THE OPINIONS OF THE KINDERGARTEN TEACHERS IN RELATION TO THE INTRODUCTION OF COMPUTERS TO NURSERY SCHOOLS: PRELIMINARY APPROACH

Irene Sivropoulou, Aggeliki Tsapakidou, Argyris Kiridis

Abstract. Computers were introduced in Greek kindergartens of our country with the new curricula for kindergarten (Inter-disciplinary Integrated Framework of Study Programs OFFICIAL JOURNAL OF THE HELLENIC REPUBLIC (376´t.B/18-10-2001, article 6) in order to contribute to the spherical growth of children and to extend their learning. In other words it is intended that the computer will increase the interests and the motives for learning, to encourage active learning, to strengthen the dynamics of visualisation, the importance of feedback, the possibility of monitoring and the possibility of connecting the school activities with extra curricula activities in order to strengthen the social and cultural dimension of kindergarten. Nevertheless technology cannot in itself, bring the sought after change in preschool education. Kindergarten teachers are the key for the successful use of computers in kindergarten. However, while kindergarten teachers in certain countries approve of the introduction and use of computers and believe that education with computers is developmentally suitable for small children, in other countries the attitude of kindergarten teachers towards computers is rather negative. This negative attitude of kindergarten teachers relates to their knowledge of computers and how often they use them or is it related to cultural factors and the prevailing educational philosophies? These questions led us to attempt to investigate the opinions of kindergarten teachers in Thessaloniki in regard to the introduction of new technologies in kindergarten. The research is made up of three interactive parts. It begins with the theoretical discussion about the introduction of computers in kindergarten, an investigation of the opinions of 122 kindergarten teachers using a questionnaire made up of 33 questions follows and it ends with the interpretative analysis.

Zusammenfassung. Computer sind in die griechischen Kindergärten nach dem neuen Curriculum eingeführt worden, (Interdisziplinares einheitliches Studienrahmenprogramm OFFIZIELLES REGIERUNGSBLATT VON GRIECHENLAND (376´t.B/18-10-2001, Artikel 6) um zu den allseitigen Entwicklung der Kinder beizutragen und um ihre Bildung zu erweitern. Mit anderen Worten, sollen die Computer ihre Interessen und ihre Motivation erhöhen, zur aktiven Bildung ermutigen, die visuelle Dynamik so wie die Wichtigkeitt des Feedbacks und die Ermöglichung der Kontrolle verstärken , aber auch die Möglichkeit, die Aktivitäten in der Schule mit der Außerschulischen zu verbinden, so dass das sozialle und kulturelle Spektrum des Kindergartens gefördert wird. Aber die Technologie allein kann die angestrebte Veränderung in der vorschulischen Bildung nicht mit sich bringen. Die Kindergärtner sind der Schlüssel zu der erfolgreichen Benutzung der Rechner im Kindergarten. Nichts desto trotz, gibt es in manchen Ländern Kindergärtner, die die Einführung und Benutzung der Computer begrüßen und davon überzeugt sind, dass Unterricht mit Computern entwicklungsgeeignet für kleine Kinder ist, in anderen Ländern aber, ist die Stellung der Kindergärtner, den Computern gegenüber, eher negativ. Steht diese negative Stellung der Kindergärtner mit ihren Computerkenntnissen und der Häufigkeit ihrer Benutzung in Zusammenhang oder mit den kulturellen Faktoren und der vorherrschenden Bildungsphilosophie? Diese Fragen haben uns dazu gebracht, die Meinungen der Kindergärtner in Thessaloniki in Bezug auf die Einführung der neuen Technologien in den Kindergarten erforschen zu versuchen. Die Forschung besteht aus drei wechselwirkenden Teilen. Sie beginnt zunächst mit der theorethischen Diskussion bezüglich der Einführung der Computer in den Kindergarten, dann folgt die Erforschung der Meinung von 122 Kindergärtnern in Form eines Fragenbogens, der aus 33 Fragen-Stellungnahmen besteht und endet mit der Interpretationsanalyse.

Keywords: preschool teachers, computers, opinions, use of computers in kindergarten.

1. Introduction

Computers were introduced into the kindergartens of our country with the new curriculum for kindergartens, Inter-disciplinary Integrated Frame of Programs of Study (OFFICIAL JOURNAL OF THE HELLENIC REPUBLIC 376 t. B /18-10-2001, article 6), in order to contribute to the spherical growth of children and to extend their learning. More specifically what is sought is the increase of interest and motives of children in active learning, the reinforcement of the dynamics of visualisation and feedback, the activation of the capacity of monitoring as the possibility of connecting the school activities with extra curricular activities because in this way the social and cultural dimension of kindergarten is strengthened.

However, the prevailing opinions with regard to the necessity for the use of computer by children of preschool age caused a variety of reactions worldwide between experts and non-experts, kindergarten teachers, researchers and other professionals, that alternate between optimistic predictions and hopes to reservations and negative positions.

More specifically a big part of the research supports that activities with a computer in kindergartens contribute to the improvement of cognitive, linguistic, socio-emotional and psychokinetic dexterities (Ntoliopoulou 1999, Kyrides et al, 2003a).

More analytically, the supporters of new technologies realise that small children have much to gain from the use of a computer and consider that the age of three can be considered the starting point for the introduction of computers at kindergarten, on condition that appropriate software be used (McCraw and Meyer 1995, Plowman and Stephen, 2005).In addition, they maintain that they relate to the comprehension of abstract ideas and connotations (Katsikis et al, 1995) they expand the thought process of children and help in bridging concrete and abstract thoughts (Fischer and Gillespie 2003, Eunsook &Genevieve, 2005). They create a powerful motive for learning, combining the moving picture with the perfection of colours (Kitsaras, 1997: 220). They change the substance of learning and the way that they interact with their peers and adults (Clements, 1999); they improve the way that children learn because they guide them towards exploring the resolution of problems creatively and automatic actions (Clements and Jamara, 2003, Haugland and Wright, 1997). They strengthen the writing abilities of children (Cochran-Smith et al, 1998) they promote socialization, self knowledge, self-confidence, self esteem, teamwork, self sufficiency and self respect (Kyrides et al, 2003a, Ntoliopoulou 1999).

Plowman and Stephen (2005) mention in their research that, as children use building blocks to build, a lens to magnify, a step ladder to climb so the computer informs them about all technologies that today play an important role in their everyday routine. (Plowman and Stephen, 2005)

In addition, the supporters of new technologies ascertain that a computer facilitates the education of children with special needs (Raptis and Rapti, 1997). More specifically they promote a virtual game environment (Malone and Langone, 1999), they reinforce their pre-reading dexterities (phonological awareness) (Moiduser et al, 2000) they improve social interaction, team work (Hutinger and Johanson, 2000) they contribute to learning (retardation, correction), they allow for self regulation and personalization according to the strengths and weaknesses of the children, they offer the possibility of using tools compatible with the particularities of the child and moreover they are continuous patient mediators (Asteris et al, 2002).

On the other hand the critics of the new technologies support that the computer is likely to cause uniformity in teaching and evaluation, to contribute to social isolation and loneliness, they particularly develop a sense of dependence as well as various secondary problems such as general fatigue and tiredness of the eyes, headaches etc. (Raptis and Rapti 1997, Kubey, Lavin and Barrows 2001). More specifically the value of the usefulness of the computer for children of a preschool age is disputed because it is considered that the computer requires a level of symbolism/recognition that small children do not have (Cuffaro, 1984). They are conceptual and difficult to use (Clarke 1990, Hattie and Fitzgerald 1987). Wardle (1999) points out that the computer should not constitute part of the education of children of a preschool age and moreover a group of scientists, researchers and doctors consider that the computer impedes the healthy, natural intellectual growth of children of a preschool age and asks for their removal from kindergartens and day care centres (Lynch &Warner, 2004). The

opinions of Hohmann (1998) who proposes that computers not be used by children under three years are also similar. We observe that the most intense disputes in regard to the introduction of the computer in educational practices are presented in preschool education (Crook, 1998)

However, it is a fact that the successful implementation of innovative ideas depends to a large extent on the teachers themselves. (Fullan, 1993). In other words, the kindergarten teacher constitutes the most important factor and administrator of this change, and the introduction of this innovation. They are the mediator that organises and creates the relationship between the children, the computer and the class. As noted by Bikos "the degree of acceptance of ideas of reform by educators and their readiness to get involved in the implementation processes appears to be of fundamental importance for a successful result" (Bikos, 2006:16). However, it is seldom that the position or at least the opinions of the educators are taken into consideration in regard to the change in the preliminary stage of the implementation (Michaelidou, 1997). This obvious lack of empirical data with regard to the opinions, expectations and more generally the views of the kindergarten teachers about introducing computer into kindergarten is what led us to the following research.

2. Sample and methodology of the research

In order to record the perceptions/attitudes of kindergarten teachers on matters concerning the utilization of computers in kindergarten, a sequence of 33 questions - statements in a graded scale were given and the subjects of the research were invited to express their degree of agreement. The questionnaires were completed by 100 kindergarten teachers that taught in kindergartens in the Prefecture of Thessaloniki during the 2005-06 academic year. We choose to use the 5-point regular Likert type scale (1: I absolutely disagree, 2: I disagree, 3: I neither agree nor disagree, 4: I agree, 5: I absolutely agree) (Javeau, 1996:110), because scales are considered to be the subject of more even type of abstract scales and their creation presupposes explicit and precise determination evaluated of the degrees of the scales, (Bamboukas, 2000: 303-319). The reasons that led to the choice of the specific research tool for the present research are because the questionnaire:

> ➢ Can easily create interest in those asked, resulting in participation in the research process. (Javeau, 1996:50).

> ➢ Is conducive to the collection of information in regard to the opinions and the perceptions of the subjects (Fraise and Piaget, 1970:98).

> ➢ As a research tool it allows for continuous interventions, and in this way it acquires the most suitable form (Javeau, 1996:148).

> ➢ The particular choice of a research tool results from the necessity to use a big sample of subjects (Davidson, 1970).

The research process using the questionnaire was based on the following stages:

> ➢ Formulation and reformulation of the objectives of the research

> ➢ Formulation and reformulation of research matters

> ➢ Pilot research in a small population so that certain basic parameters are determined to render possible the final shaping of questions for the questionnaire.

> ➢ Collection and processing of the data attributed to the pilot research.

> ➢ Initial shaping of the proposals within the range and a test distribution to a sample of 50 individuals with random sampling.

> ➢ Processing of answers of the pilot implementation and determination of the ambiguities that were observed.

> ➢ Reformulation and reshuffling of the proposals within the scale and re- distribution to a random sample of 70 individuals.

- ➢ Processing of the new answers and reformulation of concrete proposals based on the observations of the distributors regarding the difficulties faced by the subjects.

- ➢ Final moulding of the proposals within the range.

- ➢ Distribution of the questionnaires with the help of multipliers in selected geographical areas (Belson, 1986).

- ➢ Collection of the completed questionnaires, coding and checking of the coding (Moser and Kalton, 1977:112).

- ➢ Processing of the answers statistically

- ➢ Final writing up of the work and evaluation of the results (Kyridis, 2006: 264-265)

For the processing of the data the Factor Analysis, widely used in the social sciences field, was selected and used. The analysis of the elements gives us the possibility of extracting valuable conclusions about a complex total of variables, reducing them to a smaller number of factors, from which each one corresponds to more than the original ones. Moreover, by using this we were able to locate the variables that characterize each element (elemental axis) and that contribute to its creation.

Also using the Anova testing, we examined whether the gender, the years of service, the age, what they had studied and the type of connection the subjects had with the computer influenced their attitudes to it.

The intrinsic consequence of the statements of the questionnaire (that is to say if the statements of the questionnaire examine the same situation, in this case the attitudes of the kindergarten teachers in regard to the use of the computer in kindergarten) was calculated by the alpha reliability. The alpha factor (Crondach's a) is the average of all likely values of the reliable partition for the questionnaire and it was preferred because it does not depend on the order of the statements.

The sample

The sample of our research was made up of 135 kindergarten teachers that work in schools in Northern Greece, that were called to spontaneously answer the research questionnaire during the school year 2006-2007. From the 135 subjects of the sample 95,6% (129) are women and 4,4% (6) are men.

Aim and methodology of research

Results

Table 1 presents the distribution of the subjects in the sample according to their demographic characteristics and the level of time they spent with the computer.

Table 1: *Demographic characteristics and time spent with computer*

Distribution of subjects according to gender	
Women	95,6% (129)
Men	4,4% (6)
Distribution of subjects according to years of service	
1 – 5 years	17,9% (24)
6 – 10 years	26,9% (36)
11 – 20 years	34,3% (46)
20 years and older	20,9% (28)
Distribution of subjects according to age	
20 – 30	13,3% (18)
31 – 40	46,7% (63)

41 – 50	31,9% (43)
51 – 60	8,1% (11)
Training in ICT	
Yes	54,1 % (73)
No	45,9 % (62)
Computer at home	
Yes	91% (121)
No	9 % (12)
Eagerness to help the children use a computer in the kindergarten	
Yes	95,5% (128)
No	4,5% (6)

Table 2 presents the mean and the formal deviations of the degree of agreement or disagreement of the subjects with the statements of the questionnaires.

Table 2: *Mean value and formal deviations of the statements of the scale*

	Statements	Mean	Std. Deviation
1	The toddlers should tell, recognize and name the parts of the computer (tower, screen, speakers, and printer).	4,04	,839
2	The computer offers the opportunity to children for learning.	4,24	,696
3	With the use of suitable software the children execute games for resolving simple problems resolution and exploration.	4,05	,756
4	The nursery school teacher encourages the children to explore and to discover the potential and possibilities of the computer.	4,26	,712
5	The introduction of the children to the world of modern technology contributes to them investigating their educational opportunities.	4,10	,774
6	The toddlers should learn use the keyboard, the mouse, the scanner, the printer.	3,56	1,073
7	The computer contributes to the development of the self sufficiency of children.	3,72	,879
8	With the computer the children can process photographs they have taken during various activities.	3,81	,849
9	The kindergarten teacher discusses the rules for the correct use of the computer (right position for the body, attention to the cables).	4,59	,590
10	The computer should not constitute a part of the education for toddlers since continuous radiation is likely to have negative repercussions on their health.	2,65	1,067
11	In each kindergarten a computer corner should be set up.	3,61	1,191
12	The children use the tools for free drawing in order to modify or create simple drawings and pictures.	3,79	,884
13	The computer contributes to the development of the ability of children for the resolution of problems.	3,68	,852
14	The kindergarten teacher informs the parents about the way that the children work with the computer in the class.	4,10	,863
15	The time spent at the computer per day should not exceed 20 - 30 minutes.	4,25	,928
16	The toddlers are made aware that the computer is a useful tool for people.	4,28	,619
17	The computer facilitates the learning of children with special needs.	3,93	,837
18	With the computer, the toddlers create greeting cards, invitations, posters, etc.	3,52	1,135
19	The kindergarten teacher uses the computer to introduce the children to thematic modules (presents pictures).	3,84	,848
20	The computer nurtures the creativity of the children.	3,74	,755
21	The kindergarten teacher types the text on the computer that the children dictate to her.	3,67	1,006

22	The time spent at the computer begins at one or one thirty from the beginning of school year.	3,27	1,196

We have to point out that the answers of the kindergarten teachers who participated in the research generally follow the instructions concerning the use of ICT and have been included in the national curriculum (D.E.P.P.S.). It is worth to mention the high means (Table 2) of the items 9, 16, 4, 2. All the items concern the use of computers in learning process.

The monitoring of the connection of the statements with the demographic characteristics of the subjects also with the level of time spent with the computer showed statistically important results: The monitoring of the connection with gender did not show statistically important results.

Moving on, Table 3 describes the monitoring of the connection of statements with years of service, age, training, possession of a computer in the home and the eagerness to help children in the kindergarten to use the computer.

Table 3: *Correlation of statements (ANOVA test)*

3.1 According to 'Years of Service'

	Sum of Squares	df	Mean Square	F	Sig.
With the computer the children can process photographs they have taken during various activities.	12,817	3	4,272	6,905	,000
The kindergarten teacher discusses the rules for the correct use of the computer (right position for the body, attention to the cables).	6,272	3	2,091	4,691	,004
The computer should not constitute a part of the education for toddlers since continuous radiation is likely to have negative repercussions on their health.	4,834	3	1,611	2,917	,037
In each kindergarten a computer corner should be set up.	4,079	3	1,360	2,772	,044
The computer contributes to the development of the ability of children for the resolution of problems.	12,282	3	4,094	3,761	,013
The time spent at the computer per day should not exceed 20 - 30 minutes.	5,649	3	1,883	2,699	,049
With the computer, the toddlers create greeting cards, invitations, posters, etc.	11,097	3	3,699	2,694	,049

3.2 According to 'Age'

	Sum of Squares	df	Mean Square	F	Sig.
With the computer the children can process photographs they have taken during various activities.	11,509	3	3,836	6,065	,001
The computer should not constitute a part of the education for toddlers since continuous radiation is likely to have negative repercussions on their health.	4,507	3	1,502	2,729	,047

3.3 According to 'Training'

	Sum of Squares	df	Mean Square	F	Sig.
In each kindergarten a computer corner should be set up.	8,414	3	2,805	7,612	,000
The children use the tools for free drawing in order to modify or create simple drawings and pictures.	5,518	3	1,839	3,333	,022
The toddlers are made aware that the computer is a useful tool for people.	3,958	3	1,319	4,207	,007
With the computer, the toddlers create greeting cards, invitations, posters, etc.	29,280	3	9,760	7,934	,000

	Sum of Squares	df	Mean Square	F	Sig.
The kindergarten teacher uses the computer to introduce the children to thematic modules (presents pictures).	13,500	3	4,500	6,778	,000

3.4 According to 'Computer at Home'

	Sum of Squares	df	Mean Square	F	Sig.
With the computer the children can process photographs they have taken during various activities.	8,497	1	8,497	13,231	,000
The kindergarten teacher discusses the rules for the correct use of the computer (right position for the body, attention to the cables).	7,276	1	7,276	16,604	,000
The computer should not constitute a part of the education for toddlers since continuous radiation is likely to have negative repercussions on their health.	5,335	1	5,335	9,802	,002
In each kindergarten a computer corner should be set up.	6,369	1	6,369	14,301	,000
The children use the tools for free drawing in order to modify or create simple drawings and pictures.	2,461	1	2,461	4,142	,044
The toddlers are made aware that the computer is a useful tool for people.	3,542	1	3,542	11,501	,001

3.5 According to 'Willingness to be Helped'

	Sum of Squares	df	Mean Square	F	Sig.
With the computer the children can process photographs they have taken during various activities.	14,189	1	14,189	23,697	,000
The kindergarten teacher discusses the rules for the correct use of the computer (right position for the body, attention to the cables).	9,671	1	9,671	23,190	,000
The computer should not constitute a part of the education for toddlers since continuous radiation is likely to have negative repercussions on their health.	3,246	1	3,246	5,839	,017
In each kindergarten a computer corner should be set up.	12,940	1	12,940	31,995	,000
The computer contributes to the development of the ability of children for the resolution of problems.	5,058	1	5,058	4,488	,036
The kindergarten teacher informs the parents about the way that the children work with the computer in the class.	5,129	1	5,129	7,099	,009
The time spent at the computer per day should not exceed 20 - 30 minutes.	7,014	1	7,014	10,555	,001
The toddlers are made aware that the computer is a useful tool for people.	5,350	1	5,350	17,192	,000
With the computer, the toddlers create greeting cards, invitations, posters, etc.	13,256	1	13,256	9,923	,002
The kindergarten teacher uses the computer to introduce the children to thematic modules (presents pictures).	3,784	1	3,784	5,019	,027
The kindergarten teacher types the text on the computer that the children dictate to her.	13,120	1	13,120	21,069	,000
The time spent at the computer begins at one or one thirty from the beginning of school year.	3,498	1	3,498	4,146	,044

The correlation of each item in the scale with the collected demographic information and the informational items included at the beginning of the questionnaire has been tested by the use of ANOVA (Analysis of Variance) test. It is worth to be mentioned that the age, the years of service, the level of the training in ICT and the use of computer at home effects the answers of the sample. This is presumable and we have to consider that a lot of kindergarten teachers have been never trained in the

use of ICT, especially the older, those who have many years of experience or those who do not use computer at home.

The factor of reliability of the tool was calculated Cronbach's alpha = 90,6% and is statistically important. The factor analysis grouped the data based on their interrelatedness aimed at charting those factors that describe more completely the attitude of the students about the objective of the research. Based on the elemental analysis, four independent factors resulted, which interpret 58,329% of the total inactivity of the data that are described separately below in Table 4.

Table 4: *Elemental Analysis Table*

Element	Question – Statement	Interpretation of distribution (%)	Peak
1st. Use of the computer at nursery school	With the computer toddlers create greeting cards, invitations, posters etc.		0,856
	Each kindergarten should organise a computer corner.		0,795
	Toddlers should learn to use the keyboard, mouse, scanner, and printer.		0,681
Cronbach's Alpha = 84,4%	The children use the free drawing tools to modify or create simple drawings and pictures.		0,679
	The kindergarten teacher uses the computer to introduce the children to the thematic modules (present pictures).).		0,654
	With the use of suitable software the children carry out games to resolve simple problems and to explore.	26,275	0,648
	With the computer the children process photographs they have taken during various activities.		0,641
	The time spent with the computer begins one with one and a half from the beginning of the school year.		0,639
	The computer broadens the opportunities for the children to learn.		0,573
	The kindergarten teacher types the text that the children dictate to her.		0,550
	The toddlers should distinguish, recognize and name the parts of the computer (tower, screen, speakers, and printer).		0,526
2nd. Advantages of using a computer	The computer contributes to the development of the self-sufficiency of children.		0,792
	The computer nurtures the creativity of children.		0,723
Cronbach's Alpha = 82,7%	The computer contributes to the development of the ability of the children to resolve problems.	18,468	0,620
	The introduction of the children to the world of modern technology contributes to them investigating educational opportunities.		0,564
	The kindergarten teacher encourages the children to explore and discover the potential of the computer.		0,539

	The computer should not constitute a part of the education of toddlers since continuous radiation probably has negative repercussions on their health		0,459
3rd General rules for using the computer in the kindergarten Cronbach's Alpha = 72,0%	The time spent in front of the computer per day should not exceed 20 - 30 minutes.	13,586	0,665
	The kindergarten teacher informs the parents about the way the children work with the computer in the classroom.		0,634
	Toddlers are made aware that the computer is a useful tool for people.		0,578
	The kindergarten teacher discusses the rules for the correct use of the computer (right position for the body, attention to the cables).		0,545
	The computer facilitates the learning of children with special needs.		0,495

Discussion - conclusions

Based on the statistical analysis of the data, it emerges that the kindergarten teachers in general have formed a positive opinion about the introduction and use of computers in the kindergarten and consider that it broadens the learning opportunities of children. These findings agree with earlier findings in which it emerged that the computer is suitable for preschool classes and improves the cognitive growth of children (Lynch and Warner 2004, Clemens 1994, Davis and Shade, 1999). This positive opinion about the use of the computer in the kindergarten emerges also from the fact that 63% of kindergarten teachers agree that toddlers should recognize the computer as a useful tool for people adopting the opinion of Papert, which points out that the "computer is as important a tool for the children of the technological period as the pencil and the paper was for the children of the previous generation" (Ntoliopoulou, 1998:213). Corresponding opinions are pointed out also in the manual of the kindergarten teacher "Small children need to understand what needs of the contemporary person are served by new technologies and how they are useful in our life" (Dafermou et al, 2004:351). Another indication of the positive opinion of the kindergarten teachers in regard to the use of computers in the kindergarten emerges from the fact that 95% of kindergarten teachers are willing to help children learn to use the computer. In opposition to other research that proves the unwillingness of high school teachers to actively participate in the realisation of this innovation (Bikos, 2006).

The second finding focuses on the fact that 63% of the kindergarten teachers agree with the view that computers nurture the creativity of children. This result coincides with previous research conclusions in which it is pointed out that the computer strengthens thought flexibility, creativity and the critical thinking of children (Haugland 1992, Clements et al, 1993). The views of school teachers are similar, 59,9% of whom consider that the introduction of the computer in the school does not limit the creativity of children (Kyridis et al, 2003b).

The third finding concerns the role of the kindergarten teachers. It is worth noting that 56% of the sample generally agree that kindergarten teachers should discuss the rules about the correct use of the computer (correct position of the body, awareness of the cables). Michaelides reached the same conclusion when he noted that: "The health and safety of children presuppose the correct ergonomy, that is to say the right planning and co-ordination of all the appliances of the computer system on the one hand and the natural conditions of work that are related with the activities and the needs of the children on the other" (Michaelides, 2005).

The fourth finding makes it obvious that 48% of the kindergarten teachers agree completely that the time spent by the toddlers at the computer should not exceed 20-30 minutes. This opinion concurs with the opinions of other researchers who agree that children should not be left for over thirty

minutes in front of the computer screen. In other words the time spent by toddlers at the computer should be short (Ball and Salinger 1986, Michaelides 2005).

An open ended question was left for the end of the questionnaire for open comments and it is essential to report that it is the kindergarten teachers that originally raised the subject of the lack of the material and technical infrastructure. Characteristically it was noted: "I tried with an old computer that I had in my classroom, but it was so slow that the children lost interest, got annoyed and abandoned it, as did I". Then they pointed out the advantages of the computer, but also expressed their reservations. Characteristically they wrote: "A distinctive feature of the computer is the unlimited patience that it shows allowing each child to proceed with the program they are using at their own pace. However, I prefer that the bigger part of work done at the kindergarten to be completed without using it. I fear the unsociability, the isolation, the passivity".

The abovementioned findings perhaps constitute the beginning of further investigation of the opinions of kindergarten teachers on the subject of the introduction and use of the computer that has already began being applied with the new curricula. Continuous research into the opinions and attitudes of kindergarten teachers-institutions of innovative change and the diachronic comparison of changes that will probably be noted is essential. Long-term research throughout the country is required so that it can be determined how computers are used in kindergartens in Greece, what changes will bring results in the structure of the program of kindergarten, what factors prevent or facilitate the cooperation of the toddlers while the computer is being used or what are the results in the cognitive and social growth of the toddlers? Also how knowledge and experiences are made with the use of computers by young children or what type of educational activities can be intended in this frame with the use of computers in the kindergartens of Greece?

Finally the continuous training of kindergarten teachers on the use of computers in the classroom is important because as Fullan (1993) reports the success of innovative implementations depends on what the educators think and do.

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Authors

Irene Sivropoulou, *University of Western Macedonia, Kozani, Greece, e-mail: esivropo@yahoo.gr*

Aggeliki Tsapakidou, *University of Western Macedonia, Kozani, Greece,*
e-mail: atsapakid@uowm.gr

Argyris Kiridis , *University of Western Macedonia, Kozani, Greece, e-mail: akiridis@uowm.gr*