INTERNATIONAL JOURNAL

OF

INSTRUCTIONAL TECHNOLOGY

AND

DISTANCE LEARNING

Editor' Note: Teacher education is often slow to adopt innovations; it is also a problem if teacher training programs do work hand-in-hand with schools in testing and adopting new ideas. Even though communication technologies have been adopted widely in business and social spheres, education is limited by limited funding and a need for successful models to follow.

Experiences with ICT in pre-primary Education during the student´s practical training.

Rosalía Romero Tena
Spain

Abstract.

Initial training of teachers and in particular learning and experience gained during the internship, are topics of great interest to improve curricula. This paper provides information on what is done in the children´s classrooms with ICT. It gives an overview of the knowledge and experience acquired by the students on ICT during the practice period. To obtain this information, a questionnaire, previously validated by expert judgment, was administered to students of the Faculty of Education after completion the practices. Although there was great interest to acquire "in situ" knowledge on how to use ICT in classrooms, little was accomplished in this study because only a few schools work with ICT at the pre-primary level.

Keywords: teacher training, ICT, pre-primary education, practical training, teachers' skills.

Introduction.

In a review of studies undertaken on practical ICT training for teaching staff, the correlation between adequate training for teachers and how effectively technology is incorporated becomes evident in a great deal of cases.

A summary of general points from the literature review tells us that these studies make clear, firstly, that equipping trainee teachers with technological skills is essential if this knowledge is to be passed on to future generations, adding a variety of suggestions about how this training can be given in an educational setting. Secondly, there is a great deal of concern for the detection of the factors which, together with the setting, impede the use of technology. Thirdly, it can be argued that there is a close relationship between the use of computers during the teaching practice and the targeted embracing of the ICT being the study on how the perception of students influences the use of technology an interesting aspect to analyse.

The study presented in this paper can contribute to all this research by providing information on another factor which may affect the use of technology in the classroom i.e. the experience gained during teaching practice at school and how the incorporation of ICT into pre-primary classrooms learning can take advantage of it.

Some interesting findings have emerged from the data in studies undertaken in the Spanish context (Cabrero et al., 1994; Ortega et al, 1997, Romero, 2006, 2009). For instance, the fact that new teachers involved in nursery and primary levels show a persistent tendency to avoid the use of ICT, using traditional teaching material instead. They also highlight the fact that the tutors assigned to the students in the schools where they undertake their teaching practice are not adequate role models, and the students do not have the practical information to visualize the adequate implementation of this media within the classroom.

Studies carried out in other countries, such as the one by Franklin (2005), provide sufficient information to convince us that the training teachers undergo influences their later use of technology in teaching. Becker's study (2000) also shows us that the teachers who are most committed to working with computers are those with a constructivist teaching background, but

this study does not make clear how this background has influenced their classroom practice or to what extent.

Niederhauser & Stoddart (2000) examine the relationship between the teacher's own views on education and the use of technology in teaching. The aim of this study was to examine the relationship between teachers' views on the use of computers effectiveness in teaching and the types of software they use. The results of this study show that teachers' views are related to the types of software they use with their pupils.

Spaulding (2007) also carried out statistical research in which he tested future and practising teachers on their knowledge of computers and their own perception of their skills. The results of the Assessment of Technology Skills showed that trainee teachers scored higher marks in both their knowledge of the skills and their incorporation of these skills into the classroom. Also found that trainee teachers were more willing to incorporate technology. Spaulding's research (2007) showed that there is a direct correlation between the level of skills teachers consider themselves to have and their perception of their ability to incorporate technology effectively into the classroom. Although the perceptions of practising teachers were much lower than trainee teachers, and more than half responded, to a previous questionnaire, that they routinely used a computer in their teaching, this conflicts with the data from the research. These teachers continue to express less positive feelings about incorporating computers than trainee teachers. Spaulding's study discovered that a technology training programme for teachers leads to more positive attitudes towards the use of technology in the classroom. However, it highlights the need for a follow-on study to determine the actual extent to which trainee teachers incorporate technology when they begin their teaching career.

Kumpalainen (2007) raised concerns about the ICT skills of both trainee teachers and teacher trainers, and the need to update their knowledge of technology. This study began by researching university level teacher trainers for (a) their perceived skills (b) their interests and (c) their attitudes towards the use of information and communication technology. The questionnaire was given to his education staff, including teachers and lecturers at the University of Oulu, Finland. The findings provide evidence that computer skills among the teacher trainers vary considerably according to their age and gender and, consequently, suggest a certain impact in the use of technology in education, the training of personnel or the activities of educators in general.

Finally, Karpatil (2008) points out that personality traits can be associated with the success or failure of becoming sufficiently proficient in ICT use in education. The strong correlation between certain personal characteristics in the success of ICT usage seems to suggest that the incorporation of digital teaching material and its methodology can be affected by individuals themselves, whether it involves teaching professionals and staff in the context of a specific teaching environment, course content, methods or tutors. His ICT courses are therefore designed to suit not only the starting levels of technological knowledge, but also the mentality of the teachers.

Methodology

Taking into account the above exposed background, the objective of the study focused on how the experince acquired by the students during practice training provides knowledge on ICT as well as the way to integrate it in pre-primary classroom.

A questionnaire was prepared as the best way to undertake it. In order to validate the first draft of the questionnaire, it was sent to a number of experts; ICT and pre-primary education professionals. They made a number of modifications that were incorporated to create the final version, which was the one we gave to the students. The questionnaire was set out in five large sections containing questions on the school, the pre-primary teaching staff, the pre-primary

classroom, ICT in the pre-primary classroom and experiences with ICT in the classroom. The first and second sections were prepared in closed format questions, while the rest were designed as open format. For the content analysis of the open questions a category system was developed, to grouped the answer.

The respondents were in their second and third years of studying to be pre-primary teachers, total of 230 (N=230) students responded to the questionnaire, 129 were second year students, 101 were third years.

Results

Relevant information about schools,centres and teachers related to the practice period were as follows: most of the schools where they spent their teaching practice were state schools (70%) in urban settings (76.1%); 90% of these schools provided pre-primary and primary education.

The teaching staff responsible for the practical training of the students (Practice Tutor) was 80% female (12% men, 7.4% unknown) and 78% were qualified pre-primary teachers (11.7% university graduates, 2.2% other).

An important aspect on pre-primary was included in the questionnaire to determine how space and time are organised in the pre-primary classrooms, what type of methodology they use and which resources are used more often than others.

The responses received gave a clear picture of the general context in which nursery education is carried out; the vast majority of *classrooms work by corners* (83%). In some of them, this is the only methodology used, whereas in others they are combined with other strategies and methods. It appears, moreover, that this is closely linked to the distribution of the class and how the pupils are grouped. Finally, we should note that there is a wide variety of methodology, although most of it fits into what could be described as corners. Some examples are detailed below:

> *"The space is organised in corners (computer corner, art corner, library corner, maths corner, construction corner, symbols corner)"* (C.1-Corner)

> *"They are organised in corners: construction corner, letters corner, dressing up corner, hairdressing, kitchen and computer corners."* (C.2-Corner)

> *"In activity corners and in groups divided into five work tables."* (C.33-Corner+tabl)

> *"When the whole class comes together, there are four tables: two larger ones which take more children, a blue table and a red table. Corners and workshops."* (C.78-Corner+workshop)

> *"A number of corners for games, stories and other things. A large space with round tables."* (C.101-Corner+tabl)

The most commonly *used strategy* revolves around routines, projects, play, etc. (89%) which establishes work patterns such as the ones illustrated in the examples below:

> *"Through routines: class time, explaining topics, exercises, games in corners, breakfast, break, explaining other worksheets, psychomotor skills, etc."* (C.33-Met)

> *"Following a routine based on play. Class time/ worksheets/breakfast/games/music."* (C.73-Met)

> *"Class time – working independently – breakfast – break – class time – working independently. Wherever possible, this is the routine we followed."* (C.40-Met)

> They were organised in different corners. Every day, the children would choose which one they wanted to work/play in. They're not allowed to choose the same corner every day."* (C.48-Met)

> *"The first hour is class time, then working in corners, good hygiene, breakfast, class time, working in corners and home time."* (C.80-Met)

Once the most important aspects about the way of teaching and classroom physical distribution, were set, we studied the role of ICT. First we looked into whether or not they had computers in the classrooms and then how they used them. 53% answered that their classroom had a computer, whereas 45.2% said they did not. This means that out of 122 students who said they had a computer in their pre-primary classroom, 57 of them had one

The answers to the question *What are they used for* were listed by importance: for watching films or videos (images, photos, etc.) on the topic they had been working on, for playing, for learning to operate the mouse or the keyboard, for reinforcing content, as another work corner, and finally – or solely – for the use of the teachers. Examples of these uses are given below:

Videos/films (image viewing):

"It's only used for showing stories in the units, or for films or listening to music. For the last two, the cinema and the radio were also used." (C26-Film)

Play:

"There was a quadrant where they sat down to use the computer L, M, X, J, and V. The teacher would choose the pupils and they would use the computer as a reward." (C.97- Game)

Operating the computer and its accessories:

"They use it for working on an activity. The children operate the mouse and familiarise themselves with it, and they write their name using the keyboard and see it come up on the screen." (C.32-Infor operat)

General concepts:

"The computer is used so that the children can see things connected with the theme they've been working on, but the children don't operate the computer; the teacher does that." (C.20-Concep)

Activity corner:

"It's used in one of the corners (the library corner) where the pupils work with software on basic subjects designed for nurseries." (C.39-Rinc)

For the teacher's own use:

"The computer is only used by the teacher, but I never saw her using it. Someone who did use it was a person the teacher brought into the class who played songs for dancing, cartoon series, etc." (C.83-Use Teacher)

For the section Experience of ICT in the nursery classroom, perhaps the answer which gives us a general image of what tends to happen with technology in classrooms at this level is: *"I haven't seen ICT used in the nursery classroom."* The answer to this question was split almost 50:50. 47% responded that they had not seen ICT in the nursery, while 49.1% responded that they had. Some of the most relevant examples are detailed below:

"I really haven't seen an ICT or computer room in a nursery classroom, and if the school where I did my teaching practice knows anything about computers, it's because once a week the teacher shows them images of things they haven't seen, or because they use videoconferences." (C.88-No see)

"I've seen ICT in the classroom but it was not used correctly. They mostly used it to watch films. They rarely used the computer for working." (C.93-See+use)

"... my tutor wanted to use new technologies but the school would not provide the resources she needed. She brought her own computer to class, but it was too old and didn't work." (C.59-See+resource)

"I have a negative impression, because I believe that using computers every day in class would have a very negative influence on teaching." (C.55-See+percep neg)

"On the one hand I think this is a good thing, because I don't agree with such young children using computers. However, on the other hand I think it's a bad thing because in the world we live in, where

computers are part of daily life, it's a step backwards to prevent a child from using computers." (C.46-See+percep neg)

As we can see from the data and from the impressions given by the future teachers, their teaching practice in schools is not where they gain their experience of the real use of ICT, as almost half of them saw nothing in the schools where they did their teaching practice. We can go so far as to say that the majority of their comments are critical about the use of ICT and the lack of resource, they themselves even have a negative attitude towards using computers at the nursery stage.

In the face of these sometimes negative or reticent impressions about the use of ICT in the classroom, it will be useful for us to take a look at their responses to the statement: *"I do not consider it a relevant part of my teaching practice".* In this case, 67% of the sample considered it to be an important aspect of their training, as shown in the following extracts from the responses:

> *"I consider it very important because future generations are immersed (as I myself am) in a* society where new technology forms part of a child's daily life." (C.82- YES relev formation)

> *"I do not consider a computer to be an important element in a child's education. It may be something they could use as an aid."* (C.88-NO relev formation)

To find out a little about the experience they had had, we gave them another set of questions. To the first of these: "*Do you have the knowledge to be able to use ICT in the classroom?"* 60.4% (f=139) said they did. To the question *"Have you seen any use(s) of ICT in the classroom?"* 64.3% (f=148) replied "no" and 59.6% (f=137) answered "no" to the question: *"Have you seen any use(s) of ICT outside the classroom?"*

We asked those who had answered *yes* to any of these questions to give more details about what they had observed or carried out. Their responses could be set in three main categories i) those who had used the computer in classroom ii) those who had only been able to observe how computers were used in the classroom and iii) those who wished to give their comments despite having had no experience of it. The examples below give us an idea of these responses:

Use:

> *"I produced the activity myself with my laptop and the program JClic. I put together a unit for my teaching practice using JClic, connected with the unit we were working on in class." During my work in secondary education, I took part in the last EDUCARED e-conference via the website (www.plasticarboleda.es)".* (C.101-Use+desig)

Design:

> *"In the Faculty, I designed a program with JClic based on the four seasons of the year (for 5 year-olds) and I used it in class to reinforce the things they had been learning."* (C.100-Desig)

Observation:

> *"I observed pupils playing with interactive CD-ROMs where they worked with activities adapted to their age-group.* (C.93-Observ)

No experience of it:

> *"During last year's teaching practice (primary) computers were used as it's an ICT-oriented school. They were used particularly in reinforcing and revising things the children had already learned. This year I have not used computers in class, and we did not actually have a computer in the class."* (C.85-No exp)

Since the most used methodology in classrooms was "the corners", and given that this was one of the aims of the study, we asked them, "*Do you know what a computer corner is?"* Their responses were as follows: 59.6% said yes, they did know, 36.5% said they did not know and 3.9% did not answer the question.

From these responses, we asked those who had answered yes to give us more details about what they knew about it. We tried to obtain information about how they arranged their curriculum planning, class distributions, time and space management, which software they used, etc.

Training within the Faculty:

"I have had no experience of it, but for some work I did within the Faculty we made a teaching unit for nursery where we designed different corners, and one of these was a computer corner for which we produced activities for learning numbers, differentiating colours, etc. The children were divided into groups of five and the computer had a microphone and headphones for children who had difficulty seeing or writing." (C.13-Form faculty)

Curriculum planning:

"This corner was used by a group of six pupils per day whose turn it was to use the corner, as the groups took turns with it. There was no type of planning for the corner and the pupils played on their own with CD-ROMs produced by the SM Group." (C.34-No plan)

Free time (time not filled with activities):

"The computer corner only had one computer for the use of three pupils at a time. The computer was used when they had finished an activity. The computer was at a table with three chairs." (C.17-Plan+free)

Play

"There was no curriculum planning. The computers were only used at corner time and there was one for every two pupils. The resources used were games." (C.18-Plan+game)

Giving information:

"The children do not use the computer; they only watch the screen when they are being taught something." (C.40-Inform)

Class distribution (pupils-space-time):

"The computer corner is the space reserved for activities connected with learning about technology for nursery age children. They use resources such as educational computer programs in this corner to give the children a start with computers." (C.131-Distr A/E/T)

Software:

"At playtime the children choose corners, and one of these is the computer corner. There is one computer per child, and the games are educational, such as "My First Words", etc." (C.60-Soft)

"The computer corner is the space reserved for activities connected with learning about technology for nursery age children. In this corner, they use resources such as educational computer programs to give the children a start with computers." (C.113-Soft)

"They put a CD-ROM on for them and they play games against each other." (C.25-Soft)

The ideas which emerge from all these comments about the "computer corner" are that, firstly, there does not appear to be any clear planning for it within the curriculum. The corner has more use in play than in learning, and even if learning is implicit in the games, it is not properly incorporated into aims or content at curricular level. All the children in the classroom use it, and the most widely-used system of organisation is that groups take turns depending on the number of computers (pupil-computer ratio) and the amount of time dedicated to classroom corners.

The software used is more varied but they focus largely on generic interactive games from publishers, or JClic activities created by others or by students themselves. They use the MS Office package for creating presentations or other types of material, and they use applications like Paint, YouTube for watching videos and educational market software such as "Reader Rabbit" ("El Conejo lector") Pipo, the internet, etc.

Conclusions

As we have seen throughout the study, one of the major constraints for ICT training in the period of practice, is the available equipment of classrooms. Half of the classrooms where they did their teaching practice had no computers, so these students had no "real" experience of using technology in pre-primary classrooms. Where there were computers, they were mostly used for playing, watching films and for reinforcing education content.

The responses to the questionnaire provide evidence of working in corners in nursery classrooms, a methodological decision consistent with the management of time and space associated with this strategy. Therefore the implementation of ICT has to be incorporate in this teaching process so that it becomes one of the routines (class time-classwork; working independently-psycho-motor skills; corner time-class time).

In terms of our interest in finding out about "the computer corner" and how it is used to incorporate ICT into classrooms, we have seen that less than half the students have any knowledge of this corner. Their knowledge of it comes mostly from having studied it at university and not through having seen it in the classrooms where they did their teaching practice. Most of them said that it was used during "free time", in "play" and/or for the teacher to "explain something" to the children. The pupils tend to take turns in this corner, and the programs (software) they use tend to be generic CD-ROMs produced by publishers as a teaching aid.

The ultimate finding is that students would very much like learn how to use computers in the pre-primary classroom, but the fact is they have no knowledge of how to make use of ICT by the end of this component in their training because they have seen little use of them in practice.

We support the findings of the previous studies carried out by Spaulding (2007), Kumpulainen (2007), Koster, Kuiper et Volman, (2012) adding the study on technology training for student teachers and its influence upon the use of technology in the classroom conducted by Spiegel (2002). In the light of these results, Spiegel proposes questions for future research, such as finding a way to reduce the gap between what can be done with technology in the classroom and what ought to be done. He also suggests looking for ways to provide adequate training for both future and more experienced teachers, together with the time to prepare lessons in which the use of technology turns out to be effective.

Also Ihmeideh (2011) highlight that although student teachers acknowledge the role of ICT in kindergarten children's development, most of them do not use ICT in their teaching practices. Findings revealed that the inadequate equipment was found to be the main reasons for not using ICT. Moreover, student teachers mentioned that the cooperative teachers do not pay attention to computer center in the classrooms nor they encourage them to use ICT in their actual practices.

Implications

Teaching practice in schools is critical in consolidating the theoretical base of teacher training, as well as for acquiring practical experience of teaching. It is a time when everything that students learn is put into practice, but if it does not fulfill the aims of teaching practice it has not been successful. The schools which are selected, on the one hand, and the teaching staff on the other, are the focal point on which this training is founded. If they do not offer the experience required by a future teacher, some of the selection criteria for participating schools need to be revised. Indeed, they should be chosen in a carefully considered and responsible way. It is a question of fulfilling the objectives set out for teaching practice. This study has revealed, amongst other things, a lack of provision for ICT in the classrooms selected for teaching practice. As there was no computer in half of them, we can assume that half the students were unable to have any experience of incorporating ICT.

References.

Arrowood, D.R. & Davis, R.A. (2008). Preservice Teachers in the Public School Classroom: What do they see and what do they do with technology? In K. McFerrin et al. (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2008*. http://www.editlib.org/p/27818. (23-04-2012)

Becker, H. J. (2000). Findings from the teaching, learning and computing survey: Is Larry Cuban right? *Education Policy Analysis Archives*, 8(51). http://epaa.asu.edu/epaa/. (23-04-2012)

Cabero, J. (1994): Evaluar para mejorar: medios y materiales de enseñanza. En Sancho, J. (COORD.): *Para una Tecnología Educativa. Cuadernos para el análisis*. Barcelona. Horsori. (pp. 241-267)

Franklin, C (2005). Factors that influence elementary teachers' use of Computers. *Society for Information Technology & Teacher Education*. American Educational Research Association Annual Confence, 2005. http://eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/1b/c2/a0.pdf (10-06-2011)

Ihmeideh, F. (2011): Student teachers' perceptions of using information andcommunications technology in kindergarten. *5th International Technology, Education and Development Conference*, INTED2011, pp. 4773-4779.

Kárpáti1, A.; Török2, B. & Szirmai1, A. (2008). E-teaching readiness of teachers the effects of personality traits and ict skills on changes in teaching style of experienced educators. http://edutech.elte.hu/karpati/content/download/publikacio/KONFERENCIA/2008_EDEN_PARIS/2008_E-Teaching%20readiness.pdf (23-04-2010)

Koster, S.; Kuiper, E.; Volman, M. (2012): Concept-guided development of ICT use in 'traditional' and 'innovative' primary schools: what types of ICT use do schools develop?. *Journal of Computer Assisted Learning*, 28, 5, October 2012, pp 454–464.

Kumpulainen, K. (2007). Look at yourself! Computing skills among teacher trainers. In R. Carlsen et al. (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2007* (pp. 834-842).

Niederhauser, D. & Stoddart, T. (2000). Teachers´ instructional perspective and use of educational software, *Teaching and Teacher Education,* 17, January 2001, (pp. 15-31)

Ortega, J.A. (1997): Nuevas tecnologías y organización escolar: propuesta ecocomunitaria de estructura y uso de los medios didácticos y las tecnologías, en Lorenzo, M. y otros (Coords): *Organización y dirección de instituciones educativas*, Granada, Grupo Editorial Universitario, (pp. 203-222)

Romero Tena, R. (2006). *Nuevas Tecnologías en Educación Infantil. Rincón del ordenador.* Eduforma. MAD.

Romero, R.; Román, P & Llorente, Mª C (2009): *Tecnologías en los entornos de Infantil y Primaria.* Madrid: Síntesis

Spaulding, M. W. (2007) *Comparison of preservice and in-service teachers' attitudes and perceived abilities toward integrating technology into the classroom*. Ed.D. dissertation, The University of Memphis, United States -- Tennessee. http://professorarnold.net/educ6653/LitReview_2.pdf (24-04- 2012)

Spiegel, H. A. L. (2002). Pre-service teacher training and implementation in the classroom: Considerations. *National Educational Computing Conference: Proceedings* (23rd, San Antonio, Texas, June 17-19, 2002). http://eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED475952&ERICExtSearch_SearchType_0=no&accno=ED475952 (24-04-2010)

About the Author

Rosalia Romero is Professor at University of Seville, Secretary of the Department of Didactics and Educational Assistant Professor of SAV and DOE Secretary of the Department of the University of Seville. Member evaluator of several magazines such as Pixel-Bit and electronic Journal of Educational Technology-EDUTEC. Lectured in different Spanish Universities, European and Latin American as well as masters and doctoral courses related to educational technology and teacher education. He has participated in over 30 research and has contributed more than 60 works related to Educational Technology and ICT especially for kids. And more than 30 articles in national and international journal.

e-Mail: rromero@us.es

http://tecnologiaedu.us.es/rromero