materials easily accessible to students and teachers to compensate for SEN students’ difficulties. Such material facilitates a multi-modal approach that includes auditory, visual, kinesthetic, and tactile strategies. The following excerpt is quoted from the Chemistry Curriculum:

“...More specifically, the students with special needs must be provided with:

The option to use appropriate accessible teaching materials to overcome difficulties in processing visual or auditory stimuli (sign language, Braille, etc.).

Help to compensate for visual, auditory, etc. difficulties...

[SEN student should have] access to technologies to compensate for his/her inability to practice mental or abstract mathematical operations... Specific help to recall and interpret data provided by graphical – tactile representations, tables, columns, etc...”

Teaching Subject Specialties

Table 3. Distribution of references to the DI and the SEN students in the Curricula in terms of the teaching subject specialties

STEM domains Curricula Ministerial Decisions	Subject Teaching Specialties*	Special needs: CTCF	DI New Curricula (in pilot implementation)
Study of the Environment, Primary School	Teachers	√	√
Exploring our natural world	Teachers	x	
Physics	Teachers		x
Geography, Primary School	Teachers	x	√
Mathematics, Primary School	Teachers	x	√
New technologies & Computer Science, Primary School	Teachers	√	x
Geology - Geography	Science Teachers, Geology Teachers	√	√
Physics, Lower Secondary School	Physics Teachers	√	√
Chemistry, Lower Secondary School	Chemistry Teachers	√	x
Biology, Lower Secondary School	Biology Teachers	√	√
Mathematics, Lower Secondary School	Math Teachers	x	√
Computer science, Lower Secondary School	Computer Science Teachers	√	x
Technology, Lower Secondary School	Technology Teachers	x	√

* In Greece primary school teachers have no specific subject area and they teach most of the subjects included in the Curricula (Language, Math, Science, Geography, History, etc.). Secondary Teachers teach certain specialized subjects mainly based on their undergraduate studies. On occasion teachers are asked to teach a domain affiliated to but other than the one studied. This has been termed “supplementary assignment”.

According to the data presented at table 3 teachers who teach in Primary schools that implement the education policy of the last two decades have to use provisions for students with special educational needs only in the domains of Study of the Environment and New Technologies & Computer Science that is in 40% of the courses. On the contrary teachers of STEM domains in Lower Secondary School have to use provisions for these students in all the courses except Mathematics and Technology that is in 71% of the courses. As for the teachers who serve in schools that implement the current pilot education policy it seems that both in

Primary Education and Lower Secondary Education, they have to follow the DI, respectively 60% and 71% of the courses in each level.

Discussion

Our research suggests that the current STEM domain curricula, either to a small or to a larger extent in Primary and Secondary Education, have references to the difficulties of students with special needs, while they do not have corresponding references to differentiated teaching. In contrast, the curricula in pilot implementation, while they have references to differentiated teaching to the most STEM domain teaching subjects of Primary and Secondary Education, they do not have references to addressing students with special educational needs. Regarding the current curricula, we assume that in the proposed teaching strategies for dealing with students with special educational needs, differentiated teaching is also indirectly presented. In addition, we assume that regarding the curricula in pilot implementation provisions for students with special educational needs are covered through the approach of differentiated teaching as a teaching approach that includes all children without exception. In any case, we postulate that in any training –whether it was planned in 2018 (Institute for Education Policy, 2018) and is in progress (Institute for Education Policy, 2021) or it will take place in the immediate or distant future and in whatever form it is implemented– the approach of differentiated teaching and coverage of the special educational needs of students should be highlighted so that teachers take into account both factors when planning and implementing their daily teaching practice.

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Art in Enhancing Life Skills and Preventing Addictive Behavior. Introducing an innovative school-based program

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Abstract

Life Skills are a resource from which it is possible to develop psychosocial, emotional, cognitive, behavioral, and resilience skills with which individuals can negotiate the difficulties they face and be productive members of society. Training in emotional, cognitive, and social skills helps pupils transition from childhood to adulthood in a balanced way. Life Skills training programs within the school can help pupils who live in disadvantaged environments and have reduced opportunities to develop such skills. Social competitiveness and problem-solving are key elements that characterize a mentally resilient child as well as their ability to manage their emotions and interpersonal relationships. The aim of this paper is to present the effectiveness of an innovative psychosocial support program for pupils in learning Life Skills, aiming at the prevention of the occurrence of addictive behaviors. The innovation of the program is the use of art as a tool to strengthen personal and social skills. The results of the research are positive, as it seems that pupils involved managed to enhance the degree of their social skills after the implementation of the program.

Key – Words: prevention, art, life skills, addictive behaviors

Introduction

At a time of increasing complexity, young people are expected to be able to respond adequately to a multitude of requirements that include all areas of their life such as professional, interpersonal, educational, etc. Thus, psychosocial adequacy is essential so that one can effectively meet the demands of modern life and the challenges of everyday life. Essentially, it is one's ability to think more globally, to make better use of the knowledge provided, to interact more actively and creatively with their social surroundings, and to maintain their mental and physical health levels at a level that is able to behave in a healthy way in the living environment. Many of the psychosocial problems faced by modern men can be linked to the lack of skills that help them to deal with life's difficulties in an effective way (Lam et al., 2014). The strengthening of psychosocial adequacy, especially at young ages when the formation of their personality occurs, is crucial for their overall well-being and life course. This can be achieved through education in life skills, which will be an asset to the human quiver to deal with everyday life as well as managing all the situations that it will encounter.

Life skills

The involvement of the scientific community in the concept of Life Skills begins about three decades ago with the Ottawa Charter (WHO, 1986) stating that health promotion is through the support of the individual for personal and social development through the provision of information, education on health issues and the enhancement of life skills. These actions allow individuals to have more choices in being able to control their environment and health more and to make choices that will ensure their well-being. Thus, the concept of life skills is linked to responsible decision-making and the ability of the individual to make responsible choices for a healthy life. According to the World Health Organization (WHO, 1997), Life Skills are those abilities that enable a person to effectively handle the demands and challenges of everyday life.

Accordingly, UNICEF (UNICEF, 2012) with the term Life Skills refers to the set of psychosocial and interpersonal skills that help the individual make responsible decisions,

communicate effectively with others, and develop self-management skills that will help him live a healthy and productive life. Life Skills can be characterized as a source where there is potential to develop psychosocial, emotional, cognitive, behavioral skills and resilience skills with which a person can negotiate the difficulties he faces and be a productive member of society (Gelagali, 2011; Hopson & Scally, 1986).

From the above definitions, one can see that by talking about life skills we can refer to countless skills, whose definitions can vary from culture to culture and from place to place (WHO, 1997). Nevertheless, life skills can be classified into categories that are the core of the skills of those who promote a healthy lifestyle.

The World Health Organization (ibid) gives five key areas as the basic skills one needs to have in order to work effectively and meet life requirements. The areas it describes are:

a. Decision-making - problem-solving. Decision-making helps the individual to deal constructively with life by making these decisions that help him to have safe results in his health and not negative consequences. Problem-solving after proper decision-making can help the person to solve issues that if left unsolved can create anxiety and negative health consequences.

b. Creative - critical thinking. Creative thinking helps the individual to make proper decisions in order to solve problems he faces and to operate in an adaptive and flexible way on issues of everyday life. Critical thinking enables the individual to think objectively and analyze experiences and information through the process of critical thinking. Thus, through the process of critical thinking, the individual is able to effectively process those factors that affect him in relation to his behavior, his values, peer pressure, etc.

c. Communication - interpersonal relationships. Effective communication refers to the skill of being able to communicate both verbally and non-verbally with others in ways that are acceptable to the society in which they live. Good interpersonal relationships help to allow the person to interact in positive ways with others.

d. Self-awareness - empathy. Self-awareness as a skill means that one can recognize the characteristics of one's personality, strengths, weaknesses, his desires. The skill of self-awareness helps the person to recognize when they are stressed or pressed. It can also be a prerequisite skill so that one can have good interpersonal relationships with others and feel empathy. Empathy is the ability to feel how one's fellow human being can feel and the state in which one lives, even if it is a state in which one has never been.

Hopson & Scally (1986) classified Life Skills into four categories: a. Educational - Academic skills including study, reading, and empirical learning skills. b. Skills in interpersonal relationships including communication, entering into, maintaining, and ending relationships, and conflict management. c. Skills related to work and leisure management such as managing time and money, and concluding a professional plan. d. Developmental and other skills such as creative problem-solving, decision-making, negative emotion management, and physical and mental well-being preservation.

The Life Skills for Europe program (n.d.) presented eight types of skills in its work based on the definition of Life Skills. These are a. literacy b. the Numbering c. digital competencies d. personal and interpersonal skills e. communication skills f. public participation g. financial skills; and h. physical and psychological health perception skills.

Life skills and school

Life Skills training helps the young person to develop and increase the degree of self-confidence and self-esteem in order to address the daily changes and challenges of life, giving him a voice in the environment he lives in and preparing him for his life as an adult and worker. It helps him to know and understand issues that affect his life in general, develop skills such as critical thinking, expressing opinions, and forming his personality based on principles and values such as respect, justice, and democracy. The role of education in the development of

Life Skills is very important as it can contribute in such a way that the student can be strengthened as much as possible with the aim of reaping all the benefits it will have if he holds all the skills that have been reported. World organizations such as UNICEF (2012) and WHO (1997) have recognized the value of implementing educational programs on Life Skills within schools as it has been seen in recent decades how it helps students to develop psychosocial in a large extent.

Training in emotional, cognitive, and social skills helps pupils to transition smoothly from the phase of childhood to the phase of adulthood. Life Skills education programs within schools can help pupils who live in underprivileged environments and have reduced opportunities to develop such right-wing skills. Social competitiveness, as well as problem-solving, are key elements that characterize a mentally resistant child as well as their ability to manage his feelings and interpersonal relationships. Life Skills Development programs help schools to implement more integrated and integrated approaches to issues concerning the prevention of dangerous behavior of students. Finally, programs implemented within schools promote positive social standards that can greatly affect the environment in which a teenager grows, such as health services, school, and their families (Pan American Health Organization, 2001).

In addition, Life Skills programs can delay the start of a psychoactive substance, prevent risky sexual behaviors, transgressive and criminal behavior, promote the development of self-esteem of the learner and make healthy choices about his life, improve academic performance, and prevent peer rejection (Hansen et al., 1988; Mize & Ladd, 1990). The school environment is considered more suitable for education in Life Skills as the very purpose of education embodies the cultivation of those skills and abilities of students that will help them to progress smoothly into adulthood, forming a personality with such elements that will help them have a smooth life afterward.

School as an environment that brings together a large number of children and adolescents is an ideal environment for the implementation of education programs in Life Skills. After all, it is the most powerful institution in the life of the child after the family, an institution that helps a lot in his socialization. The implementation of programs within schools is considered very economical as the cost is minimal and there are already experienced teachers who can implement them. In school, there is the possibility to implement short and long-term programs. Also, through school, there can be interconnection with family and society so that there is even greater efficiency after education in Life Skills (WHO, 1997).

Life skills and addictive behaviors

Life Skills programs are aimed at the general population with the aim of developing the psychological skills that will enable individuals to be productive, participate in society and manage effectively the difficulties they face in life. However, specific life skills learning programs have also been developed which focus on specific issues, in particular on issues related to high-risk behaviors such as substance use, addictive behaviors in general, HIV and risky sexual behavior. Some of the life skills such as resilience, decision-making, self-control and social interaction seem to be related to how a child or adolescent will deal with issues and problems such as the above. Thus, life skills programs aimed at supporting young people in relation to high-risk behaviors combine providing information and knowledge about psychoactive substances, risky behaviors and other addictions with learning these skills to help them cope (UNICEF, 2012).

Global organizations such as WHO (1997) and UNICEF (2012) having recognized the importance of developing and implementing Life Skills learning programs focused on preventing the occurrence of high-risk behaviors have developed comprehensive textbooks for implementing such actions emphasizing the promotion of a healthy life model and education around issues related to substance use, HIV, unwanted pregnancies, nutrition,

violence. Already in the late 1970s, actions to learn life skills and focus on peer pressure, self-management, and interpersonal relationships have been planned and implemented. Through participation in Life Skills programs, children and adolescents have the ability and opportunity to learn to make decisions that will lead them to positive outcomes and to establish positive attitudes, views, and knowledge about their lives. Thus, they will have managed to shape their personality in such a way as to be resistant to challenges such as drugs or other dangerous behaviors (Gazioglu & Canel, 2015).

Life Skills programs focus on preventing dangerous and addictive behaviors relying on specific content such as students' attitudes to substance use, social stereotypes that exist for example in relation to gender, and the provision of information and knowledge related to health promotion (Mangrulkar et al., 2001). Botvin and his partners (1990) argue that life skills programs seem effective and can positively influence the attitudes and behaviors of young people in relation to issues concerning their health. Such issues are the use of psychoactive substances, sexual behavior, and other dangerous behaviors such as dependence on the internet or gambling.

Art and life skills

Art as a means of communication and expression exists in all societies from the very beginning of their existence. Art, as a result of man's intellect and culture, evolves along with him, adapting, changing and differentiating itself (Pappa, 2020). Its purpose is to stimulate the senses, activating the mind and emotion. Art was born together with social life (Diamantopoulos, 1988) and expresses the most important aspects of social life, namely religion, war, work, relationship with nature, love.

The use of expressive means at our disposal then activates our inner world in many ways. Dealing with trauma through art externalizes the feelings of fear, anger, and internal conflict we struggle with while allowing a traumatic story to be told in a different way, within a safe environment. It leads to the processing of emotions, the emergence of reflective situations, communication, and the building of relationships. Through art, we have the opportunity to challenge different behaviors, test our limits and endurance, and negotiate a different outcome: to take control, again.

Pupils through arts such as literature, painting, cinema, theater etc. have the opportunity to develop, to understand themselves and the world they live in in a creative and beneficial way as well as to acquire critical thinking, sensitivity, and capacity for creative learning in more holistic ways (Lawrence, 2008).

Integrating art into the education system should not simply aim to provide information to students on arts-related issues. The use of art in school has as its primary objective to mobilize pupils to observe more effectively the world around them, to process in a critical way the information they receive, to discover, to compare, to create, and thus to be in a position to create their own value system and worldview (Trilianos, 2009).

Fowler (1996) recognizes the value of art in education as it helps to develop a pupil's personal skills in various ways through the formation of his mentality and personality. Art contributes to the development of thinking processes and abilities and to the strengthening of skills that will make him more capable of dealing with the world in which he lives and grows up. In his book *Strong Arts, Strong Schools* (1996), Fowler highlights the relationship between art and critical thinking. In addition, through engaging in the arts, the pupil cultivates self-awareness, and the ability to be able to interpret the world he lives in through different perspectives without being trapped in stereotypes and prejudices.

"pArt of you" program

"pArt of you" is a program of psychosocial support and primary prevention that aims to empower elementary school students aged 10-12 years in matters related to dangerous and

addictive behaviors. It consists of 8 weekly meetings of an experiential nature. The originality of the "pArt of you" program lies in the fact that it utilizes art, as a tool to strengthen the skills that will help pupils develop a high degree of mental resilience, thereby removing them from the possibility of exhibiting high-risk behaviors risk and other addictive behaviors.

The design of the integrated psychosocial support program was based on theoretical approaches related to the prevention of dangerous addictive behaviors and promoting the individual's well-being. The Life Skills approach seems to be the most effective intervention at the level of prevention programs in schools (Buhler & Heppekausen, 2006) and especially in Primary classes. Other research data (Botvin, 1996; Gazioglu & Canel, 2015) show that the implementation of Life Skills learning programs with an emphasis on the prevention of dangerous and addictive behaviors has positive results, in the short and long term, with an obvious reduction in substance use both in the early stage of use as well as in advanced.

Materials and Methods

Objective of the study

From the literature review, it is clear that the implementation of school-based prevention programs can benefit pupils, strengthening skills that will act as a protection network against the manifestation of addictive behaviors. The use of art can act as reinforcement in the above condition.

Aim of this study is to investigate the effectiveness of an innovative psychosocial support program, which utilizes art as a tool to strengthen pupils' social skills and prevent the manifestation of addictive behaviors.

Based on the existing evidence, we hypothesized that the psychosocial program «pArt of you» will have a positive impact on pupils' social skills.

Methodology and Process

Action research was chosen as the most appropriate methodology to answer the research hypothesis of this study. Action research in the context of education is a form of self-reflective exploration of social situations with the aim, by its participants, of improving the rationale underlying (a) their own social or educational practices, (b) their understanding of those practices, (c) the situations in which those practices are applied (Kemmis, 1980 in Hopkins, 1985). Action research is an excellent tool for achieving change and improvement in the education system (Altrichter et al., 2001). It emphasizes the reflective investigation of existing practices in the school with the aim of changing and improving them.

The occurrence of risky addictive behaviors and the role of the school in terms of prevention is clearly most effectively investigated by utilizing action research. Through this research methodology, the researcher and the trainees will be equally involved in an experiential process, trying to understand the phenomenon, how school can act as a protective factor and the usefulness of the educational tool in which they will be trained.

The present research was carried out during an extremely difficult period, as the pandemic of Covid-19 had greatly affected the functioning of the whole society and, by extension, of schools. The project «pArt of you» was planned to be implemented in the second half of the 2020-2021 school year but as there was a general lockdown and schools were closed this was not possible.

When schools finally opened in the spring of 2021 the research process began. Indeed, in early September school teachers were contacted as it was felt that the implementation of the program should begin immediately through the fear of further school closures. A meeting was held with the teachers where they were informed precisely and in detail about the process, the program and its implementation and duration. A meeting was also held with the principals of the schools where the implementation of the program would take place so that they themselves would be aware of it.

About a week before the start of the program, teachers gave parents information sheets with details of the program and a consent form for their participation in the program. It should be noted here that there were parents who did not agree and did not give consent for their child to participate. These students did not complete the questionnaires or participate in the procedures during the program.

After agreeing on dates and times to go to the schools, the teachers informed the students about the activity that was to be implemented. In the first meeting with each school class, there was a hands-on introduction to the students and a detailed description of the project. The questionnaire (SSRS-C) was then completed. A total of 8 meetings were held and the implementation of the project lasted 2 months (October-November 2021). The meetings were two hours long. At the last meeting and after the intervention was completed, the students completed the same questionnaire (SSRS-C). After three months there was a follow-up where the researcher visited the classes again and asked the students to complete the same questionnaire again in order to check the effectiveness of the program over time.

Participants

«pArt of you» program was implemented in 3 elementary schools in Patras, Greece. 109 primary school pupils took part in this study, specifically, pupils who attended the last two grades of primary school, fifth and sixth grade. Approximately half of the pupils were girls (N=54) and the rest were boys (N=55) at the age of 11-12 years (Mean = 11.3, SD = 0.486).

Results

In order to analyze the data of our research we used SPSS v.28. Repeated Measures ANOVA was used to define the effect of “pArt of you” program. Results show a high level of statistical significance while measuring the impact of the program before its implantation, right after, and 3 months later.

In table 1. we can see the results of Repeated Measures ANOVA. Specifically, after the overall analysis of the SSRS-C questionnaire, it was found that the difference of the means before (M=51.64, S.D.=8.390), immediately after (M=55.53, S.D.=6.66) and three months later (M.=55.75, S.D.=6.631), the intervention is statistically significant (p=0.000). The F criterion shows that the results of the implementation of the program are related to the increase in the degree of mental resilience of the students (F=9.088). Eta square is ,145, showing the effect of the program, and Λ of Wilks’ is ,855.

Table 1. Repeated Measures ANOVA

Time	Pupils (N=109)				
	Mean S.D.	Λ Wilks	F	η^2	p
Before	51,64 (8,390)	,855	9,088	,145	,000
After	55,53 (6,666)				
3 months later	55,75 (6,631)				

Discussion

The present study focused on investigating the effectiveness of a program to strengthen the social skills of elementary school pupils with the aim to prevent the occurrence of addictive behaviors. It is an innovative school-based program as it utilizes the processing of works of art as a tool to empower and cultivate pupils' skills on an individual, psychological, and social level. The findings of the study show that the "pArt of you" program has positive results in terms of strengthening pupils' Life Skills.

The students, through their participation in the "pArt of you" program, were able to improve their social skills such as cooperation, participation, taking initiative, and strengthening self-esteem. The scores collected by pupils before, right after, and three months after the implementation of the program were higher than before the implementation of the program, which shows its effectiveness.

The findings of the research come to confirm the results of similar research where it seems that the implementation of psychosocial support programs in the school environment brings positive results and can help support students through the cultivation of life skills (Throuvala et al., 2019; Malinauskas & Malinauskiene, 2019).

Through their participation in such programs, students are trained in management techniques and better social adaptation (Psilou, 2014; Pincus & Friedman, 2004). Students cultivate skills such as decision-making, conflict resolution, emotion management, and stress reduction and thus can have a stronger personality and characteristics that will help them reduce the likelihood of developing addictive or risky behavior (Schmidt, 2022).

The results of research that have been done in relation to the effectiveness of the implementation of Life Skills learning programs in the school area have shown that these can have positive results in terms of the non-manifestation of some dangerous behavior, the initiation or reduction of the use of some psychoactive substance (Buhler et al., 2008).

Life Skills help adolescents' transition smoothly into adulthood by establishing skills that are essential elements for healthy personal growth and the development of a resilient child. The research results show that the Life Skills approach promotes the strengthening of the adolescent's personal, social, cognitive, and emotional competence, characteristics that act as a protection net against aggravating factors that may threaten the adolescent's life and lead him to dangerous situations or addictive behaviors (Kibret, 2016). Through his participation in Life Skills training programs, the student appears to develop resilience, and competence on a personal and social level adapts smoothly to the social conditions he lives in and has better academic performance (ibid.).

It is indisputable that contact with art can benefit man on many levels and in the whole range of his life. Art is able to contribute to the empowerment and development of skills and personality traits of the individual that will help him function in a way freed from shackles and lead him on a path of healthy choices for his life. Enhancing the creative power of human existence is one of the benefits that one can derive from coming into contact with a work of art. It offers him supplies that will help him develop positive attitudes, behaviors, and a corresponding worldview that will act as a wall of protection and prevention against situations that may lead him to make dangerous decisions for his life, such as addictions.

In the prevention of addictive behaviors, the strengthening of pupils' creativity, the expression of their feelings as well as the development of their abilities and talents, is a key point. As long as the student has the opportunity to express his feelings and thoughts in a creative way, he can move away from choosing to resort to self-destructive behaviors.

The use of art in education is not just a means of expression. It is about the possibility of creative expression that has educational value at all levels. Students through contact with arts such as literature, painting, cinema, theater, etc. have the opportunity to develop across the spectrum of their lives. They understand themselves and the world they live in in a creative and beneficial way as well as acquire critical thinking, sensitivity, and capacity for creative learning in more holistic ways (Lawrence, 2008). Art can help pupils develop skills that may prevent the onset of addictive behaviors and contributes to the promotion of a healthy lifestyle (Farrington et al., 2019; Stride & Cutcher, 2015).

Although the sample of the research is small and the results cannot be generalized, nevertheless it seems that pupils' response to "pArt of you" program is positive. This research can be a motive for further application of the program to a larger number of pupils, in order to establish its positive results in the prevention of the manifestation of addictive behaviors.

The integration of «pArt of you» program as a Health Promotion school-based program, should have positive outcomes in the prevention of addictive behaviors in adolescents.

Conclusion

It is undeniable that contact with art can benefit people on many levels and across the whole spectrum of their lives. Art is capable of helping to empower and develop skills and personality traits that will help an individual to function in a way that is free of attachments and lead them on a path of healthy choices for their lives. The empowerment of the creative power of the human being is one of the benefits one can gain when coming into contact with a work of art. It provides him with tools that will help him to develop positive attitudes, behaviours and a similar worldview that will act as a wall of protection and prevention against situations that may lead him to make dangerous decisions for his life, such as addictions (Pappa & Dritsas, 2022).

School, as the second most important social institution after the family in a child's life, plays an extremely important role in shaping his character and personality (Papanis et al., 2010). After all, the aim of the school is not only the sterile transmission of knowledge and information but also pupils' all-around development. The implementation of universal prevention programs in schools comes to strengthen and supports students to have a greater degree of self-awareness, to be able to assess their value as individuals, and to deal effectively with life's adversities. Pupils, through their participation in such programs, have the opportunity to acquire important skills and resources that will keep them in their life toolbox and protect them from future risks and dangerous behaviors. Life skills programs can offer important opportunities for pupils but also allow teachers to train and acquire more skills to support their pupils in better ways.

«pArt of you» is an innovative proposal for a psychosocial support program. It is designed according to the principles that prevention programs are based on. It seems to have positive results in strengthening personal, social, and psychological skills. It also offers pupils those supplies that will protect them from the manifestation of some addictive behavior. The use of art, as an innovative tool to strengthen life skills, comes to give additional support to the program, giving it a special character and diversity. Art in all its forms can help pupils to express themselves freely, develop their imagination, become creative, and be collaborative. Through art, pupils open their horizons, learn new things in a creative way and finally they develop in a spiritual and integrated way into strong, autonomous personalities avoiding addictive behaviors.

the "pArt of you" psychosocial support program for pupils can enhance the promotion of children's physical and mental well-being through active experiential learning and the use of tools that promote creativity and critical thinking, such as art. The integration of the program within the wider Health Education programming will actively contribute to the development of improving students' self-confidence, strengthening social skills and increasing their mental resilience, skills that will help students throughout their lives to be able to negotiate, think critically and make good choices.

The school is proposed as the ideal place to implement psychosocial support programs for pupils, as children spend a large part of their day there and have the opportunity not only to learn but also to shape their personality, making use of the stimuli they receive during the educational process. Thus, the program proposed in this article can also be implemented within the school context and can bring positive results in enhancing students' skills such as communication, cooperation, conflict resolution, decision-making, etc.

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Teachers attitude, personal reaction and proposal for effective treatment in developmental dyslexia. Comparisons between General and Special Education Teachers

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Abstract

The primary aim of the research was to explore teachers' attitude toward developmental dyslexia, to record their opinion about the effective strategies in order to treat developmental dyslexia and to capture teachers reaction to students with developmental dyslexia. A quantitative research was conducted in 204 primary and secondary education teachers using an appropriate questionnaire. Special Education teachers were more confident in their ability to teach children with special needs and considered that they were adequately trained to meet the needs of children with disabilities. Also, Special Education teachers agree to a greater degree that academic progress is possible in children with special needs and students with special needs should be included in regular education classrooms. In contrast, General Education teachers become more anxious when they learn that a student with special needs will be in their classroom.

Key Words: Teachers Attitude, Teacher Reaction, Effective Treatment, Developmental Dyslexia

Introduction

In recent decades, an increase in the number of children with 'own learning needs - of which they are part of a small proportion and dyslexia - which they attend, at all levels of education, is increasingly evident. This is likely to be due to a number of factors, such as the increased social need for education and education of all citizens, the generalization of the compulsory nature of education, the social demands for equality and equality between citizens, and the widening of the debate on (Wagner et al., 2022). In many countries abroad, there has already been awareness of the specific there is a growing tendency for the medical approach previously dominated and replaced by a more dynamic approach in the field of education. In the context of this philosophy, more and more countries are trying to develop the use of assessment of pupils with special educational needs for the implementation of appropriate education, which is mainly pursued with educational reforms and innovations and through tailor-made educational programs (Skočić Mihčić et al., 2020). Also, the modern tendency in the European Union countries is to develop a policy of inclusion of pupils with special educational needs in joint schools, providing teachers with different ways of supporting such staff, training materials, teachers training and equipment (Yang et al., 2022).

In Greece, according to Anastasiou and Polychronopoulos (2009), some teachers and people from the educational environment believe that oral exams should be cancelled, because it is a very easy way of examination, even for pupils with special learning difficulties. The most relevant Greek study is Anastasiou and Polychronopoulou (2009), which surveyed the attitudes of 200 primary school teachers within the Attica region of Greece and found that teachers perceive a need for more adequate knowledge about how to teach children with special educational needs and that 'they do not share a totally positive attitude towards inclusion' (Anastasiou & Polychronopoulou, 2009). Konstantopoulou (2000) survey study which conducted with questionnaires with 250 language teachers from different areas of Greece has shown that school principals who were language teachers as well did not have good knowledge on signs of Dyslexia and possible causes. 87 % of the language teachers stated

that they were not competent to teach students with Dyslexia as there was a lack of teachers' training on Dyslexia and that there was confusion about the types of dyslexia (auditory, visual, mixed groups) (Konstantopoulou, 2000). Apart from Greece and according to the literature, children with Dyslexia usually feel isolated and excluded in their schools, and many of them are regularly teased or bullied (Humphrey & Mullins, 2002). A very strong example of this is the case of the fourth most prolific inventor in history, who admitted that "A teacher sent the following note home with a six-year-old boy: "He is too stupid to learn". That boy was Thomas A. Edison". Another strong example was that of Albert Einstein who "...did not speak until the age of three and teachers labeled him mentally slow": "Anyone who has never made a mistake has never tried anything new". According finally to Ranaldi (2003), most people have vague ideas about the causes of dyslexia, and they often consider it a sign of low intelligence, which results in the stigmatization of dyslexics (Gyarmathy & Vassné 2004). Edwards' (1994) study illustrates the negative experiences of dyslexic students at school and reveals that even successful and confident dyslexic students experience unfair treatment, discrimination, neglect and humiliation during school years.

Aim

The relevance of this research lies in its evaluation of teachers' beliefs and understanding of developmental dyslexia. Considering the current dearth of research on dyslexia and other learning disabilities in the Greek context, this study both contributes to existing knowledge and fills the literature gap by providing insight into how teachers conceptualize developmental dyslexia. This insight would be useful in understanding the misconceptions and beliefs about the developmental dyslexia that influence classroom practice. The primary aim of the research is to explore teachers' attitude toward developmental dyslexia, to record their opinion about the effective strategies in order to treat developmental dyslexia and to capture teachers reaction to students with developmental dyslexia. Also, secondary aim of the research is to investigate if the attitude, reaction and opinion about the effective strategies differ between General and Special Education teachers.

Methodology

Research Design and tool

In terms of the type of empirical data, the research is characterized as quantitative, since the perceptions of the subjects (of the sample teachers) expressed as answers to the various questions - mostly "closed" - are concentrated and reduced to specific attitudes. gradations and therefore can be expressed in quantitative - numerical terms during statistical analysis. Even the answers to some "open-ended" questions are analyzed and coded into categories, so that again the findings can be expressed in percentage by answer categories. The quantitative approach uses statistical analysis to arrive at a specific conclusion while allowing for comparisons between groups with different characteristics, for example comparisons of views by age group or years of service. It was also preferred because of the shorter time required to collect and analyze data compared to the qualitative method. For the purposes of this research, a questionnaire consisting of three sections was used as a tool. The first part of the questionnaire aimed to record teachers' reactions when they have students with developmental dyslexia. To this end, 9 questions were used on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly Agree). The questions used were based on research by Wadlington and Wadlington (2005) and Gwernan-Jones and Burden (2009). The second part of the questionnaire was designed to record teachers' suggestions for effective management in cases of students with developmental dyslexia. To this end, 12 questions were used on a 5-point Likert scale (1 = Totally ineffective 5 = Totally effective). The questions used were based on a survey by Gwernan-Jones and Burden (2009). The third part of the questionnaire was designed to record teachers' attitude on the inclusion of students with developmental dyslexia. To this end, 13 questions were used on 5-point Likert scale (1 = Strongly Disagree, 5

= Strongly Agree). The questions used were based on a survey by Avramidi and Norwich (2002).

Sample

The research population was designated to be teachers serving in primary education units. In Greece and teachers serving in special education units in Greece. In the present study, the general strategy was to carry out convenience sampling (Creswell, 2014). A pilot survey was carried out to identify and correct any weaknesses or ambiguities in the wording of the questionnaire questions and in addition to estimate the total time it took to complete. So, the questionnaire was initially distributed to 5 primary education teachers and 5 special education teachers. Then, after some corrections were made and the questionnaire took its final form, it was distributed to teachers serving public and special education public primary schools. The questionnaire was distributed in the prefecture of Thessaloniki. In total, the questionnaires distributed to both categories of teachers were approximately 280, out of which 204 completed questionnaires were returned.

The demographics of the sample are presented in Table 1. The 64.2% (n=131) of the sample were female and 35.8% (n=73) were male. The 22.5% (n=46) of teachers worked in an urban area, 26.5% (n=54) worked in a semi-urban area, 22.1 (n=45%) worked in a community area and 28.9% (n=59) worked in a rural area. The 84.8% (n=173) of sample was General Education teachers and 15.2% (n=31) was Special Education teachers. Finally, it was observed that 72.4% (n = 147) of the teachers had a bachelor's degree while 14.8% (n = 30) had a postgraduate degree. In addition, only 25.6% (n = 52) had received Special Education training. The mean age of the teachers was 46.82 (SD = 8.06) years while on average they had 20.42 (SD = 7.78) years of service.

Table 1. Demographics characteristics of the sample

		n	%
Gender	Male	73	35.8%
	Female	131	64.2%
Area of school	Urban	46	22.5%
	Semi-urban	54	26.5%
	Community	45	22.1%
	Rural	59	28.9%
	Position	General Education	173
	Special Education	31	15.2%

Ethical considerations

Saunders et al., (2012) suggest that three ethical principles must be followed to achieve a high level of ethics in social studies. These principles are: ensuring a high degree of respect for the autonomy of individuals, work for the benefits of society as a main motivation and respect for privacy For these purposes the researcher enclosed a cover letter explaining the purpose of the study and a promise of confidentiality with copies of the questionnaire. With regard to confidentiality, this is fulfilled by excluding the names and identification numbers of the respondents from the questionnaire. Participants were also informed that their participation was completely voluntary and that they could be withdrawn at any time in line with Creswell (2014) suggestion that respondents should be informed of their right to participate or cease their participation at any time. Respondents were also informed that the researcher would be the only one to have access to the answers provided.

Statistical analysis

Descriptive statistics such as percentage (%), Mean (M) and Standard Deviation (SD) were used in order to capture teachers attitude toward developmental dyslexia and effective treatment of developmental dyslexia. Also, descriptive statistics were used in order to record teachers' reaction to students with developmental dyslexia. In addition, in order to investigate the existence of statistically significant between General and Special Education teachers, the t-test for two independent samples was used. The significance level was set at $\alpha = 0.05$ in the data analysis. Analysis was performed in SPSS version 26 software.

Results

Personal reactions in dyslexia

The results in Table 2 indicate that teachers feel significantly responsible for helping the child and using all the means they had (eg individual, working with parents, with specialist help, etc.) (M = 4.16, SD = 0.77). Moreover, teachers strongly agreed that if they had to manage a student with developmental dyslexia they would use Means and Materials to achieve the goals of the curriculum (M = 4.13, SD = 0.76). Also, teachers feel sympathy or compassion for a child with developmental dyslexia (M = 3.47, SD = 1.09). On the contrary, teachers express neutrality about whether they could deal with the case if they could involve parents in the process (M = 3.13, SD = 1.07) and if they had confidence in their ability to teach children with special needs (M = 3.02, SD = 1.11). Finally, teachers disagreed that they felt embarrassed, anxious, fearful of hurting the child (M = 1.99, SD = 0.87) and disagreed that they were appropriately trained to respond to the needs of disabled children (M = 1.99). = 2.58, SD = 1.32).

Table 2. Results about personal reactions in dyslexia

	1	2	3	4	5	M ± SD
I feel embarrassed, anxious, fear not to hurt the child	30.4%	48.5%	13.7%	6.9%	0.5%	1.99 ± 0.87
I feel sympathy or compassion for the child	7.4%	11.3%	21.2%	47.3%	12.8%	3.47 ± 1.09
I feel pressured and helpless	16.4%	24.9%	30.3%	25.4%	3.0%	2.74 ± 1.10
I am responsible for helping the child and I use all the means I have (eg individual, collaborating with parents, with the help of specialists etc.)	1.5%	1.5%	9.3%	54.9%	32.8%	4.16 ± 0.77
I know how to deal with students with dyslexia from personal experience.	11.8%	31.4%	26.5%	24.5%	5.9%	2.81 ± 1.11
I could deal with the case if I could involve parents in the process of dealing with the problem	5.9%	22.7%	35.5%	24.6%	11.3%	3.13 ± 1.07
Means and materials to achieve the objectives of the curriculum	0.0%	3.9%	10.8%	53.2%	32.0%	4.13 ± 0.76
I have confidence in my ability to teach children with special needs	9.4%	22.2%	35.5%	23.2%	9.9%	3.02 ± 1.11
I have been trained appropriately to respond to the needs of disabled children	24.1%	33.5%	14.3%	16.7%	11.3%	2.58 ± 1.32

1=Strongly Disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree; M=Mean, SD=Standard Deviation

In addition, an analysis was conducted to investigate the difference between General and Special Education teacher regarding personal reactions to dyslexia. The results of the t-test are given in Table 3. The analysis showed that there were statistically significant differences in personal reactions to dyslexia. More in detail, General Education teachers felt more pressured and helpless compared to Special Education teachers ($t = 3.431, p < .05, 2.84 \pm 1.05$ vs. 2.10 ± 1.23). On the contrary, Special Education teachers appeared to think that they were to a greater extent responsible for helping the child and using all the means they had ($t = -3.941, p < .05, 4.65 \pm 0.49$ against 4.08 ± 0.78) and to a greater extent know how to deal with students with dyslexia from personal experience ($t = -7.722, p < .05, 4.06 \pm 0.89$ vs. 2.59 ± 0.99). Finally, it was observed that Special Education teachers were more confident in their ability to teach children with special needs ($t = -8.471, p < .05, 4.35 \pm 0.75$ vs. 2.78 ± 0.98) and believe to a greater degree that they were appropriately trained to responded to the needs of disabled children ($t = -10.16, p < .05, 4.39 \pm 0.76$ against 2.25 ± 1.12). Similarly, Special Education teachers were more likely to use means and materials to achieve the goals of the curriculum in case of child with developmental dyslexia ($t = -4.566, p < .05, 4.68 \pm 0.54$ against 4.03 ± 0.75).

Table 3. Comparisons between General and Special Education teacher regarding personal reactions in dyslexia

	Position				t	p
	General Education		Special Education			
	M	SD	M	SD		
I feel embarrassed, anxious, fear not to hurt the child	2.03	0.85	1.74	1.00	1.692	.092
I feel sympathy or compassion for the child	3.48	1.03	3.42	1.36	0.270	.787
I feel pressured and helpless	2.84	1.05	2.10	1.23	3.431	.001
I am responsible for helping the child and I use all the means I have (eg individual, collaborating with parents, with the help of specialists etc.)	4.08	0.78	4.65	0.49	-3.941	.000
I know how to deal with students with dyslexia from personal experience.	2.59	0.99	4.06	0.89	-7.722	.000
I could deal with the case if I could involve parents in the process of dealing with the problem	3.09	1.05	3.32	1.19	-1.097	.274
Means and materials to achieve the objectives of the curriculum	4.03	0.75	4.68	0.54	-4.566	.000
I have confidence in my ability to teach children with special needs	2.78	0.98	4.35	0.75	-8.471	.000
I have been trained appropriately to respond to the needs of disabled children	2.25	1.12	4.39	0.76	-10.16	.000

1=Strongly Disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree; M=Mean, SD=Standard Deviation; t=t-test statistic, p=p-value

Proposals for effective treatment

The results in Table 4 indicate that teachers consider effective treatment of developmental dyslexia fees and positive incentives (M = 4.14, SD = 0.72) and multi-sensory techniques (M = 4.11, SD = 0.75). In addition, teachers found it important to manifest their acceptance of the

child, win confidence and try to restore confidence in themselves (M = 4.07, SD = 0.77) while believing that an important process is to try to learn more to deal with a child with Dyslexia (M = 4.15, SD = 0.86) and included the child in class activities (M = 4.05, SD = 0.81). Finally, teachers thought it helpful to apply words and letters discrimination exercises (M = 3.82, SD = 0.73), to apply self-assessment techniques that the child would use (M = 3.72, SD = 0.86) and to personalize the teaching for the child (M = 3.67, SD = 0.89).

Table 4. Results about proposals for effective treatment

	1	2	3	4	5	M ± SD
Fees and positive incentives	1.0%	2.5%	6.1%	62.6%	27.8%	4.14 ± 0.72
Negative aid	41.6%	42.6%	14.2%	0.5%	1.0%	1.77 ± 0.79
I would manifest my acceptance of the child, I would win his trust and I would try to restore the confidence in himself	2.0%	1.5%	10.3%	60.1%	26.1%	4.07 ± 0.77
I will personalize the teaching for the child	2.0%	6.5%	29.1%	46.7%	15.6%	3.67 ± 0.89
I would let the child decide when to participate in classroom activities	9.9%	39.1%	25.7%	21.3%	4.0%	2.70 ± 1.04
I would use multi-sensory techniques	1.0%	2.0%	10.9%	57.4%	28.7%	4.11 ± 0.75
I would apply self-assessment techniques that the child would use	0.5%	6.5%	32.0%	42.5%	18.5%	3.72 ± 0.86
I would apply words and letters discrimination exercises	1.5%	1.0%	25.7%	57.9%	13.9%	3.82 ± 0.73
I would ask the child to do the same work as other children	15.8%	42.1%	17.3%	20.3%	4.5%	2.55 ± 1.12
I would try to learn more to deal with a child with Dyslexia	2.0%	4.4%	5.9%	52.5%	35.3%	4.15 ± 0.86
I would involve the child in the activities of class	1.5%	3.9%	9.9%	57.6%	27.1%	4.05 ± 0.81
I would suggest attending the child in the integration section	5.9%	7.8%	26.5%	43.1%	16.7%	3.57 ± 1.05

1=totally ineffective, 2=ineffective, 3=Neither effective nor ineffective, 4=effective, 5=completely effective; M=Mean, SD=Standard Deviation

Subsequently, an analysis was conducted to investigate the difference between General and Special Education teacher regarding proposals for effective treatment. The results of the t-test are given in Table 5. The analysis showed that there were statistically significant differences in their proposals for effective treatment of developmental dyslexia. The results showed that Special Education teachers believe to a greater extent that appropriate treatment is based on personalize the teaching for the child (t = -2.442, p <.05, 4.03 ± 1.00 against 3.61 ± 0.85), let the child decide when to participate in classroom activities (t = .33.319, p <.05, 3.26 ± 1.24 against 2.60 ± 0.97), apply self-assessment techniques (t = -4.445, p <.05, 4.33 ± 0.84 against 3.61 ± 0.82), apply words and letters discrimination exercises (t = -2.334, p <.05, 4.103 ± 0.75 against 3.77 ± 0.72), asking the child to do the same work as other children (t = -2.400, p <.05, 3.00 ± 1.26 2.48 ± 1.07), involving child in class activities (t = -22.852, p <.05,

4.43 ± 0.79 against 3.98 ± 1.06) and child attending class integration (t = 183.118, p <.05, 4.10 79 0.79 against 3.47 ± 1.06).

Table 5. Comparisons between General and Special Education teacher regarding proposals for effective treatment

	Position				t	p
	General Education		Special Education			
	M	SD	M	SD		
Fees and positive incentives	4.11	0.64	4.26	1.03	-1.029	.305
Negative aid	1.70	0.70	1.90	1.11	-1.983	.091
I would manifest my acceptance of the child, I would win his trust and I would try to restore the confidence in himself	4.03	0.74	4.26	0.93	-1.482	.140
I will personalize the teaching for the child	3.61	0.85	4.03	1.00	-2.442	.015
I would let the child decide when to participate in classroom activities	2.60	0.97	3.26	1.24	-3.319	.001
I would use multi-sensory techniques	4.08	0.70	4.27	0.98	-1.258	.210
I would apply self-assessment techniques that the child would use	3.61	0.82	4.33	0.84	-4.445	.000
I would apply words and letters discrimination exercises	3.77	0.72	4.10	0.75	-2.334	.021
I would ask the child to do the same work as other children	2.48	1.07	3.00	1.26	-2.400	.017
I would try to learn more to deal with a child with Dyslexia	4.14	0.84	4.19	0.98	-0.325	.746
I would involve the child in the activities of class	3.98	0.82	4.43	0.63	-2.852	.005
I would suggest attending the child in the integration section	3.47	1.06	4.10	0.79	-3.118	.002

1=totally ineffective, 2=ineffective, 3=Neither effective nor ineffective, 4=effective, 5=completely effective; M=Mean, SD=Standard Deviation; t=t-test statistic, p=p-value

Attitude towards inclusive education

The results in Table 6 indicate that teachers strongly agreed that academic progress was possible in children with special needs (M = 3.99, SD = 0.71) and that self-esteem of children with special needs was increased when included in the regular education classroom. (M = 3.81, SD = 0.77). Also, teachers tend to agree that students with special needs should be included in regular education classrooms (M = 3.65, SD = 0.89) and that although children may differ intellectually, physically, and psychologically, all children can learn in most environments (M = 3.50, SD = 1.08). On the contrary, teachers tend to disagree that they are confident in their ability to teach children with special needs (M = 2.75, SD = 1.16), and they have been adequately trained to meet the needs of children with disabilities (M = 2.54, SD = 1.19). Also, teachers reported that students with special needs in the regular education classroom had the academic progress of the regular education student (M = 2.52, SD = 1.03).

Table 6. Results about attitude towards inclusive education

	1	2	3	4	5	M ± SD
I am confident in my ability to teach children with special needs	14.7%	28.9%	31.4%	16.2%	8.8%	2.75 ± 1.16
I have been adequately trained to meet the needs of children with disabilities	18.6%	39.7%	18.1%	15.7%	7.8%	2.54 ± 1.19
I become easily frustrated when teaching students with special needs.	12.3%	46.6%	30.9%	7.4%	2.9%	2.42 ± 0.90
I become anxious when I learn that a student with special needs will be in my classroom.	15.7%	28.9%	27.5%	24.5%	3.4%	2.71 ± 1.11
Although children differ intellectually, physically, and psychologically, I believe that all children can learn in most environments.	2.9%	19.6%	19.1%	41.2%	17.2%	3.50 ± 1.08
I believe that academic progress is possible in children with special needs.	0.5%	3.0%	13.8%	62.6%	20.2%	3.99 ± 0.71
I believe that children with special needs should be placed in special education classes	3.4%	19.6%	37.7%	27.5%	11.8%	3.25 ± 1.01
I can adequately handle students with mild to moderate behavioral problems	2.5%	9.8%	28.9%	47.5%	11.3%	3.55 ± 0.91
Students with special needs learn social skills that are modelled by regular education students.	6.9%	9.8%	24.0%	53.9%	5.4%	3.41 ± 0.98
It is difficult for children with special needs to make strides in academic achievement in the regular education classroom	5.4%	34.8%	40.2%	14.7%	4.9%	2.79 ± 0.93
Self -esteem of children with special needs is increased when included in the regular education classroom.	0.5%	5.9%	20.1%	58.8%	14.7%	3.81 ± 0.77
Students with special needs in the regular education classroom hinder the academic progress of the regular education student	15.7%	38.7%	25.5%	17.6%	2.5%	2.52 ± 1.03
Students with special needs should be included in regular education classrooms.	1.5%	6.4%	35.8%	38.7%	17.6%	3.65 ± 0.89

1=Strongly Disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree; M=Mean, SD=Standard Deviation

The results in Table 7 show that there are several statistically significant differences between General and Special Education teacher regarding attitude toward inclusive education. More specifically, it was observed that Special Education teachers were more confident in their ability to teach children with special needs ($t = -9.988, p < .05, 4.32 \pm 0.75$ against 2.47 ± 0.98) and considered that they were adequately trained to meet the needs. of

children with disabilities ($t = -11.69, p < .05, 4.32 \pm 0.65$ vs. 2.23 ± 0.96). In contrast, General Education teachers become more anxious when they learn that a student with special needs will be in their classroom ($t = 4.636, p < .05, 2.86 \pm 1.03$ against 1.9 ± 1.16). Special Education teachers agree to a greater degree that although children of different levels intellectually, physically, and psychologically can learn in most environments ($t = -4.852, p < .05, 4.32 \pm 0.75$ against 3.35 ± 1.07). Also, Special Education teachers agree to a greater degree that academic progress is possible in children with special needs ($t = -2.625, p < .05, 4.30 \pm 0.65$ against 3.94 ± 0.71) and students with special needs should be included in regular education classrooms ($t = -4.302, p < .05, 4.25 \pm 0.92$ vs. 3.53 ± 0.85).

Table 7. Comparisons between General and Special Education teacher regarding attitude towards inclusive education

	Position				t	p
	General Education		Special Education			
	M	SD	M	SD		
1. I am confident in my ability to teach children with special needs	2.47	0.98	4.32	0.75	-9.988	.000
2. I have been adequately trained to meet the needs of children with disabilities	2.23	0.96	4.32	0.65	-11.69	.000
3. I become easily frustrated when teaching students with special needs.	2.44	0.82	2.32	1.28	0.661	.509
4. I become anxious when I learn that a student with special needs will be in my classroom.	2.86	1.03	1.90	1.16	4.636	.000
5. Although children differ intellectually, physically, and psychologically, I believe that all children can learn in most environments.	3.35	1.07	4.32	0.75	-4.852	.000
6. I believe that academic progress is possible in children with special needs.	3.94	0.71	4.30	0.65	-2.625	.009
7. I believe that children with special needs should be placed in special education classes	3.25	1.02	3.19	0.98	0.307	.759
8. I can adequately handle students with mild to moderate behavioral problems	3.44	0.89	4.19	0.70	-4.466	.000
9. Students with special needs learn social skills that are modelled by regular education students.	3.42	0.95	3.35	1.14	0.350	.727
10. It is difficult for children with special needs to make strides in academic achievement in the regular education classroom	2.83	0.89	2.55	1.12	1.570	.118

11. Self -esteem of children with special needs is increased when included in the regular education classroom.	3.77	0.74	4.03	0.91	-1.720	.087
12. Students with special needs in the regular education classroom hinder the academic progress of the regular education student	2.32	1.02	2.00	0.97	1.934	.072
13. Students with special needs should be included in regular education classrooms.	3.53	0.85	4.25	0.92	-4.302	.000

1=totally ineffective, 2=ineffective, 3=Neither effective nor ineffective, 4=effective, 5=completely effective;M=Mean, SD=Standard Deviation; t=t-test statistic, p=p-value

Conclusion

Teachers' reaction toward students with Developmental Dyslexia

The results of personal reactions in dyslexia showed that teachers felt significantly responsible for helping the child and using all the means they had, using Means and Materials to achieve the goals of the curriculum and feeling sympathy or compassion for a child with developmental dyslexia. General Education teachers felt more pressured and helpless than Special Education teachers. On the contrary, Special Education teachers appeared to think that they were to a greater extent responsible for helping the child and using all the means they had and know how to deal with students with dyslexia from personal experience. Also, Special Education teachers were more confident in their ability to teach children with special needs. Results on proposals for effective treatment of dyslexia have shown that teachers consider effective treatment of developmental dyslexia fees and positive incentives and multi-sensory techniques. Also, teachers find it important to manifest their child's acceptance, gain confidence and try to restore confidence in themselves and include the child in class activities. Special Education teachers believe in the appropriate treatment to be based on personalizing the child's teaching, let the child decide when to participate in classroom activities, apply self-assessment techniques, apply words and letters discrimination exercises, ask the child to do the same work as other children, including child in class activities.

Research has confirmed that General Education teachers felt more pressured and helpless about the treatment of students with dyslexia (Fyssa et al., 2013). In addition, according to Smith et al. (2015), Special Education teachers were more confident in their ability to teach children with special needs, they were to a greater extent responsible for helping the child and using all the means they had and how to deal with them. students with dyslexia from personal experience. Finally, a study by Strogilos and Tragoulia (2013) showed that teachers consider effective treatment of developmental dyslexia fees and positive incentives and multi-sensory techniques to encourage students' participation in classroom activities and apply self-assessment techniques. Similarly, research by Saricam and Sakiz (2014) found that special educators had a higher sense of self-efficacy compared to music, art, and general education teachers.

Most students with dyslexia most often face obstacles when trying to read to learn. Such difficulties are decoding or trying to understand text without an adequate knowledge base (Lyon et al., 2003). Such challenges pose significant obstacles to academic performance. Teachers often try to tailor their curricula to meet the diverse needs of their students, while trying to find creative ways to engage the entire classroom potential of students (Coyne et al., 2006), or at least they should teachers are in need of adopting innovative supports, strategies and tools that make it possible to meet all students' educational needs (Hall et al., 2015).

Teachers' attitude toward inclusive education



Finally, the results on attitude toward inclusive education showed that Special Education teachers were more confident in their ability to teach children with special needs and considered that they were adequately trained to meet the needs of children with disabilities. Also, Special Education teachers agree to a greater degree that academic progress is possible in children with special needs and students with special needs should be included in regular education classrooms. In contrast, General Education teachers become more anxious when they learn that a student with special needs will be in their classroom.

According to research conducted (Black-Hawkins, Florian & Rouse, 2007), teachers' attitudes towards students with disabilities and their integration are often negative. Deficiencies in educational knowledge and skills, coupled with the lack of organized teacher training programs, are the main causes of the deterioration of the Special Education provided. Indeed, dyslexic students themselves believe that their education is degraded and believe that the main factor for this situation is the lack of specific knowledge from their teachers (Smith, Polloway, Patton, & Dowdy, 2015). At the same time, it is argued that all children, regardless of their 'disadvantage' or special learning difficulties, should be included in the general classes. This view focuses on the importance of peer interaction, the positive impact on children with and without dyslexia and the development of friendly relationships between their peers, and at the same time, there are several studies that have at times demonstrate the success of inclusion (Black-Hawkins, Florian & Rouse, 2007). In another study, Hodkinson (2010) studied the historical evolution of inclusion in the UK. Research has shown that over time the positive perception of inclusion has increased. The same conclusion is reached by Scruggs et al. (2017) in a review of research conducted during 1958-1995 on teachers' perceptions of inclusion. Specifically, the researchers concluded that, regardless of methodology, sample, time period, or geographic region, a positive perception of inclusion was recorded. Using a different methodology, a wide range of ethnographic research methods, Avramidis et al (2000), confirm Special Education teachers' positive perceptions of inclusion. More specifically, teachers express positive perceptions by arguing that inclusion respects the rights of children with special educational needs while pointing out that progress is made at the academic, social and emotional level for all students.

More generally, as Elhoweris and Alsheik (2004) point out, general education teachers are favorably inclined to include students with special educational needs in the scales related to children's legal rights but express negative views on the practical application of inclusion if teachers consider that they fail to meet the requirements of an inclusive process. In a recent study by Koutrouba et al. (2012) in secondary education, teachers' positive perceptions were also recorded in 52.9% of the total of 365 participants. However, the percentage is marginal and represents almost half of the sample. The other participants expressed significant difficulties in implementing inclusion related to: (a) lack of appropriate infrastructure, (b) inaccurate curriculum, (c) education system orientation towards achieving quantitative learning objectives and degrees, and (d) lack of training regarding with proven teaching methods and practices. Similar were the findings of Avramidis and Kalyva's (2007) research in which 155 elementary school teachers were generally in favor of inclusion. The reasons were mainly for the right of students with special educational needs to inclusive education and the opportunities for the development of the cognitive and emotional areas of all students. Certainly, there were also concerns about schools' ability to implement inclusion. At the same time, we should also add Ververi et al (2011) with data from a survey conducted in Greece. Research shows that initially there is an increased number of children with disabilities in Greece, but this school system cannot provide the necessary support to children and their inclusion teachers, and often there is a large negative social stigma.

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Investigating science specialties teachers' training needs in the post-covid era. A comparative study of the factor 'gender'

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Abstract

This research aims at investigating and recording male and female science disciplines teachers' (math, science, mechanics and ICT specialties) training needs in a region of Thessaly. It also aimed to detect the effect of the factor gender on the training needs. A number of 252 science disciplines teachers (104 of them being male and 148 female) participated in the research which was conducted with the mixed method approach using a questionnaire and a focus group discussion with eight teachers as research tools. The results of the questionnaire and focus group discussion data analyses revealed that teachers wish to be trained mainly on issues that relate to student psychology, behavioral problems, differentiated instruction, application of ICT in teaching, soft skills, multimodal education or creativity in students' work. The research results also point to statistically significant results as to the effect of the factor female gender on the training needs.

Keywords: teacher training; science disciplines; lifelong learning; factor gender

Introduction

In today's modern societies, the achievements of science and technology are, without doubt, valuable and necessary support for people and their survival, and for this reason their utilization and exploitation are considered important (European Commission, 2023). This increase in technology and its significant discoveries have brought about many changes in the communities around the world in all forms of people's daily lives and in areas such as work, research, or education (Ahmmed et al., 2022). The need to meet these changes successfully has led to new ways and tools that can be effectively used to address the rising demands (Avgitidou, 2023; Doukas et al., 2023). In the field of education, changes and tools are equivalent to contemporary, modern and innovative teaching methods, imaginative material and media which are capable of properly preparing teachers and ultimately their students for the modern era and the challenges that appear along the way (Milhem et al., 2014; Doulkeridou, 2015).

Together with new methods, materials, tools and educational means that are constantly being suggested to support educationists today, teacher's training into how to use them is also considered necessary in terms of knowledge and appropriate exploitation of these new methods and materials used in the classroom (Tzafliklou et al., 2022). Teacher training is the

process of teaching or learning the knowledge, skills, and attitudes you need to be a teacher in an educational setting in all levels (Chatzikonstantinou, 2022; Kalogiannakis & Papadakis, 2007; Gountra, 2023; Madesi, 2023). Hatzipanagiotou (2001), as ref. to Sakkoulis et al. (2017) defines training as “the organized processes, statutory and non-institutional, that aim to supplement and renew the initial education and training of primary and secondary teachers, so that they are able, during their tenure, on the one hand to improve the knowledge, skills and attitudes related to their teaching work and on the other hand to develop themselves as people (Freedom, 2022). The ultimate goal of the training is to contribute to the improvement of the professional practice of teachers and, by extension, to quality education”.

In addition to the above, significant changes are also required in the role of teachers today (Ogba et al., 2020; Professional Development Plan 2022-23). Their new role relates to classroom management ways, ICT skills or the 21st century skills provision to their learners. In particular, today, we are facing a multinational and multimodal society and consequently classrooms, for which teachers should be ready and prepared about how to handle and address (Ionescu & Vrasmas, 2022). Similarly, teachers should be trained how to manage and address the new generation of students, the so-called digital generation, who are often ahead of their own teachers where innovative ideas and ICT skills are concerned (Ganal et al., 2019). In parallel to the above, issues such as the ability to learn how to learn, the development of initiative taking, the ability to express yourself freely and creatively, to be flexible, communicative or empathetic are just some of the 21st century skills teachers should be aware how to pass on to their learners as being some of the most important pillars of educationists’ professional portfolio today and students’ future curriculum background. Based on the aforementioned, it can be argued that teacher training refers to a process of personal and professional development and broadening of knowledge in methods, tools, approaches and practices that teachers are called to apply in their educational practices (Jurs et al., 2007).

Where teacher training is concerned, Feiman-Nemser, & Buchman (1983) refer to a number of stages. These begin with the pre-educational stage which concerns the knowledge and experiences that teachers have accumulated throughout their educational and personal actions. The next stage is the pre-service one, that is, the education that teachers have had in a typical teacher education and training center, usually during the first years of their service. This is followed by the induction stage which is mainly about the knowledge gained in their first years of teaching, when teachers learn from practice in the classroom mainly (also known as teacher induction or early professional training). The next stage is the intra-service stage which concerns all the activities organized by institutions, organizations or teachers themselves to improve their teaching practices.

The training of teachers is directly linked to the need of providing them with opportunities of self-empowerment in their teaching duties, in their interaction with the rest of the educational community members, students, and parents, with their pedagogical and professional role as well as with their cognitive level. As Papanoum (2005) argues, the need for training is also significant as, for teachers to be effective, they should display a good knowledge of the teaching subject, relevant teaching skills/abilities, positive attitudes/perceptions, knowledge about the school, teaching, and learning, positive personal qualities, such as inspiration, creativity, exploratory ability, and commitment to their work (Papanoum, 2005).

Teachers’ training cannot be a one-time process but there is need for lifelong learning and continuous improvement in order to cover for the requirements of the contemporary educational processes. For these processes to be effective and successful and the aims of education to be fulfilled teachers need to improve as best as they can. A good school can be considered successful and effective when teachers are also good at what they do (Papanoum, 2008). But they can only become better when their needs are met and skills are upgraded constantly. Any teacher training program generally aims mainly to improve the educational

process, the school atmosphere, to introduce modern teaching practices, to update methodologies, to improve student effectiveness, to support teachers' professional development, to increase the effectiveness of education in general and improve the relations with the community helping schools to open up to the public, sharing and exchanging views and ideas with the community members. According to Papanou (2005) the prerequisites for the success of training are many and concern: a) its philosophy, i.e whether it adopts the understanding of teaching and the role of the teacher b) whether it is designed based on scientific data c) whether it is integrated into the policy of the teaching profession.

Rationale of the study

The purpose of teacher training is to help teachers enrich their knowledge, skills and abilities in order to meet the needs of modern schools and educational policies. It is a very important issue and a key feature of their career path and the achievement of their goals. A key condition for their upgrading success is a continuous and effective training process, capable of responding to their individual needs and preparing them appropriately for the contemporary school classroom. Often, however, these needs are not always known or taken into account by educational authorities. Several times, the training programs are designed in the absence of the teachers, who are often asked to attend them without being particularly interested in them. Instead, these programs are often predetermined in the context of a general in-service school process. However, based on the diversity of the different needs of teachers, but also on frequent educational and pedagogical gaps, these needs differ and vary depending on specialties, background knowledge, school demands and so on. Based on the aforementioned, this research was decided in order to detect, record and classify the training needs of secondary education teachers, focusing particularly on science specialties, in the hope that we can draw a clear view of which these are and how they could be addressed for the benefits of teachers and ultimately of their students.

Methodology

Research purpose and research questions

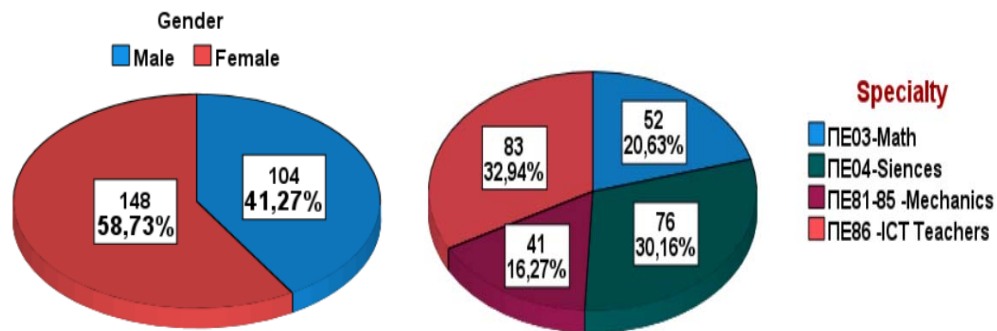
The purpose of the present research was to detect, record and classify the training needs of secondary education level science specialties teachers in a region of Thessaly, Greece. Conducting the research with a mixed method approach (quantitative and qualitative), the research questions were the following:

1. Which are science specialties teachers' training needs in the area of the research?
2. How are the teachers' training needs classified in terms of preference?
3. How does the factor 'gender' affect the need for training of science specialties teachers in terms of training topic?

The sample

A sizeable number of science specialties school teachers were participants in the present research, namely 252 science disciplines teachers (Math teachers (52), Science teachers (76), teachers of Mechanics (41), ICT teachers (83)), with 104 of them being male and 148 female teachers, all working at different schools in a region of Thessaly, Greece. They all taught at Junior and Senior High Schools. However, there were ICT teachers that derived from elementary schools as well, as ICT specialty teachers are also able to work in primary education level schools apart from the secondary one. A graphical representation of their categorization, as regards their specialty and gender is depicted below (Graph 1). For the purposes of triangulation of the research, eight science disciplines teachers also participated in a focus group discussion. In particular there were four male and four female teachers per specialty (math/science/mechanic ICT teachers). For ethical reasons, these teachers will be referred to, in the results section, as: M1 (The math male teacher), M2 (The science male

teacher), M3 (The mechanic male teacher) and M4 (The ICT male teacher). Accordingly, the female teachers will be referred to as F1 (The math female teacher), F2 (The science female teacher), F3 (The mechanic female teacher) and F4 (The ICT female teacher).



Graph 1: Distribution of participants by gender and specialty

The Research tools

For the implementation of the research, the mixed research approach was followed. For the purposes of the survey, a suitably designed, structured questionnaire was used and administered to the science disciplines teachers. Closed-ended questions were used with simple language and appropriate explanations in the beginning. For ethical reasons, the participants’ involvement was voluntary and their anonymity was maintained, so that they could answer freely and honestly the questions that were addressed to them. The questionnaires were completed online. A short introductory text preceded the questionnaire items in order to inform the participants on the reason of the research, their voluntary participation and the possibility to be informed about the results in case they wished so. The first part of the questionnaire includes questions that are about the demographics of the participants and in the second part there are questions pertaining to their training needs. As aforementioned, the questionnaire items were closed type and the responses were placed on a Likert scale, ranging from 0 to 5 (Likert type scale).

An important element of any research is the validity and reliability of the research tool. In terms of content validity, the questionnaire was examined by a group of teachers as regards its correspondence with its objectives and in terms of structural validity it was examined with personal interviews. The reliability of the questionnaire was checked with the Cronbach α coefficient (values greater than 0.7 indicate good reliability). The statistical analysis was done with the software program Statistical Package for Social Sciences (SPSS) V.26.0 (SPSS Inc, Chicago, IL, USA). The analysis of the results showed that the reliability of the questionnaire, in terms of its internal consistency and structural validity, is confirmed by the Cronbach α coefficient, which was found in the current phase (pre-test procedure) to be equal to 0.959 for the entire questionnaire, as shown in tables 1 and 2 below:

Table 1: Cronbach’s α reliability coefficient

Reliability Statistics	
Cronbach's Alpha	N of Items
0,959	48

Table 2: Cronbach's α reliability coefficient, the mean value, the variance and the correlation coefficient for the whole questionnaire by successively removing one question

Item-Total Statistics

		Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
1	Psychopedagogical issues	0,561	0,699	0,959
2	Classroom problem management- Addressing crises & behaviors	0,448	0,663	0,959
3	School violence/school bullying	0,556	0,674	0,959
4	Democracy in education	0,633	0,636	0,958
5	Intercultural education	0,610	0,700	0,958
6	Special education	0,545	0,670	0,959
7	Differentiated teaching and learning	0,502	0,576	0,959
8	Design and implementation of European programs	0,302	0,326	0,960
9	Development of communication and cooperation relationship with teachers and parents	0,597	0,592	0,958
10	Organization and administration of education	0,493	0,651	0,959
11	Work stress management	0,559	0,621	0,959
12	Modern teaching approaches	0,530	0,611	0,959
13	Application of interdisciplinary practices	0,563	0,593	0,959
14	ICT and digital media utilization in the teaching practice	0,522	0,577	0,959
15	Teaching methodology in Adult Education	0,613	0,752	0,958
16	Teaching Greek as a Second Foreign Language	0,513	0,601	0,959
17	Counseling and career guidance	0,500	0,489	0,959
18	Teaching in Second Chance Schools	0,553	0,669	0,959
19	Mentoring, Management & Coaching for teachers	0,591	0,655	0,958
20	Issues of health and environmental education	0,533	0,545	0,959
21	Child psychology issues and family therapy	0,660	0,720	0,958
22	School psychology	0,596	0,724	0,958
23	ICT, Educational Robotics and STEM for everyone: from Kindergarten to Upper Secondary schools	0,347	0,503	0,959
24	Soft Skills and innovation in education	0,626	0,635	0,958
25	Evaluation in education (students' school units' and teachers')	0,665	0,620	0,958
26	Multimodal teaching and education	0,626	0,640	0,958
27	Supportive teaching in the classroom	0,569	0,630	0,959
28	Vocational education and training	0,663	0,654	0,958
29	Website design – HTML language	0,364	0,521	0,959
30	Managing students' anxiety in regards to loss and death	0,689	0,658	0,958

31	Administrative documents in educational units	0,532	0,669	0,959
32	Research Methodology	0,557	0,548	0,959
33	First Aid seminars	0,510	0,505	0,959
34	Educational legislation and law	0,627	0,674	0,958
35	Introduction to SPSS – Basic principles of Statistics	0,357	0,423	0,960
36	Sex education in schools/Building a healthy relationship with our body	0,617	0,629	0,958
37	Art in education	0,559	0,576	0,959
38	Social Networks in Education	0,602	0,588	0,958
39	Geographic Information Systems (GIS)	0,409	0,413	0,959
40	Counseling support for parents of children with special educational needs	0,633	0,707	0,958
41	Creative writing a tool to understand literature	0,500	0,511	0,959
42	Professional burnout in the educational sector – Stress and panic attacks	0,687	0,718	0,958
43	Skills workshops in education	0,607	0,546	0,958
44	The art of communication in education	0,675	0,673	0,958
45	Adult education per specialty	0,599	0,752	0,958
46	Effective learning and education	0,729	0,739	0,958
47	Inclusive education and co-education	0,718	0,738	0,958
48	Creative thinking and types of intelligence in education	0,637	0,622	0,958

By successively omitting each of the 48 aforementioned items, contained in the questionnaire, different values of the Cronbach's α coefficient are obtained between the values (0.958 -0.960), showing that it is a valid, reliable and effective tool for recording and prioritizing the educational training needs of science teachers.

Furthermore, for triangulation purposes, a focus group was also held with 12 teachers (six male and six female). The discussion took place in an area and time of their preference and for ethical reasons the views of the participants are referred to in the analysis of the results as P1, P2 (Participant 1, Participant 2) and so on.

Results

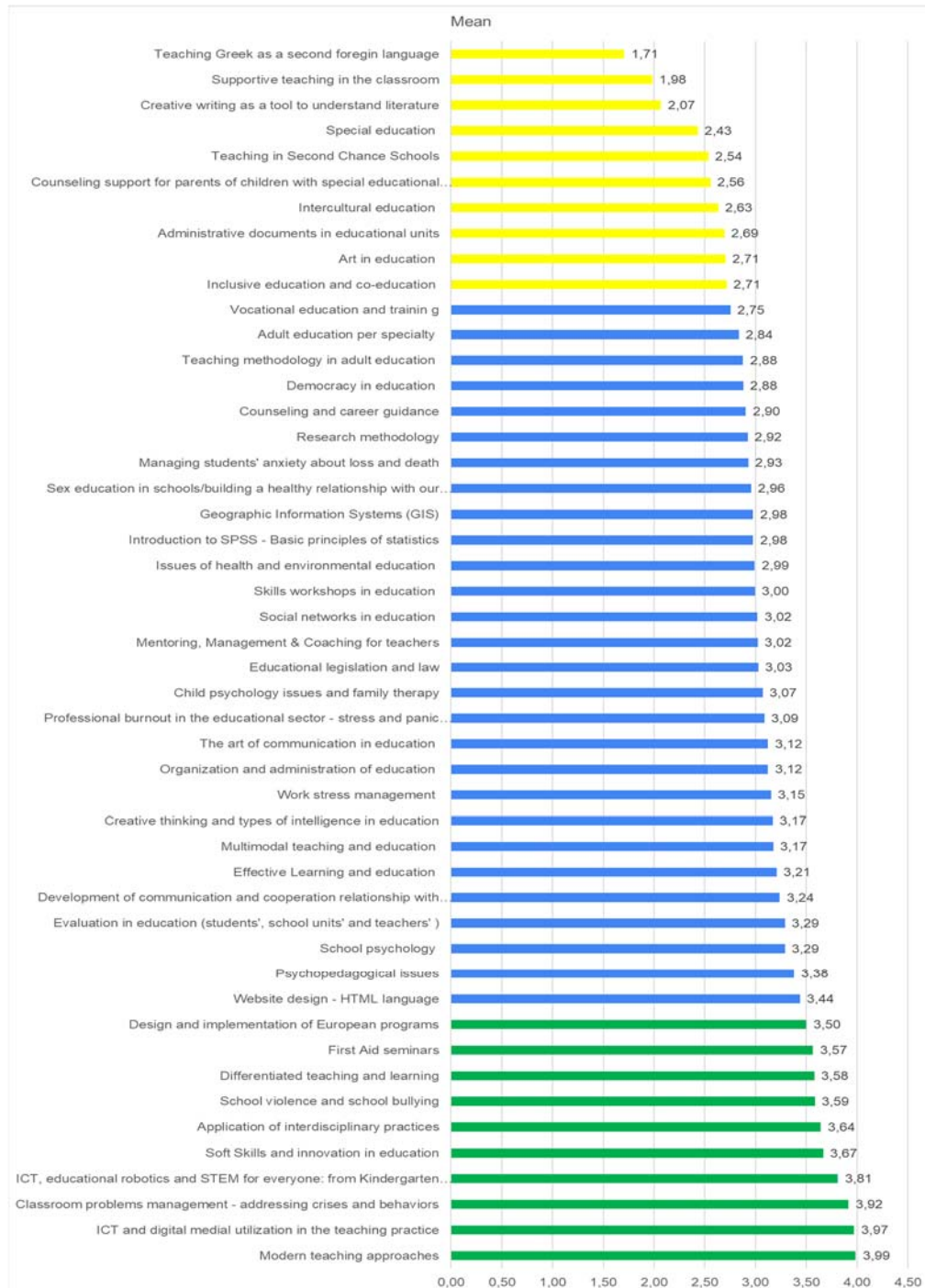
Research question 1: Which are science specialties teachers' training needs in the area of the research? The answers for the first research question, as concerns teachers' training needs, as these were declared by the teachers themselves, are given below in the table that follows (Table 2).

Table 2: Teachers' training needs

A/A	Item Statistics	Mean	Std. Deviation
1	Modern teaching approaches	3,99	1,264
2	ICT and digital media utilization in the teaching practice	3,97	1,273
3	Classroom problems management – Dealing with crises and behaviors	3,92	1,219
4	ICT, educational robotics and STEM for everyone: from Kindergarten to Upper Secondary Schools	3,81	1,400

5	Soft Skills and innovation in education	3,67	1,357
6	Application of interdisciplinary practices	3,64	1,287
7	School violence/school bullying	3,59	1,251
8	Differentiated teaching and learning	3,58	1,286
9	First Aid seminars	3,57	1,431
10	Design and implementation of European programs	3,50	1,364
11	Website design – HTML language	3,44	1,517
12	Psychopedagogical issues	3,38	1,329
13	School psychology	3,29	1,425
14	Evaluation in education (students', school units' and teachers')	3,29	1,400
15	Development of communication and cooperation relationship with teachers and parents	3,24	1,271
16	Effective learning and education	3,21	1,405
17	Multimodal teaching and education	3,17	1,409
18	Creative thinking and types of intelligence in education	3,17	1,397
19	Work stress management	3,15	1,384
20	Organization and administration of education	3,12	1,438
21	The art of communication in education	3,12	1,455
22	Professional burnout in the educational sector – stress and panic attacks	3,09	1,397
23	Child psychology issues and family therapy	3,07	1,381
24	Educational legislation and law	3,03	1,457
25	Mentoring, Management & Coaching for teachers	3,02	1,501
26	Social networks in education	3,02	1,410
27	Skills workshops in education	3,00	1,487
28	Issues of health and environmental education	2,99	1,420
29	Introduction to SPSS – Basic principles of statistics	2,98	1,589
30	Geographic Information Systems (GIS)	2,98	1,538
31	Sex education in schools/Building a healthy relationship with our bodies	2,96	1,492
32	Managing students' anxiety about loss and death	2,93	1,378
33	Research methodology	2,92	1,474
34	Counseling and career guidance	2,90	1,517
35	Democracy in education	2,88	1,285
36	Teaching methodology in adult education	2,88	1,501
37	Adult education per specialty	2,84	1,572
38	Vocational education and training	2,75	1,470
39	Inclusive education and co-education	2,71	1,370
40	Art in education	2,71	1,494
41	Administrative documents in educational units	2,69	1,461
42	Intercultural education	2,63	1,297
43	Counseling support for parents of children with special educational needs	2,56	1,406
44	Teaching in Second Chance schools	2,54	1,531
45	Special education	2,43	1,336
46	Creative writing as a tool to understand literature	2,07	1,315
47	Supportive teaching in the classroom	1,98	1,246

Research question 2: How are the teachers’ training needs classified in terms of preference? As regards the answers for the second research question, the graphical representation that follows presents the teachers’ training needs in order of preference from least (at the top) to most (at the bottom) (Graph 2).



Graph 2: Teachers’ training needs in order of preference from least to most

From the answers displayed on graph 2 above it can be seen that teachers prefer most to be trained in issues such as: design and implementation of European programs, First Aid seminars, differentiated teaching and learning, school violence and school bullying, application of interdisciplinary practices, soft skills and innovation in education, ICT,

educational robotics and STEM for everyone from Kindergarten to Upper Secondary Schools, Classroom problems management – addressing crises and behaviors, ICT and digital media utilization in the teaching practice and modern teaching practices.

Research question 3: Does the factor gender differentiate the need for training of the science specialties teachers in terms of topics?

In order to exploit the sample data two hypotheses were formulated: (a) null hypothesis H₀, based on the acceptance that there is no statistically significant effect of the independent sample on the dependent and (b) alternative hypothesis H₁, which expresses the opposite.

A statistically significant difference, smaller than an acceptable limit of significance (5%, 1% or 1%) means the rejection of the null hypothesis and the acceptance of the alternate one [1,2]. For the purpose of the present study, the level of significance was set at 5%. The use of the appropriate checking criterion (parametric or not) between research hypotheses depends mainly on the plan of the research, the commitment of the level of data, and the type of the indices of the measurement of the variables.

In the present study, the parametric t criterion was chosen as the most appropriate for dependent and independent samples that fulfill the conditions of its use (the data distribution is Gaussian). The research hypotheses are:

H₀: Null hypothesis: The training needs do not differ in terms of gender.

H₁: Alternative hypothesis: The training needs differ in terms of gender.

It should be noted that, in H₁, there is no intrinsic attempt to predict which group displays the best or worse performance. Therefore, a two-sided checking hypothesis is formulated. The results are presented below (Table 3).

**Table 3: Training needs in terms of gender
Independent Samples Test**

		t	Two-Sided p	Mean Difference	
1	Psychopedagogical issues	-2,692	0,008	-0,452	sign
2	Classroom problems management-addressing with crises & behaviors	-1,402	0,162	-0,218	no sign
3	School violence/school bullying	-1,236	0,217	-0,198	no sign
4	Democracy in education	-0,858	0,392	-0,141	no sign
5	Intercultural education	-0,989	0,323	-0,164	no sign
6	Special education	-0,956	0,340	-0,163	no sign
7	Differentiated teaching and learning	-2,642	0,009	-0,430	sign
8	Design and implementation of European programs	-1,886	0,061	-0,327	no sign
9	Development of communication and cooperation relationship with teachers and parents	-0,378	0,706	-0,062	no sign
10	Organization and administration of education	0,196	0,845	0,036	no sign
11	Work stress management	-1,867	0,063	-0,329	no sign
12	Modern teaching approaches	-1,806	0,072	-0,291	no sign
13	Application of interdisciplinary practices	-2,189	0,030	-0,358	sign
14	ICT and digital media utilization in the teaching practice	-2,034	0,043	-0,329	sign
15	Teaching methodology in adult education	0,408	0,684	0,078	no sign

16	Teaching Greek as a second foreign language	0,183	0,855	0,025	no sign
17	Counseling and career guidance	-1,105	0,270	-0,214	no sign
18	Teaching in Second Chance Schools	-0,644	0,520	-0,126	no sign
19	Mentoring, Management & Coaching for teachers	-0,466	0,642	-0,090	no sign
20	Issues of health and environmental education	-2,755	0,006	-0,494	sign
21	Child psychology issues and family therapy	-1,997	0,047	-0,351	sign
22	School psychology	-3,022	0,003	-0,542	sign
23	ICT, educational robotics and STEM for everyone: from Kindergarten to Upper Secondary Schools	-0,055	0,956	-0,010	no sign
24	Soft Skills and innovation in education	-2,218	0,027	-0,382	sign
25	Evaluation in education (students', school units' and teachers')	-1,570	0,118	-0,280	no sign
26	Multimodal teaching and education	-4,439	0,000	-0,772	sign
27	Supportive teaching in the classroom	0,682	0,496	0,109	no sign
28	Vocational education and training	-0,123	0,902	-0,023	no sign
29	Website design – HTML language	-1,556	0,121	-0,301	no sign
30	Managing students' anxiety about loss and death	-2,015	0,045	-0,353	sign
31	Administrative documents in educational units	-0,807	0,420	-0,151	no sign
32	Research methodology	0,159	0,873	0,030	no sign
33	First Aid seminars	-0,716	0,475	-0,131	no sign
34	Educational legislation and law	0,185	0,853	0,035	no sign
35	Introduction to SPSS – Basic principles of statistics	1,410	0,160	0,286	no sign
36	Sex education in schools/building a healthy relationship with our bodies	-1,328	0,185	-0,253	no sign
37	Art in education	-0,895	0,371	-0,171	no sign
38	Social networks in education	-0,913	0,362	-0,165	no sign
39	Geographic Information Systems (GIS)	1,038	0,300	0,204	no sign
40	Counseling support for parents of children with special educational needs	-1,164	0,246	-0,209	no sign
41	Creative writing as a tool to understand literature	-0,196	0,845	-0,033	no sign
42	Professional burnout in the educational sector – stress and panic attacks	-0,556	0,579	-0,100	no sign
43	Skills workshops in education	-2,396	0,017	-0,452	sign
44	The art of communication in education	-1,927	0,055	-0,357	no sign
45	Adult education by specialty	-0,494	0,622	-0,100	no sign
46	Effective learning and education	-1,136	0,257	-0,204	no sign
47	Inclusive education and co-education	-1,619	0,107	-0,283	no sign
48	Creative thinking and types of intelligence in education	-2,004	0,046	-0,356	sign

Based on the above tables 2 and 3, where the educational needs of science teachers are described and recorded (on a Likert scale from 1 - not at all - to 5 - very much), and comparing them in terms of gender, it is observed that there are statistically significant differences between the two sexes in the following fields/training needs: psychopedagogical issues, differentiated teaching and learning, application of interdisciplinary practices, ICT and digital media utilization in the teaching practice, issues of health and environmental education, child psychology issues and family therapy, school psychology, soft Skills and innovation in education, multimodal teaching and education, managing students' anxiety about loss and death, skills workshops in education, creative thinking and types of intelligence in education.

What is more, observing Table 2, which refers to the averages, the training needs of teachers in the relevant fields (needs) of psychopedagogical issues, differentiated teaching and learning, application of interdisciplinary practices, ICT and digital media utilization in the teaching practice, issues of health and environmental education, child psychology issues and family therapy, school psychology, Soft Skills and innovation in education, multimodal teaching and education, managing students' anxiety about loss and death, skills workshops in education and creative thinking and types of intelligence in education, are greater in women than men, presenting statistically significant differences.

Focus group results

The focus group discussion, held with eight participant science disciplines teachers (four female and four male (one teacher per specialty) revealed a number of interesting findings in relation to the research questions, which validate the aforementioned quantitative results. According to the teachers' answers, there seems to be a consensus of opinions between the two specialties of math and ICT teachers (male and female). In particular, female teachers seem to agree that supportive teaching in the classroom is very important today as there is a growing number of students with learning difficulties, a fact that complicates their teaching quite a lot, as very few of them have had almost no training during their studies *"Every year I see more and more students that need more help which I cannot give, I was not trained how to address students with learning difficulties, I need to know how to..."* F1, *"Teaching learners with learning difficulties has always being my worry in class... we cannot do this unless we are trained with different methods, use appropriate tools, only then can we help these kids"*F4. Another issue that seems to trouble female teachers a lot is how to deal with students' psychological issues and how to use a variety of different teaching techniques that apply to all learners' knowledge background *"I have a lot of students coming from families with problems, some of them are closed up to themselves, they do not participate, they are indifferent and I feel helpless. I need all the support I can get, how to handle such students"* F2, *"I have many mixed ability classes and a lot of learners that are naughty. Sometimes I just want to yell and at the end of day I am so exhausted. Schools today have changed a lot. We need to know how to manage such classes and how to help learners with different levels of knowledge. It is urgent"* F3.

Male teachers on the other hand, focus on other needs such as students' evaluation or vocational education and training issues. *"Parents are very demanding today and they don't understand the difficulty of our job. They expect good grades, they don't realize that this is based on their children's performance. We need some advice not only on evaluation methods but also how to handle parents on this"* M2, *"Vocational education is very complicated with many sectors and specializations that are linked to the employment market. We need to link our work to the demands of the market and we need to be told where to emphasize our teaching. It is very important I think"*M3. Other teachers believe that issues such as professional burnout or educational legislation and law for instance are important topics to

be trained for. “Schools are harder today than in the past. Students are more difficult to handle and even their parents. I would like to know how to facilitate my work, my everyday presence in school, to do my job well, but also to go home in one piece!” M1, “Sometimes, I think principals are very demanding. They ask a lot of things from us, school advisors do the same, the state is also very demanding with all those laws and regulations. I think they need to reconsider many things but above all they need to explain to me, to train me how to do all this paper work for example and how everyone also does the same thing, not just a few of us!” F4.

Conclusions-discussion

This research aimed to investigate the educational needs of science teachers in the region of Thessaly. More specifically, the research aimed at recording and prioritizing the educational needs of the educational sciences, but also at investigating the effect of the gender factor on the educational needs. The research participants were 252 science teachers (men and women), majoring in mathematics, physics, engineering and IT. The research was conducted using a mixed method, while a questionnaire and a focus group discussion with eight teachers were used as data collection tools. The results of the research revealed that teachers have a variety of training needs and mainly on issues such as design and implementation of European programs, First Aid seminars, differentiated teaching and learning, school violence and school bullying, application of interdisciplinary practices, soft skills and innovation in education, ICT, educational robotics and STEM for everyone from Kindergarten to Upper Secondary Schools, Classroom problems management – addressing crises and behaviors, ICT and digital media utilization in the teaching practice and modern teaching practices with women having a higher average in all cases than men.

Based on the focus group discussion results women feel that issues such as learning difficulties, classroom management and child psychology are very important as topics for their training as schools today have a different profile than ever before, they have become more demanding and pedagogical issues are more difficult to handle than cognitive matters. On the contrary, male teachers feel that issues such as managerial matters or training learners for the world market are more important due to the fact that schools should be able to link to the society and its needs. An interesting fact was also the similar preferences for training between ICT and math teachers regardless of gender. It is hoped that the results could be exploited by school advisors or school authorities for teachers’ appropriate and updated training of their needs today and the facilitation of their instructive and pedagogical practices for the benefits of education and ultimately of the learners themselves

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