

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 (Chatzikonstaninou, 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

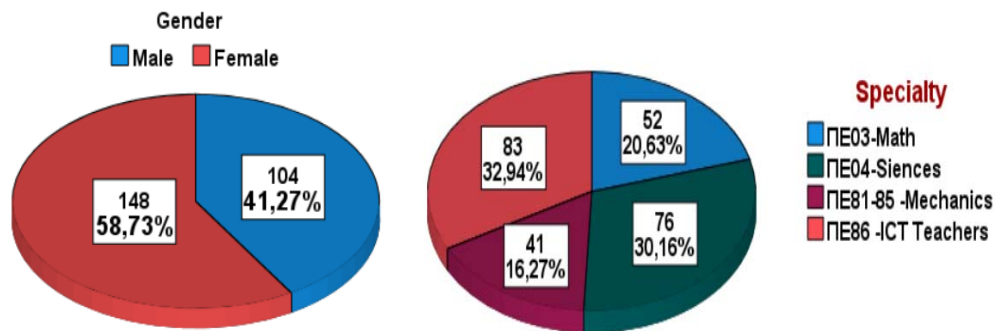
The purpose of the present research was to detect, record and classify the training needs of secondary education level science specialties teachers in a region of Thessaly, Greece. Conducting the research with a mixed method approach (quantitative and qualitative), the research questions were the following:

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

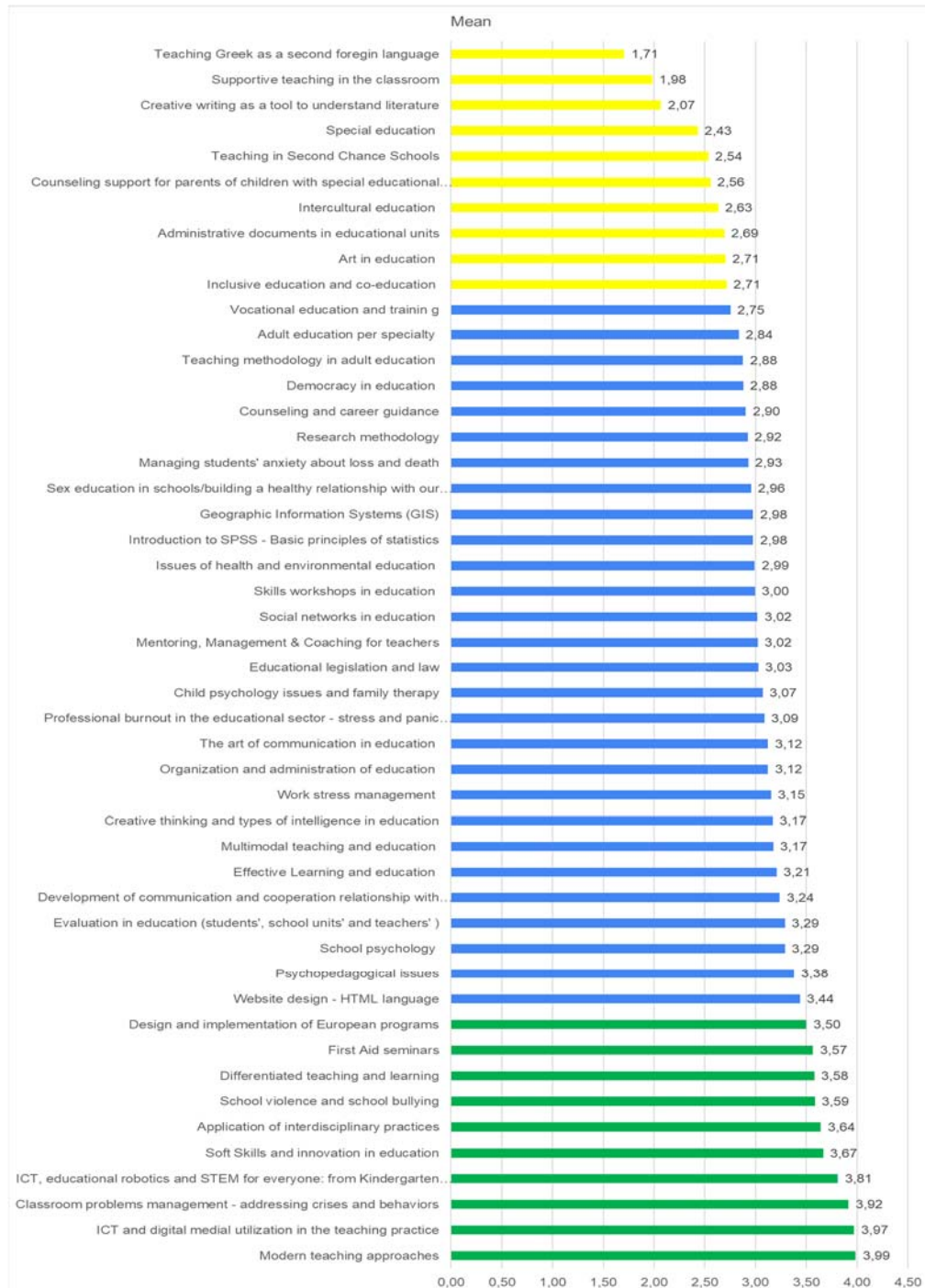
Research question 1: Which are science specialties teachers' training needs in the area of the research? The answers for the first research question, as concerns teachers' training needs, as these were declared by the teachers themselves, are given below in the table that follows (Table 2).

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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