Open Journal for

Educational Research

CONTENTS

_____

COAS

Teacher Knowledge Manifestation of Integrated Science Teachers in Zimbabwe

Diamond Dziva, Maroni Runesu Nyikahadzoyi
Bindura University of Science Education, Faculty of Science Education, Zimbabwe
Department of Curriculum Studies

Konstantinos Ravanis, Dimitrios Koliopoulos
University of Patras, Faculty of Humanities and Social Sciences, Greece
Department of Educational Sciences and Early Childhood Education

Abstract

This study explored the teacher knowledge manifestation of Integrated Science (IS) teachers who have specialised in Chemistry, Biology or Physics during their pre-service teacher education. 60 experienced Integrated Science teachers responded to an 'Integrated Science Teacher Knowledge' questionnaire which embraced different dimensions of teacher knowledge. The results of the study indicate that the IS teachers have a common set of knowledge, skills, and dispositions that are, in their professional opinion, needed and in some instances, would enable them to teach IS. The research participants had considerable knowledge as well as clear views about what it meant for them to be IS teachers. It however should be noted that there was a marked variance in the perception of the three cohorts of teachers towards teaching through Practical Work, importance of pre-service teacher education specialisation towards teaching IS and knowledge of students' culture. This study provides contextual inputs to effective IS teacher education re-alignment informed by the IS teacher practitioners, those with the craft knowledge of the contextual environment of the IS classrooms.

Keywords: teacher knowledge, integrated science, Zimbabwean educational system.

1. Introduction

This research is framed under the theoretical perspective of teacher knowledge. There is an on-going discourse on exploring teacher knowledge in General Education and Science Education fields (Elbaz, 1983; Shulman, 1987; Grossman, 1990; Carlsen, 1999; Lederman, 2006; Chapman, 2013; Goodwin & Kosnik, 2013; Adoniou, 2015; Mouza et al., 2017; Slavit & Lesseig, 2017). The nature of teacher knowledge debates often borders on whether teacher knowledge is situated within contexts or it is propositional in nature (Calderhead, 1996). Teacher knowledge research is essential as it has a direct bearing on student success (Coleman, et al., 1966; Ferguson, 1991; Flippo, 2001; Ingersoll, 2002; Reutzel & Cooter, 2012). Teacher knowledge is by definition, embedded in the personal context of the teachers, where all kinds of domain-related, teacher-related and pupil-related and the intermingling of these circumstances play a role. Verloop, Driel and Meijer (2001) stress that it is logical to direct the search for shared teacher knowledge on

Correspondence: Konstantinos Ravanis, Department of Educational Sciences and Early Childhood Education, University of Patras, Patras, 26504, GREECE. E-mail: ravanis@upatras.gr.

groups of teachers that are in similar situations with respect to variables such as subject matter, level of education, and age group of students.

This research interrogates the teacher knowledge manifestation of Zimbabwean Integrated Science teachers who have specialised in Chemistry, Biology or Physics during their pre-service teacher education. These teachers are likely to experience out-of-field teaching phenomenon when teaching certain topics of Integrated Science Ordinary Level school subject. Out-of-field teaching has been described as "education's dirty little secret". According to du Plessis (2017), out-of-field teaching is not an aberration, and it is not restricted to only a few subjects-for example, to the STEM-subject areas of Science, Technology, Engineering and Mathematics – but has implications for all subject areas and year level.

Science education in Zimbabwe at Forms 3 and 4 (15-16 -year olds) also referred to as Ordinary Level (O-Level) exists in a number of subject syllabi ranging from Chemistry, Biology, Physics, Human and Social Biology to Integrated Science. The Integrated Science subject is however the most common Science subject in Zimbabwean schools with for instance 151,717 candidates having set for O-Level terminal examinations in the year 2016 as compared to Biology's 23,138, Physics' 6,767 and Chemistry's 6,842 candidates (Zimbabwe School Examinations Council, 2016). Student have not been performing very well in terminal Integrated Science in Zimbabwe School Examinations Council (ZIMSEC) examinations at Ordinary Level. An analysis of November Ordinary Level examination results confirms that the performance of students in IS was general low as compared to other science subjects, for instance in year 2014 IS pass rate was 21.9% and in 2015 it was 31.52% (Zimbabwe School Examinations Council, 2016). Comparing the 2016 pass rate with other Science subjects, whilst IS was 39.58%, Physics was 61.18%, Biology was 57.07% and that of Chemistry was 77%. According to Makwati (2000: 1), "teachers are the single, most important component in the Zimbabwean education system. They are also the only measure parents, students, and administrators have for evaluating the effectiveness of the school system. Teachers have been institutionalised in the education system and remain the focal point of all curricular and classroom organisation" and hence the focus of this study on teacher knowledge.

The Integrated Science syllabus is divided into 5 compulsory components, i.e. Science in Agriculture, Science in Industry, Science in Energy Uses, Science in Structures and Mechanical Systems and Science in the Community. Applications of science and technology to agriculture, environmental, and socio-economic fields are embedded in the syllabus as an extension of subject concepts and skills. These concepts are intended to be imparted to students through an investigative and practical approach. In Zimbabwe there is no specific pre-service Integrated Science teacher education programme. Most prospective teachers specialise in specific science disciplines like Chemistry, Biology or Physics. With this context in mind, this study is therefore guided and limited by a central question: How do teachers who specialised in Chemistry, Biology or Physics describe secondary school Integrated Science teaching?

2. Research methodology

Sixty Integrated Science teachers were selected through snowball sampling and surveyed. These 60 research participants were distributed across 3 equal cohorts according to their specialisation areas of study at pre-service teacher education (i.e., Chemistry, Biology and Physics education). A 5-point Likert Scale Integrated Science Teacher Knowledge questionnaire was developed based on an extensive review of the literature that provided the most important aspects to be evaluated, which were later reflected in the questionnaire items 1 to 15. The questionnaire items embraced the different dimensions of teacher knowledge (Elbaz, 1983; Shulman, 1986; Grossman, 1990; Carlsen, 1999; Mouza et al., 2017). They closely matched the theoretical framework about different types of teacher knowledge through encompassing the practical and propositional knowledge that IS teachers expressed (Elbaz, 1983; Shulman, 1986).

_____

The initial designed instrument had 53 items pieced together from several existing instruments which measure teacher knowledge. After the questionnaire had been developed, it was submitted to a panel of three university professors who acted as judges. They were asked to react to the questionnaire and suggest any necessary revisions for the items. They content validated the instrument to verify that the items were appropriate and were likely to yield accurate responses. The questionnaire items were derived from Teacher Knowledge Domains: General Pedagogical Knowledge – items 1, 5, 7, 9, 10; Subject Matter Knowledge – item 14; Pedagogical Content Knowledge – items 2, 3, 4, 8, 11, 12, 15; and Knowledge about the Specific Context – items 6, 13. These knowledge domains were derived from the studies of Elbaz (1983), Shulman (1986; 1987), Grossman (1990) and Carlsen (1999). The questionnaire was physically distributed to the 60 Integrated Science teachers in four provinces of varying size, location, and population in Zimbabwe. Analysis of the questionnaire responses was electronically done on IBM SPSS (Statistical Package for Social Science) version 24 software.

3. Research findings and discussion

Table 1 indicate the response frequency to the fifteen questionnaire items. As indicated on Table 1 the response rate to the Likert scale items was high. However, three respondents each, making up 5% per questionnaire item 5 and 15 did not attempt to respond to these. These high response rate might be pointing to the high drive of the participants to partake in this research and as well, the issues being interrogated by this research resonated with the concerns that the Integrated Science (IS) teachers have as they practice their profession.

Table 1
Summary of the questionnaire items frequency

Code	Strongly Agree		Agree		Neither Agree nor Disagree		Disagree		Strongly Disagree		Valid N
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	
1.	15	25.0	29	48.3	8	13.3	5	8.3	2	3.3	59
2.	29	48.3	23	38.3	2	3.3	6	10.0			60
3.	32	53.3	19	31.7			6	10.0	1	1.7	58
4.	22	36.7	28	46.7	5	8.3	5	8.3			60
5.	13	21.7	16	26.7	6	10.0	15	25	7	11.7	57
6.	17	28.3	16	26.7	3	5.0	16	26.7	7	11.7	59
7.	8	13.3	23	38.3	7	11.7	14	23.3	7	11.7	59
8.	8	13.3	15	25.0	6	10.0	24	40.0	6	10.0	59
9.	6	10.0	9	15.0	7	11.7	27	45.0	10	16.7	59
10.	42	70.0	14	23.3	2	3.3					58
11.	4	6.7	9	15.0	18	30.0	24	40.0	5	8.3	60
12.	3	5.0	3	5.0	6	10.0	29	48.3	18	30.0	59
13.	17	28.3	22	36.7	5	8.3	16	26.7			60
14.	4	6.7	15	25.0	7	11.7	24	40.0	10	16.7	60
15.	7	11.7	21	35.0	9	15.0	13	21.7	7	11.7	57

Code

1. Need of student culture knowledge
2. Importance of Knowledge of History of Science in teaching
3. Teaching Practicals is as important as teaching Theory
4. Practical Work enhance student learning
5. Teaching Integrated Science is different from teaching other science subjects
6. Specialising in a science discipline is important in teaching IS
7. I could be a better teacher if I had not specialised in one science discipline
8. When teaching a particular section of IS, I divert and teach another aspect of IS if that aspect captures student interest at that time
9. The rate of student learning does not impact my teaching of IS
10. Audio and visual aids are important in facilitating student learning of IS
11. IS teaching should mostly be done outdoors
12. I have not been trained in the use of IT as a science teaching aid
13. The subject matter/content taught at college is enough for one to teach IS
14. Upon being employed, I had to start reading hard in order to be able to teach those topics in IS divorced from my area of specialisation
15. IS teaching should mostly be conducted in-doors i.e. in laboratories or classrooms

3.1 *Need for student culture knowledge*

On being asked on need for student culture knowledge when teaching IS, 85% of IS teachers who specialised in Biology Education indicated that teaching IS requires as a prerequisite

some knowledge of students' culture. This was at par at 85% with IS teachers who specialised in Chemistry education at college whilst only 50% of IS teachers who specialised in Physics Education agreed that teaching IS requires knowledge of students' culture (Figure 1).
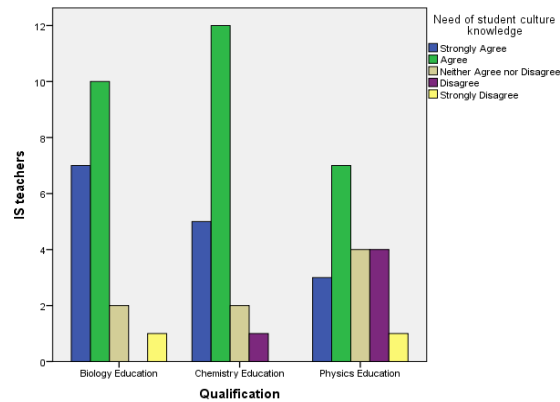

Figure 1. Crosstabulation of IS teacher qualification against
need of knowledge of students' culture

Knowledge about students' cultural background and its influence on students' misconception on certain scientific concepts together with the ability of a teacher to manage these misconceptions lie at the heart of what effective science teachers do and are indeed important aspects of pedagogical knowledge (Shulman, 1986, 1987). The research participants were generally in concurrence across the cohorts that students' culture was essential for learning IS, this disclosure is consistent with the research findings of Dziva, Mpofu, & Kusure (2011) although the research participants in Dziva et al. (2011) study placed the students' cultural knowledge on a low rung of importance.

3.2 *Importance of knowledge of History of Science in teaching*

On being asked to indicate the degree of agreement to questionnaire item statement 2 which read, "It is important for IS teachers to know the history of science", the IS teachers' response is presented on Figure 2 cross tabulated against their area of teaching specialisation.
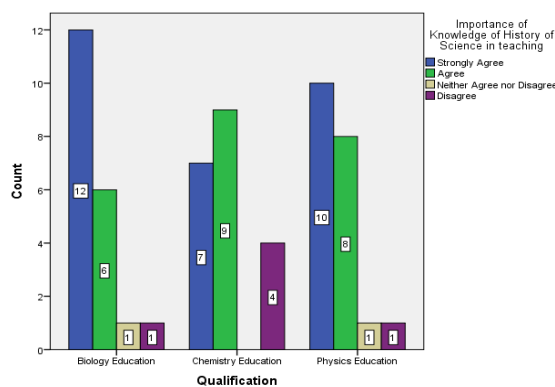

Figure 2. Crosstabulation of Qualification and Importance
of Knowledge of History of Science in teaching

The IS teachers who specialised in Biology and Physics agreed to this statement matching at eighteen participants per cohort. Although sixteen participants from the Chemistry cohort agreed to the statement, four participants from this cohort disagreed to the said statement

_____

as compared to one participant apiece for the Physics and Biology cohort. By and large about 87% of the participating IS teachers agreed with the importance of history of science in student learning. Literature has it that the history of science proffers vivid, concrete case studies that demonstrates the nature of scientific reasoning (Matthew, 1994; Pitt, 1990) and hence maybe that is the reason why the majority of IS teachers recognise its importance. The history of science unravels the Nature of Science as well as providing examples of Pedagogical Content Knowledge which the IS teachers hold in the form of syntactic knowledge which are the agreements, norms. paradigms, and ways of establishing new knowledge that scientists in their respective specialisations hold as currently acceptable (Gess-Newsome, 1999). Many science educators treasure the history of science as it uncovers the scientific process, instead of focusing solely on final products and possesses a great potential for a multifaceted improvement of the learning process and its results (Galili & Hazan, 2002).

3.3 *Teaching through Practical Work is as important as teaching Theory*

Of the 58 Integrated Science teachers who responded to Item 3, 55.2% strongly agreed that teaching through Practical Work was as important as teaching theory, 32.8% agreed whilst 10.3% disagreed and 1.7% strongly disagreed. Fifty-two Integrated Science teachers which is about 90% of the respondents, agreed to strongly agreed that teaching IS through practical work is as important as teaching it theoretical, whilst 6 (10%) disagreed to strongly disagreed to this.
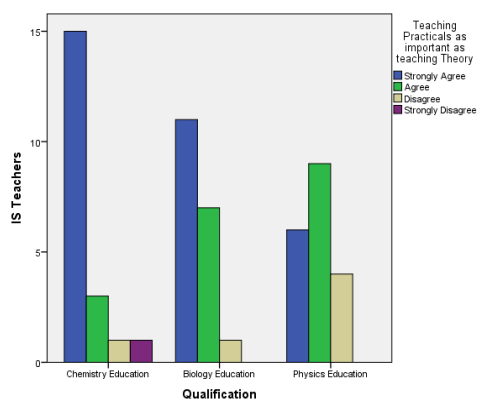
Figure 3. Crosstabulation of IS teacher qualification against their perception
on teaching through practical work as important as teaching theoretical

Although the IS teachers generally strongly agreed with the statement that: "Teaching through Practical Work is as important as teaching theory in IS"; the level of strongly agreeing was more from the Chemistry education specialisation cohort than the other two cohorts (Figure 3). On the other hand, the Physics education specialisation cohort had more teachers disagreeing to the questionnaire statement item 3 as compared to the other two cohorts.

3.4 *Practical Work enhance student learning*

84.4% of IS teachers agreed to strongly agreed on the importance of Practical Work in enhancing student learning (Figure 4) as compared to 8.3% who disagreed. From the results of the survey it emerged that teachers recognise the importance of Practical Work in Integrated Science. Literature allude to the fact that general there is no remarkable divergence about the importance of Practical Work in school science (Kapenda et al., 2002) the main issues raised are on whether any such Practical Work endeavour genuinely supports learning and teaching.

Figure 4. Crosstabulation of Qualification and Importance
of Practical Work in enhancing learning

3.5 *Teaching Integrated Science is different from teaching other science subjects*
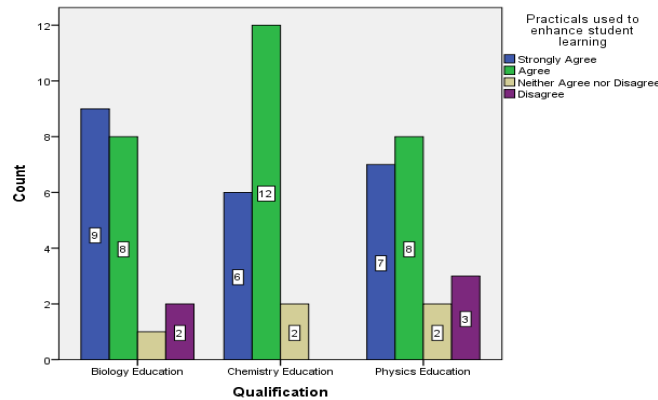
About 48% of the research participants indicated that teaching IS is different from teaching other subjects whilst 36.7% viewed the teaching of IS as being similar to teaching any other science subject (Figure 5). The 36.7% IS teachers are missing the point on what constitute IS which according to Harrel (2010) is an approach to learning and teaching from an assortment of world-views, strategies, and resources; and the taking advantage of real-life situations for problem solving and critical thinking in the classroom. It therefore should be taught in a different way as compared to other science subjects.
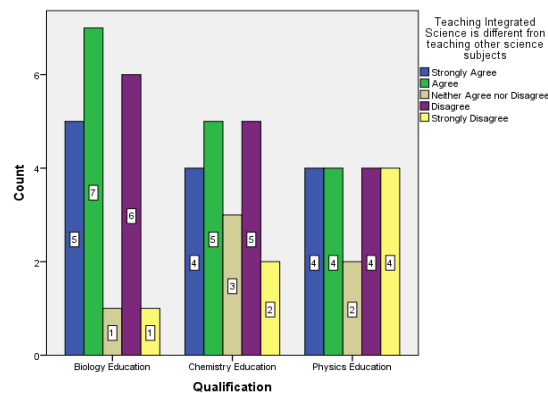
Figure 5. Crosstabulation of Qualification and uniqueness of teaching IS

3.6 *Specialising in a science discipline is important in teaching IS*

Figure 6 shows the crosstabulation of IS teacher qualification against their views on the need for specialising in a particular science discipline in order to teach IS. 55% of the research participants agreed to strongly agreeing that specialising during pre-service teacher education was important as a preparation for teaching IS, 38.4% disagreed whilst the rest were undecided. It can be observed from Figure 6 that the count of IS teachers who agreed were higher for the Biology cohort as compared to the other cohorts. This questionnaire item did not however interrogate if the IS teachers thought whether their subject area specialisation was the one which was need or not for IS teaching. The questionnaire item 7 interrogated this.

_____
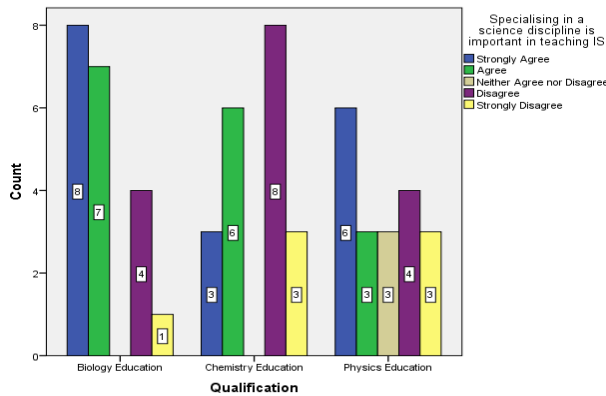
Figure 6. Crosstabulation of IS teacher qualification against the need for specialising in a particular science discipline in order to teach IS

Researches on teaching science topics within and outside areas of specialism reveal important differences in the quality of preparation and delivery of science lessons (Harrell, 2010; du Plessis, 2017; Nixon & Luft, 2015). IS teachers might find themselves feeling 'out-of-field' when found teaching those concepts which they are not specialised in, however, because of the nature of IS in Zimbabwe which has about 75% Biology content (ZIMSEC, 2010) the IS teachers might feel that those who specialise in Biological discipline are better-off.

3.7 *Need for not specialised in one science discipline at pre-service teacher education level*

70% of IS teachers who specialised in Chemistry Education viewed the importance of not specialising in a single science discipline as they agreed to questionnaire item number 7 whilst 60% of IS teachers who specialised in Biology Education agreed with Item 7. For those who specialised in Physics education only 25% of IS teachers reported as agreeing to being better teachers if they had not only specialised in Physics Education. 11 of those teachers who specialised in Physics education at college were more inclined to the view that specialising in Physics education was enough for one to be a better IS teacher.

Figure 7. Crosstabulation of IS teacher qualification against effect of specialisation on IS teaching

It is evident that teachers who specialised in Physics education most times are teaching IS concepts out-of-field. However even when they are aware of this it is evident that they identify themselves with their area of specialisation and are satisfied that it is good enough preparation for them to teach IS (Figure 7).

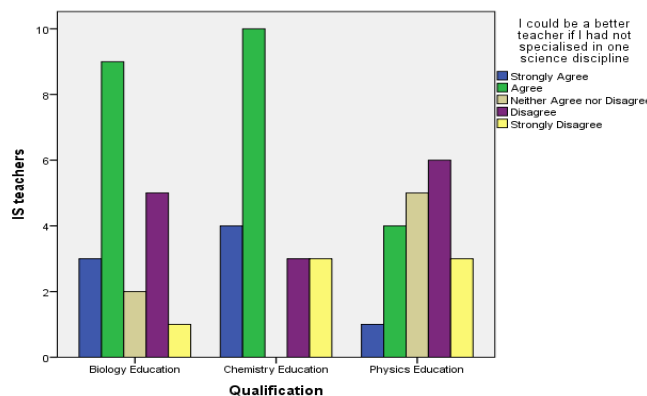### 3.8 *Divert to teach aspects of IS if that aspect captures student interest during a lesson*

On being asked on whether they concurred that they would divert and teach another aspect of IS if that aspect captures student interest at that time when teaching a particular section of IS, 38.3% of the research participants agreed 50% disagreed whilst 10% neither agreed nor disagreed and IS teacher did not respond to the item (Figure 8). The reason why 50% of the IS teacher participants disagree with the statement item might be that these teachers remember instances of their teaching outside subject specialism in which situation, according to Mizzi (2013), there is a tendency to be rigid, less confident in their teaching, following a textbook structure quite closely and tending to ask recall questions.
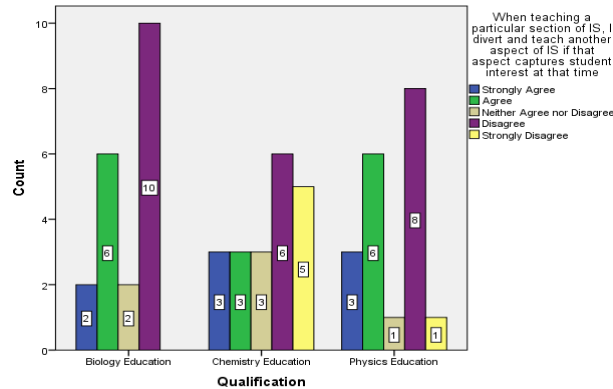
Figure 8. Crosstabulation of IS teacher qualification against teaching that captures student interest

3.9 *Influence of rate of student learning on teaching of IS*

The majority of the IS teachers disagreed to the questionnaire item statement which stated that the rate of student learning did not impact their teaching of IS.
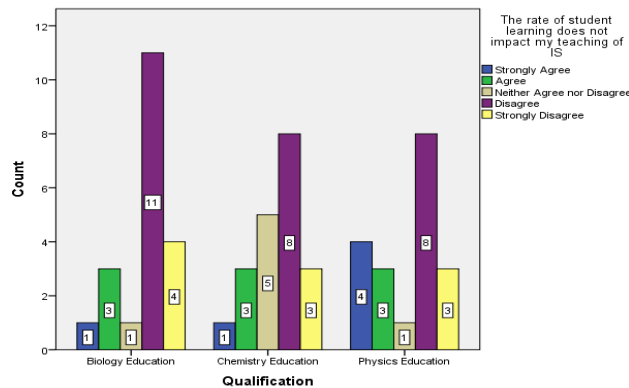
Figure 9. Crosstabulation of IS teacher qualification against impact of rate student learning on IS teaching

61.7% of the participating IS teachers disagreed to strongly disagree, 25% agreed to strongly agreed, 11.7 % neither agreed nor disagreed and one teacher did not respond to the question. Across the 3 cohorts the IS teachers recognised the need to pace teaching with rate of student learning and in so doing the teachers acknowledge the "knowledge of students" and "learner characteristics" as propounded by Shulman (1987).

_____

3.10 *Importance of audio and visual aids in facilitating student learning of IS*

93.3% of the research participants agreed to strongly disagreeing that audio and visual aids facilitated student learning of IS whilst 3.3% neither disagreed nor agreed, two participants did not however respond to the questionnaire item (Figure 10).
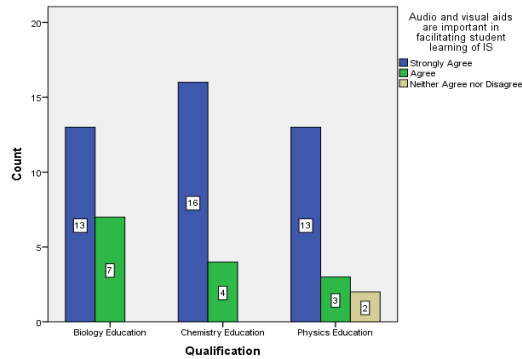
Figure 10. Crosstabulation of IS teacher qualification against importance
of audio and visual aids in facilitating student learning

The level of concurrence to the importance of audio-visual aids in facilitating learning cut across all the three cohorts. The audio and visual aids have been identified by Grossman (1990) as the 3rd PCK knowledge of which teachers are expected to know the curricular materials available to enact the curriculum.

3.11 *Teaching IS outdoors*

Item 11 of the questionnaire asked on whether IS teachers agreed or not with the statement: "Integrated Science teaching should mostly be done outdoors". 21.7% agreed, 30% neither disagreed nor agreed whilst a substantial number of 48.3% disagreed to strongly disagree across the three cohorts (Figure 11).
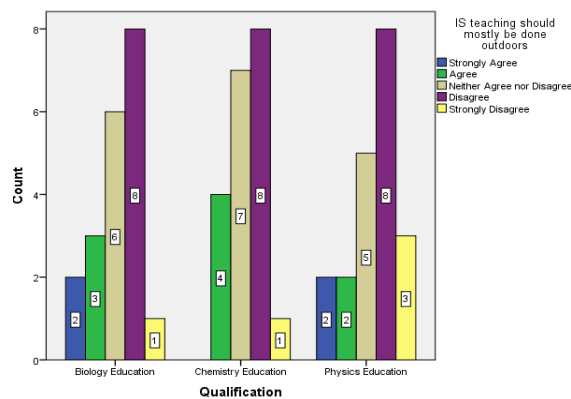
Figure 11. Crosstabulation of IS teacher qualification against need
of teaching of IS through outdoors activities

Despite the fact that the IS syllabi document recommend that teachers should take advantage of out-doors to facilitate learning through for example field observations some teachers still view this approach as undesirable (ZIMSEC, 2010).

_____

3.12 *Training to use IT as a science teaching aid*

78.3% of the research participants indicated that they were well trained in the use of IT to aid IS teaching whilst 10% said the contrary and another 10% neither agreed nor disagreed. One teacher however did not respond to the questionnaire item.
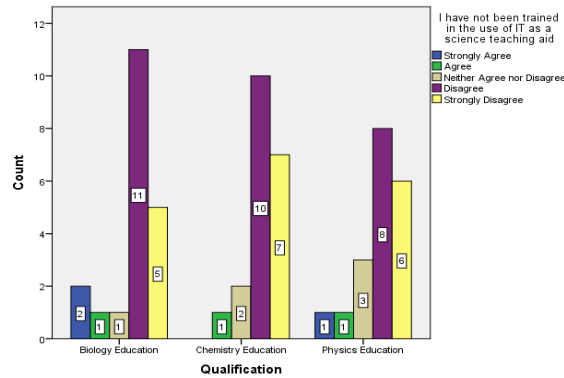
Figure 12. Crosstabulation of IS teacher qualification against
training in the use of IT to aid IS teaching

The response to this item is consistent to the response given to questionnaire item 10 where about 93% of the respondents indicated that audio and visual aids facilitate the learning of IS. Nyikahadzoyi (2013: 265) also acknowledged the need for teachers be holders of IT knowledge which he referred to as technological knowledge for the purpose of teaching when he referred to this knowledge as the knowledge of "advanced digital technologies – knowledge of operating systems, computer hardware, ability to use standard sets of software tools such as word processors, spread sheets, browsers, and e-mail".

3.13 *Adequacy of the subject matter/content taught at college to teach IS*

75% of the IS teacher participants felt that the subject matter they were taught at college was adequate for enabling them to teach IS. 8.3% of the teachers were not sure whilst 26.7% felt that the content knowledge which they were taught was not adequate for IS teaching (Figure 13).
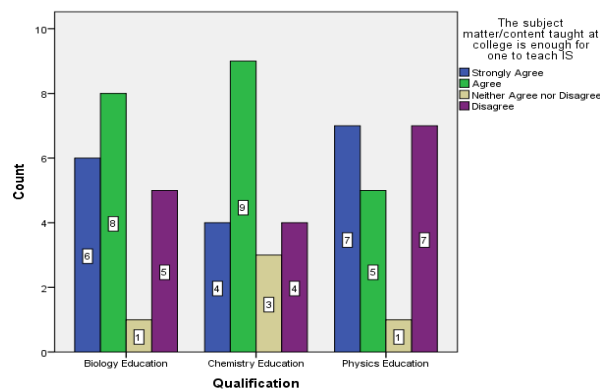
Figure 13. Crosstabulation of IS teacher qualification against adequacy
of subject matter/content taught at college for the purpose of teaching IS

Whilst the majority of the research participants viewed subject matter they were taught at college as adequate for IS teaching albiet IS being multidisciplinary and them specialising in one science discipline, Shulman (1986) and Spear-Swerling and Cheesman (2012: 1692) warns that inadequate Content Knowledge by the teacher leads to constricted and

_____

regressionist pedagogies as teachers resort to replicating own past experiences which may result in teachers providing "inadvertently confusing instruction" to students especial in those concepts where they experience out-of-field phenomenon (Nixon & Luft, 2015).

3.14 *IS Teaching experiences upon joining the teaching profession*

31.7% of the respondents across the cohorts indicated that they were ill-prepared Content-wise to teach IS when they joined the teaching profession from college whilst 56.7% said that they were well prepared to teach IS upon assumption of teaching duty from college, however, 8.3% of the research participants were neither in agreement nor disagreement that upon being employed they had to start reading hard in order to be able to teach those topics in IS divorced from their area of specialisation (Figure 14).
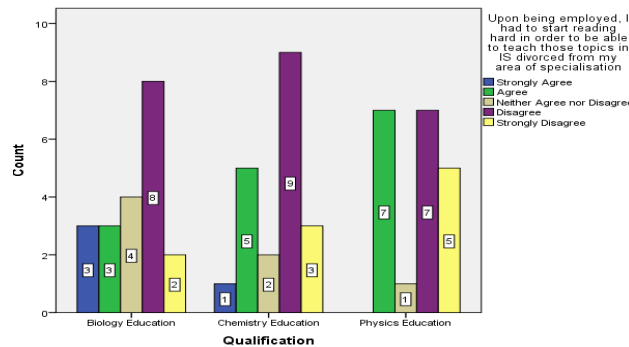
Figure 14. Crosstabulation of IS teacher qualification against content knowledge taught at college versus actual teaching situation

Although the IS teachers acknowledge that there are some content topics in IS which lie outside their area of specialisation more than half of the participants still felt that they were adequately prepared to teach IS upon graduation. This might be due to the fact that most of these participants had learnt IS as a subject at secondary school level and hence the content was not actual new to them but might still however be lacking PCK (Shulman, 1987).

3.15 *IS teaching should mostly be conducted in-doors*

Item 15 of the questionnaire asked the research participants if they agreed or not on whether IS teaching should mostly be conducted in-doors, i.e. in laboratories or classrooms. 36.7% of the participating IS teachers agreed to the teaching of IS indoors whilst 15% could neither agreed nor disagreed and 33.4% disagreed. Three research participants chose not to respond to the questionnaire item.
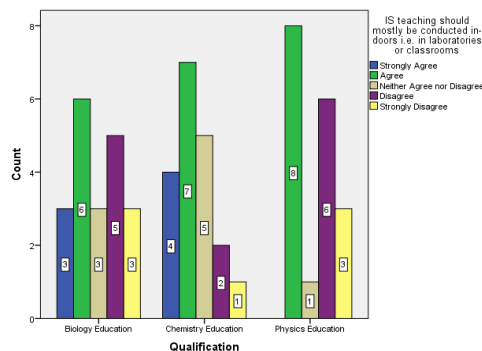
Figure 15. Crosstabulation of IS teacher qualification against teaching of IS in-doors

On comparing the teachers' responses of questionnaire items 11 and 15 it appears as if more of the research participants preferred teaching IS indoors (36.7%) than outdoors (21.7) despite the fact that the teachers should take advantage of out-doors to facilitate learning through for example field observations (ZIMSEC, 2010).

3.16 *Statistical significance*

The IBM SPSS Statistics 24 was used to perform a Kruskal-Wallis test on the Likert-scaled items. The independent variable, or categorical variable, was the qualification (subject specialisation) group to which the Integrated Science teacher belonged. The dependent variables were fifteen Likert-scale ordinal data statements. The analysis was based on the following hypotheses:

H_0: The three groups have the same distribution of scores.

H_A: At least two of the groups will contain a statistically significant difference in the distribution of scores.

Out of the fifteen Likert-scale statements on the questionnaire, one statement (item 3) resulted in a statistically significant difference between groups as noted by the Kruskal-Wallis score, where $p<0.05$ (Table 1). A pairwise comparison post-hoc tests on this item with statistically significant differences was carried out to determine which two groups differed significantly in their responses since a Kruskal-Wallis score does not indicate between which two groups the differences occur. Items 1, 2 and 4-15 were not statistically significant. However, items 1 and 7 did show marginal significance at $p=0.051$ and 0.084, respectively and hence considered as *just conditions*.

Table 2. Test statistics a, b

Dependent Variables														
1. Need for culture in IS teaching	2. Importance of History of Science	3. Practicals and Theory	4. Practicals	5. Uniqueness of Integrated Science	6. Specialising at college	7. Not specialising at college	8. Not focusing on one task	9. Rate of Student Learning	10. Aids	11. Teaching IS out-doors	12. IT training	13. Subject matter acquired at College	14. Preparation for Teaching	15. Teaching IS in-doors
5.850	2.885	6.792	.751	.917	4.406	4.917	1.517	1.522	1.087	.677	.703	.166	.923	3.643
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
.054	.236	.034	.687	.632	.110	.086	.468	.467	.581	.713	.704	.920	.630	.162
.051	.241	.032	.688	.637	.110	.084	.474	.474	.568	.719	.706	.921	.635	.163
.000	.002	.000	.001	.000	.000	.000	.000	.000	.007	.001	.001	.001	.001	.000

a. Kruskal Wallis Test

b. Grouping Variable: Qualification

Item 3 stated: "Teaching through practical work is as important as teaching theory in IS". This item showed a significant difference in views regarding the statement between teachers who have specialised in chemistry education and those who have specialised in physics education

_____

during their teacher education programmes. The difference maintained statistical significance following the Bonferroni correction, where *adj.p*=0.033. Integrated Science teachers who specialised in Chemistry education were much more likely to accept as true that teaching through Practical Work is as important as teaching theory in Integrated Science than those who specialised in Physics Education.

Table 3. Questionnaire item 3's Pairwise comparison of teachers' qualification

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.
Chemistry Education-Physics Education	-12.279	4.827	-2.544	.011	.033
Biology Education-Physics Education	-8.684	4.888	-1777	.076	.227
Chemistry Education-Biology Education	3.595	4.827	.745	.456	1.000

Each row tested the null hypothesis that the Sample 1 and Sample 2 distributions were the same. Asymptotic significances (2-sided tests) are displayed. The significance level was .05. Significance values were adjusted by the Bonferroni correction for multiple tests. Although the IS teachers generally strongly agreed with the statement that: "Teaching through practical work is as important as teaching theory in IS"; the level of strongly agreeing was more from the Chemistry education specialisation cohort than the other two cohorts. Whilst about 88% of the respondents agreed to item 3's assertion, about 12% disagreed to this. The IS syllabus document however demands, "practical and investigative approach must be adopted in teaching this syllabus" (ZIMSEC, 2010: 2). Despite the IS teachers resonating with the importance of practical work in teaching IS and being aware of the demands of the IS syllabus document, those from the Physics education specialisation cohort, however, had more teachers disagreeing to the questionnaire statement item number three as compared to the other two cohorts. This sentinel position of teachers from the Physics specialism is in line with the findings of Hashweh (1987) and Nixon and Luft (2015) that if teachers' Content Knowledge is low, it directly influences the way they teach, often times they find themselves comfortable with sticking to the script, employing more teacher centred approaches and the resultant is the accompanied reduced teaching effectiveness as a result of limited content knowledge (Hobbs, 2013). It should be noted that this study is however, not implying that holding a degree qualification with requisite Content Knowledge makes teachers proficient, but, holding a teaching qualification in the "content area serves as a readily available minimum requirement" (Nixon & Luft, 2015: 76). Topic-knowledgeable teachers are often-times more likely to diverge from textbook accounts and demand synthesis from their students and engage in practical activities (Hashweh, 1987). The teachers from the Physics education cohort seem to be less exposed to biology concepts and to some extent chemistry concepts and these are the major concepts which make-up the Integrated Science curriculum at Ordinary Level in Zimbabwe (ZIMSEC, 2010).

4. Conclusion

The results of the study indicate that the IS teachers have a common set of knowledge, skills, and dispositions that are, in their professional opinion, needed and in some instances, would enable them to teach IS. The research participants had considerable knowledge as well as clear views about what it meant for them to be IS teachers.

The research participants were generally in concurrence across the cohorts that students' culture was essential for learning IS. Although almost half of the research participants indicated that teaching IS is different from teaching other subjects, a significant 36.7% viewed the teaching of IS as being similar to teaching any other science subject thus, failing to acknowledge

that each content knowledge has a unique approach to teaching it. The majority of IS teachers who specialised in Chemistry Education and Biology Education acknowledged the importance of not specialising in a single science discipline whilst the majority of IS teachers from the Physics Education cohort disagreed. IS teachers who specialised in Physics education identify themselves with their area of specialisation and were satisfied that it was a good enough preparation for them to teach IS. Across the 3 cohorts the IS teachers general recognised the need to pace teaching with rate of student learning. The was a high level of concurrence across the 3 cohorts on the importance of audio-visual aids in facilitating learning.

Although the IS teachers acknowledged that there were some content topics in IS which lie outside their area of specialisation more than half of the participants still felt that they were adequately prepared to teach IS upon graduation.

The majority of the participating IS teachers agreed to the importance of history of science in student learning. The IS teachers generally strongly agreed with the statement that: "Teaching through practical work is as important as teaching theory in IS"; the level of strongly agreeing, however, was more from the Chemistry education specialisation cohort than the other two cohorts. Integrated Science teachers who specialised in Chemistry education were much more likely to accept as true that teaching Integrated Science through Practical Work was as important as teaching theory than those who specialised in Physics Education. From the results of the survey it emerged that the research participants recognised the importance of Practical Work in Integrated Science. About half of the IS teacher participants indicated that they will not divert to teach aspects of IS if that aspect captures student interest during a lesson. This tendency to be rigid, less confident in their teaching, following a textbook structure quite closely and tending to ask recall questions is often evidenced in instances of teaching outside subject area specialism. The research participants preferred teaching IS indoors (36.7%) than outdoors (21.7) despite them being encouraged to take advantage of out-doors to facilitate learning. The majority of the research participants indicated that they were well trained in the use of IT to aid IS teaching.

Slightly above half of the research participants agreed to strongly agreeing that specialising during pre-service teacher education was important as a preparation for teaching IS. The IS teacher participants felt that the subject matter they were taught at college was adequate for enabling them to teach IS albiet IS being multidisciplinary and them specialising in one science discipline.

This study provides contextual inputs to effective IS teacher education re-alignment informed by the IS teacher practitioners, those with the craft knowledge of the contextual environment of the IS classrooms. Ultimately, with the findings of this study, a tool for recruiting and developing teachers who can effectively teach IS can be developed.

_____

References

Adoniou, M. (2015). Teacher knowledge: A complex tapestry. *Asia-Pacific Journal of Teacher Education, 43*(2), 99-116. https://doi.org/10.1080/1359866X.2014.932330

Carlsen, W. S. (1999). Domains of teacher knowledge. In: J. Gess-Newsome, & N. G. Lederman (Eds.), *Examining pedagogical content knowledge: The construct and its implications for science education* (Vol. 6, pp. 133–146). Boston, MA: Kluwer Academic Publishers.

Chapman, O. (2013). Investigating teachers' knowledge for teaching mathematics. *Journal of Mathematics Teacher Education, 16*, 237–243. https://doi.org/10.1007/s10857-013-9247-2

Childs, A., & McNicholl, J. (2007). Science teachers teaching outside of subject specialism: Challenges, strategies adopted and implications for initial teacher education. *Teacher Development, 11*(1), 1-20.

Coleman, J. S., Campbell, E. Q., Hobson, C. J., McPartland, J., Mood, A. M., Weinfeld, F., . . . et.al. (1966). *Equality of educational opportunity*. Washington: U.S. Government Printing Office.

du Plessis, A. E. (2017). *Out of field teaching practices. What educational leaders need to know*. Rotterdam: Sense Publishers.

du Plessis, A. E. (2017). *Out-of-field teaching practices what educational leaders need to know*. Rotterdam: Sense Publishers.

Dziva, D., Mpofu, V., & Kusure, L. P. (2011). Teachers' conceptions of Indigenous Knowledge in Science Curriculum in the context of Mberengwa District, Zimbabwe. *African Journal of Education and Technology*, *1*(3), 88-102.

Elbaz, F. (1983). *Teacher thinking: A study of practical knowledge*. London: Croom Helm.

Ferguson, R. F. (1991). Paying for public education: New evidence on how and why money matters. *Harvard Journal on Legislation*, *28*, 465-498.

Flippo, R. F. (2001). *Reading researchers in search of common ground*. Newark, DE: International Reading Association.

Galili, I., & Hazan, A. (2002). The influence of a historically oriented course on the content knowledge of students in optics. In: H. Behrendt, H. Dahncke, R. Duit, W. Gräber, M. Komorek, A. Kross & P. Reiska (Eds.), *Research in science education – Past, present, and future* (pp. 247-251). New York: Kluwer Academic Publishers.

Gess-Newsome, J. (1999). Secondary teachers' knowledge and beliefs about subject matter and their impact on instruction. In: J. Gess-Newsome, & N. Leaderman (Eds.), *Examining pedagogical content knowledge* (pp. 51-94). Dordrecht: Kluwer Academic Publishers.

Goodwin, A. L., & Kosnik, C. (2013). Quality teacher educators = quality teachers? Conceptualizing essential domains of knowledge for those who teach teachers. *Teacher Development, 17*(3), 334-346.

Grossman, P. L. (1990). *The making of a teacher: Teacher knowledge and teacher education*. New York: Teacher College, Columbia University.

Harrell, P. E. (2010, Spring). Teaching an integrated science curriculum: Linking teacher knowledge and teaching assignments. *Issues in Teacher Education, 19*(1), 145-165.

Hashweh, M. Z. (1987). Effects of subject-matter knowledge in the teaching of biology and physics. *Teaching and Teacher Education, 3*(2), 109-120.

Hobbs, L. (2013). Teaching "out-of-field" as a boundary-crossing event: Factors shaping teacher identity. *Int J Sci Math Educ, 11*(2), 271-297.

Ingersoll, R. M. (2002). *Measuring out-of-field teaching*. Graduate School of Education, University of Pennsylvania, Philadelphia, PA: Unpublished manuscript.

Kapenda, H. M., Kandjeo-Marenga, H. M., Kasandra, C. D., & Lubben, F. (2002). Characteristics of practical work in science classrooms in Namibia. *Research in Science & Technological Education*, 53-65.

Lederman, N. G. (2006). Syntax of nature of science within inquiry and science instruction. In: B. Flick, & N. G. Lederman (Eds.), *Scientific inquiry and the nature of science: Implications for teaching* (pp. 301-317). Dordrecht: Springer.

Makwati, G. J. (2000). *Education for all the year 2000 assessment: Republic of Zimbabwe.* Harare: Ministry of Education, Sport and Culture.

Matthew, M. R. (1994). *Science teaching: The role of history and philosophy of science.* New York: Routledge.

Mouza, C., Nandakumar, R., Ozden, S. Y., & Karchmer-Klein, R. (2017). A longitudinal examination of preservice teachers' technological pedagogical content knowledge in the context of undergraduate teacher education. *Action in Teacher Education*, 1-20. https://doi.org/10.1080/01626620.2016.1248301

Nixon, R. S., & Luft, J. A. (2015). Teaching chemistry with a biology degree: Crosscutting concepts as boundary objects. In: J. A. Luft, & S. L. Dubois (Eds.), *Newly Hired Teachers of Science* (pp. 75-85). Rotterdam: Sense Publishers.

Nyikahadzoyi, R. M. (2015). Teachers' knowledge of the concept of a function: A theoretical framework. *International Journal of Science and Mathematics Education*, *13*(2), 261-283.

Pitt, J. C. (1990). The myth of science education. *Studies in Philosophy and Education, 10*, 7-17.

Reutzel, D. R., & Cooter, R. B. (2012). *Teaching children to read: The teacher makes the difference* (6th ed.). Columbus, OH: Pearson Education.

Saldaña, J. (2013). *The coding manual for qualitative researchers* (2nd ed.). Angeles, CA: Sage.

Shulman, L. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4-14.

Shulman, L. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review, 57*(1), 1-22.

Slavit, D., & Lesseig, K. (2017). The development of teacher knowledge in support of student mathematical inquiry. *PRIMUS, 27*(1), 58-74. https://doi.org/10.1080/10511970.2016.1183156

Verloop, N., Driel, J. V., & Meijer, P. (2001). Chapter 1 Teacher knowledge and the knowledge base of teaching. *International Journal of Educational Research, 35*, 441-461. Retrieved from www.elsevier.com/locate/ijedures

Zimbabwe School Examinations Council (2016). *Zimbabwe School Examinations Council*. Retrieved from Ordinary Level Results Analysis: http://www.zimsec.co.zw/an-analysis-of-the-november-2016-ordinary-level-examination-results/

ZIMSEC (2010). Zimbabwe General Certificate Of Education Integrated Science (5006) O Level Syllabus For Examination in June/November 2011 – 2020. Zimbabwe: ZIMSEC.

COAS

_____

Factors Influencing the Use of ICT in Greek Primary Education

Vasileios Neofotistos[1] & Vasiliki Karavakou

University of Macedonia, Thessaloniki
School of Social Sciences, Humanities and Arts
Department of Educational and Social Policy

Abstract

Despite the efforts made to upgrade hardware and software, in primary education in the Greek educational system, the use of ICT in classes is particularly low-level. In this study, we analyze the role of accessibility to ICT school infrastructure and the teachers' characteristics concerning their skills and attitudes in order to explain the use of ICT in education. We use data from teachers in Greek primary education. The sample consists of 284 teachers (92 male and 192 female) who teach in various elementary schools across the Greek region. Analysis was performed using One-way ANOVA and Pearson correlations. The main results show that the availability of digital media, school hardware and Internet connection infrastructure, teacher training in ICT and their pedagogical background seriously influence the use of ICT in the classroom. In particular, media accessibility is seen as the dominant factor for ICT implementation in Primary Education. Based on the findings, recommendations are made in order to guide Greek education policy administrators to encourage the use of ICT in classrooms.

Keywords: ICT, primary education, constructivism, attitudes.

1. Introduction

The integration of ICT into a country's education system is a multi-component project that involves logistics, human resources, curricula and the necessary training actions. It also depends on the economic resources available for the project, the general educational policy and the social conditions that prevail at that time. In Europe, ICT integration was based on the i2010 strategic framework (European Commission, 2005), which considers it necessary that all EU citizens develop digital skills. The European Commission is now focusing on the development of research, creativity and innovation, and the introduction of ICT as a holistic tool at all levels of education (European Commission, 2009). The transformation of the modern era into a time based almost solely on digital technology has influenced education. From practical and procedural knowledge, emphasis is now placed on the development of conceptual knowledge and, above all, of metacognition, evolving the educational systems themselves (Anderson, 2008), altering the concept of literacy itself. As a result of this development, the teachers themselves need to develop

_____

[1] PhD candidate.

_____

their skills to apply a variety of teaching methods during the educational process with the help and use of ICTs. Furthermore, many educational systems have sought to increase the availability of computers and internet connections in classrooms. This equipment is an efficient tool for study, a valuable source of information, and a flexible support for teaching (Tondeur, van Braak & Valcke, 2007).

- Teacher pedagogical background seriously influences the use of ICT in the classroom.
- Media accessibility is seen as the dominant factor for ICT implementation in Primary Education.
- Continuous teacher training in ICT is a general requirement.

According to Romeo, Lloyd and Downes (2012), the process of integration and approach of ICT by the candidate teachers is distinguished in four phases: (a) the exploratory phase, in which teachers express the intention to implement ICT; (b) the implementation phase, in which there is an initial use of ICT to a limited extent, (c) the integration phase, in which ICT is fully implemented, and (d) the expansion and leadership phase in which teachers use ICT as a holistic tool in the school culture.

The provision of equipment and infrastructure is the prerequisite for the implementation of any ICT policy designed in a national context. In recent years, specific programs have been developed for the provision on ICT infrastructures in schools in some countries. According to the Vacchieri report (in Gil-Flores, Rodríguez-Santero & Torres-Gordillo, 2017), the common adoption of ICT in the education system has not influenced Europe's policy-makers to implement different strategies. Hungary, the Czech Republic, Portugal, Germany, Estonia and the Italy finance the schools that meet certain conditions. Other countries, such as Spain and United Kingdom, try to equip all schools. In France, Italy, Malta, Poland, Portugal, the Ministry of Education cooperates with private companies, providing incentives for students or families to acquire a netbook and in some cases broadband connection. In Greece, during the programming period of the Second Community Support Framework (1994-1999), the introduction of New Technologies in education was the first to be implemented. Subsidies from the Operational Programme for Education and Initial Vocational Training were then absorbed. Today, in times of economic recession, most schools are trying to renew their equipment either using their own economic resources or with the help of institutions and private companies. The Greek economy and, consequently, the educational system has been afflicted during the last ten years by one of the deepest recessions. As an unfortunate result, the country has witnessed major inequalities and signs of educational and social exclusion. Agreements to rescue the Greek economy required drastic cuts in spending, which resulted in turn to the downgrading of the quality of education offered by the public system (Pickles, 2015). The subsequent economic crisis is a factor that explains (at least partially) the enormous deficiencies and the bad state in general in the infrastructure regarding ICT. The merging of schools and departments in Primary and Secondary Education, the reduction of infrastructure funds and, above all, the reduction of teachers' remuneration are affecting their attitudes. Economic and occupational uncertainty enhances their work-related anxiety and professional exhaustion, interrupting the smooth functioning of the educational process. According to Aristotle, the roots of education are bitter, but the fruit is sweet. In this spirit, education may be seen as an expensive and time-consuming investment but its final result is stability and growth. The application of this interpretation of Aristotle's thought in the current economic crisis in Greece is important: if the government continues to degrade one of the most essential areas of education, when the financial crisis subsides, the economy will not maintain its stability (Ortiz, 2013).

Regarding the integration of ICT into the curriculum, most countries set out general guidelines for ICT. These guidelines relate to different regions, communities and, in some cases, even schools, such as the example of Ireland. In Greece, Cyprus and Turkey, the curriculum is entirely determined by the Ministry of Education. Focusing on the Greek context where this study

_____

was conducted, initial approaches to the introduction of new technologies in education followed the techno-centric approach. "Informatics" was considered an autonomous subject, which could be integrated into the curriculum and taught only in Secondary Education. The primary objective was to acquire knowledge and skills on computer operation and on algorithmic programming thinking. The curriculum for computer science as a cognitive school subject aimed at preparing students as professionals in the field to meet the growing needs of the blooming software industry at the time. Pedagogically, a vertical approach was followed (based on the learning theory of behaviorism), which defines learning as a visible change in behavior that results from experiences and exercises posed by the teacher (Good & Brophy, 1990). The introduction of "Informatics" began in the period 1983-1985 from the vocational secondary school (Technical-Professional Lyceum). It was followed by the introduction of the subject in junior high school (Gymnasium) and finally established in the General Lyceum in 1998. "Informatics" was also gradually introduced in Primary Education. It was piloted in the 1996-1997 school year. In 2002-2003, the subject of "Informatics" is introduced into the institution of the whole-day school. In the next school year, 2003-2004, the subject is renamed to "New Technologies in Education". The Unified Reformed Educational Program was piloted in 2010-2011, marking upgrades in Computer Science courses, paving the way for the full development of the Digital School and the new pilot curricula. In 2010, after the updating of the curriculum, the course is introduced in the afternoon teaching zone of schools as "Information and Communication Technologies" (ICT). Since 2016 the lesson has been introduced into all elementary schools of the country.

In a wider context the Ministry of Education, Research and Religious Affairs has recently established the General Directorate of Primary and Secondary Education of the Department of Support for New Technologies and Innovation. The responsibility of the Associated Section concerns the support of digital educational policy and the creation of working groups for conducting surveys and studies in cooperation with the supervised bodies of the Ministry. It will also investigate and record the impact and utilization of digital technology and innovation education programs related to teacher training, the use of educational digital content and digital media upgrade equipment in the educational community (Ministry of Education, Research and Religious Affairs, 2016). In general, developed countries consider ICT integration in education as a key strategy for enhancing citizens' quality of life, innovation and national economic competitiveness. The US government updates the National Technological Education Plan about almost 5 years, stating clearly that its technology-driven structural reforms will be implemented in the education system. In the United Kingdom, JISC a membership organization providing digital solutions for UK education and research promoted ICT in educational strategy and defined its area of implementation in the United Kingdom. Since 1996, Singapore has been developing ICT development projects in education every five years, providing strategic teaching on ICT in education (Wu et al., 2016).

Current evidence suggests that, although the use of technology during the teaching and learning process is steadily increasing (Berrett, Murphy & Sullivan, 2012), achieving technological integration is still a complex process of educational change. This is due to the fact that the use of technology in schools is still extremely varied and, in many cases, limited (Spector 2010). Achieving the goal of a holistic approach of teaching and learning, through technology, is not solely dependent on technology-related factors (Kimmon et al., 2015). Teacher's personal pedagogical beliefs play also a key role in their pedagogical decisions about whether and how to integrate technology into their classroom practices (Deng et al., 2014). The combination of ICT and learning theories in the light of curriculum proposals is the key to a structured educational policy with successful results. However, the introduction of such a program has caused a variety of reactions, due, mainly, to poor information, training and logistical infrastructure. According to Dede (2008), the contribution of ICT to the acquisition of knowledge and skills from students, in relation to the curriculum of each course, depends on the tools, applications, digital media and virtual environments used in the educational process. This approach has delineated new rules and

significantly different educational attitudes. In recent years, the leadership of the Ministry of Education believes that information technology and ICT are both "structural" elements for future citizenship. Application of any template in schools is intended to make computing not a distinct subject but an important tool, motivating learners to use it throughout the lifelong learning process. Similarly, Pelgrum and Voogt (2009), cite the need for the development of a collaborative culture that promotes the introduction of ICT into the teaching and learning process.

2. Factors associated with ICT use

Several researchers have investigated factors that have a significant impact on the use of ICT in classroom instruction (Flanagan, & Jacobsen, 2003; Lim, 2006; Vanderlinde, & van Braak, 2010; Yuen, Law & Wong, 2003). Based on the literature, the factors that influence the holistic integration of ICT in the curriculum focus mainly on the characteristics of teachers, including gender (Tezci, 2011), teachers' attitudes towards ICT (Drent & Meelissen, 2008), teachers' pedagogical beliefs (Tondeur et al., 2016) and ICT training (Tondeur et al., 2008). However, other researchers have highlighted factors that influence the use of ICT and come from the wider environment of a school community (Flanagan & Jacobsen, 2003; Yuen, Law & Wong, 2003). They mention the school culture (Tezci, 2011), ICT educational policy (Tondeur et al., 2008; Vanderlinde, van Braak & Dexter 2012), ICT infrastructure (Tondeur et al., 2008) and institutional and technological factors (Buabeng-Andoh, 2012).

The implementation of ICT in the educational process depends mainly on the teachers' own skills to exploit hardware and software as much as possible. The term "ICT skills" refers mainly to the concept of digital literacy which involves the use of basic ICT tools. Anderson (2008) refers to the concept of applied information literacy including both the areas of technical skills and knowledge areas. These areas are part of a teacher's ability to effectively implement ICT in the learning process by designing and organizing ICT-based themes and assessing learning outcomes. The issue is the combination of pedagogical and technological knowledge of ICT content, which is determined by the Technological Pedagogical Content Knowledge (TPACK) model of Mishra and Kohler (2006).

The development of teachers' ICT skills internationally, and specifically according to the American system, is based on the following six key areas of the range of competencies (Thomas & Knezek, 2008):

- Possession of knowledge and skills related to the handling of technologies.
- Design of learning experiences and environments using ICT.
- Implementing policies and methods for integrating ICT into curricula to improve learning outcomes.
- Use of ICT as an evaluation tool.
- Use of ICT by teachers to increase their productivity and practices.

Regarding the teachers' attitudes towards computer use and, more generally, towards ICT, these depend largely on factors relating to self-efficacy or confidence (Al-Khaldi & Al-Jabri, 1998; Beckers & Schmidt, 2003), computer anxiety (Al-Khaldi & Al-Jabri, 1998; Beckers & Schmidt, 2001), computer liking (Al-Khaldi & Al-Jabri, 1998), perceived usefulness (Davis, 1993), perceived ease-of-use (Davis, 1993), the level of computer skills (Beckers & Schmidt, 2001), and how one perceives the effects of use computing in society (perceived consequences for society) (Beckers & Schmidt, 2003). Lee and Lee (2014) support the importance of encouraging teachers' self-employment beliefs as regards technological integration, teacher attitudes towards computers, computer use, and the design and development skills of a lesson using digital media.

Effective integration of ICT into all aspects of school life requires reliable hardware and software infrastructure as well as broadband internet connections. On the other hand,

_____

negative influence may be caused by the absence or aging of technological equipment, lack (or malfunctioning) of the Internet, inaccessibility to IT laboratories, and various limitations resulting from the curriculum of each subject (Legontis, 2015; Lockwood & Cornell, 2013). In this research we used the theoretical model Will, Skill, Tool (WST) designed solely to assess the level of integration of ICT in the learning process (Knezek, Christensen & Fluke, 2003). According to the model, the variables that influence the integration of ICT in the learning process are: (a) teacher attitudes towards ICT; (b) their skills in handling and using applications; and (c) access to ICT tools (Knezek & Christensen, 2003).

3. Research framework and research questions

This study analyzes variables associated with the frequency of ICT use in course activities in Primary schools. Moreover, according to Bingimlas (2009), the lack of digital technology infrastructure is an inhibiting factor for the integration of ICT into the educational process. From the teachers' perspective data showed that equipment is still the biggest obstacle to the use of ICT, followed by pedagogical factors" (European Commission, 2013). However, the lack of access to resources is not, in itself, the main reason for the reduced use of ICT in primary education. Assessment of a general form or the feeling of a person's preference or disposition towards computers and activities that use them are the structural elements that define computer attitude (Smith, Caputi & Rawstorne, 2000). According to Palaegeorgiou (2006), in relation to the Theory of Reasoned Action (TRA) concerning the use of computers, the users' attitude towards computers has an impact on future moods that generally affect the real use of computers. The adoption model (Hall & Hord, 2015) argues that each person responds to a new program, or innovation, according to his stance and beliefs, regardless from a large extent of the supply of materials or resources. The integration of technology into education is particularly dependent on the acceptance of computers by teachers (Kumar, Rose & D' Silva, 2008). Based on TRA theory, the Technology Acceptance Model (TAM) proposed by Davies (1989) is one of the most commonly used and validated models of technology adoption (Teo, Ursavas & Bahcekapili, 2012). TAM explains how users accept and use technology by focusing on two dimensions: perceived utility (PU) and perceived ease of use (PE). PU is defined as a person's belief in a particular technology that affects the performance of his work, while PE is defined only as a person's belief in a particular technology.

Hargreaves (1994), points out that the quality, breadth and flexibility of a teacher's work is directly related not only to his professional development but also to the personality he has developed. According to Stiegelbauner (1992), beyond the knowledge and skills, it is vital that the teacher maintains the "desire to have a positive effect on the life of his pupils". Teaching is a moral practice that does not exclude its technical dimension but places it in a wider context of values (Elliott, 1991). A successful teaching process presupposes the teacher's emotional intelligence and exudes "pleasure, passion, creativity, challenge and joy" (Hargreaves, 1995). It presupposes not only the ability but the desire for success. In this context, the attitude of the teacher becomes a critical factor for the final outcome of any innovation (Prawat, 1996), since his beliefs influence practice, but at the same time the practice itself and the subsequent experience influences the formation of beliefs. Mavroyorgos (1999), advocates the above, stating that teachers' consensus is the prerequisite for the introduction of any innovations or reforms in the educational process. Therefore, for developmental educational strategies to be successful they need to influence attitudes and to lift teachers' resistance to change first (Day, 1999). Teachers in Greece, according to Plomaritis, Maletskos and Fousteris (2015), show positive attitudes in the introduction of innovations in education. They perceive innovation primarily as "educational change", "creativity development" and "improving the quality of the educational project" and secondarily as "culture of novelties".

The purpose of this study is to explore the factors that influence the use of ICT in the educational process in relation to the technological infrastructure of schools, accessibility, attitudes of teachers and their pedagogical perceptions.

Specifically, our research questions are as follows:

(a) Is there a relationship between the digital infrastructure of a Primary Education school in Greece that involves access to hardware, software, Internet and teacher ICT use during the educational process?

(b) Is there a relationship between the attitudes and beliefs of teachers towards computers and the use of ICT in the educational process?

(c) Is there a relationship between teachers' pedagogical perceptions and the use of ICT in the educational process?

(d) Is there an impact of teachers' age on infrastructure accessibility?

(e) Is there an impact of teachers' years of service in education on accessibility?

In addition, variables related to demographic characteristics such as gender, specialization and pedagogical training of teachers were examined in relation to their degree of influence on the use of ICT in the classroom.

4. Method

This study is an analysis that uses data obtained from primary schools across the Greek territory. It aims to obtain indicators and analysis regarding teachers' beliefs and practices which can provide a basis for the review and development of policies that promote improvements in teaching and learning in Greece.

5. Participants

The random sampling method was used for the selection of teachers from the 13 educational areas of the country. In each educational area, different schools were selected according to the size of each layer. From these schools we use data from 284 teachers (92 male and 192 female).

6. Instrument

In the context of quantitative empirical research, the descriptive sampling method was selected using a questionnaire (Cohen & Manion, 1994). The wide five-dimensional Likert measurement scale was used to minimize the effects that may result from incorrect answers due to misunderstanding the meaning of the content of a variable, or the wrong choice in one of the variables. The Cronbach's Alpha internal coefficient was calculated for the reliability of the questions. Factor analysis, and more specifically the Principal Component Analysis, was used for parts of the questionnaire that mainly concerned views and attitudes of the participating teachers.

The questionnaire developed for the purpose of this research consisted of questions that were divided into 5 categories: (a) demographic data; (b) pedagogical perceptions; (c) computer attitudes; (d) accessibility to ICT infrastructure; and (e) use of ICT in the educational procedure. This questionnaire was posted on a digital platform and sent via the e-mail of the researcher to the emails of the selected primary school units, with the request to promote messages to the personal electronic accounts of the service teachers in those schools. In particular, the first

part of the questionnaire consists of 8 questions and concerns demographic factors such as gender, age, specialty, type of school, area (urban, semiotic, rural, island), educational experience, training in ICT and pedagogy.

The second part of the questionnaire used 15 questions of the questionnaire "The Emerging Theory / Philosophy of Teaching and Learning" (Sass, 2003). These questions were used in order to highlight the pedagogical perceptions of teachers and were tailored to the Greek educational system. The questions concern the following points:

- Students need praise, good grades, or other rewards in order to learn effectively (B1).
- Learning occurs when there is a measurable change in student behavior (B2).
- For the most effective learning, students' errors should be minimized and successes maximized (B3).
- Students learn best when they have the opportunity to observe a demonstration or example of what is being taught (B4).
- Learning is growing through the accumulation of information (B5).
- The teacher should be a facilitator of learning rather than a presenter of knowledge (S_C1).
- Students can be trusted to find their own goals and should be given choices as to what and how they will learn (S_C2).
- Learning increases through interaction with others (S_C3).
- Collaborative learning is an effective way to enhance student learning (S_C4).
- Teaching offers meta-cognitive skills (S_C5).
- The best learning occurs when students discover answers for questions and problems themselves rather than having the answers told to them (R_C1).
- It is important to help students organize their thinking by teaching them general concepts (or schemes) before they learn more specific information (R_C2).
- Meaningful learning occurs, when students mentally create knowledge structures (schemes or concepts) by combining new ideas with their prior knowledge (existing schemes or concepts) (R_C3).
- Teachers must be active knowledge mediators (R_C4).
- Learning involves conscious decision-making (R_C5).

The part of the questionnaire on teacher attitudes towards ICT, accessibility to ICT infrastructure and the frequency of use of ICT to support teaching and learning was based on the corresponding questionnaire "ICT in School Inventory 2013: Subsequent Questionnaire" (Cosgrove, Butler, Leahy, Shiel, Kavanagh, & Creaven, 2013) adapted to the needs of this research and the design of the Greek educational system. This part included 22 questions:

- I have access to a computer in classroom (Ac1).
- I have access to a digital projector (Ac2).
- I have access to an interactive whiteboard (IWB), (Ac3).
- I have access to Internet (Ac4).
- I have access to educational software (Ac5).
- I have access to the computer lab (Ac6).
- It increases the academic performance of students (At1).
- It promotes student collaboration (At2).
- It promotes the development of communication skills (e.g., writing and presentation), (At3).
- It encourages students to participate more in learning activities (At4).
- It improves the atmosphere in the classroom (At5).
- Use presentations for lesson items (U_IT1).
- Use computer based simulations and virtual labs (U_IT2).

- Use applications such as word processing and presentation software to prepare resources for class (U_IT3).
- Create multimedia resources, incorporating sound, video, images or other digital media for use in class (U_IT4).
- Record student work for assessment purposes (e.g., digital camera, digital video), (U_IT5).
- Support assessment of learning (formative and summative assessment), (U_IT6).
- Use curriculum relevant online resources for lesson preparation (e.g., websites, blogs and wikis), (U_Int1).
- Support collaboration between students for learning (e.g., live chat, online forums, school VLE), (U_Int2).
- Publish students' work online (U_Int3).
- Use social networks in teaching and learning (U_Int4).
- Communicate with students (e.g., email), (U_Int5).
- Use web questions (U_Int6).

7. Factors

This study analyzes variables related to the factors that affect the frequency of use of ICT by primary school teachers during their courses. The first group of variables provides information regarding ICT infrastructure in schools: computers for instruction, internet access and software for instruction. The second set of variables relates to teachers' beliefs about learning theories and classroom use. The third set of variables corresponds to teacher's attributes related to beliefs, behaviors and educational performance. The variables were allocated into seven factors based on the prediction of the main component factor analysis. The factors are presented below:

- The factor "ICT accessibility" is based on six variables (Ac1…Ac6).
- The factor "behaviorism" is based on five variables (B1…B6).
- The factor "radical constructivism" is based on five variables (R_C1…R_C5).
- The factor "social constructivism" is based on five variables (S_C1…S_C2).
- The factor "attitudes towards ICT" is based on five variables (At1…At5).
- The factor "frequency of IT use" to support teaching and learning is based on six variables (U_IT1…U_IT6).
- The factor "frequency of internet" use to support teaching and learning is based on six variables (U_Int1…U_Int6).

The factors correlation synthesizes the structure of this research. The importance of ICT training according to the views of educators was also examined, using the variable (Tr1).

8. Data analysis

Principal component analysis (PCA) with varimax rotation was conducted to statistically determine the number of factors that should be retained in the questionnaire. The PCA helps to identify the number of factors to be interpreted by extracting the maximum variance from the dataset to each item (Tabachnick & Fidel, 2007). It quantifies the importance of each, describing the variability of a set of data. It also compresses data, reducing the number of factors without much loss. Prior to the implementation of the PCA, the suitability of data for factor analysis was evaluated. The Bartlett's test of sphericity and Kaiser-Meyer-Olkin's sampling rate measurement (KMO) were calculated. The significance ($p < .05$) of the Bartlett's test of sphericity and the values above .70 for the KMO index were considered appropriate. The reliability analysis was carried out by calculating alpha Cronbach for each measure. The credibility of a measure indicates the stability and consistency of the instrument to measure a concept and contributes to

_____

assessing the credibility of a measure (Sekaran & Bougie, 2010). Alpha coefficients above .70 are considered acceptable (George & Mallery, 2003).

9. Results

Table 1 presents the indexes of Descriptive statistics and the suitability evaluation. The Cronbach's alpha for each factor is considered acceptable with values above .75. The KMO statistical control has values above .75 proving the suitability of the sample.

Table 1. Internal Consistency, Means, and Standard Deviations
for each factor of the questionnaire

Factors	N	Cronbach's a	Mean ± SD
Behaviorism (B)	284	.77	2.78 ± .53
Radical Constructivism (RC)	284	.77	4.11 ± .41
Social Constructivism (SC)	284	.81	4.12 ± .43
Attitudes (At)	284	.76	3.81 ± .56
Access (Ac)	284	.80	3.26 ± .90
Use of Internet (U_Int)	284	.82	2.51 ± .89
Use of IT (U_IT)	284	.83	3.04 ± .87

Table 2 presents the relationships among factors. The relationship among the factors (Radical Constructivism, Social Constructivism, Attitudes, Access, Use of Internet and Use of IT) was examined using Pearson product-moment correlation coefficient. There was a strong, positive correlation between the variable Access and the variables Use of Internet ($r=.51$, $n=284$, $p<.01$) and Use of ICT ($r=.62$, $n=284$, $p<.01$). Moreover, there was a strong positive correlation between the variables Use of IT and Use of Internet ($r=.75$, $n=284$, $p<.01$). Finally, there was a medium positive correlation between the variables Radical Constructivism and Social Constructivism ($r=.472$, $n=284$, $p<.01$).

Other correlations between the variable Attitudes and those of Access, Use of Internet and Use of ICT were significant at the .01 level but not strong. Pearson Correlation Coefficients among the Questionnaire's factors are shown in Table 2.

Table 2. Pearson Product-moment Correlations among questionnaire factors

	Correlations						
	B	R_C	S_C	At	Ac	Use_Int	Use_IT
Behaviorism (B)							
Radical Constructivism (RC)	-	-	.472[**]	.161[**]	.172[**]	.198[**]	.190[**]
Social Constructivism (SC)	-	-	-	.171[**]	-	.207[**]	.185[**]
Attitudes (At)	-	-	-	-	.210[**]	.264[**]	.292[**]
Access (Ac)	-	-	-	-	-	.506[**]	.623[**]
Use of Internet (U_Int)	-	-	-	-	-	-	.749[**]
Use of IT (U_IT)	-	-	-	-	-	-	-
[**]. Correlation is significant at the 0.01 level (2-tailed).							

A one-way analysis of variance between groups was conducted to explore the impact of age on accessibility. Participants were divided into four groups according to their age (group 1:

23-30, group 2: 31-40, group 3: 41-50, group 4: >50). There was a statistically significant difference at the accessibility scores for the four groups: F(3,280)=4.53, p=.004. Despite reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was .05 which is considered rather small (Cohen, 1988). Post-hoc comparisons using the Tukey HSD test indicated that the mean score for group 1 (M=2.83, SD=.87) was significantly different from group 3 (M=3.34, SD=.88) and group 4 (M=3.45, SD=.81). Group 2 (M=3.11, SD=.96) did not differ significantly from groups 1, 3 and 4.

Another one-way analysis of variance between groups was conducted to explore the impact of years of service in education on accessibility. Participants were divided into four groups according to their years of service in education (group 1: 1-10, group 2: 11-20, group 3: 21-30, group 4: >30). There was a statistically significant difference at the accessibility scores for the four groups: F(3, 280)=5.61, p=.001. Despite reaching statistical significance, the actual difference in mean scores between the groups was medium. The effect size, calculated using eta squared, was .06 which is considered medium (Cohen, 1988). Post-hoc comparisons using the Tukey HSD test indicated that the mean score for group 1 (M=2.90, SD=.96) was significantly different from that of group 3 (M=3.49, SD=.77). Group 2 (M=3.22, SD=.92) and group 4 (M=3.38, SD=.84) did not differ significantly from groups 1 and 3.

The importance of teacher education in ICT is highlighted by its high acceptance rate. According to teachers' views, training in ICT is important (M=4.02, SD=.75).

10. Discussion

We present the results of this study in order to investigate the factors that influence the use of ICT in the educational process in relation to the technological infrastructure of schools, accessibility, attitudes of teachers and their pedagogical perceptions. The results of the first research question contradict what other authors contend about the importance of a school's digital infrastructure in using ICT in the classroom (Aoki, Kim & Lee, 2013; Bingimlas, 2009; De Witte & Rogge, 2014; Lee, 2002). Primary education in the Greek educational system is characterized by the lack of infrastructure or the use of obsolete technology. Based on this fact, inaccessibility is a dominant factor that affects the use of ICT negatively during the educational process. In particular, there is lack of accessibility to the computer lab. As a result, the use of educational software and the Internet in collaborative learning is not exploited. In most schools there is only one organized computer lab that is used exclusively for the Computer Science course. The results confirm the importance attributed to the literature for mismatch over software availability compared to hardware (Bingimlas, 2009; Lee, 2002).

Concerning the second research question, the results show a positive relationship between the use of ICT in the classroom and the characteristics of teachers and their attitudes towards computers. The increased need for ICT training, positive attitudes towards computers and the use of ICT teaching practices confirm the relevance of the relationship. The high demand for training is considered to be the most important variable in relation to the use of ICT in the educational process. Surveys examining the results of Level B' training in ICT show its particular positive impact on teachers' attitudes towards computers and the increased use of new technologies. Equally important is the role of the perception of the teacher's self-esteem as it is highlighted in previous studies. Self-esteem is directly correlated with self-efficacy associated with technology integration in teaching (Lee & Lee, 2014) or using digital learning materials (Kreijns et al., 2013).

_____

Regarding the third question, the results demonstrate teachers' pedagogical beliefs. Teachers in the Greek educational system are presented as radical constructivists and social constructivists. Practically, these two types of teachers equate radical constructivism and social constructivism. The teachers' beliefs have a positive relationship with the use of ICT in their classroom. The use of technology, and especially the Internet, during the educational process has slowly shifted the theoretical balance from behaviorism to constructivism. There is a shift from behavioral learning practices to learning design practices associated with the increased use of educational technologies; the shift stems also from the fact that many available technologies support structured learning platforms. But there are also several educators who support the combination of the two theories, because they can be used in conjunction with existing educational technology and the official educational software, most of which presupposes the principles of behaviorism. However, there are many factors that need to be taken into account when deciding which theory is most applicable in some practices, such as the curriculum, the need for assessment and the available resources (Weegar & Pacis, 2012).

Teachers' views on accessibility in relation to their age and educational background are of particular interest. Younger teachers feel more excluded by their older colleagues as regards their accessibility to the digital infrastructure of the school. This can be explained by the greater involvement of young educators with ICT. As users of new technological applications, young educators have been trained in more modern educational systems and exposed to innovative teaching applications; consequently, they feel the need to apply their knowledge to the school environment in which they work. The same effect is also observed for teachers with fewer years of service. Their access to digital media is smaller than that of their colleagues with more years of service.

Variables associated with demographic characteristics such as gender, specialization and pedagogical training of teachers do not have a significant statistical relationship with the use of ICT.

11. Conclusion

This study has enabled us to confirm, or verify, the view that the amount of ICT infrastructure in Greek schools is very low. In fact, it is among the most limited in Europe. The lack of infrastructure in the Greek educational system runs counter to similar surveys that control relevant factors in educational systems in other countries in Europe. An example is the Spanish education system where infrastructure is one of the highest in Europe (Gil-Flores et al., 2017). According to Wastiau, Blamire, Kearney, Quittre, Van de Gaer and Monseur (2013), at EU level on average, between 25 and 35% of students in grades 4 are in highly equipped schools. Conversely, less than 20% of students in grade 4 are in such schools in countries such as Bulgaria, Croatia, Greece, Hungary, Italy, Slovakia, Slovenia, Poland, Romania and Turkey. However, infrastructure alone is not enough. The use of ICT in classrooms is limited by the characteristics of teachers, in particular because of the high ICT training needs of teachers and the lack of development of interdisciplinary knowledge. Using this information, interventions should be made to encourage the use of ICT in Greek schools.

Continuous teacher training in ICT is a general requirement. However, according to the recommendations of various authors (Bingimlas, 2009; Drent & Meelissen, 2008; Koh & Chai, 2014; Lee & Lee, 2014; Valtonen et al., 2015), knowledge should be incorporated into the development of the teaching procedures in the classroom. In order to achieve this goal, training proposals should focus on groups of teachers working in the same school (Vanderlinde et al., 2014). This design will result in encouraging professional co-operation, developing innovative teaching methods in conjunction with a constructive focus.

In conclusion, successful implementation of educational technology in schools does not depend solely on the accessibility or the lack of any single factor. It depends on a dynamic process involving a set of interrelated factors, such as adequate support from managers, the existence of logistics infrastructure, the acceptance of the utility of the use of technology by the teacher, the continuous updating and acquisition of knowledge by the teacher in relation to ICT and their correlation with innovative teaching methods. Moreover, as it is quite frequent with research, one the weaknesses of our study need to be highlighted. Regarding the dependent variables, they were considered on the basis of the information that was provided by teachers. However, it would be interesting to contrast this information with information obtained from other sources, such as students. In addition, it would be interesting if future studies included teacher-related variables such as motivation theory, in particular their self-determination within their professional environment.

References

Al-Khaldi, M., & Al-Jabri, M. (1998). The relationship of attitudes to computer utilization: new evidence from a developing nation. *Computers in Human Behavior*, *14*, 23-42.

Aoki, H., Kim, J., & Lee, W. (2013). Propagation & level: Factors influencing in the ICT composite index at the school level. *Computers & Education*, *60*(1), 310-324. https://doi.org/10.1016/j.compedu.2012.07.013.

Anderson, R. (2008). Implications of the information and knowledge society for education. In: J. Voogt & G. Knezek (Eds.), *International handbook of information technology in primary and secondary education* (5-22). New York: Springer.

Beckers, J., & Schmidt, H. (2001). The structure of computer anxiety: a six-factor model. *Computers in Human Behavior*, *17*, 35-49.

Beckers, J., & Schmidt, H. (2003). Computer experience and computer anxiety. *Computers in Human Behavior*, *19*, 785-797.

Berrett, B., Murphy, J., & Sullivan, J. (2012). Administrator insights and reflections: Technology integration in schools. *The Qualitative Report*, *17*(1), 200–221.

Bingimlas, K. A. (2009). Barriers to the successful integration of ICT in teaching and learning environments: A review of the literature. *Eurasia Journal of Mathematics, Science & Technology Education*, *5*(3), 235-245.

Buabeng-Andoh, C. (2012). Factors influencing teachers' adoption and integration of information and communication technology into teaching: A review of the literature. *International Journal of Education and Development using Information and Communication Technology*, *8*(1), 136-155.

Commission of the European Communities (2005). *i2010 – A European Information Society for growth and employment*. Retrieved from http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2005:0229:FIN:EN:PDF.

_____

Cohen, J. W. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cohen, L., & Manion, L. (1994). *Research methods in education* (4th ed.). London: Routledge.

Cosgrove, J., Butler, D., Leahy, M., Shiel, G., Kavanagh, L., & Creaven, A-M. (2013). *ICT in Schools Census 2013: Post-Primary Questionnaire*. Retrieved from http://www.pdsttechnologyineducation.ie/en/Technology/ICT-Census-2013-Post-Primary/ICTCensus2013-PP-Teacher-Eng.pdf.

Davis, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology, *MIS Quarterly*, *13*(3), 319–340.

Davis, F. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioural impacts. *Int. J. Man-Machine Studies*, *38*, 475-487.

Day, C. (1999). *Developing teachers: The challenges of lifelong learning*. Psychology Press.

De Witte, K., & Rogge, N. (2014). Does ICT matter for effectiveness and efficiency in mathematics education? *Computers & Education*, *75*, 173-184. https://doi.org/10.1016/j.compedu.2014.02.012

Dede, C. (2008). Theoretical perspectives influencing the use of information technology in teaching and learning, *International Handbook of Information Technology in Primary and Secondary Education* (43-62). New York: Springer.

Deng, F., Chai, C. S., Tsai, C. C., & Lee, M. H. (2014). The relationships among Chinese practicing teachers' epistemic beliefs, pedagogical beliefs and their beliefs about the use of ICT. *Journal of Educational Technology & Society*, *17*(2), 245–256.

Drent, M., & Meelissen, M. (2008). Which factors obstruct or stimulate teacher educators to use ICT innovatively? *Computers & Education*, *51*(1), 187-199. https://doi.org/10.1016/j.compedu.2007.05.001

Elliot, J. (1991). *Action research for educational change*. McGraw-Hill Education (UK).

European Commission (2009). *Commission working document. Consultation on the future "EU2020" strategy*. COM(2009) 647 final. Retrieved from http://ec.europa.eu/dgs/secretariat_general/eu2020/docs/com_2009_647_en.pdf.

European Commission. (2013). *Survey of schools: ICT in education*. Retrieved from https://ec.europa.eu/digital-agenda/node/51275.

Flanagan, L., & Jacobsen, M. (2003). Technology leadership for the twenty-first century principal. J*ournal of Educational Administration*, *41*(2), 124-142. https://doi.org/10.1108/09578230310464648

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference*. 11.0 update (4th ed.). Boston: Allyn & Bacon.

Gil-Flores, J., Rodríguez-Santero, J., & Torres-Gordillo, J. J. (2017). Factors that explain the use of ICT in secondary-education classrooms: The role of teacher characteristics and school infrastructure. *Computers in Human Behavior*, *68*, 441-449.

Good, T. L., & Brophy J.E. (1990). *Educational psychology: A realistic approach* (4th ed). White Plains N.Y. Logman.

Hall, G. E., & Hord, S. M. (2015). *Implementing change: Patterns, principles and potholes* (4th ed.). Upper Saddle River, NJ: Pearson.

Hargreaves, A., (1994). *Changing teachers, changing times: Teachers' work and culture in the postmodern age*. New York: Teachers College Press.

Ionita, I., & Schiopu, D. (2010). Using principal component analysis in loan granting. *Buletinul*, *62*(1), 88–96.

_____

Kimmons, R., Miller, B. G., Amador, J., Desjardins, C. D., & Hall, C. (2015). Technology integration coursework and finding meaning in pre-service teachers' reflective practice. *Educational Technology Research and Development*, *63*(6), 809-829.

Knezek, G., Christensen, R., & Fluke, R. (2003). Testing a will, skill, tool model of technology integration. Paper presented at *the Annual Meeting of the American Educational Research Association*. Chicago, IL, 21-25 April 2003.

Knezek, G., & Christensen, R. (2003). *Scientifically-based research on the impact of technology on reading achievement*. Denton, TX: University of North Texas, Institute for the Integration of Technology into Teaching & Learning.

Kumar, N., Rose, R.C., & D' Silva, J. L. (2008). Teachers' readiness to use technology in the classroom: An empirical study. *European Journal of Scientific Research*, *21*(4), 603-616.

Lee, K. T. (2002). Effective teaching in the information era: Fostering an ICT-based integrated learning environment in schools. *Asia-Pacific Journal for Teacher Education and Development*, *5*(1), 21-45.

Lee, Y., & Lee, J. (2014). Enhancing pre-service teachers' self-efficacy beliefs for technology integration through lesson planning practice. *Computers & Education*, *73*, 121-128. https://doi.org/10.1016/j.compedu.2014.01.001

Legontis, A. (2015). *Training of teachers in the Training Support Centers (CTT) and in the University Education Centers (Un.CT) in the use of ICT in the educational and teaching process*. PhD Dissertation, University of Macedonia.

Lim, C. P. (2006). Effective integration of ICT in Singapore schools: Pedagogical and policy implications. *Educational Technology Research and Development*, *55*(1), 83-116. https://doi.org/10.1007/s11423-006-9025-2

Lockwood, B., & Cornell, R. (2013). School ICT infrastructure requirements for teaching computing. *A Computing at School (CAS) Whitepaper*.

Koh, J. H. L., & Chai, C. S. (2014). Teacher clusters and their perceptions of technological pedagogical content knowledge (TPACK) development through ICT lesson design. *Computers & Education*, 70, 222-232. https://doi.org/10.1016/j.compedu.2013.08.017

Kreijns, K., Van Acker, F., Vermeulen, M., & Van Buuren, H. (2013). What stimulates teachers to integrate ICT in their pedagogical practices? The use of digital learning materials in education. *Computers in Human Behavior*, *29*(1), 217-225.

Mavroyorgos, G. (1999). The educational unit as an institution of formation and exercise of educational policy. In: Athanasoula-Reppas, A., Koutouzis, M., Mavroyorgos, G., Nitsopoulos, V. & Halkiotis, D. (Eds.) *Educational Management and Policy*, Volume I.

Ministry of Education, Research and Religious Affairs (2016). Establishment of a separate department of new technologies and innovation at the Ministry of Education, Research and Religious Affairs. *Law 4415/2016 GG159/A/6-9-2016*.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, *108*, 1017-1054.

Ortiz, J., (2013). The economic crisis and its effect on education in Greece. *PoliticOle*. Retrieved from https://oleville.com/politicole/2013/09/24/567/.

Palaigeorgiou, G., (2006). *Studying the structure and evolution of student-computer interaction*. PhD Dissertation, Thessaloniki: A.U.Th.

Pickles, M. (2015) Greek tragedy of education opportunities. *BBC News*. Retrieved from http://www.bbc.com/news/business-34384671.

Plomaritis D., Maletskos A., & Fousteris, N. (2015). Teachers' perceptions and suggestions on innovation and new technologies in education. In: G. Alexandratos, A. Tivas & T. Arvanitis-Papadopoulou

_____

(Eds.), *Proceedings of the 2nd Scientific Conference of the Panhellenic Association of School Counselors: Educational Policies for the 21st Century School.*

Prawat, R. (1996). Learning community, commitment and school report. *Curriculum Studies*, *28*(1).

Pelgrum, W. J., & Voogt, J. (2009). School and teacher factors associated with frequency of ICT use by mathematics teachers: Country comparisons. *Education and Information Technologies, 14*(4), 293-308.

Romeo, G., Lloyd, M., & Downes, T. (2012). Teaching teachers for the future (TTF): Building the ICT in education capacity of the next generation of teachers in Australia. *Australasian Journal of Educational Technology*, *28* (Special issue, 6), 949-964.

Sass, E. J. (2003) *Your emerging theory / Philosophy of teaching and learning*. Retrieved from http://www.employees.csbsju.edu/esass/learningratingscale.htm.

Smith, B., Caputi, P., & Rawstorne, P. (2000). Differentiating computer experience and attitudes toward computers: an empirical investigation. *Computers in Human Behavior*, *16*, 59-81.

Sekaran, U., & Bougie, R. (2010). *Research methods for business: A skill-building approach* (5th ed.). West Sussex, UK: John Wiley & Sons Ltd.

Stiegelbauer, S. (1992). Why we want to be teachers. Paper presented at *the Annual Meeting of the American Educational Research Association*, San Francisco.

Spector, J. M. (2010). An overview of progress and problems in educational technology. *Interactive Educational Multimedia*, *1*, 27-37.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Allyn & Bacon.

Thomas, L. G., & Knezek, D. (2008). Information, communications, and educational technology standards for students, teachers, and school leaders. In: J. Voogt & G. Knezek (Eds.), *International handbook of information technology in primary and secondary education*. New York: Springer.

Teo, T., Ursavas, O.F., & Bahcekapili, E. (2012). An assessment of pre-service teachers' technology acceptance in Turkey: A structural equation modeling approach. *The Asia-Pacific Education Researcher*, *21*(1), 199-210.

Tezci, E. (2011). Turkish primary school teachers' perceptions of school culture regarding ICT integration. *Educational Technology Research and Development*, *59*(3), 429-443. https://doi.org/10.1007/s11423-011-9205-6

Tondeur, J., van Braak, J., & Valcke, M. (2007). Towards a typology of computer use in Primary Education. *Journal of Computer Assisted Learning*, *23*(3), 197-206.

Tondeur, J., van Keer, H., van Braak, J., & Valcke, M. (2008). ICT integration in the classroom: Challenging the potential of a school policy. *Computers & Education*, *51*(1), 212-223. https://doi.org/10.1016/j.compedu.2007.05.003

Tondeur, J., van Braak, J., Ertmer, P. A. & Ottenbreit-Leftwich, A. (2016). Understanding the relationship between teachers' pedagogical beliefs and technology use in education: a systematic review of qualitative evidence. *Educational Technology Research and Development*, 1-21.

Valtonen, T., Kukkonen, J., Kontkanen, S., Sormunen, K., Dillon, P., & Sointu, E. (2015). The impact of authentic learning experiences with ICT on pre-service teachers' intentions to use ICT for teaching and learning. *Computers & Education*, *81*, 49-58. https://doi.org/10.1016/j.compedu.2014.09.008

Vanderlinde, R., & Van Braak, J. (2010). The e-capacity of primary schools: Development of a conceptual model and scale construction from a school improvement perspective. *Computers & Education*, *55*(2), 541–553. https://doi.org/10.1016/j.compedu.2010.02.016

Vanderlinde, R., van Braak, J., & Dexter, S. (2012). ICT policy planning in a context of curriculum reform: Disentanglement of ICT policy domains and artifacts. *Computers & Education*, *58*(4), 1339-1350. https://doi.org/10.1016/j.compedu.2011.12.007

Vanderlinde, V., Aesaert, K., & van Braak, J. (2014). Institutionalised ICT use in primary education: A multilevel analysis. *Computers & Education*, *72*, 1-10. https://doi.org/10.1016/j.compedu.2013.10.007

Yuen, A. H. K., Law, N., & Wong, K. C. (2003). ICT implementation and school leadership: Case studies of ICT integration in teaching and learning. *Journal of Educational Administration*, *41*(2), 158-170.https://doi.org/10.1108/09578230310464666

Wastiau, P., Blamire, R., Kearney, C., Quittre, V., Van de Gaer, E., & Monseur, C. (2013). The use of ICT in education: A survey of schools in Europe. *European Journal of Education*, *48*(1), 11-27. https://doi.org/ 10.1111/ejed.12020

Weegar, M. A., & Pacis, D. (2012). *A Comparison of two theories of learning behaviorism and constructivism as applied to face-to-face and online learning*. Retrieved from https://www.g-casa.com/conferences/manila/papers/Weegar.pdf.

Wu, D., Yu, X., Rao, J., & Yu, L. (2016). Comparative study on the status and strategies of infrastructure construction of ICT in education between China and the United States. *ICT in Education in Global Context*, 95-106. https://doi.org/10.1007/978-3-662-47956-8_5

_____

Institution of All-day Primary School in Greece: A Qualitative Approach

Antonia Skopelitou

Ministry of Education and Religious Affairs, Greece

Panagiotis Giavrimis, Ekaterini Nikolarea

University of the Aegean, School of Social Sciences, Mitilene
Department of Sociology

Abstract

This study presents, discusses and assesses the findings of a research into All-day School (AS) and All-day Primary School (APS) institutions and the teacher's role in them in Greece. The AS in kindergarten and primary school emphasizes the children's process of development and learning, is flexible to shape the curriculum, prepares children for the next day's lessons, thus pedagogically utilizing students' free time; it helps change the pedagogical climate, develops new forms of teaching and is considered educational innovation. As far as the participants of the present research is concerned, it is made up of 22 Primary School teachers who worked in the APS in the past. The criteria for their selection were gender, years of service in Primary Education and whether they had worked in an APS. In terms of gender, the men who participated in the research were 9 and the women were 13. According to the teachers, the APS was established having the best standards. Teachers seem to support the institution and recognize the important role it can play in the students' all-round development. However, the problems that arise are many and teachers have been trying to do their utmost with the few resources available and the absence of the State. The State must ensure that the APS will find its place in the education system and will play its social and pedagogical role.

Keywords: All-day School (AS), All-day Primary School (APS), compensatory education, remedial teaching.

1. Introduction

Education is part of a globalized reality characterized by multiculturalism, barrage of information (Stromquist & Monkman, 2014; Gioultsis, 2004), socio-political changes and the emergence of new forms of inequality (e.g. digital divide) (Cruz-Jesus et al., 2016; Papert, 1996). Nowadays, there is need for equality in education and the reduction of social inequalities (Ballantine & Hammack, 2015; Whitty, 2007; Diakogeorgiou, 2013: 7; Chalkiadaki, 2013: 73). This developmental and dynamic texture of reality influences both the formation of the school framework (Freire, 1977: 107) and the creation of institutions for compensation of educational inequalities (Slavin et al., 1989). The creation of the All-day Primary School (APS) in Greece is

Correspondence: Panagiotis Giavrimis, Department of Sociology, University of the Aegean, Postal address: Pamfilis 17, 81100 Mitilene, Greece. E-mail: giavrimis@soc.aegean.gr.

such a measure to address and combat discrimination and promote social cohesion (Demiroglou, 2010; Lukeris & Syriou, 2007: 122). The APS has been developed in several countries (Andreou, 2003; Thaidis & Chaniotakis 2012; Fischer & Klieme, 2013), and is an extension of the school curriculum beyond the normal working hours of the school, aiming to support students, so that they can cope with social, educational, cultural, economic and political developments (Thoidis & Chaniotakis, 2015; Konstantinou, 2007: 17-18).

The operation of compensatory education is based on the theory of human capital, according to which education contributes to the development of all skills, knowledge and other skills of individuals that can influence the increase in production and incomes (Becker, 1993). The All-day School (AS) is considered part of the effort to develop the human capital of a society, blunting social and educational inequalities and contributing to its technological and economic development. Within this context, the school and its structures are meant as mechanisms to preserve and reproduce the social structure and social consensus so that social needs are met through the skills that are developed in individuals (Saha, 1997; Sharma, 2008). Nevertheless, the effects of compensatory treatment has been challenged (Neves et al., 2017; Whitty, 2016), and the operation of the school and its parts are thought to reproduce the ideals of the capitalist system. From a Marxist point of view, school is a mechanism that feeds and fills people from an early age with ideologies and views that go hand in hand with the capitalist system and reproduce unequal production relationships (Blackledge & Hunt, 2004). Teachers through the teaching of morality, responsibility, maturity, freedom and the provision of knowledge essentially create future citizens who will take on the corresponding role in society (Althusser, 1983: 91-95). The school leads to the student's alienation and the development of social inequalities through cycles and additional hours for weak students (Illich, 1976: 11-23). Social inequalities that exist when children enter school still exist and are fed. Within this context, AS does not promote equality; on the contrary, it degrades it no matter how progressive the curricula are implemented.

2. The development of the All-Day School (AS) institution in Greece

The AS in kindergarten and primary school emphasizes the children's process of development and learning, is flexible to shape the curriculum, prepares children for the next day's lessons, thus pedagogically utilizing students' free time; it helps change the pedagogical climate, develops new forms of teaching and is considered educational innovation (Brownell et al., 2015; Fischer & Klieme, 2013; Heagle et al., 2017; Moutafidou & Sivropoulou, 2010; Vitsilaki, 2007; Pyrgiotakis et al., 2001: 364 -365; Pyrgiotakis, 2002; Chalkiadaki, 2013: 17-27).

In 1994, the Ministry of Education created the Creative Activities Curriculum in 332 primary schools for children of working parents and mainly in economically and socially deprived areas (Chalkiadaki, 2013: 21). In 1997, with Law 2525, the All-day Primary School (APS) was established, as we know it today. One thousand (1,000) "All-day Primary Schools - Enlarged Schools" were established where students' attendance was optional. The purpose of these courses has been the compulsory implementation of the curriculum, the application of remedial teaching, the optional study of the next day's lessons and the implementation of creative activities curriculum (OGG (Official Government Gazette) 188/1997). The objectives of the APS are related to the obligatory implementation of its own curriculum, with the optional study of the next day's lessons, students' creative activities, and the optional implementation of remedial teaching for the weakest students. By circular YPEPTH F.13.1/767/C1/884/3-9-1998, the objectives of the All-day School (AS) in general are distinguished in pedagogical, with emphasis on the student, and in the social ones, highlighting the need to provide assistance to working parents and balance those factors that lead to the emergence of educational inequalities. The subjects that were introduced were: music, visual arts, theatrical education, environmental education, dance, sports, audiovisual expression, movement and culture. Students' lunchtime was at 14.00, and the next 20 to 30

_____

minutes students could spend their free time as they wished. At 14.30, the study of the next day's lessons started and was ended at 15.30. Students could leave after the end of the curriculum at 16.00. The above curriculum was implemented until 2002. In 1999-2000, 28 Pilot APSs operated through the Second Community Support Framework to ensure the logistical infrastructure of these schools. Students' attendance was mandatory until 16.00 (Ioakeimidis, 2011: 57). From 1997 to 2002, "open-day schools", which were Extended Timetable Schools, and the "closed" Pilot-ASs were operating in Greece.

In 2002, with Circular YPEPTH F.13.1/885/88609/C1/3-9-2002, there was the introduction of the term "socio-pedagogical purposes". The aims focus mainly on the family, on the "pedagogical exploitation" of leisure time. While OGG 1471/2002 addresses the objectives of the all-day school curriculum: "*Consolidation of the knowledge and skills that students are taught by the students in the morning programme and enrichment of the morning programme with extra teaching subjects*", without however the social objectives being distinguished from the pedagogical ones, as was the case in the 1998 Circular. New subjects, such as English and computer science, were introduced, and a cross-thematic approach to subjects was facilitated, thus allowing for students' interaction, exchange of views and their development of critical thinking (Zourelidis, 2005: 3). At the same time, the morning zone of the AS is set from 7:00 to 8:00 (OGG 1471/2002). After 2002, Expanded All-day Schools (ASs) were renamed as "All-Day Primary Schools of Optional Character", and Pilot ASs in as "Experimental ASs" (Konstantinou, 2007: 24-27). The former operated in 2,600 schools, where hourly teachers were employed (Kyrizoglou & Grigoriadis, 2005: 71). From Circular YPEPTH F.50/57/26650/C1 /17-3-2003 and thereafter, the flexibility of the curriculum was lost. Specialist teachers were recruited to teach newly introduced subjects, which resulted eventually in a reduction of the teacher's time. English and information and communication technology (ICT) became obligatory. Moreover, a curriculum is created for optional subjects, such as sports and visual arts. In Circular YPDVMTH F.50/162/88353/C1/5-9-2006, there was reference to the social purpose of the APS, something that was clear in the previous circulars. However, it can be observed that support for the family was expressed in the phrase: "*it supports and shapes the child and stands next to the working family, the income of which it protects by relieving it of the financial burden and the search for extra education out of school*". With the OGG 1048/2010 it is understood that the social role of the school ceased to exist. First of all, the operation of all-day sections in the 6-position and below primary schools is abolished. Thus, children in small schools are excluded from attending all-day curricula. Furthermore, only the children whose both parents were working were allowed to attend by submitting to the school principal their parents' corresponding proof of work.

With the OGG 1327/2011, schools within the Unified Curriculum Framework (EAEP, in Greek) were established, which were operating in parallel with the "classic", and the Experimental All-day Schools were abolished. The All-day Schools (ASs) started at 14:00 with the students' lunch. Parents could choose between two new subjects, such as sports, theatrical education, TV, English, music, visual arts, and second foreign language (French, German). Initially, 800 schools were designated as such in Greece and, late, they reached the number 2,248 (YPEPTH, 2016). So, nowadays, "classic" ASs and schools within EAEP (Chalkiadaki, 2013: 21) are operating. With the OGG 1327/2011, the pedagogical role of the APS started to be revoked, as the students are allowed to leave the school at any time after 14.00, if their parents wish. After circular YPEPTH 125334 / C1 / 09-09-2013 of the Ministry of Education, emphasis was placed on covering the gaps of the morning zone, whereas only one teacher is provided for the APS and none for EAEP. Androulaki's research into the all-day EAEP, which was carried out in 622 corresponding units (7,532 questionnaires and 30 interviews with teachers) (Androulaki et al., 2001), mentions that strengthening subjects such as English, theatrical education and computer science is considered positive, but (a) there is insufficient logistical infrastructure and educational staffing; (b) the zones and periods that are implemented do not achieve their educational

_____

objectives; (c) the next day's work is not completed, despite the students' schooling; (d) there is teachers' incomplete or no education and training; and (e) there is inadequate funding.

In 2016, the parallel operation of the two types of all-day Primary Schools (APSs) – that is, the "classic" APS and the APS within EAEP – is abolished, and the "Integrated Type of All-day Primary School" (ITAPS) was formed in all primary schools in Greece with functionality from 4-position schools and above (OGG 1324/2016). The ITAPS is open from 8.00-16.00, whereas the Morning Zone (7.00-8.00) may be set up, and students can leave after the 2nd hour of the All-Day Curriculum (15.00). Enrollment in this type of school is based on the basic conditions of both parents' work, unemployment or vulnerability. With Ministerial Decree 83939/D1/19-5-2017 (OGG 1800/24-5-2017/B), the timetable for the Curriculum of Multi-grade Primary Schools (1-position, 2-position and 3-position) was set, something that was not provided by the previous law. The ITAPS has been criticized for reducing hours, compressing available teaching time, allowing students to leave, and changing philosophy to remove social exclusion and the school's compensatory role (Koumnetos, 2016; PASOK, 2016). The European Commission's report on Greece's support program from the European Support Facility criticizes the abolition of all-day EAEP schools and their replacement by a "more economical" AS (Lakasas, 2017).

Concluding, since 2002, the innovations and new ways of teaching that AS has introduced are impossible to implement, due to the fact that new subjects have been introduced, new subject specialists have been recruited and teaching time has been fragmented in the curriculum. Although the AP teacher establishes closer ties with his/her students, the creative time that s/he can spend with them is minimal. His/her role is now limited to the study and preparation of the next day's lessons, while the innovative activities mentioned in the circulars cannot be implemented (Chalkiadaki, 2013: 160).

3. Research into the Greek literature

Surveys in Greece have revealed that teachers considered the role of the APS to be limited and that it focuses more on servicing the working parents (Anagnostopoulou et al., 2013: 22-26). Teacher surveys in Greece indicate that the APS: (a) assists moderately in the student's learning and psychosocial profile, although its operation is considered necessary (Giavrimis et al., 2009; Konstantinou, 2007); (b) helps *only* in the study of the next day's lessons, since this study consumes all teaching time (Salteris, 2006; Kontorli, 2010), and thus a large number of innovative activities do not take place since there is not sufficient teaching time (Thoidis & Chaniotakis, 2015; Kyrizoglou & Grigoriadis 2005); (c) satisfies parents' social needs (Konstantinou, 2007); (d) contributes to the lower social groups and makes an effort to remove educational and social inequalities (Salteris, 2006); and (e) has not been able to deal with shadow education, despite the fact that new subjects have been introduced (Loukeris et al., 2009). Moreover, it appears that the compensatory role that the AS is supposed to play, according to the teachers' surveys, seems not to work (Kontorli, 2010). The dysfunctions and problems of the institution are many as the teachers of the surveys mention. The majority of these teachers focus on their inadequate training, insufficient funding and inadequate and inappropriate logistic infrastructure, inadequate staffing with teachers and auxiliary staff (i.e. adjunct teachers) (Arvanitis, 2006; Kontorli, 2010; Loukeris et al., 2005; Loukeris et al., 2009; Mouziou-Mylona, 2010; Thoidis & Chaniotakis, 2015; Tsekouras, 2003; Tsipoura & Gousteri, 2007; Yfanti & Karantzis, 2008).

Moreover, ambiguous seem to be the results for implemented teaching methods. Thus, one the one hand, some research has shown that face-to-face teaching plays a predominant role in the teaching process, while cross-thematic, group work and the project method have been minimal (Tsekouras, 2003). On the other hand, some other research has illustrated that teachers implement group teaching, project method and cross-thematic approaches (Mousiou-Mylona, 2010; Lukeris et al., 2005). Papadimas (2014), with the research he carried out, has concluded

_____

that both teachers and specialist teachers use the same tactics to shape the right climate within the classroom. Most of these tactics are within the pedagogical frameworks, while few are the cases where authoritarian methods are used.

As far as the role of the teacher of the APS is concerned, as opposed to the morning zone teacher, s/he puts more emphasis on good interpersonal relationships with his/her students. Their relations with students are more familiar and the students themselves see him/her as a collaborator and not as an evaluator (Mousiou-Mylona, 2010; Tsekouras, 2003), although one research emphasizes that the teacher's role is undermined (Anagnostopoulou et al. 2013). The collaborative relationships that exist between the morning zone teachers and the AS teacher are recognized as important, but it is also acknowledged that there are difficulties in these relationships (Mousiou-Mylona, 2010; Thoidis & Chaniotakis, 2015; Tsekouras, 2003). Teachers and school principals believe that collaboration with senior education authorities and the school advisor is bad, since the former think that they do not have the proper support from the latter so that the AS can operate properly. On the other hand, teachers and school principals emphasize the existence of good collaborative relations with the actors of the local community (Konsolas & Martinou, 2013; Kyrizoglou & Grigoriadis, 2005).

The purpose of the present research was to explore the views of teachers who are currently working or who worked in the past in an APS on its objectives, the operation of the AS and APS institution and the teacher's role in it.

4. Method

4.1 *Participants*

As far as the participants of the present research is concerned, it is made up of 22 Primary School teachers who worked in the APS in the past. The criteria for their selection were gender, years of service in Primary Education and whether they had worked in an APS. In terms of gender, the men who participated in the research were 9 and the women were 13. The participants had worked from 1 year to 4 years in the APS. The age distribution of teachers participating in the research is as follows: 12 teachers from 23 to 35 years old, 7 teachers from 36 to 50 years old and 3 teachers from 51 and over.

4.2 *Research instrument*

As far as the interview guide is concerned, the biographical details of each interviewee were recorded in the first part. The thematic axes of the interview guide concerned: the first that described the general operation of the APS and, more specifically, the curriculum, the compensatory, pedagogical and social role of the AS and APS, the role of the full-time teacher and his/her training as well as the role of the State. Indicative questions of this topic were: "*What do you think about the APS curriculum?*", "*Which do you think is the pedagogical role of the APS?*", "*Do you believe that APS helps reduce school failure and social inequalities?*" The second axis concerned: teachers' suggestions how the operation of the APS as an institution should be improved and how it can maximized so the purposes for which it was created could be fulfilled. The question the teachers were asked was "*What would you suggest in order to improve the operation of the institution?*"

5. Findings

5.1 *Objectives of the APS institution*

The findings of the research have shown that teachers reported that the objectives of the APS as an institution are pedagogical, social and their role is also compensatory. More specifically, as far as pedagogical objectives are concerned, the participants referred to the study of the next day's lessons and the constructive use of leisure time in a safe environment. ("… *supportive help in school subjects…*", "… *consolidation of the knowledge and skills that students are taught in the morning curriculum …*", "… *pedagogical utilization of the afternoon time of children's stay in a safe space, with teachers' full responsibility and supervision*"), the development of students' skills through innovative activities and their contact with new subjects ("… *development of students' cognitive, research, constructive and cultural skills …*" "… *enriching the morning curriculum with additional teaching objects*"), and the battle against shadow education ("… *it contributes to the battle against shadow education and, more importantly, in the city where the ASs have so many specialties [and specialist teachers]*").

Regarding social objectives, all participants referred to: the service that the APS offers: to working parents ("… *students' creative activities in the afternoon for working parents*"); battle against discrimination and, at the same time, socialization through the interaction of heterogeneous students ("…*[it] strives to contribute to battling against discrimination*" "… *the children through the process of "having common lunch" are socialized*"); and it helps the students to come in contact with the society in which they live, its needs, with its actors and professionals ("… *[it] uses many activities to bring children into contact with the local community, with local jobs and occupations. It brings them closer to the environment they live in. It does not work with the book as a bushel; it helps children progressively and smoothly integrate into society as responsible and democratic citizens*").

Regarding the compensatory role of the APS, there have been some differentiations between its contribution to battling against social inequalities and school failure and drop-outs. On the one hand, some teachers argue that social inequalities are blurred as students are in contact for many hours, thus allowing the principles of equality and collaboration to prevail, and they receive stimuli that may not be provided with in their family and social environment ("… *[it] tries to fill in the gaps that exist and give poor children the stimuli they lack*", "… *[it] contributes to alleviating social inequalities, as children are more hours together and come into contact with students of other classes*", "*The implementation of compensatory treatment is done to cover children's learning gaps so that they will be able as tomorrow's citizens to claim a position in the labor market*", "… *Why is compensatory treatment being done? Basically, the children should be able to get into the labour market and to find a job tomorrow*", "… *[it] contributes to promoting social cohesion and preventing the phenomenon of school dropouts*"). On the other hand, some other teachers argued that the APS cannot play such a role, by considering that family influences are not offset ("… *social inequalities I think remain because they depend on the family, the stimuli the child generally gets from the environment where s/he lives …*", "… *if the AS institution really aimed at compensatory education, then the teacher-student correspondence would be 1 to 1*").

5.2 *Operation of the APS*

5.2.1 *Curriculum*

As far as the curriculum is concerned, the participants/teachers consider that it is very positive to add subjects such as music, English, computer science, dance ("… *it is very positive that specialist teachers teach special subjects, such as music, visual arts, theatre*"). Nevertheless, the strict allocation of teaching time does not favour the focus on children's abilities, although the up-to-now Circulars emphasize the development of their competences and skills ("… *the AS*

_____

curriculum should be more extended, giving children the opportunity to cultivate more their talent and potential"). Teachers point out that the APS has ended up dealing only with the study of next day's lessons and thus being unable to cope with its pedagogical objectives ("*Unfortunately, however, in most schools, the curriculum may be adapted to the parents' demands, that is, the child should return home after having studied next day's lessons and fed!!!*"). They also argue that the timetable of the curriculum strictly allocates teaching time, and this makes it difficult for the teacher to perform or implement experiential activities *("... with the strict timetable of the curriculum that is most reminiscent of the morning zone the teacher cannot do any activities lying out of the framework of the curriculum; that is, any extracurricular activities*").

At the same time, one more serious problem that teachers face is the large number of students, so the teacher cannot deal extensively with each student. This is one of the reasons why remedial teaching cannot be implemented. In addition, the absence of specialist teachers makes it even more difficult to battle against shadow education ("*... the classes are often numerous*", "*my attempt to fill in learning gaps may not be as effective as tutorials, because I don't have enough time to deal with only a child*", "*It doesn't battle against shadow education since the special subjects are covered occasionally, and the short time of teaching time and the number of children do not help to produce integrated results*", "*What kind of all-day school is this if the subjects included in the curriculum aren't taught?*")

Then, with regard to the time that students leave APS, on the one hand, some teachers consider the change to be positive, and each parent can choose their child's departure time as each student has different levels of endurance and different extracurricular activities ("*... each child has levels of endurance so I do not think it's a problem that some kids leave earlier than 16.15*", "*It's good. Each student leaves at the time the parent chooses, usually depending on the time s/he leaves his/her job and the extracurricular activities that each child has in the afternoons*"). On the other hand, the majority of participants (9 out of 15) consider that this change is one of the problems, as this is the way that the APS becomes a prey to the wishes of each parent, and thus the objectives of the APS cannot be fulfilled ("*... leaving their child whenever and for how long they want, according to their personal schedule, parents think of school being a child guard and the teacher as a concierge*", "*for the proper operation and achievement of the objectives of the APS, a unique departure time for all students should be strictly applied*").

5.2.2 *Teaching methods*

The overwhelming majority of participants mentioned that they use collaborative learning technique and the project method, playful activities and method of mutual instruction, while few also mentioned face-to-face and individualized teaching when they had to explain something that children did not understand ("*... in performing playful activities such as theatrical play, singing, dancing I use principles of participatory learning and alternative pedagogy*", "*... project method, educational drama, group work*", "*after the end the study of their lessons, students of the upper grades many times help the younger ones*", "*... when I need to explain something to a student, teaching becomes teacher-centered*").

5.2.3 *Infrastructure*

Teachers express their deep dissatisfaction and disappointment with the lack of infrastructure. More particularly, neither are there suitable classrooms for teaching various objects, nor is there a suitable lunch room so that the APS can operate as defined in the circulars ("*... they spend so many hours at school on a wooden chair without a more relaxing space for*

_____

relaxation, lunch or a safe place where they can play and relax even when it rains ...", "... Never have funds for such a purpose been given, the teacher uses his/her own audiovisual material").

5.3 *The APS teacher*

5.3.1 *The APS teacher's role*

According to the interviewees, the role of the teacher is supportive, since there is no fear of evaluation ("... *the AS or APS teacher must be supportive, s/he can help the children but also create a more relaxed climate in the classroom, with various games, with painting ... there is no evaluation", "the AS or APS teacher has the potential to establish better relationships with children"*). As far as the difficulties in the work of the AS or APS teacher are concerned, these are related to the responsibilities of the morning zone teacher ("... *the APS teacher does not have the pressure to cover the curriculum as the classical teacher does. Nevertheless, s/he should have knowledge of the subject matter of all classes and has more responsibilities"*), staffing the faculty with both teaching and auxiliary staff ("... *the subjects that would meet students' preferences do not take place due to the fact that the appointments of specialist teachers are not sufficient", "... waiters and auxiliary staff for secondary work should work in the APSs"*), the inadequate training teachers ("... *I have not attended a training seminar", "... some seminars that have been made, I cannot say that they were very helpful as we stood in the theoretical context that clearly differs greatly from the practical one", "... we are informed through the Internet, by older colleagues who were in an APS in the past and by the school principal"*), the collaboration with the rest of the staff ("... *executives of education offer NO help to the teachers responsible for the AS; the former help the latter neither in their training, nor in their work"*) and undermining the teacher's role ("... *undermining their role after they have implemented a curriculum without any training and satisfactory cooperation with the school counselors", "parents often do not acknowledge their work and see him/her as a second-class teacher", "Parents, fortunately in very few cases, think that the APS teacher has the role of "nanny" "*).

5.3.2 *Relations with members of the teaching community*

As far as their relations with the rest of school teachers are concerned, they seem to have mainly formal relationships. The cooperation lies only in reporting any weaknesses the child has, while there is no cooperation with the specialist teachers at all ("... *there is cooperation with the other teachers, especially when students present some particularity or weakness, but these are often formal", "... most specialist teacher often do not cooperate"*). According to the majority of the participants, the relationship of the APS teacher with the parents is also formal and even non-existent ("... *cooperation with parents is usually limited to their complaints about the work that their children did not finish", "there is no cooperation with parents ... what parents want is that their children will have studied their basic lessons for the next day and have been fed when they go back home"*).

6. Discussion

From the findings of our research it is clear that teachers perceive the role that APS plays and the importance of the objectives set but have a hesitation as whether it can act as a compensatory factor for mitigating social inequalities. Thus, teachers refer to the characteristics of the pedagogical role of the APS (skills development, study of the next day's lessons, teaching of new subjects) and its social role (creative activities for children of working parents, combating discrimination, promoting social cohesion, combating shadow education, preventing school drop-outs, socializing children). The views of teachers are similar in several researches that have been

_____

carried out in Greece (Arvanitis, 2006; Yfanti & Karantzis, 2007; Salteris, 2006). The institutions of compensatory education, such as the APS that have been implemented in various education systems aim to support the learning of the student population and eliminate social inequalities. The framework of the APS objectives in Greece has been moving within this educational policy context.

However, implementation of the aforementioned in the educational practice has faced many difficulties. What is found both in the present research and in other Greek researches (Lukeris et al., 2005; Mousiou-Mylona, 2010) is that, although teachers think that the APS has positive features - such as: (a) the introduction of new objects; (b) the use of group collaboration, project and interactive teaching, as well as individualized and face-to-face education; and (c) the development of good interpersonal relationships between the student and the teacher - they are dissatisfied because in practice all these positive features cannot easily be implemented due to a lack of specialist teachers, reduced teaching time and child departure hours, the large number of children and parents' insistence only on the learning part of the APS (that is, the children's preparation for the next day's lessons). An important problem is the shortage in the infrastructure and audiovisual materials. There are no suitable classrooms, there is no separate dining room and there is no adequate audio-visual material and equipment so that various activities can done. Everything takes place in one and the same classroom. All these comments coincide with the comments that other APS teachers made in other surveys in Greece (Arvanitis, 2006; Germanos, 2006; Grollios & Liabas, 2012; Kontorli, 2010; Mousiou-Mylona, 2010; Tsekoura, 2003; Tsipoura & Gousteri, 2007).

The consequences of the above are that: there are not the appropriate learning conditions (Anagnostopoulou et al., 2013: 9-10; Mitilis, 2005: 2), shadow education cannot be fought against, extracurricular activities continue to intervene in school education, teaching time is fractured and, eventually, the APS teacher is unable to engage his/her students in creative activities (Chalkiadaki, 2013). There is a part of the teachers of the present research who claim that social inequalities are not diminishing, something that is also are found in other researches in Greece (Giavrimis et al., 2009; Kontorli, 2010; Konstantinou, 2007). Although the establishment of the APS institution aimed to offer equal opportunities and compensate socially excluded and marginalized students – especially, those of lower social strata (Lukeris & Syriou, 2007), the APS does not achieve this very aim; on the contrary, it seems that it reinforces and reproduces social and educational inequalities. The compensatory institutions of education have been unable, except for a small percentage, to eliminate social inequalities, by preparing people for their integration in a capitalist society (Althusser, 1983; Illich, 1976). Uncertainty and risk biographies - and much more in Greece which is plagued by the economic crisis - are exacerbated by a globalized education where, as Bauman (2005) claims, there is an indispensable "production line" of human waste or wasteful people. Several times, education with its institutions have failed in pursuing the continuous and dynamic transforming realities of the post-modern era and the processes of globalization, attesting even more the sovereignty of the privileged (Bauman 2004).

In addition, there is significant concern about the relations of the APS teachers with those of the morning zone, which are typical and limited in that the latter inform the former about students' possible weaknesses, while there is no cooperation with the specialist teachers at all. This finding also exists in other surveys (Mousiou-Mylona, 2010; Tsekoura, 2003), with the consequence that there is no connection between these two cycles, and problems with implementing the curriculum are observed (Anagnostopoulou et al. 2013). An educational system that is characterized by structural problems, competition and evaluation to get just a job position (OECD, 2011; Papaconstantinou, 2007; Tsoukalas, 1985), competition between specialties (Vlachou, 2006), the division of objects (Ball & Youdell, 2007) and centralization of decision-making by some bureaucrats (Saiti & Eliophotou-Menon, 2009) puts sufficient pressure and anxiety on teachers (Brunsting et al., 2014) and form a context of ambivalence and confusion to

the teacher, resulting in alienation and inability to react and make sense to the intended purpose within the school framework.

In conclusion, according to the teachers, the APS was established having the best standards. Teachers seem to support the institution and recognize the important role it can play in the students' all-round development. However, the problems that arise are many and teachers have been trying to do their utmost with the few resources available and the absence of the State. The State must ensure that the APS will find its place in the education system and will play its social and pedagogical role.

References

Althusser, L. (1983). *Positions (1964-1975)* (Trans. X. Giataganas). Athens: Themelio (in Greek).

Anagnostopoulou, M., Arvanitis, I., Vassila, V., Koptis, A., Koutsoupias, F., Martídou, P., Batsios G., Xanthidou, P., Paraskevas, P., Tamvakis, P., & Tsipouras, S. (2013). *The all-day school in Greece*. [Online] Available: http://kmaked.pde.sch.gr/site/attachments/article/490/oloimero-protasi2.doc (August 22, 2015) (in Greek).

Andreou, A. (2003). All-day school: The social character of All-Day Schools: Historical overview in Europe, INE Research: All-day school, social importance and perspectives, *INE/GSEE – ADEDY Activities, Update*, Issue 95, 1-24 (in Greek).

Androulakis G., Emvavolatis A., Bonidis K., Stamovlasis D., & Kaklamanis S. (2011). *Experiences and views of teachers working at schools of single reformed educational program, Annas: IPEM – IOC*. [Online] Available: http://docplayer.gr/1982136-Androylakis-georgios-1-emvalotis-anastasios-2-mponidis-kyriakos-3-stamovlasis-dimitrios-4-kaklamani-stamatina-5.html (March 2, 2015) (in Greek).

Arvaniti, I. (2006). *The institutionalization and development of the all-day school in Greece*. Athens: Typothito.

Ball, S.J. & Youdell, D. (2007). *Hidden privatisation in public education*, Education International 5th World Congress Preliminary Report, July, London: Institute of Education, University of London. Accessed on November, 9, 2015, at http://pages.eiie.org/quadrennialreport/2007/upload/content_trsl_images/630/Hidden_privatisat ion-EN.pdf [25 Nov 2011].

Ballantine, J., & Hammack, F. M. (2015). *The sociology of education: A systematic analysis*. Routledge.

Bauman, Z., (2004). *Globalization – The human consequences* (Trans. Chr. Vallianatos). Athnes: Polytropon (in Greek).

Bauman, Z., (2005). *Wasted lives. Modernity and its outcasts* (Trans. M. Karasinis). Αθήνα: Katarti (in Greek).

Becker, G. (1993 [1964]). *Human capital: A theoretical and empirical analysis, with special reference to education*. London: The University of Chicago Press, Ltd.

_____

Blackledge, D., & Hunt, B. (2004). *Sociological interpretations of education* (Trans. M. Deligianni). Athens: Metaixmio (in Greek).

Brownell, M. D., Nickel, N. C., Chateau, D., Martens, P. J., Taylor, C., Crockett, L., Katz, A., Sarkar, J., Burland E., & Goh, C.Y. (2015) Long-term benefits of full-day kindergarten: a longitudinal population-based study, *Early Child Development and Care*, *185*(2), 291-316.

Brunsting, N. C., Sreckovic, M. A., & Lane, K. L. (2014). Special education teacher burnout: A synthesis of research from 1979 to 2013. *Education and treatment of children*, *37*(4), 681-711.

Chalkiadaki, A. (2013). *All-day primary school in Greece: The introduction and evolutionary course of the institution in the Greek school reality*. University of Crete, School of Educational Sciences, Department of Pedagogical Primary Education. [Online] Available: http://thesis.ekt.gr/thesisBookReader/id/29527#page/1/mode/2up (March 2, 2015) (in Greek).

Cruz-Jesus, F., Vicente, M. R., Bacao, F., & Oliveira, T. (2016). The education-related digital divide: An analysis for the EU-28. *Computers in Human Behavior*, *56*, 72-82.

Demiroglou, P. (2010). *All-day primary school: Functional framework, teacher characteristics and aspects of the educational process*. Thessaloniki: Kyriakidis SA (in Greek).

Diakogeorgiou, A. (2013). *All-Day School – An innovation in education. Pedagogical streams in the Aegean, 6-7, 1-11*. [Online] Available: http://www.pre.aegean.gr/revmata/issue6/05%20%CE%94%CE%99%CE%91%CE%9A%CE%9F%CE%93%CE%95%CE%A9%CE%A1%CE%93%CE%99%CE%9F%CE%A5_2013.pdf (November, 9, 2015) (in Greek).

Fischer, N., & Klieme, E. (2013). Quality and effectiveness of German all-day schools: Results of the study on the development of all-day schools. *Extended education–an International perspective*, 27-52.

Freire, P. (1977). *Pedagogy of the oppressed* (Trans. J. Kritikos). Athens: Kedros (in Greek).

Germanos, D. (2006). Changes in the school area to upgrade the educational environment in All Day School. In: A. G. Kyridis, E. Tsakiridou & I. K. Arvanitis (Eds.), *All-Day Primary School in Greece: Research and Theoretical Approaches* (pp. 185-226). Athens: printed – George Dardanos (in Greek).

Giavrimis, P., Papanis, E., & Roumelliotou, M. (2009*). Topics of sociology of education*. Athens: I. Sideris (in Greek)

Gioultsis, B. (2004). *General sociology*. Thessaloniki: Brothers Kyriakidis SA (in Greek).

Grollios, G., & Liampas, T. (2012). Views of all-day schools using the comprehensive reformed curriculum. *Pedagogiki, Theoria kai Praxi (Pedagogical Theory and Practice),* 5, 85-97 (in Greek).

Heagle, K., Timmons, K., Hargreaves, F., & Pelletier, J. (2017). The social kindergartener: Comparing children's perspectives of full-and half-day kindergarten. *Early Child Development and Care*, 187(5-6), 978-989.

Illich, I. (1976). *Deschooling society* (Trans. V. Antonopoulos). Athens: Nefeli (in Greek).

Ioakimidis, P. (2011). *Theatrical education in the optional full-time school: Empirical investigation at elementary schools in Crete* (Unpublished Dissertation). School of Educational Sciences, Department of Pedagogical Primary Education, University of Crete, Crete (in Greek).

Konsolas, M. & Martinou, A. (2013). Infrastructure in All Day Primary School: The role of the principal. In P. Georgogiannis (ed.), *Annual Inter-University Inter-Seminar on Management of Education and Intercultural Reality*, 2013-2014. EL.P.PO (pp. 114-125) (in Greek).

Konstantinou, Ch. (ed.) (2007). *Investigation of the social and pedagogical role of the All-Day Primary School – A Pan-Hellenic research with the views of parents and teachers*. Athens: INE / GSEE (in Greek).

_____

Kontorli, O. (2010). *Investigating the difficulties of implementing a full-day school: teaching teachers.* (Postgraduate Thesis). University of Patras, Pedagogical Department of Primary Education. [Online] Available: http://nemertes.lis.upatras.gr/jspui/bitstream/10889/3379/1/Nimertis_Kontorli%28ptde%29.pdf (November 6, 2015) (in Greek).

Koumentos, G. (2016). EAEP Approaches to the issue, after the abolition of the institution by the Ministry of Education. *ESOS*. [Online] Available: https://www.esos.gr/arthra/43960/eaep-proseggiseis-toy-thematos-ystera-apo-tin-katargisi-toy-thesmoy-apo-ypoyrgeio (March 2, 2015) (in Greek).

Kyrizoglou, G., & Grigoriadis G. (2005). All-Day School: How do parents, teachers and principals assess the implementation of the institution? *Epistimoniko Vima,* 4, 69-83. [Online] Available: http://www.syllogosperiklis.gr/old/ep_bima/epistimoniko_bima_4/KIRIZOGLOY.pdf (March 2, 2015) (in Greek).

Lakasas, A. (2017). Steps to the back in Greek education. *Kathimerini* (a daily news) [Online] Available: http://www.kathimerini.gr/934620/article/epikairothta/ellada/vhmata-pros-ta-pisw-h-ellhnikh-ekpaideysh (November 15, 2017) (in Greek).

Loukeris, D., & Syriou, I. (2007). School effectiveness and its role in the qualitative upgrading of the function of the All-Day Primary School. A bibliographic review. *Scientific Yearbook of the Pedagogical Department University of Ioannina*, 20, 111-131 (in Greek).

Loukeris, D., Stamatopoulou, E., & Alvertis, N. (2005). Evaluation of the participatory process of organizing and operating the Full-Day Primary School Program. A critical approach according to the views of the Directors and Deputy Directors or school leaders of the Piraeus Region. *Epistimoniko Vima* (: *Scientific Step*), 4, 53-65 (in Greek).

Loukeris, D., Verdis, A., Karabatzaki, Z., & Syriou, I. (2009). Aspects of the effectiveness of the Greek holoimero ('All-Day') primary school. *Mediterranean Journal of Educational Studies*, *14*(2) 161-174.

Mitilis, A. (2005). *Pedagogical parameters of full-day school operation*. [Online] Available: http://www.pi-schools.gr/download/programs/Oloimero/oloimero_03_05/eishghseis_hmer_05/eis_mitilh.pdf (November 9, 2015) (in Greek).

Mousiou-Mylona, O. (2010). *The full-time elementary schools of the prefecture of Florina in the school year 2002-2003: A case study*. [Online] Available: http://www.olgamousiou.gr/component/content/frontpage/frontpage.html?start=95 (November 10, 2015) (in Greek).

Moutafidou, A., & Sivropoulou, I. (2010). Cooperation in all-day kindergartens: Kindergarten teachers' beliefs. *Procedia-Social and Behavioral Sciences*, *5*, 350-355.

Neves, T., Ferraz, H., & Nata, G. (2017). Social inequality in access to higher education: grade inflation in private schools and the ineffectiveness of compensatory education. *International Studies in Sociology of Education*, *26*(2), 190-210.

OECD (2011). *Better performance and successful reforms in education. Recommendations on educational policy in Greece*. OECD. Accessed on 10/5/2015 at https://bit.ly/2tXx7tq (in Greek).

OGG (Official Government Gazette) 1048/2010 *Definition of 161 All-Day Primary Schools with a Unified Reformed Educational Program* (in Greek).

OGG 1327/2011 *Programmes of Primary Schools with a Unified Reformed Educational Programme – EAEP*. (2011, June 16). Official Government Gazette of the Hellenic Republic, second issue (in Greek).

OGG 1471/2002 *Definition of Study Programmes, Hours of Operation and Hourly Schedule of Full-Day Primary School*. (2002, November 22). Official Government Gazette of the Hellenic Republic, second issue (in Greek).

OGG 188/1997 *Unified Lyceum, access of its graduates to Tertiary Education, evaluation of the educational work and other provisions* (1997, September 23). Official Government Gazette of the Hellenic Republic, first issue (in Greek).

Papadimas, L. (2014). *The pedagogical climate in the school class – The case of schools with a Unified Reformed Educational Programme* (Unpublished Postgraduate Thesis). School of Humanities and Social Studies, Department of Primary Education, University of Thessaly, Volos. (in Greek).

Papakonstantinou G. (2007). Education management: Neo-Taylorism trends in the Greek Educational System. *Dioikitiki Enimerosi* (: *Administrative Update*), 41, 62-72 (in Greek).

Papert, S. (1996). *The connected family: Bridging the digital generation gap*. Atlanta, GA: Longstreet Press.

PASOK (2016). You are empoverishing our education Mr Filis. [Online] Available: 2/4/2015 at https://bit.ly/2Mdw2J3/ (in Greek).

Pyrgiotakis, I. (2002). All-day school. International developments and the Greek case. In: I. Pyrgiotakis (ed.), *All-day school. Function and prospects*. Athens: OEDB, YPEPTH, 23-56 (in Greek).

Pyrgiotakis, I., Thoidis, I., & Chaniotakis, N. (2001). All-day school: Valuable conditions and new requirements for the role of the teacher. In: K. Ouzounis & A. Karafyllis (eds.), *Proceedings of the Conference of the PTDE and the Association of Teachers of Primary Education of Alexandroupolis - The 21st Century teacher in the European Union, 10-13 May 2001* (pp. 364-366). Xanthi: Spanidis (in Greek).

Saha, L. J. (1997). *International encyclopedia of the sociology of education*. Oxford, UK: Pergamon Press.

Saiti, A., & Eliophotou-Menon, M. (2009). Educational decision making in a centralised system: The case of Greece. *International Journal of Educational Management*, *23*(6), 446-455.

Salteris, N. (2006). The All Day School as a new reality in the Greek Educational System: A sequential selective approach based on the views of All-Day School principals. In: A. Markantonatou & N. Salteris (eds.), *All Day School: Close and Long Shots* (pp. 43-53). Athens: Taxideytis (in Greek).

Sharma, P. L. (2008). *A hand book of sociology of education*. New Delhi: Sarup & Sons.

Slavin, R. E. Karweit, N. L., & Madden N. A. (Eds.) (1989). *Effective programs for students at risk*. Boston: Allyn & Bacon.

Stromquist, N. P., & Monkman, K. (Eds.). (2014). *Globalization and education: Integration and contestation across cultures*. R&L Education.

Thoidis, I., & Chaniotakis, N. (2012). *All Day School: Pedagogical and social dimensions*. Thessaloniki: Brothers Kyriakides SA (in Greek).

Thoidis, I., & Chaniotakis, N. (2015). All-day School: A school in crisis or a social pedagogical solution to the crisis? *International Journal of Social Pedagogy*, *4*(1), 137-149.

Tsekouras, I. (2003). *The all-day school in theory and practice. A case study of the Pilot All-day Schools in Crete* (Unpublished postgraduate thesis). Rethymno: Pedagogical Department of Primary Education, University of Crete.

Tsipouras, S., & Gousteris, S. (2007). The All-day Primary School from the point of view of the teachers who serve in it. In: D. Chatzidimou, K. Bikos, P. Stravakou, K. Chatzidimimou (Eds.), *Proceedings of the 5th Panhellenic Conference* (pp. 243-251). Thessaloniki: Kyriakides Brothers.

Tsoukalas, K. (1985). *Dependence and reproduction. The social role of educational mechanisms in Greece*. Athens: Themelio (in Greek).

Vitsilaki, Ch. (2007). *Sociological, cognitive and educational foundation of the institution of the all-day school*. Thessaloniki: Kyriakidis SA.

Vlachou, A. (2006). Role of special/support teachers in Greek primary schools: A counterproductive effect of 'inclusion' practices. *International Journal of Inclusive Education 10*(1), 39-58.

Whitty, G. (2016). My life with the sociology of education. In: A. R. Sadovnik & R. W. Coughlin (Eds.), *Leaders in the sociology of education: Intellectual self-portraits* (pp. 287-300). Rotterdam: Sense Publishers.

Yfanti, A. & Karantzis, I. (2008). Primary education teachers' views on All-Day Elementary School: A case study. *Epitheorisi Dioikitikis Epistemis: Dioikitiki Enimerosi*, *46*, 71-83 (in Greek).

YPDVMTH (2006). F.50/162/88353/C1/5-9-2006 *All Day Elementary School* (in Greek).

YPEPTH (2016). "Answer to Question No 5247/09-05-2016 (Registration No. 94998/F1 E 74624 on / 09-06-2016)" (in Greek).

YPEPTH 125334/C1/09-09-2013. *Guidelines on meeting operational needs in all-day primary schools & kindergartens* (in Greek).

YPEPTH (1998). F.13.1/767/C1/884/3-9-1998 *Full-Day Primary School, Extended School – Extended Operation of Creative Activities Departments* (in Greek).

YPEPTH (2002). F.13.1/885/88609/C1/3-9-2002. *All Day School* (in Greek).

YPEPTH (2003). F.50/57/26650/C1/17-3-2003 *Purpose and content of the full-time elementary school*. Accessed on 2/4/2015 from www.pi-schools.gr (in Greek).

Zourelidis, S. (2005). *New Technologies and their application to All-Day School*. [Online] Available: http://www.pi-schools.gr/download/programs/Oloimero/oloimero_03_05/eishghseis_hmer_05/eishgZOYRELIDH.pdf (November 7, 2015) (in Greek).

_____

Teachers' Educational Needs and Their Motives for Participation in Lifelong Learning in Greece

Konstantina Kiriatzakou

University of Macedonia, Thessaloniki
School of Social Sciences, Humanities and Arts

Abstract

The aim of the study is to investigate teacher's educational needs in terms of their teaching work and scientific profile and to examine the frequency and motives of their participation in training programs. The survey focuses on Primary and Secondary Education teachers of all fields across the Greek territory. The majority of the 556 who completed the questionnaire have attended training programs-workshops during the previous two years (95.4%). Regarding the participation in training programs with specific thematic areas over the past two years, higher participation rates are observed in new teaching methods (32.9%) and New Technologies (ICT) (31.1%) with the areas of Teaching Methodology (27.6%) and Addressing Learning Difficulties (27%) following. Low participation rates are observed in the training programs on stress management strategies (7.5%) and the topics related to the evaluation of the teaching process (9.8%) and that of students' evaluation (10.7%). Teachers also want to take part in training courses related to pedagogical and psychological issues and much less to courses related to the administration of education. Finally, teachers participate in training courses for their professional and personal development and much less for career development and personal pleasure (i.e. to meet people etc.).

Keywords: educational needs, teachers' participation, motives in training.

1. Introduction

The importance of this thesis is reflected in the European Union's increasing importance in professional development, teacher education and training, professional satisfaction and increased incentives to attract highly qualified teachers. World economic conditions make the profession of the teacher an important factor that plays a key role in the development of the economy by producing effective educational work and improving the quality of education.

The quality of education is a major priority issue for European and international education systems. Its definition and, furthermore, its evaluation is an extremely complex issue, influenced by political, economic, historical and social circumstances.

The introduction of "quality" in education comes from the economy and business areas, based on a concept that emphasizes organizational planning, risk management, certification and outflows and it is directly linked to the introduction and the use of "tech-management" terms (competitiveness, productivity, efficiency, accountability) in the public service sector (Morley & Rassool, 2000; Borraz, 2007).

Correspondence: Konstantina Kiriatzakou, PhD candidate, 1st Vosporou Street, 55132, Kalamaria-Thessaloniki, GREECE. E-mail: kyriatzakou@uom.edu.gr.

In the international literature there is no acceptable definition of the concept of quality, which is considered to be a "chameleon term" (Vidovich, 2001) and becomes important due to the reference framework (Harvey & Green, 1993). Since the 1990s, a holistic approach to the concept has been attempted, including conditions such as the definition and achievement of excellence standards, the excellent fit-for-purpose relationship, the value for money, the quality assurance, the quality assessment, the quality improvement, the quality management, the quality of training and total quality control (Van Damme, 2000; Knight & Trowler, 2000; Ursin, 2007; Harvey & Stensaker, 2008).

> - 95.4% of teachers have attended training programs during the previous two years.
> - Higher participation rates are observed in new teaching methods and ICT.
> - Teachers request courses related to pedagogical and psychological issues.
> - Teachers participate in training for their professional and personal development.

Since the early 1980s, a demand for "high quality education for all" has been raised. Thus, in the 1980s and 1990s one of the main issues for teacher education globally, concerned its upgrading in order to be carried out by higher education institutions. In the first decades of the 21st century, the main issues are the further increase of teachers' level in order to entrance in the educational profession, and the retreat of the existing model of teacher education by incorporating initial training into a vocational/learning continuum, starting from selection procedures for candidate teachers, including their basic studies and the period of their initiation into the educational profession and continuing with their professional development (OECD, 2005; Buchberger et al., 2000).

The common European principles on the abilities and qualifications of teachers describe the profession of European teacher with the following characteristics:

- *It is a highly qualified profession.* All teachers are graduates of higher education institutions (and those working in the field of initial vocational training have high qualifications in their professional sector and appropriate pedagogical skills). Each teacher has extensive knowledge of each subject he/she teaches, good knowledge of pedagogy, the skills and abilities required to guide and support learners, and an understanding of the social and cultural dimension of education (Eurydice, 2004: 12-18).
- *It is a life-long learning profession.* Teachers are encouraged to continue their professional development throughout their careers. Both they and their employers recognize the importance of acquiring new knowledge, innovating and introducing new elements into their work.
- *It is a profession characterized by mobility.* Mobility is a central component of initial and continuing teacher education programs. Teachers are encouraged to work or study in other European countries for professional development purposes.
- *It is a profession based on partnership.* Teacher training institutions organize their work in partnerships with schools, local work environments, job-based training providers and other stakeholders. The European Commission's texts show that teachers should work and collaborate with others in order to be able to meet the new requirements of their profession. They should also use technology and information, work with the society and within it, contributing to the assurance of the quality of their work.

2. Training for professional development and improving the quality of education

In the international literature, three main dimensions of training are distinguished. Firstly, emphasis is given to its compensatory character as a complement to the inadequate initial or basic educational training of teachers. Secondly, training is considered as a modernization of

_____

the cognitive stock of active teachers. Finally, training is related to the personal and professional development of the teacher and accompanies him/her throughout his/her service in education (Xohellis, 2005: 111). In addition, the European citizen should have access to education and training throughout his life, gradually aiming at the creation of a learning society (Sipitanou, 2005: 95).

The term "teachers' professional development" does not always appear with the same conceptual range in the literature. Keiny (1994: 157-167), studying the professional development of teachers in the light of social constructivism, considers that professional development is limited to investigating teachers' professional experiences and using them as input in order to construct and develop new teaching theories. Hargreaves and Fullan (1995) approach the development of teachers through the development of knowledge and skills, their self-awareness and adaptation to the social and educational environment, the improvement of their teaching capacity, the development of teachers' cooperation with each other and the deeper awareness of their role in society. Day (2003: 25-26) identifies four learning environments: (a) *direct teaching* (through conferences, courses, experiential and counseling meetings); (b) *learning at school* (e.g. through coaching, criticism from friends, evaluation, research practice, working with colleagues, etc.); (c) *learning outside school* (e.g. through reform networks, school or university partnerships, professional development centers, etc.), and (d) *learning within the classroom* (e.g. by responding to pupils).

The basic elements that define teachers' profession and the central characteristics of their professional development are the basic education, the autonomy in the exercise of the educational work, the continuous updating and training, the social mission of the teacher. Teachers, from an early age and for many years, follow an "informal apprenticeship" in the profession. However, learning only from experience limits their personal development (Day, 2003: 24). In fact, professional development is a continuous process of learning in which teachers acquire their professional knowledge and skills, as well as personal qualities and beliefs that enable them to fulfill their professional role (Papanaoum, 2014: 15).

The need to ensure high quality teaching is now one of the key objectives of the Strategic Framework for Education and Training (ET 2020). The framework highlights the importance of providing adequate initial education and continuing professional development for teachers as well as the need to make teaching an attractive career choice. An institution of strategic importance, both for the EU and for every national education system, and an integral part of a continuous and lasting professional and personal development of teachers is training. In Greece, training is provided on the one hand by specialized educational institutions (Regional Training Centers and others) and, on the other hand, by a variety of public or private sector bodies as well as through programs funded by the European Union. At the same time, a systematic and coherent policy of appropriate training for the trainers themselves has not been promoted. The aging of teachers moves part of the interest of educational policy from the initial education of candidate teachers and the initial training to the practices of continuing professional development of the training activity. At the same time, there are resolutions and reports pointing out that the teaching profession must become an attractive profession and attract highly qualified people.

The prospective for teacher training in a globalized economy is important, as teachers are considered to be key levers in promoting change. All this, however, requires a lifelong trained teacher. So, for all the above reasons, this study is considered necessary as it tries to clarify the educational needs and motives of teachers-basic elements of planning training programs – for their training and their teaching work.

3. The study

3.1 *The aim of the study*

The aim of the study was to investigate the educational needs of teachers in terms of their teaching work, their scientific profile and development and to examine the frequency and the motives of their participation in training programs.

The survey focused on Primary and Secondary Education teachers of all fields across the Greek territory. Thus, individuals who participated in the research are primary and secondary school teachers of: (a) general elementary and nursery schools, (b) model and experimental schools (kindergartens, elementary schools, high schools and lyceums), (c) second chance secondary schools, (d) general and technical secondary schools, and (e) special education schools.

3.2 *Methodology*

The method of stratified sampling was chosen for the best representation of the Greek teachers. This method of sampling was designed to ensure representation of all sections of the target population, in this case teachers, to reduce the estimation error and to have a sufficient number of subjects from subpopulations (Zafeiropoulos, 2015: 161). In particular, the type of proportional stratified sampling was chosen in order for the total sample to be a proportional miniature of the target population, since in each layer a sample is chosen so that the ratio of the sample size in the layer to the size of the total sample is equal to the ratio of the size of the population of the stratum to the size of the total population (Zafeiropoulos, 2015: 162).

2,255 schools were selected, a number that corresponds to 15.5% of all public primary and secondary schools. The choice of schools was initially made by region of education, then by administration of education and ending by municipality. At each stage of the selection, an attempt was made to select 15.5% of each type of school.

From the above selection of schools, special and experimental schools of primary and secondary education were excluded, as it was preferred to take the sum of the schools of these two categories into the selection of the school units to be sent the questionnaire. The reason for this was to have as much representation of the teachers of these types of schools in the sample of research as possible since the number of these schools is small nationwide.

3.3 *The questionnaire*

The first part of the questionnaire consists of questions concerning demographic factors such as gender, age, position of service (principal, vice principal, teacher), type of school and number of teachers serving in the school unit (Urban, suburban, rural), prefectural service and educational qualifications (titles, familiarity with computers, knowledge of foreign languages).

The second part of the questionnaire refers to lifelong learning and participation of teachers in training programs. In particular, the first question concerns the optional participation in seminars and training programs as well as the number of seminars-programs attended by the teachers of the sample during the previous school year, which are distinguished in seminars of 1-20 hours, 21-50 hours of seminars, 51-100 hours and 101 hours or more. The second question concerns the preferences of teachers regarding the forms of training: (a) training in Training Centers (RTC), (b) in-school training, (c) distance learning, (d) mixed training model, (e) participation in teacher education networks/communities, (f) mentoring, and (g) teachers' exchanges through European programs. The third question investigates the main thematic programs that teachers participated in. The fourth question investigates the educational needs of

Open Journal for Educational Research, 2018, *2*(2), 103-116.

_____

the participants concerning their educational work, professional development end promotion. Finally, the fifth question investigates their motives of participation to lifelong learning activities.

4. Demographic characteristics of the sample

562 primary and secondary school teachers participated in the survey conducted using a questionnaire. The number of recoverable final questionnaires amounted to 556. All the participants completed the questionnaire between December 2016 and April 2017. The statistical analysis of the data was carried out with the SPSS software programme for Windows Release 21 and Amos 22.

The sample is made up of 71.2% women and 28.8% men, reflecting the tendency for women to outnumber men in the Greek education system. A 19.8% of the sample is aged between 41 and 45, 27.7% from 46 to 50 and 20.7% of the sample are aged between 51 and 55 (Table 1).

Table1. Sample distribution by gender and age

Gender	Frequency	Percentage
Men	160	28.8
Women	**396**	**71.2**
Total	556	100.0
Age		
Up to 30	28	5.0
31 to 35	48	8.6
36 to 40	52	9.4
41 to 45	110	19.8
46 to 50	**154**	**27.7**
51 to 55	**115**	**20.7**
56 to 60	43	7.7
60 and up	6	1.1
Total	556	100.0

As we can observe in Table 1 the distribution of the sample by age shows that the participants are mainly middle-aged teachers who have years of experience in teaching. In table 2, we have the sample distribution by sector of service.

Table 2. Sample distribution by sector of service

	Frequency	Percentage (%)
Sector of service		
Primary education	**324**	**58,3**
Secondary education	232	41,7
Total	556	100,0

As Table 2 shows, the majority of the sample comes from primary education (58.3%), while the rest from secondary education (41.7%), The overwhelming majority of respondents are educators (75%), followed by principals with 20.1% and finally 4.9% are vice principals.

4.1 *Results of the study*

The majority of teachers attended training programs related to their work during the previous two years (95.4%), while only 4.63% did not.

During the previous school year 13.6% did not attend any training program, 28.2% have attended at least one, 13.6% two programs, 13.4% participated in three, 10.5% attended four programs, 7.1% participated in five, 4.1% in six, 1.8% in seven, 1,1% in eight and the remaining percentage (6.6%) participated in over eight training programs (Table 3).

Table 3. Frequency of attendance training programs during the last year

Number of programs during the lasts year	Percentage
0	13.6
1	28.2
2	13.6
3	13.4
4	10.5
5	7.1
6	4.1
7	1.8
8	1.1
More than 8 programs	6.6

Table 4. Percentage of teachers' participation at programs of specific duration

| Number of programs | Duration of programs | | | |
	1-20 hours	21-50 hours	51-100 hours	101+ hours
0	27.1%	**72.5%**	**85.4%**	**89.6%**
1	**26.1%**	22%	12.1%	9.5%
2	**12.7%**	3.4%		
3	**11.8%**			
4	6.8%			
5	7.5%			
6	1.1%			
10	4.3%			

According to the data of Table 4, 27.1% did not attend a program of 20 hours, 26.1% have attended one of 1-20 hours, 12.7% participated in two programs, 11.8% have attended three, 6,8% four programs, 7.5% five and 1,1% have attended six, while 4,3% state that they have attended 10 programs of 1-20 hours. 72.5% of the sample did not attend a program of 21-50 hours during the previous school year, 22% have attended one program of 21- 50 hours and 3.4% have attended two. A large percentage of teachers (85.4%) did not attend a program of 51-100 hour in the previous school year, while only 12.1% have attended one and only 1.3% have attended two programs of 51-100 hours. 89.6% of the sample did not take part in a training course of 101 hours or more, while only 9.5% participated in one program.

Table 5 shows the means and standard deviations of teachers' preferences about the training forms.

_____

Table 5. Means and standard deviations of sample preferences about the training forms

Forms of training	Mean	SD
Training in RTCs	**3.81**	1.78
in-school training	**5.21**	1.48
Distance learning	4.97	1.76
Mixed training model	5.11	1.63
Participation in teacher education networks/communities	4.80	1.66
Mentoring	4.96	1.64
Teachers' exchanges through European programs	4.79	1.91

4.2 *7-point Likert scale*

As can be seen, all the forms of training in Table 5 are scored by the majority of the sample with values from 5 to 7, except those of *the training in RTCs,* exceeds the mean value 4. With the exception of the factor training in RTCs, the average is around 4.97 in the rest of the cases.

Table 6. Percentage of teachers' participation in training programs of specific subjects

Subjects of training programs	Percentages
Stress management strategies	7.50%
Evaluation of the teaching process in classroom	9.80%
European dimension in education	10.30%
Evaluation/ grading of students	10.70%
Organization and administration of education	10.90%
Issues of Pedagogical psychology	13.90%
School unit evalution	13.90%
Special education	15.70%
Pedagogical methods of classroom management	20.30%
Interpersonal relationships in school units	20.60%
Promotion and support of innovation in education	22.10%
Dealing with learning disabilities	27%
Methodology of each subject	27.60%
Information and communication technology (ICT)	31.10%
New teaching methods	32.90%

According to Table 6, higher participation rates are observed in new teaching methods (32.9%) and New Technologies (31.1%) followed by the themes of Teaching Methodology per subject (27.6%) and Dealing with Learning Difficulties (27%). Low participation rates are observed in training actions on stress management strategies (7.5%) and topics related to the evaluation of the teaching process in the classroom (9.8%) and students' evaluation/grading (10.7%). Low participation rates include thematic issues related to the administration of education, such as the European dimension in education (10.3%) and the organization and administration of education (10.9%), which is partly due to the limited supply of training programs in these areas as well as the limited interest of teachers in the transition to the educational administration.

4.3 *Teachers' educational needs*

Table 7 shows the means and standard deviations of the educational need factors as they developed from the Exploratory Factor Analysis (Bartlett's Sphericity Test: x^2=5190,139, df=120 and p<0,001, KMO=0,914, MSA is in the range 0.887 to 0.937, four factors with initial eigenvalues ranging from 1.032 to 7.456 and a total rate of variation interpreted by these factors of 70.43%).

Table 7. Means and standard deviations of the educational need factors

	Factors	N	Mean	SD
1	Pedagogical and psychological issues	556	5.10	1.31
2	Educational work in the classroom	556	5.64	1.18
3	Classroom rating	556	4.93	1.50
4	Administration of education	556	4.33	1.68

As Table 7 shows, the average of all factors exceeds the average value 4. As expected, the mean of the need to attend training programs on educational administration approaches a mere 4.33. This means that teachers do not share the need for participation in management-related programs to the same extent as other themes.

4.4 *Motives of participation in training*

Table 8 shows the means and standard deviations of the motives' factors of participation in training as they developed after the Confirmatory Factor Analysis (χ^2/df=4,68, NFI=0.919, CFI=0.935 RMSEA=0.82, SRMR=0.523).

As can be seen from the data in Table 8, the means of the *career development* and *personal pleasure* factors- as reasons for participation- are lower than the average 4, in contrast with the mean of the professional and personal development factor, which is very high.

Table 8. Means and standard deviation of the motives' factors

	Factors	N	Mean	SD
1	Professional and personal development	556	6.14	0.92
2	Career development	556	3.4	1.48
3	Personal pleasure	556	3.12	1.30

5. Further statistical analysis

Non-parametric tests were carried out to establish the relationship between the demographic characteristics of sex and sector service of teachers (primary or secondary education) with their perceptions of their educational needs. Mann-Whitney U tests were then carried out to determine the degree of desire to attend training programs on specific topics. The results of the test in Table 9 showed that the degree of need to attend training programs in pedagogy and psychology for female teachers is statistically higher than that of male teachers (U=25659, N1=160, N2=396, p=0.001, bilateral control). Similarly, the degree of desire to attend programs related to the teaching work was found to be statistically higher in women than in men (U=26244, N1=160, N2=396, p=0.001, bi-lateral control). The same result occurred with the need to attend training programs concerning the evaluation in the classroom (U=27096, N1=160, N2=396, p=0.007, bi-lateral control). As for the degree of desire for programs about the administration of education, the perceptions of men are statistically higher than those of their women colleagues (U=27363, N1=160, N2=396, p=0.011, bi-directional control).

_____

Table 9. Mann-Whitney U test for independent samples of
teachers' training needs based on gender

Factors of degree of desire to follow training programs about:	Gender	N	Mean Rank	Mann-Whitney U test	Z	p
Pedagogical and psychological issues	Men	160	240.87	25659.0	-3.516	0.001
		160	312.64			
	Women	396	293.73			
Teaching work in the classroom	Men	160	244.53	26244.0	-3.179	0.001
	Women	396	292.23			
Classroom rating	Men	160	249.85	27096.0	-2.697	0.007
	Women	396	290.08			
Administration of education	Men	160	305.48	27363.0	-2.527	0.011
	Women	396	267.60			

Mann-Whitney's U test was then conducted to investigate the degree of desire to attend training programs with specific topics relative to the sector of service that research participants serve in. The test revealed that the degree of desire for monitoring programs in pedagogy and in psychology is statistically higher in primary school teachers than in secondary school teachers (U=26522, N1=324, N2=232, p=0.001, bi-lateral control). Also, the degree of willingness to attend programs about the educational management is statistically higher among teachers of primary education than teachers of secondary education (U=33376.5, N1=324, N2=232, p=0.024, bi-directional control).

To facilitate the statistical analysis of the data a grouping of the sample subjects was made in relation to age and three age groups were created. The first group is for teachers aged up to 40 years old (N=128), second teachers from 41 to 50 years old (N=264) and the third group includes teachers from 51 years of age (N=164). A Kruskal-Wallis test was carried out to look into the relationship between the degree of desire to attend programs with specific themes and age. It was found that the degree of desire for programs concerning the administration of education differs significantly (x^2= 6.483, df=2, n^2=0.030, p=0.001). Then a Mann-Whitney U test (Table 10) was conducted to find out which pairs of age groups present a statistically significant difference in the degree of desire to attend programs in the management of education. It was found that the degree of desire is statistically higher for teachers of 51+ years of age than for teachers up to 40 years old (U=7756.5, N1=128, N2=164, p=0.001, bilateral control) or teachers from 41 to 50 years old (U=17666.5, N1=264, N2=164, p=0.001, bilateral control).

Table 10. Mann-Whitney U test for independent samples of
teachers' training needs of teachers based on age

Factor of degree of desire to follow training programs about:	Age group	N	Mean Rank	Mann-Whitney U test	Z	P
Administration of education	Up to 40 years	128	125,10	7756.5	-3.843	0.001
	51 and up	164	163,20			
	41-50 years old	264	199,42	17666.5	-3.213	0.001
	51 and up	164	238,78			

Regarding the motives for participating in training programs, a Mann-Whitney's U test found that women's rates in attending training programs for professional and personal growth were statistically higher than these of men (U=22794, N1=160, N2=396, p=0.001, bi-lateral

control). Regarding the sector of service, the Mann-Whitney U test found that the values of the factor of personal pleasure are higher in the primary school educators than those of Secondary Education teachers (U=32763.5 , N1=324, N2=262, p=0.010, bi-directional control).

The Kruskal-Wallis test for the relationship of participation ratios with age showed that only the factor of career development among the three age groups differs significantly (x^2=12.813, df=2, p=0.002, n2=0.024, bilateral control). The Mann-Whitney U test (Table 11), showed that the values of the career development factor in teachers up to 40 years of age are statistically higher than those of teachers from 41 to 50 years of age (U=14158,5, N1=128, N2=264, p=0.009, bi-directional control), and that the specific factor values for teachers aged up to 41 years are statistically higher than those for teachers aged 51 and above (U=8014.5, N1=128, N2=164, p=0.001, bilateral control) whereas values among age groups of 41-50 years and 51 years of age and above were not statistically significant.

Table 11. Mann-Whitney U test for independent samples of the motives of participation by age

Factor for participation in training	Age group	N	Mean Rank	Mann-Whitney U test	Z	p
Professional evolution	Up to 40 years old	128	217.89	14158.5	-2.608	0.009
	41-50 years old	264	192.39			
	Up to 40 years old	128	165.89	8014.5	-3.474	0.001
	51 and up	164	131.37			
	41 -50 years old	264	221.43	19817.5	-1.475	0.140
	51and up	164	203.34			

6. Discussion

According to the data of this study the majority of the sample reply that they have been trained through the last two years. However, the majority of the sample prefers training forms such as in-school training, distance learning, and mix training model to training in Regional Training Centers due to the fact that these centers provide "traditional" model programs. Regarding teacher training, a survey conducted on a sample of 305 secondary school teachers found that the overwhelming majority of the sample had attended a training course besides that of introductory training (National Center for Social Research & KEDROS SA 2008). Regarding the participation in specific programs, higher participation rates are observed in programs related to the teaching work and the professional development of the teachers and low participation rates include thematic issues related to the administration of education.

The educational needs of the sample focus on topics such as Educational work in the classroom (M=5.64), Pedagogical and psychological issues (M=5.1), evaluation of the classroom (M=4.93) and to a lesser extent on topics related to the administration of education (M=4.33). At the survey of the National Center for Social Research (2010), they found that the educational needs of the teachers are mainly related to their daily pedagogical practice. In the question of educational needs the first choice of teachers was "pedagogical psychology", followed by "learning and teaching theories". Papanaoum (2003), in her research, asked teachers to characterize the importance they attach to specific subjects of training based on their own current needs. The results showed that a high percentage seek training in topics such as: psychology, teaching methodology, general education issues, special education, assessment of students and the administrative and pedagogical dimension of their role. Goliaris' (1998) research concerned the educational needs of primary school teachers and was carried out in the context of the 2nd Regional Training Center in 1996 in order to improve the training programs offered by this center. The results of the research

have shown that theoretical areas which teachers wish to address are, in order of priority: (a) child's psychology, (b) pedagogy, (c) Special education, (d) Health Education, (e) Research methodology, (f) History and Greek Culture, (g) Administration of Education, (h) Education of Technology, (i) Educational evaluation, (j) Sociology, and (k) European Dimension of Education, areas related to their teaching work.

In 2007, in a survey of the Pedagogical Institute with a sample of 4,164 teachers from 100 school units, the vast majority (83% of the total) wanted discussion of problems faced by teachers about the daily educational act to be included in the training programs (Pedagogical Institute, 2008: 43). In addition, the thematic area considered by most sample educators (77% of the total) as more important in the field of education is the management of school reality (students' behavioral problems, conflict management, diversity of student population, etc.) (*Ibid.*, 46). In a more recent study of the educational needs survey conducted by the Pedagogical Institute in 2010, in the framework of the Major Teacher Training Program, a sample of 27,785 teachers of all specialties and levels of education (Pedagogical Institute, 2010), three out of the top five teacher preferences refer to teaching work ("modern teaching approaches", "exploitation of new technologies" and "didactic methodology on cognitive subjects") both in relation to the classroom ("school classroom management" and "developing creative relationships with students and parents") (*Ibid.*, 55).

Regarding the motives of participation to training courses, teachers participate for their professional and personal development (M=6.13) and to a lesser extent for their personal pleasure or their career development. Based on the world literature, the main incentives for adult participation in training programs are grouped into the following categories: (a) development of social relations, (b) external expectations, (c) social contribution, (d) professional upgrading, (e) and (f) interest in knowledge (Boshier, 1971; Boshier, 1973; Boshier & Collins, 1985). At the Greek level, the recent study by Karalis (2013) in education programs, the answer "because I like to learn new things" gathered the highest rates, while high rates are accounted for the answer "because education has to last throughout our lives". High acceptance rates are also noted for reasons of professional development such as an increase in earnings, formal qualifications, finding better work, and securing a job. A survey at 223 Primary Education Teachers in the Eastern Macedonia and Thrace Region found that the two main factors influencing their participation in training were firstly the personal need for development and, secondly, the acquisition of better qualifications (Salpigidis, 2011). At the survey of the National Center for Social Research (2008) the most important reasons teachers would follow a training program in the future is the improvement of teaching methods (46%) and techniques (25%), followed by improvement of their scientific knowledge. Formal certification from a training program does not seem to be a particularly important motivator (0.7%). Moreover, there is no real motivation to get rid of the daily routine (4.7%) and to meet with colleagues (4.4%).

The study also revealed that women are more willing to take part in educational programs on pedagogical and psychological issues, with topics related to classroom teaching and classroom evaluation than men. However, men declare themselves more receptive to taking part in training programs for the administration of education. This may be attributed to the fact that the percentage of women claiming a managerial position in the Greek educational system is relatively lower than that of men, although women teachers are outnumber male teachers. In addition, primary school teachers are more willing to attend programs on pedagogical and psychological issues and on the administration of education than secondary school teachers.

Regarding the reasons of participation in training, women seem to be more involved for their personal and professional development than male teachers. Primary school teachers also report to be involved in training for personal pleasure to a greater extent than secondary school teachers. Teachers aged up to 40 years consider that they participate in training programs for career development to a greater extent than the other age groups.

7. Proposals

According to the literature and the results of this study, teacher training should be decentralized and respond to identified training needs of teachers, to be provided by various bodies, to take many forms and to be able to integrate a variety of training activities. It must be short, repetitive but long-range in terms of the number of teachers targeted. It has to be closely related with educational research and school practice, to use work types tailored to adult learning experiences.

According to the above, certain aspects of a framework for improving the quality of education are the planning of teachers' training through the evaluation of training programs, the exploitation of the results of good practices, the recording of teachers' perceptions of their profession, the organizational development of training, the delimitation of procedures/criteria/methodology of design, organization, implementation and evaluation of programs. There is also need for systematic information on the planning and implementation of training activities and dissemination of training actions and related materials.

References

Borraz, O. (2007). Governing standards: The rise of standardization processes in France and in the EU. In: Governance: *An International Journal of Policy, Administration, and Institutions*, *20*(1), 57-84.

Boshier, R., & Collins, J. (1973). The Houle typology after twenty-two years: A large-scale empirical test. *Adult Education Quarterly*, *35*(3), 113-130.

Boshier, R. (1971). Motivational orientations of adult education participants: A factor analytic exploration of Houle's typology. *Adult Education Quarterly*, 21 (2): 3-26.

Boshier, R. (1973). Educational participation and dropout: A theoretical model. *Adult Education Quarterly*, *23*(4), 255-282.

Buchberger, F., Campos, B. P., Kallos, D., & Stephenson, J. (Eds.) (2000). *Green paper on teacher education in Europe*. Thematic Network on Teacher Education, Umea University, Sweden.

Day, C. (2003). *The evolution of teachers*, translated by Anthi Vakakis. Tepotheto: D Dardanos.

Eurydice (2004). *Key topics in education in Europe. Volume 3: The teaching profession in Europe: Profile, trends and concerns. Report IV: Keeping teaching attractive for the 21st century – General Lower Secondary Education*. Brussels: Eurydice European Unit.

Hargreaves, A., & Fullan, M. (1995). *The evolution of teachers*, translated by Panagiota Chatzipantelli. Athens: Pataki.

Harvey, L., & Green, D. (1993). Defining quality. *Assessment and Evaluation in Higher Education*, 18(1), 9-34.

Harvey, L., & Stensaker, B. (2008). Quality culture: Understandings, boundaries and linkages. *European Journal of Education*, *43*(4), 427-442.

Karalis, Th. (2013). *Incentives and obstacles for the participation of adults in lifelong learning*, Athens: GSEE Labor Institute

Keiny, S. (1994). Constructivism and teachers' professional development. *Teaching and Teacher Education, 10*(2), 157-167.

Knight, P., & Trowler, P. (2000). Editorial. *Quality in Higher Education*, *6*(2), 109-114.

Morley, L., & Rassool, N. (2000). School effectiveness and the displacement of equity discourses in education. *Race Ethnicity and Education*, *3*(3), 237-258.

National Center for Social Research & KEDROS SA (2008). *Study: Detection of training needs in secondary education*. Athens: National Center for Social Research & KEDROS SA. Available at: http://reader.ekt.gr/bookReader/show/index.php?lib=EDULLL&item=1158&bitstream=1158_01#page/106/mode/2up

OECD (2005). *Teachers matter: Attracting, developing and retaining effective teachers*. Paris: OECD.

Papanaoum, Z. (2014). Supporting teachers' professional development: principles and practices of training. In: Z. Papanaum & M. Liakopoulou (Eds.), *Supporting the professional development of teachers*. Training Manual (pp. 13-20). Action "Training of teachers and members of the educational community".

Papanaoum, Z. (2003). *The profession of teacher: Theoretical and empirical approach*. Typothito: Athens.

Pasias, G., & Roussakis, Y. (2009). Towards the European Panopticon: EU discourses and policies in education and training 1992-2007. In: R. Cowen & A. M. Kazamias (Eds.), *International handbook of comparative education* (pp. 479-495). Dordrecht: Springer Publishers.

Pedagogical Institute (2010). *The contribution of investigating training needs to training τeacher: Comparative Interpretation of Results*. Athens: Pedagogical Institute.

Salpigidis, Andreas (2011). *The educational needs of the teachers in Primary Education: An empirical exploration of the Western Macedonia and Thrace schools, based on teachers' perceptions*. Thessaloniki: University of Macedonia, Department of Educational Sciences and Social Policy, Postgraduate essay.

Sipitanou, A. (2005). *Institutions and policies of the European Union for lifelong learning: A critical-interpretive approach*. Thessaloniki: University of Macedonia Publishing.

Ursin, J. (2007). In quality we trust? The case for quality assurance in Finnish universities. In: D. Epstein et al. (Eds.), *Geographies of knowledge, geometrics of power: Higher education in the 21st century, World year book of education 2007*. London: Routledge Falmer.

Van Damme, D. (2003). Standards and Indicators in Institutional and Programme Accreditation in Higher Education. Paper for UNESCO-CEPES.

Vidovich, L. (2001). That Chameleon "Quality": The multiple and contradictory discourses of "quality" policy in Australian higher education. *Discourse: Studies in the Cultural Politics of Education*, 22(2), 249-261.

Xohellis, P. (2005). *The teacher in the modern world*. Athens: Typothiito G. Dardanos.

C O A S

AIMS AND SCOPE

The OJER, as an international multi-disciplinary peer-reviewed *online open access academic journal*, publishes academic articles deal with different problems and topics in various areas of the science of education (theory of education, history of education, preschool education, adult education, learning, development, instruction, teaching, methodology of educational research, etc.).

The OJER provides a platform for the manuscripts from different areas of research, which may rest on the full spectrum of established methodologies, including theoretical discussion and empirical investigations. The manuscripts may represent a variety of theoretical perspectives and different methodological approaches.

All articles published in the OJER have DOI (Crossref) and will be applied for indexing in different bases (Clarivate Analytics – SCIE, ESCI and SSCI, Scopus, DOAJ, ERIH, OCLC, Google Scholar, Ulrich's Periodicals Directory, Cabell's Directory, SHERPA/RoMEO, EZB - Electronic Journals Library, WorldCat, J-Gate, Directory of Research Journals Indexing, NewJour, CiteFactor, Global Impact Factor, Unique Link Identifier – ULI, ResearchBib, Open Academic Journals Index, etc.).

The authors of articles accepted for publishing in the OJER need to get the ORCID number (www.orcid.org), and Thomson-Reuters researcher ID (www.researcherid.com).

The journal is now publishing 2 times a year.

PEER REVIEW POLICY

All manuscripts submitted for publishing in the OJER are expected to be free from language errors and must be written and formatted strictly according to the latest edition of the APA style. Manuscripts that are not entirely written according to APA style and/or do not reflect an expert use of the English language will *not* be considered for publication and will *not* be sent to the journal reviewers for evaluation. It is completely the author's responsibility to comply with the rules. We highly recommend that non-native speakers of English have manuscripts proofread by a copy editor before submission. However, proof of copy editing does *not* guarantee acceptance of a manuscript for publication in the OJER.

The OJER operates a double-blind peer reviewing process. The manuscript should not include authors' names, institutional affiliations, contact information. Also, authors' own works need to be blinded in the references (see the APA style). All submitted manuscripts are reviewed by the editors, and only those meeting the aims and scope of the journal will be sent for outside review. Each manuscript is reviewed by at least two reviewers.

The editors are doing their best to reduce the time that elapses between a paper's submission and publication in a regular issue. It is expected that the review and publication processes will be completed in about 2-3 months after submission depending on reviewers' feedback and the editors' final decision. If revisions are requested some changing and corrections then publication time becomes longer. At the end of the review process, accepted papers will be published on the journal's website.

_____

OPEN ACCESS POLICY

The OJER is an open access journal which means that all content is freely available without charge to the user or his/her institution. Users are allowed to read, download, copy, distribute, print, search, or link to the full texts of the articles, or use them for any other lawful purpose, without asking prior permission from the publisher or the author. This is in accordance with the BOAI definition of open access.