

# The utilization of the digital student folder (e-portfolio) in pre-school education: Exploration of the views of kindergarten teachers

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**Abstract:** The rapid development of digital technologies, their integration and utilization in education, enable the creation and implementation of tools to support and enhance the learning process. The student's digital folder (e-portfolio) is such a tool, that its integration in the educational process of the kindergarten constitutes a special case of innovation. With the present study, an attempt is made to explore the attitudes and to record the views of kindergarten teachers regarding its use and utilization in pre-school education. The findings show that the majority of the participants seem to be in favor of utilizing the e-portfolio in the teaching practice of kindergarten. However, an ambivalence is evident towards its usefulness in the learning process and reservations and considerations are expressed about the possibilities for its integration.

**Keywords—***e-portfolio, pre-school education.*

## I. INTRODUCTION

The student's digital folder (e-portfolio) which is also known in bibliography as eportfolio, efolio, digital folder, web folio is basically an electronic version of the student's portfolio, which is based on paper, created in a computing environment and integrates not only text but also graphics, audio and video (Abrami & Barrett, 2005).

Student portfolios were first introduced into the educational process in 1980 and support the functions: a report documenting the progress and knowledge of the holder, knowledge assessment, critical review and reflection of knowledge and social interaction of parents, teachers and students (Karsenti & Collin, 2010). The advent of digital folders in 1990 added flexibility to the nature of data and to content modification, flexibility to content structure, internet access and social networking operation potential (Karsenti, Komis, Collin & Siampou, 2011).

According to Sutherland & Powell (2007), "the e-portfolio is an intentional collection of digital objects, ideas, reflection elements, feedback, etc. - which aims to present information about the individual's learning and abilities to a selected audience". Digital folders can potentially be used by all levels of education in order to encourage education into a more student-centered approach rather than a teacher-centered one.

Referring to the relevant research data, their introduction in the educational practice is accompanied by significant advantages, mainly in terms of improving the educational process and the student's self-assessment. They can be utilized by the teacher in the areas of student and teaching assessment, as they also provide student-originated feedback on the choice of teaching strategies in the directions of self-assessment and learning management (Arter & Spandel, 1992, Barrett, 2000). They are considered to provide authentic assessment, because they are based on more than one of the student's projects, show his/her course of thought and are representative of his/her abilities (Abrami & Barrett, 2005; Kimball, 2005). In Greek bibliography the term "portfolio" is referred to as "material folder" (Γεωργούσης, 1998) or "work folder" (Δ.Ε.Π.Π.Σ., 2002, Ντολιοπούλου & Γουργιώτου, 2008). It is included among the authentic assessment methods and is essentially a method of collecting evaluative information by applying other methods and techniques as well (McAfee & Leong, 2004), such as forms of observation, interview, questionnaires and therefore constitutes a flexible way of assessment, self-assessment and heteroassessment in kindergarten as well.

## II. LITERATURE REVIEW

According to the ICT Curriculum in pre-school education, " children use software and internet services, organically integrating ICT into the day-to-day kindergarten activities as supervisory teaching tools, as tools for exploration, experimentation and problem solving, and as tools for managing information, digital literacy and expression in multiple ways, creation, communication and collaboration" (ΥΠΕΠΘ-ΠΙ, 2012).

The organic integration of ICT in the educational process, however, depends on many factors, as shown by many studies. The educational policies, the syllabus, the curriculum and to a very important extent the attitudes and knowledge of teachers (Zhao, et.al, 2002, Μπήκος & Τζιφόπουλος, 2011). The study of attitudes and perceptions of teachers about ICT in education remains an open research issue (Liu & Huang 2005, Ruthven et al. 2004).

The review of international and Greek bibliography reveals the positive attitude of teachers towards the use of ICT in teaching practice, as well as towards the processes of informing them about their potential (Gulbahar & Guven, 2008, Κυρίδης κ.α., 2003, Τζιμογιάννης & Κόμης, 2006).

The views of kindergarten teachers as revealed by recent research (Tsitouridou & Vryzas 2003, 2004, Chen & Chang 2006, Ζαράνης & Οικονομίδης, 2009, Χριστοδούλου-Γκλιάου, Ν. & Γουργιώτου, Ε.2009) on the integration of ICT in kindergarten are influenced by their knowledge and experience in computers. Those kindergarten teachers who had experience in computer use and attended relevant training expressed more positive views (Chen & Chang 2006).

Findings of a recent study on the transformation of the views of kindergarten teachers trained at level B, confirm that trained kindergarten teachers adopt ICT as educational and learning tools. In addition, they are able to reorganize their teaching in

ways that transform their existing teaching practices (Παναγιωτοπούλου & Κτενιαδάκη, 2015).

Several studies have been developed internationally on teachers' attitudes and the inclusion of the digital folder in teaching and learning. These surveys mainly concern secondary and tertiary education and highlight a plethora of possibilities of digital folders. It seems that the integration of digital folders highlights the communication between learners and teachers (Bolliger & Shepherd, 2010), the acquisition of knowledge, skills and attitudes towards new technologies (Herner-Patnode & Lee, 2009), shared knowledge and its collective building. It also promotes the development of dialogue among the educational community (Shepherd & Bolliger, 2011) and peer interaction (Lorraine, Mason, Pegler, 2007).

In Greece, to date, relevant studies have been developed, however, few attempts have been made to systematically explore teachers' attitudes towards the use of e-portfolio in the educational process while there is no reference to teachers of pre-school education.

In a survey by Varsamidou, teachers agree that student entries in the e-portfolio can be adapted to individualized educational goals and play an important role in formative assessment, while the majority of them are positive about the use and design of an e-portfolio (Βαρσαμίδου, Α., 2012). The digital work folder cultivates students' observation and interest and contributes to the development of communication skills, cooperation, use of a variety of strategies, metacognition and comfort in operating in different cognitive contexts according to Sophos, A., & Liapi, V. (2007).

## METHODS

The study of the use of Digital Folders by teachers and their integration into classroom practice is an open research problem. Considering all the above, it was considered important to investigate the views of pre-

school teachers regarding the use of e-portfolio in the teaching practice of kindergarten. Its integration in Pre-school Education is an important innovation and it is well known that the success of an innovation in education largely depends on the reception it will receive by the educational community (Κυρίδης, Δρόσος & Τσακιρίδου, 2003).

Therefore, the views of kindergarten teachers on the use of the student's digital folder in the educational process of kindergarten are decisive, as they will influence their decisions regarding its utilization in the classroom, while their role is also important in improving young children's experiences with ICT in kindergarten (Sime & Priestley 2005, Stephen & Plowman, 2007).

A structured questionnaire with closed-ended and open-ended questions was designed with the main purpose of detecting the attitudes, opinions and intentions of pre-school teachers regarding the integration and utilization of the student's digital folder in the learning process.

### **Methodological framework Aim**

The study mainly aims to ascertain the views of kindergarten teachers on the various aspects of the introduction of the Digital Portfolio in Pre-school Education, to identify the factors that influence the formation of these views and to determine the needs of kindergarten teachers regarding its use and utilization in the educational process of kindergarten.

### **Formulation of research questions**

In order to achieve the purpose of the research apart from the interest in outlining the current situation in the field of pre-school education, where research data is scarce, we attempted to explore: *a) The views and attitudes of kindergarten teachers towards ICT at the time of conducting the current research b) Their views on the usefulness of the Digital Folder in the educational process of kindergarten. c) Their intentions for its integration into teaching practice. d) Their views on its impact on teaching*

*methodology. e) The possibilities of its utilization in teaching. f) The positive and negative results that they consider emerging from its pedagogical utilization and its contribution to the achievement of the objectives of the kindergarten curriculum. g) The requirements that arise for the kindergarten teacher from its use and utilization in teaching.*

In order to explore the factors that influence these views of kindergarten teachers, we formulated the following research hypotheses: *1) Older kindergarten teachers are more negatively inclined towards its utilization in kindergarten compared to their younger colleagues. 2) Kindergarten teachers' views on the introduction of the Digital Folder in education are differentiated according to the educational background of the kindergarten teachers. 3) Kindergarten teachers' views on the introduction of IWB in pre-school education vary according to their knowledge and qualifications in the use of ICT in teaching practice.*

### **Research tool**

Data was collected using a questionnaire which was structured with 26 closed-ended questions and 5 open-ended questions structured on a five-point Likert scale. The attitudinal questions - suggestions were formulated either positively or negatively and participants were asked to indicate their level of agreement or disagreement with the content of the suggestion, based on a five-point scale, in which 1 corresponded to total agreement and 5 to total disagreement. The questions were structured in four axes, which related to the following: A) Educational level - Experience of the Kindergarten teacher. B) Kindergarten teachers' attitudes towards the use and utilization of ICT in kindergarten. C) The attitudes of kindergarten teachers towards the use and exploitation of the student's digital folder (e-portfolio) in kindergarten. D) Exploration of the factors that enable the utilization of the student's digital folder (e-portfolio) in kindergarten.

Other research and suggested tools in the bibliography as well as the structure of the

Kindergarten Curriculum were taken into account for the content of the questions (Lee & Tsai, 2010). In the present research we only refer to part of the questions of the questionnaire, which are summarized in the tables of results.

**The process**

No intervention was made prior to the research. The researcher's role was limited to clarifying the content of the various questions to the teachers. To ensure that all questions are clear and understandable, a pilot survey was carried out involving 25 teachers.

**Method of data analysis**

The research data collected from the questionnaires was analyzed through the statistical program SPSS. The findings were organized into thematic units based on the data from our pre-research bibliographic review and the initial grouping of questions. Techniques involving qualitative or categorical variables were used, since the values of our variables are expressed in words and allow us to classify the individual units of the sample into distinct categories.

**The sample of the research**

The research sample consisted of 200 kindergarten teachers who served during the school year 2014-15 in public and private schools in the prefecture of Attica and the prefecture of Corinthia and most of them were women. This was not intentional but was to be expected since the majority of kindergarten teachers are women. The majority of the kindergarten teachers (51.8%), who participated in the survey and completed the questionnaire, were aged 40-50 years old, 32.7% were aged 30-40 years old and 8% were up to 30 years old. 7.5% were over the age of 50.

**III. RESULTS**

**Descriptive analysis**

**A. Educational level - Experience of the Kindergarten teacher**

In respect to the educational experience related to their previous experience, we observe that the largest percentage of kindergarten teachers 58.0% had between 5 and 15 years of teaching experience, 25.4% had between 15 and 20 years of experience and from 20 years and over we observe a percentage of 10.4%, while kindergarten teachers with less than 5 years of teaching experience were only 6.0% of the sample. Regarding the education of the sample, a significant percentage (74.5%) are university graduates, while a significant number have a postgraduate diploma (Kindergarten Teacher Training College) (21.0%). The vast majority of two-year educated kindergarten teachers had also attended a simulation program. However, the 10.0% percentage of kindergarten teachers who had completed postgraduate studies was also noteworthy.

Table 1 displays the answers of the sample teachers to the questions of research axis A, concerning the level of knowledge in the use of the computer and the way in which this knowledge was acquired.

**Table 1: Relative frequencies' distribution of kindergarten teachers by level of computer knowledge and the way in which this knowledge was acquired**

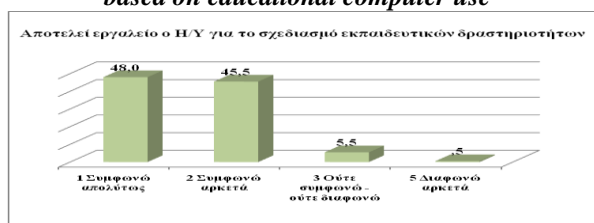
Do you have computer skills? If so, to what level?		How did you acquire your computer skills?	
No knowledge	1.0%	Self-education	38.7%
Simple operation	41.4%	During my basic studies	14.1%
Experienced user	52.0%	With seminars/trainings from the Ministry of Education and Culture	60.8%
Knowledge of programming	5.6%	By training outside the Ministry of Education and Culture	28.6%
		With postgraduate studies	2.0%

**B. Attitudes of kindergarten teachers towards the use and utilization of ICT in kindergarten**

Analyzing the answers of the second axis of the questionnaire regarding the attitudes of kindergarten teachers towards the use of ICT (figure 1), the following results emerge: In general, kindergarten teachers are positive about

the utilization of ICT in the educational process of kindergarten, since almost all of the sample 93.5% consider the computer as a tool for creating educational activities. Moreover, as the findings show, the vast majority agree with the various possibilities of using ICT in the educational process of kindergarten.

**Figure 1: Relative frequencies' distribution of the sample based on educational computer use**



### C. Kindergarten teachers' attitudes towards the use and utilization of the digital student folder (e-Portfolio) in kindergarten

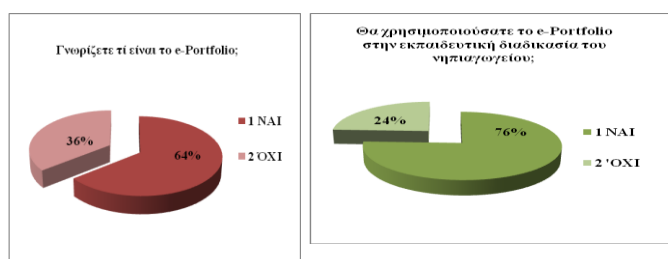
When asked if they use a system to record each child's learning development, 55.3% responded positively and 44.5% said they do not use one (figure 2).



A significant percentage of the sample, 78.0% (figure 3), are aware of the Portfolio method of monitoring learning development and most of them (68.2%) believe that its use brings about changes in the educational process. However, only 31.5% state that they use the Portfolio as a method of recording the toddler's learning development.

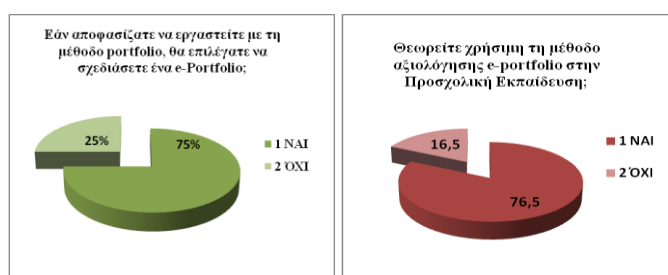
When asked if they know what e-Portfolio is, we can see that 64.3% are aware (figure 4) and although a remarkable percentage of the sample 24.3% are absolutely certain that they would not use e-Portfolio in the educational process of the kindergarten, the majority of kindergarten teachers 76.0% as recorded by their responses are positive about its use in the teaching practice of kindergarten (figure 5).

**Figure 4: Distribution percentage of kindergarten teachers based on their knowledge of e-Portfolio**



Considering the percentage of respondents who answered positively to the previous question, it is particularly interesting that almost the same percentage of 75.0% (figure 6), answered positively as well to our question whether they would choose to design an e-Portfolio and work with this method. The percentage of kindergartens (81%) that have a computer corner and internet connection is also noteworthy. As can be observed in figure 7, the assessment method using e-portfolio is considered useful by a large majority 76.5% of respondents.

**Figure 6: Distribution percentage of kindergarten teachers based on their intention to work with the e-Portfolio in and computer corner in their kindergarten pre-school education**



By reading the contents of the table below (Table 2), it is made clear that the majority of the 75% of respondents agree (strongly and fairly) that e-portfolio entries are likely to help students with diverse learning needs. The same percentage also agrees that its use contributes to the involvement of the student in the assessment of his/her progress, while its utilization in the learning process of the kindergarten facilitates the achievement of the teaching objectives (63.5%, absolutely and sufficiently). In addition, 69.5% of respondents agree that its use helps the toddler's learning development.

We then invite them to judge some negative views on the use and exploitation of e-portfolio. To our query whether the introduction of e-portfolio in kindergarten is premature and risky we can observe a dispersion in the answers. 27.0% state they are not sure and less than half

say they do not agree. A spread of responses is also recorded in the next three questions. We find that 29% of the respondents agree that its utilization in kindergarten exacerbates the disparities with non-computer using toddlers while 14.7% state that they are unable to answer with certainty. However, about half of the sample (47.0%) say they disagree with this view. We subsequently observe that a part of the sample of 20.5% answers that they agree with the view that the e-portfolio cannot be easily adapted to personalized educational purposes while 22.5% cannot answer with certainty. Then again, less than half of the sample, 46.0%, say they disagree with this. 21.5% of the respondents believe that the use and utilization of the e-portfolio in kindergarten makes kindergarten more scholastic. However, exactly half of the sample disagrees with this view.

**Table 2: Relative frequencies' distribution of kindergarten teachers regarding positive and negative positions on the use and utilization of e-portfolio**

<b>Rate the following POSITIVE views on the use and utilization of the e-portfolio in Kindergarten:</b>	I totally agree	I fairly agree	I neither agree nor disagree	I fairly disagree	I totally disagree
1. The e-portfolio entries are likely to help students with different learning needs	21.0%	54.0%	18.0%	1.5%	2.0%
2. With the e-portfolio method, the student himself is involved in assessing his progress	28.0%	47.0%	17.5%	1.0%	2.5%
3. The use and utilization of the e-portfolio in Kindergarten facilitates the achievement of teaching objectives	17.5%	45.0%	21.5%	3.5%	1.5%
4. The use and utilization of the e-portfolio in Kindergarten helps in the learning development of the toddler	23.5%	46.0%	17.5%	3.0%	1.0%
<b>Rate the following NEGATIVE views on the use and utilization of the e-portfolio in Kindergarten:</b>	I totally agree	I fairly agree	I neither agree nor disagree	I fairly disagree	I totally disagree
1. The introduction of e-portfolio in kindergarten is premature and bold	5.0%	13.5%	27.0%	27.5%	19.5%
2. The use and utilization of e-portfolio in the Kindergarten exacerbates inequalities with toddlers who do not use computers	8.0%	21.0%	14.5%	31.5%	15.5%
3. The e-portfolio can not be easily adapted to personalized educational purposes	5.5%	15.0%	22.5%	27.0%	19.0%
4. The use and utilization of e-portfolio in the Kindergarten makes it more scholastic	8.5%	13.0%	19.5%	27.5%	22.5%

In conclusion, we would say that the answers of the kindergarten teachers in the section of questions concerning the positive and negative results that arise from the use and utilization of the e-portfolio in the kindergarten program, indicate that the majority of kindergarten teachers have a positive attitude. Moreover, they believe

that its utilization can contribute to the improvement of learning and pedagogical outcomes but they have reservations on certain issues.

### D. Exploration of the factors that enable the utilization of D.S.F. in kindergarten

Regarding our question, what the successful introduction of the e-portfolio in Kindergarten depends on and to what extent, the vast majority of respondents (88.5%) consider the main factor to be appropriate information and support for Kindergarten teachers (School Advisors - Directorate of Education) as well as their training and education in ICT (87.0%). The same percentage of the sample believes that the adequacy of technological equipment (financial

resources) is very important for its utilization in kindergarten teaching practice. A large percentage (80.0%) also consider adequate knowledge in computer use as well as increased pedagogical and teaching skills of kindergarten teachers (84.0%) to be an important factor (table 3). To conclude, the responsibility for the training of Kindergarten Teachers in the utilization of the e-portfolio in the educational process according to the views of the respondents (93.50%), belongs equally to each kindergarten teacher individually, as well as to the Ministry of Education.

**Table 3: Relative frequencies' distribution of kindergarten teachers regarding the factors of successful utilization of the e-portfolio**

<b>The successful use and utilization of the e-portfolio in Kindergarten depends on the following factors and to what extent</b>	I totally agree	I fairly agree	I neither agree nor disagree	I fairly disagree	I totally disagree
1. Adequate information, support for Kindergarten teachers (advisors, management)	65.0%	23.5%	4.0%	1.5%	1.0%
2. Further training of Kindergarten teachers in ICT	64.0%	23.0%	5.5%	0.5%	0.5%
3. Very high level of knowledge of Kindergarten teachers on the use of computers	51.0%	29.0%	9.0%	2.0%	1.0%
4. Adequacy of technological equipment (financial resources)	66.5%	20.5%	3.5%	1.5%	0.5%
6. Increased pedagogical and teaching skills of kindergarten teachers	39.0%	34.0%	14.0%	2.5%	1.5%

### Discussion - conclusions

The findings of the present study seem to confirm findings of previous research (Ζαράνης & Οικονομίδης, 2005). Specifically, it is observed that a significant percentage of kindergarten teachers are positively disposed towards the utilization of ICT in kindergarten and the vast majority of them agree that the computer is a tool for planning educational activities. Teachers' IT knowledge and their experience in computer use influence the attitudes and practices they adopt regarding the utilization of ICT in the educational process. These findings are in line with the results of research on pre-school teachers, as has been pointed out by the relevant bibliography (Tsitouridou & Vryzas 2003, 2004, Chen & Chang 2006, Zaranis & Economidis, 2005, Christodoulou-Gkλιαou, N. & Gourgiotou, E.2009).

Regarding the usefulness of the e-portfolio in the kindergarten educational process and their intentions for its integration in teaching practice, we observed that the majority of kindergarten

teachers have a positive attitude and regard its utilization as being able to contribute to the improvement of learning and pedagogical outcomes. However, they are skeptical about issues such as how much the utilization of the e-portfolio in Kindergarten exacerbates the disparities with non-computer-using toddlers and whether it can be easily adapted to personalized educational purposes.

We observe that the majority of kindergarten teachers believe that there are positive results from the use of the e-portfolio in teaching practice, findings that are consistent with the research conclusions of our bibliographic review. According to their views, the use and utilization of e-portfolio in kindergarten facilitates the achievement of teaching goals and helps the learning development of the toddler. At the same time, most of them agree that with the e-portfolio method the student is involved in the evaluation of his/her progress. In addition, its utilization in teaching can help students with different learning needs. On several points, however, they have not yet formed a clear opinion and have several reservations. It is

possible that the lack of experience of using e-portfolio in teaching practice does not provide kindergarten teachers with concrete representations.

Regarding the assumptions made during the research design phase that kindergarten teachers' views on the utilization of e-portfolio in kindergarten teaching practice are influenced by their age and teaching experience, the findings do not seem to confirm them. Nonetheless, kindergarten teachers who claimed to be experienced users are less skeptical about the various aspects of e-portfolio utilization in kindergarten, in contrast to kindergarten teachers who claimed to be simple computer users, thus confirming related research (Zhao, et.al, 2002, Μπήκος & Τζιφόπουλος, 2011).

As resulted from the statistical processing of the data, the requirements raised for kindergarten teachers regarding the use of the digital student folder are fully linked to the adequate informing and support from the competent bodies (advisors - Directorate of Education) as well as to their training in the utilization of ICT in teaching practice. It is obvious that there is still much to be done for the e-portfolio to be used in pre-school education.

Its use and utilization in the kindergarten educational process, apart from the continuous pedagogical support, requires the acquisition of skills for the integration of ICT in teaching practice along with the nurturing of a general culture regarding the application of ICT in the educational process. The conclusions of our research may form the basis for the formulation of further research queries, which would be useful to be detected with the help of other research methods and practices.

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