ICT integration in Primary and Secondary Education in Andalusia, Spain: Curricular and Organizational Implications

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Abstract: This work, part of the Spanish government's National I + D Plan 2004/07, entitled "Observatics: the implementation of free software in ICT centres in Andalusia: an analysis of its effect on the teaching-learning process", aims to describe the most recent impact of online communication technologies on education in Andalusia (Spain), within a new environment, as are the new ICT schools, characterized by the large-scale implementation of technology in primary and secondary education. By combined qualitative and quantitative methods, the study shows that, due to the presence of ICTs (Information and Communication Technologies) in educational centres, the frequency of computer use in the classroom has increased, along with an expansion of a teacher training process that is progressively oriented towards contextualized models of learning. After investigating the most important factors behind the success of the mass computer installation programmes at the centres, a series of recommendations at centre and governmental level are presented that will ensure the maximizing of the potential of these technological resources.

1. THEORETICAL FRAMEWORK

Dobrov (1979), in his classic work, may be one of the first writers that mentioned the need for considering the organizational aspects of the incorporation of ICT in the teaching-learning processes. This writer considers 'hardware' and 'software' as constituent elements of the resources, as well as bearing in mind a new one: 'orgware', or the structural component of a technological system that serves to keep this system in good working order and guarantee the interaction of other elements with other systems of a different nature. For him, all technological systems require a specific form of structural organization without which the design and the technological component is useless or

even harmful. Thus, he defines it as "…the group of socio-economic, organization, and administration measures that are aimed at guaranteeing the identification and the effective use of a given technique and the given scientific-technical knowledge, as well as the potential ability of the technological system to adapt, develop and improve itself" (Dobrov 1979, p. 632).

The significance of this organizational dimension is more important than it first seems; to give an example, in different research (Cabero 1998, p. 2001), the reasons given by teachers for not using technologies are: the lack of a person in charge of the resources, the lack of a flexible timetable to use the resources or the lack of separate resources available to be used by the teaching staff and students. All this could very well be placed within the organizational dimension. Fernández Morante and Cebreiro (2007, p. 136) have gone into greater depth in this area: "when we talk about the organization of resources in educational contexts we must admit that we are faced with an extremely complex situation which involves practically all aspects of school life, management and organization insofar as the incorporation of the resources is projected upon the teaching-learning processes, the management and administration of the centres, the dynamics of interaction, the educational proposal of the centre, etc".

There are many studies which have shown that the organizational aspects represent one of the greatest barriers that teachers have to face when they use the resources in their teaching practice (Cabero 1998; Fernández Morante 2002; Fernández Morante and Cebreiro López 2001 & 2002; Guzmán 2002; Reyes y Siles 2002; Fandos 2004; Raposo 2004; Bakkali 2005; Ortiz 2005 y Pérez Lorido 2006).

Likewise, ICTs cause changes in the educational organizations themselves. For example, they bring about an increase in the interrelations between different members of the community enabling them to communicate in a more fluid way. However, on its own, this is not enough. As Kagel (2003, p. 279) points out, "it is necessary to think about how to implement them and what idea underlies this implementation".

The research we are dealing with is based on the scientific evidence that the mere presence of computer science and telematics is not enough to improve educational quality, unless a firm commitment is made to didactically incorporate them in the teaching-learning processes and in the organization of the centre. However, this commitment requires overcoming first- and second-order obstacles (Ertme 1999, p. 2002; Pelgrum 2001) that have been considered in literature for over 20 years. We are talking about obstacles that are *not* directly controlled by the teacher (access to the technology, availability of time, support, materials, training) and those that *are* (attitudes, beliefs, practices, resistance), which affect teaching efforts to incorporate the technology in the classroom (Brickner 1995).

Many studies have dealt with the role that the first-order obstacles play in the efficiency of the incorporation processes of technology (Owen 2006; Fletcher 2006). Access to technology in schools and in the home is losing influence as a barrier to the incorporation of technology, given the growth of schools that have Internet access and the increase in the ratio of computers to students. Nowadays, we can state, in a more or less effective way, that efforts have been made in this direction in all countries in the West, at all educational levels and by all governments, such is the case of the 'ICT schools' in Andalusia, on which we have focussed our research.

However, it is not enough to have computers and Internet access in schools; it is not enough to create computer rooms. We have to change the idea of 'computer classrooms' for that of 'computer science to the classroom', or differentiate between 'access to the web' and 'be a part of the web'; so that the technology is available to the teaching staff when they want to incorporate it in teaching practice, and it is the teaching staff, based on purely methodological criteria, that decide on its incorporation or not. Until the technology takes on the characteristic of being 'invisible', it is not perfectly incorporated into teachers' formative actions. Nobody looks into a classroom to see if there is a board because it is common technology; it is invisible for our educational practice. This is now happening in some schools with other technologies, for example, overhead projectors, computers and video projectors. Together with this, it can be pointed out that progressive price reduction will favour their presence; wi-fi connections, 'blue tooth', lap-tops, etc. will become common in the centres.

The presence of technologies in the educational field should not be exclusively restricted to hardware, but also, and in the future this is what may be really important, to the software that keeps it in good working order. The history of audiovisual resources has clearly shown that some specific resources have quickly become obsolete, simply because of a lack of materials for their use. But this use also has to be didactic and educational. The authentic use of ICTs is achieved when teachers have a wide range of learning objectives at their disposal from which they can select the most appropriate for the communicative problem which they are confronted with. Subsequently, the strengthening of teachers' associations for the production and exchange of materials could be a great help.

Any type of educational reform needs time so that the staff can carry out changes systematically. In order that the teachers obtain the skills needed to efficiently incorporate the technology in the curriculum, the school administrators must provide opportunities to make this possible. The educational administration has to find creative alternatives which allow the teaching staff to find time to take part in workshops, conferences, courses, and working parties (Byrom 1998; Ertmer 1999).

Another barrier closely related to the availability of time is the need that the teaching staff has for professional development. The educational systems have to consider and develop long-term professional development programmes. The schools that only give sporadic or infrequent consideration to professional development will not have the ability to deal with educational reform (Bybee and Loucks-Horsley 2000). Moreover, this professional development should not only look to improve the technological skills of the teaching staff but also their pedagogic skills (Dwyer 1994). In fact, the use of training programmes based on tutorship or coaching in the school are often effective in increasing the incorporation rate of technologies in the classroom (Pedroni 2004).

The final first-order barrier that educators face is the lack of support for the incorporation of technology. One of these is administrative resources. The administrators should have an idea of the way in which technology influences the pedagogic processes in their educational systems (Roberts 1998), and consequently, administrators should spend a large part of the school budget (approximately 30%) on the technological and pedagogic development of the teaching staff in order to achieve their educational objectives (Byrom 1998).

As well as administrative support, the teachers need to have support staff *in situ* in order to make the incorporation of the technology in the curriculum easier. Although these posts have been quite common in the school systems over the last 20 years, the matter of funding and badly defined roles have, however, hindered the use of these positions. Regardless of the problems that have occurred in the past, the existence of staff *in situ* has been considered a necessary factor to overcome the first- and second-order barriers for the incorporation of technologies in education (Hofer, Chamberlin y Scot 2004). Among the varied nomenclature used to refer to this figure are terms such as computer coordinator, information technology coordinator, technology facilitator, educational technologist (Hofer et al. 2004) or, as it is known in Andalusia (Spain), ITC coordinator.

Marcovitz (1998) studied several of the roles that the ICT coordinator could play as a support for the incorporation of technology in schools. This way, he found roles such as curricular designer, politician, support technician and trainer. He also found that the coordinators can change teachers' beliefs with respect to the importance of technology in education. There are also more arguments that justify the importance of the coordinator. Brown (1998) said that the total dedication of the ICT coordinator to his/ her work increased the possibilities of achieving the incorporation of technology in the curriculum. Fuller (2000) found that the students' use of computers increases in accordance with the increase of technological and pedagogic support by the coordinators. Many other studies have also confirmed the potential of the ICT coordinator to make pedagogic reforms easier with the use of technologies that improve the teaching-learning processes (Hofer et al. 2004), as well as the importance of the quality of this personal technological support for an effective incorporation of technology in the everyday practices of the teaching staff (Dexter, Anderson and Ronnkvist, 2002). These same authors (Ronnokvist, Dexter and Anderson, 2000) recognized two types of support that the technological coordinator could carry out: support of a technical nature and

of a pedagogic nature. Technical support covers all aspects which refer to technology such as the working of the software, problem solving for hardware and software, which are not related to specific didactic methods. The pedagogic support refers to didactic strategies and to the implementation of diverse teaching methods. So, the coordinator acts as a trainer or energizer of the processes of the training of the teaching staff.

Hypothesis

The support and monitoring measures taken by the educational administrations, and organizational factors such as the training processes of the teaching staff planned by the centres, are going to determine the didactic use that is made of the technology. The analytical description of the didactic use and incorporation of computing and telematics in the teaching-learning processes in the context of the ICT centres, as well as their determining factors, will allow us to draw up reference indicators that let us assess the didactic use of ICT and suggest improvements in keeping with the present situation.

2. THE RESEARCH DESIGN

Objectives

The objectives that this research intends to achieve are directed towards describing the current situation as regards the use of technological resources in the ICT schools in Andalusia in order to analyse the overall viability of these programmes and their effect on the day-to-day running of the centres. The aim is to obtain information to contrast the degree of implementation of the new free software resources in the ICT schools and their impact on the teaching-learning processes that take place directly in the classrooms.

These objectives specifically fall within the National I+D Programme (2004-07) in the National Programme of Social Science of the Spanish government's Department of Science and Education, and in particular they meet the "didactic, methodological, and technological components of the

teaching-learning programmes", as well as the research area "new information and communication technologies throughout life", "learning in virtual contexts", open and distance teaching-learning"… Specifically, the objectives of this research are the following:

- Describe thoroughly the current situation as regards the use of technological resources in the ICT schools in order to analyse the overall viability of these programmes and their effect on the day-to-day running of the schools.

- Obtain information to contrast the degree of implementation of the new free software resources in the ICT centres and their impact on the teaching-learning processes that take place directly in the classrooms.

- Analyse first-order factors such as the support measures of government administrators for the monitoring and development of the programme.

- Identify reference indicators and suggestions for a critical and pluralist didactic incorporation of the information technologies in the educational field.

Sample

This research was made with the first Andalusian Centres in order to have an approximation of the effects of the program implemented by the Counseling of Education Andalusian. The area where the investigation was carried out was in fact made up of Andalusian «ITC centres» for the first promotion in 2003; equivalent to 50 Andalusian centres, 14 of which were Infant, Primary and Secondary schools.

Our study has been applied to the practice of 800 teachers from 16 schools chosen at random, which all participated in the first round of ITC projects. Five of them are Infant and Primary schools and the other 11 are Secondary schools.

There is a certain bias as regards the greater proportional attendance in Infant and Primary schools (31% of our study versus 28% of the whole sample), which we have rejected, given that choosing another Secondary school at the expense of a Primary school would have potentially meant a

biased sample as well (in this case in favour of Secondary schools). For many reasons (most of them logistical) we could not extend the sample to more than 16 centres.

Methods of gathering information

For this type of evaluative research, descriptive methodologies are the most appropriate when we want to understand a specific social phenomenon in all its complexity. The survey (see Appendix at the end of the document) is to be used as the main methodology, given that our principal aim is to describe the present situation as regards the use of the technological resources in the ICT schools, as previously pointed out. As a method of research, the survey can answer questions in descriptive terms, as well as in the terms of the links between variables, with the final aim of describing a situation, identifying practices, patterns of conditions and actions, and establishing links between events (Buendía 1997). In this study, we will complement them with group interviews and discussion groups (Rincón and others, 1995) that will allow the qualitative and precise expression of the information gathered through the first methods, with confirmation and triangulation of the information serving as a contrast. On the other hand, we will make use of content analysis for the analysis of documents, analysing and interpreting the information found in the organizational documents of the centres dealing with the introduction of ICT in these schools. Also, and complementary to the previous, we will make use of observational methodology, as a procedure to get the meaning of particular behaviour in its natural context, with a rigorous inspection of this behaviour. The analysis of the availability and use of the computer and online resources in the ICT schools will be carried out through systematic observation, in a non-participative way, achieved through control lists and ranking scales. Finally, we have to specify that for the analysis of the surveys we have used the SPSS 11.0 package, while for the qualitative analysis we have used HiperResearch software.

Dimensions	Variables of the study	Instruments	
Infrastructure and technical package/ funding	Project gestation and design. Project development. Resources and organizational obstacles. Organizational measures.	Document analysis. Teaching staff questionnaire.	Discussion group for teachers
Educational implementation of free software	New free software resources in the ICT centres and their impact on the teaching-learning processes that take place directly in the classrooms.	Teaching staff questionnaire. Observation scale. Interviews.	
Process of didactic innovation and teaching staff training	Role of the school management team, the coordinator, the teacher training centres, the teaching staff, innovation projects, involvement in the centre's projects and curriculum, educational training models…	Interviews with the school management team. Teaching staff questionnaires. Document analysis.	

However, given the natural limitations of any periodic publication and the aims set out in this article, we present the most important information from the surveys and discussion groups. As regards the survey format, it is easy to complete and contains 41 yes/no questions.

On the other hand, we have considered the discussion group as "a carefully planned conversation, designed to obtain information about a specific area of interest, in a permissive, non-managerial atmosphere; carried out with around seven to ten people, guided by an expert moderator" (Krueger 1991, p. 24).

Categories	Subcategories	Description
- Determining factors. Administration	Inflexibility of the project	In the first call for projects for the ICT schools, the equipment supplied and the number of classrooms to fit out were predetermined (1 PC for every 2 students) without paying attention to the contextualized need of each centre.
	Role of the coordinator	Although the role of the project coordinator of the ICT schools is defined as a didactic energizer, the overload of technical work prevents the development of this role.
	Support of the Administration	With reference to the lack of support and involvement of government administrators in the development of the project
	Lack of incentives	The ICT projects require an effort on the part of the coordinators and teachers, either time or training, which needs to be recognized or encouraged.
	Support of the CGA (Advanced Management Centre)	The support of the CGA has been decreasing in effectiveness and speed since it began to the present day.
	Centralized management of the system	Citing security problems, the management of the computer system is controlled by the CGA, without allowing the teachers any margin of control.
	Teaching staff turnover	The constantly changing work force limits the continuity of the working parties.

For the carrying out of the discussion groups, we planned a first meeting which, although originally designed to be held with the headmasters, the ICT coordinators and the researchers of that study, was in some cases attended by others involved with the setting up and development of the ICT plan, as is the case of some heads of studies, school secretaries, or the first ICT coordinator, as well as the other previously mentioned members (headmaster and coordinator of the school) of the plan. Although there were many work sessions and topics dealt with, we select those aspects that led to most discussion and debate.

3. DISCUSSION

The first question put to the teaching staff concerned the regular use of the computer in the classroom. In answer to this question, the majority of the teaching staff stated that they regularly used computers in class (62.8%) as opposed to a third of the teaching staff who indicated that they do not regularly use them (37.2%).

The next question was aimed at discovering the evolution in the use of the computer in the classroom on the part of the teacher, and to achieve this we asked about its use from 2000 to 2005. The analysis of the information gathered by this question allows us to state that there has been a continuously progressive increase in the use of the computer from 2000 to 2005. Specifically, if we look at the percentage of those who stated that they used ICTs daily or at some time during the week, we will see that in 2000 it was 9.2%, in 2002, 12.7%, in 2003, 33.5%, in 2004, 61.5% and in 2005 76.9%. As we can see, starting from the large-scale incorporation of computers in these centres in 2003, after the initiatives taken by the Andalusian Provincial Government, there was a sharp growth in the regular use of computers in the classroom.

Regarding organizational changes in the schools, the greatest repercussions are seen in the collaboration between the teaching staff, the communication between teachers and in other activities in the institutions. Only minor repercussions have occurred regarding collaborative work with parents and communication with parents. Specifically, 69.7% think that

collaboration between the teaching staff of the schools has improved; 60% that other activities in the institutions have improved; 50.7% that there has been an improvement in communication between teachers. In contrast, only 17.5% are of the opinion that communication with parents has improved, and 11.3% that there has been an improvement in collaborative work with parents. Another aspect, communication with the school management team, has improved according to 40.9%.

Improvements within educational centres
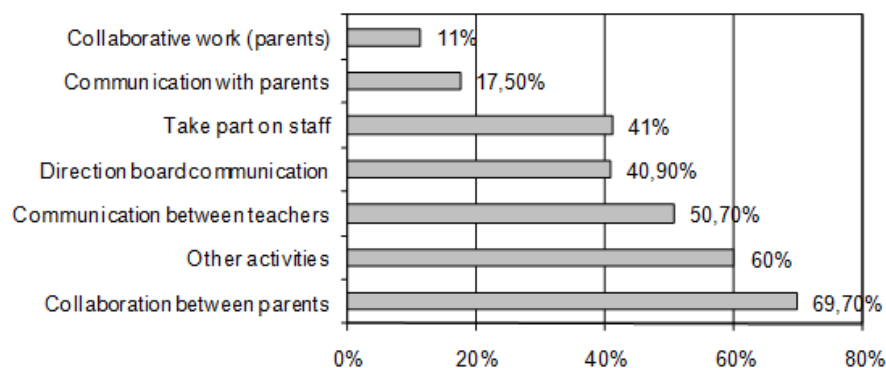
In In this research project, we thought it would be interesting to discover whether the presence of computers in institutions has led to an increase in the making of materials by the teaching staff adapted to these new media. When we asked if they develop or design any type of material, only 14.8% said that they did. Of those that design some type of didactic material, 41.2% design web quests, 39.7% design web pages, and 33.8% design presentations. We have to bear in mind that these figures are based on only 14.8% of the teaching staff, so there are relatively few teachers who produce their own didactic materials.

One of the most obvious effects of the presence of computers in schools has been the increase in the number of teaching staff involved in training programmes. In this sense, we can emphasize the fact that although the percentage of teachers involved in training programs has increased steadily every year since the beginning of the period we are studying, there has been a sharp increase since computers have been incorporated in academic establishments. If 69.4% of the teaching staff were involved in some kind of training programme in 2000, then in 2002 this figure was 78.6%, in 2003 (coinciding with the start of the plan) 91.8% of the teaching staff took part in training programmes, 93.1% in 2004 and 92.4% in 2005.

Progress in the participation of training activities
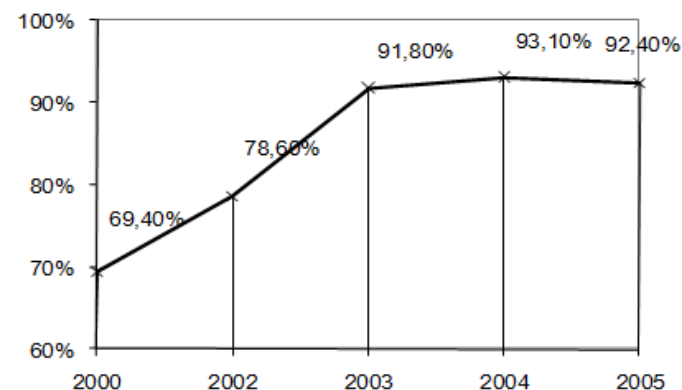
As regards the training methods, we can point out that in 2000 and 2002 the training was, above all, autodidactic (23.4% and 26.6%) and through the Teacher Training Centre (17.4% and 25.7%) respectively, while at the start of 2003 training through Teacher Training Centre courses increased (48.4%), autodidactic training continued (36.8%), and in comparison to previous years there was a considerable increase in training methods carried out in the institutions (35.9%). In 2004, the method of training courses in the institutions was consolidated at 50%, equalling the training courses of the Teacher Training Centre (50.7%). The level of autodidactic training also stayed quite high (44.4%). In 2005, this trend continued, reaffirming the method of training in the academic establishments as the most widely used (50.7%), followed by the two we have previously mentioned: autodidactic training (49.7%) and courses in

the Teacher Training Centre (41.4%). The other training methods (courses with an online component, external courses, and innovation projects) show more incidental figures which range between 3% and 23.4%.

Progress in the types of training activities
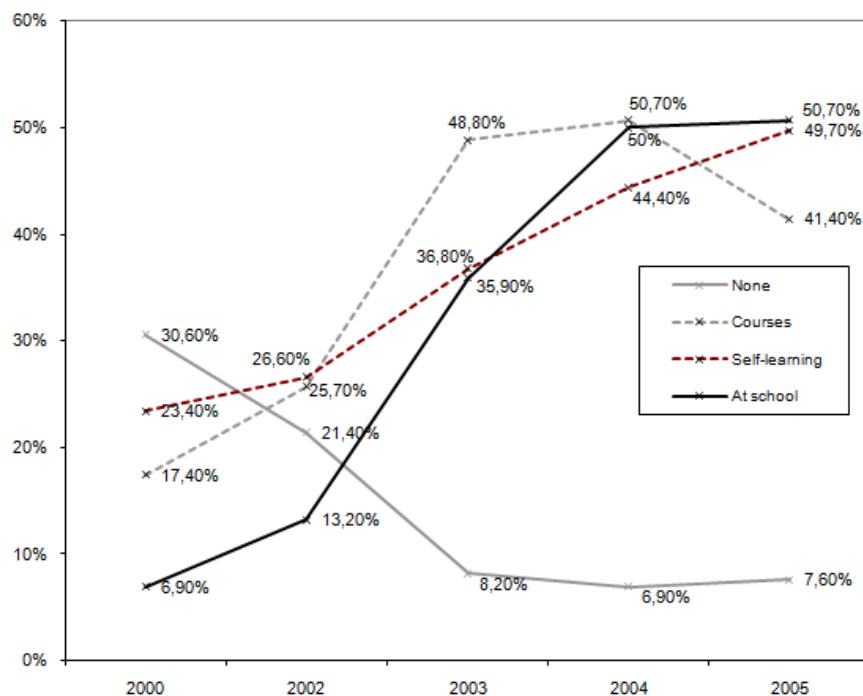
The The involvement of the teaching staff in training activities is affected by other aspects such as the length of time in the institution. As we have previously pointed out, the percentage of teachers who have been in the educational centre for an intermediate period (3-6 years) is higher than that of teachers who have been in the school for a shorter period of time (less than 3 years), although only slightly higher than teachers who have been there for more than 6 years. Therefore, we can confirm that this period (between 3 and 6 years) is one in which the teaching staff is very

active in training programs, as well as in ICT use. Likewise, age proves to be a factor that influences the involvement of the teaching staff in training activities for computer use, the percentage of teachers over forty-five being higher (92.3%) than that of younger teachers; as we go down the age scale, the figures also descend. Consequently, we imagine that these figures are due to the fact that older teachers need training in the technical and didactic use of ICTs. In the same way, we find that younger teachers are those that most use online training methods.

X^2; p<0.05	Length of time in the institution.			Employment situation.	
	Up to 3 years	From 3-6 years	6 years or more	Supply teachers	Permanent staff
Have taken part in training programs	72,9%	96,8%	96,1%		
Are still training	86,2%	98,4%	96%	75,9%	96,3%
Are training in the institution				36,2%	53,5%

The constantly changing staff in the institutions is one of the topics that really provokes most debate in the discussion groups. As we have shown, it is one of the factors that affects the development of the programme, specifically the use that the teachers make of ICT and their involvement. One of the arguments put forward is that the processes of professional development based on working parties (of the department or subject) are hindered in some way by the break-up of these groups due to the movement of supply teachers. Therefore, the members of these groups varies, which has a negative effect on the continuity of collaborative work. It seems that this situation could reduce the motivation of some of the workmates who continue in the school. On the other hand, this movement also hinders the incorporation of new teachers into the working parties as this lack of stability in the institution does not allow them to learn either how to didactically use ICT or to bring knowledge to the project.

Another important thing is the stability of the institution. My school, as it is new, is tiny- I am lucky in that I don't have as many classes as some others have. In this sense I am privileged but we do have the disadvantage that every year 50% of the teaching staff change, at least 50%. [Example (elementary level teacher interview)].

Faced with this problem, the heads of the institutions choose to ask the Provincial Education Department for the continuance of a certain number of supply teachers to allow them to maintain the continuity of the working parties formed. Discussion groups have put forward solutions, such as the creation of a certain number of specific posts for these institutions. This measure seems to be quite valid, at least for the period of the curricular incorporation process of ICT in the educational establishments.

4. ADMINISTRATION SUPPORT MEASURES

Among the measures that government administrators will take, we find repeated references to the assessment and updating of projects. To begin, we find a question related to the design of projects. In this sense, the first schools did not have the opportunity to design anything; the ICT plan was conceived in advance as a measure that involved the incorporation of a computer for every two students in every classroom starting from the second stage of Primary Education. This type of predetermined plan did not allow the choice of different organizational models for these resources or of classrooms suited to the functional needs of the institutions or of methodologies for the work planned. On the other hand, the institutions lacked experience in this field and, therefore, they lacked references that would have allowed them to design projects adequately suited to their needs, expectations and innovative ambitions.

As you have already said, there are more options now, but the first year, and that is the problem, they split up all of the classrooms, all of the classrooms with that material and that is what we have. I think that this has improved a lot as now we can at least choose. [Example (teaching manager interview)].

The schools, as well as lacking a design in advance of the ICT project, have not, in general, been supervised or assessed by school inspectors, which has led to a feeling of confusion and dissatisfaction tied to a sense of being abandoned by the Administration. What the discussion groups call for is an internal and external assessment of the ICT schools' projects and for the consideration of improvement plans in relation to the results with the support of the Administration. In short, it is about truly incorporating the ICT project in the PEC (School Educational Program), making it a living medium which can be developed and adapted to the characteristics and needs of the school.

Do you know what the problem is? That the Administration gave us the equipment and then forgot about us. They said, "What do you want? Computers? Well, here are your computers... What I'm saying is that I don't know of any school that has been visited by an inspector. [Example (teaching manager interview)].

One of the most common suggestions for improvement is the continual maintenance of the programs and the equipment. Technical assistance is essential in order to give the coordinator time which can be devoted to energizing working parties and taking a leadership role within the projects. Without this condition, the projects are pedagogically neglected and, as a result, it will be difficult to achieve the basic objectives of these projects:

Yes, this is true, the role of the coordinator was initially defined as an energizer, and really in the first year she didn't energize much, at least not in my institution, and you know Lourdes and how dynamic she is, but she didn't energize much because her time was taken up by technical problems, updating… maintenance [Example (elementary level teacher interview)].

It is evident that there is a certain caution on the part of the discussion groups when putting forward solutions such as those related to the technical maintenance of the systems. Mainly they highlight the need for a technical assistance that regularly makes sure that the equipment is working properly. The gradual deterioration of the equipment accumulates, and this affects the impetus of the teaching staff to make the most of these materials. We believe that some educational establishments, especially Secondary schools with a lot of equipment and the consequent technical

problems that result from this equipment, should have a technical maintenance staff member.

One of the main worries that the coordinator and the head of the schools have is that of updating the equipment. They are worried that the old equipment supplied at the beginning of this ICT plan will not be able to support new program developments as, in many cases, in addition to lacking the quality needed, it has become obsolete:

> I think that they will have to update the equipment because as soon as they update the software again it will not be compatible with the equipment we have… [Example (head of teaching team interview)].

Given the fundamental role that the ICT coordinator has in the project, this role urgently needs to be defined clearly and given the corresponding recognition of the Administration. The discussion groups suggest various measures. One is a greater reduction in teaching hours. Nevertheless, we need to bear in mind that these suggestions have to be seen within the framework of the coordinator's present situation. We refer to the excessive technical maintenance workload that the coordinator has to deal with. This situation has also led the groups to think about the creation of ICT teams which will share the responsibility of this technical work.

Another measure that is thought to be appropriate, in recognition of the coordinator, and also to strengthen the development of the project, is to include the ICT coordinator in the school management team, a measure that appears to be under consideration in the Andalusian Education Law. It is thought that this measure will strengthen the project, as it will have the support and impetus of the school management team.

> Thirdly, the ICT coordinator should be a part of the school management team... because the headmaster and the school management team have to be closely involved in this project and often this is not the case. Therefore the solution is to make the ICT coordinator a part of this management team. [Example (head of teaching team interview)].

The set-up plan became a determining factor in the subsequent development of the project. The truth is that such a plan did not exist. Simply the network and the equipment along with its programs were installed, conditioned by the official start date of the course, a date by which everything had to be installed. This brought with it a number of oversights in the installation of the wiring and other devices that led to a series of predictable problems.

One of the solutions put forward for solving the problem of the unstable workforce and the lack of involvement of the teaching staff is that of a set number of permanent staff for the ICT schools. This measure would allow the supply teachers that arrive at the school to become involved in the project, supporting and giving impetus to the work of the teachers' groups.

> I don't know whether there is any solution to the problem of teachers coming and going from the schools, but at least there is a solution for the supply teachers that come to ICT schools, or at least for those that have specific training. Because there are people who are not in ICT schools who are desperate to be there. [Example (teaching manager)].

The inadequate installation of wiring and the resulting distribution of furniture, which limits the range of work dynamics in the classroom associated to the mobility of tables and chairs, have led the discussion groups to call for the installation of wireless connections. However, it seems that this technology is not sufficiently developed:

> As regards space, they are now using a wireless internet connection, but it doesn't work. In the latest schools things are beginning to work, late, but at least they are starting. But the power supply can't be made wireless. So, I think they will have to come up with a system in which the desks are not fixed to the floor with cables. What I mean is that there are not so many cables in the way. The problem is that you can't move the desks where you want... [Example (head of teaching team interview)].

5. CONCLUSIONS

According to the results obtained, some of which we have highlighted here, it is evident that plans like the one that the Andalusian autonomous region has implemented cannot be limited to providing material, furnishings and technical support. On the contrary, it should also anticipate the design and setting up of a logistics system that enables the development

of innovative projects. This therefore confirms the hypothesis proposed that the success of these types of interventions is determined by the correlation of various aspects, not only in the basic supply of material in educational centres, as great as this may be.

Some of the reasons that we can draw from this study and which confirm its hypothesis, is that this measure, technical in its appearance yet pedagogical in its essence, can be improved with mechanisms (of an administrative, economic, personal, educational and complementary nature) that enable the involvement of the teaching staff and encourages their enthusiasm in their dedication to the results, thus establishing, for example, a formula that enables an authentic professional career.

The success of the measures promoted by the Andalusian government for the rapprochement of a society of concrete knowledge in «ITC centres» only makes sense if the ITC centres are integrated normally into the life of other educational centres by means of innovative projects that imply a progression of teaching and learning processes. This should be created naturally and not using shock tactics by providing extensive technology, which in any case lead to conflicts and organised chaos due to the lack of projects that really incorporate technology into the teaching syllabus and education system.

Promotional measures require support programmes. The teaching staff makes a great effort, but nonetheless with the lack of incentives, stimulation and support from administration; we run the risk of deteriorating the teachers' involvement to the point of extinction.

From this perspective, we suggest some of the implications that arise from this study in two sections.

Implications at an institutional level

1) The projects for a didactic, objective and pluralist incorporation of information technologies in the education field must be the result of the initiative of the school management team, as well as, at least, of a group of teachers that is convinced of the initiative, and have the support of the Administration and the staff.

2) The school's previous experience in educational innovation projects is a factor which has been shown to be fundamental in order to make the most of these projects. These initiatives usually have similar background experiences although of less importance.

3) We follow the pedagogic precept that states that innovations, due to their very nature, must come from within the institution, never from the Administration, although the Administration should supply resources which make this easier (Hernández et al. 1998).

4) The ICT project, like any curricular project, should respond to a set-up plan that would start with the design of the project in relation to a definition of the types of resources (technical characteristics), the number of computers and classrooms, the organization of the furniture in the classrooms, a maintenance plan, a training program for the teaching staff… All of this based on a defined but flexible model of planned didactic use which should be an underlying organized reflection of the objectives of the use of ICT and the ways in which these can be achieved.

5) Among the teaching staff, contradictory reactions can be found, from teachers who receive the initiative with enthusiasm and optimism, to those who react to the change with confusion and rejection tied to a general uncertainty, and finally those who adopt a sceptical attitude. These projects are normally developed thanks to the drive of a small group of workmates who, with their effort and usually led by the ICT coordinator, disseminate and propagate actions and experiences that end up becoming widespread.

6) A change is taking place, from individual coordination to the development of collegial coordination as the agent of the Project development. The disproportionate workload of the ICT coordinator, dedicated to technical tasks to the detriment of pedagogical tasks, has led to the schools themselves, faced with the lack of support from the Administration, coming up with their own solutions supported by student volunteers and workmates. This way we have arrived at models

of collegial coordination called 'ICT commissions', made up of students, platform committee, web page committee, coordination and resource working parties…

Implications at an Administration level

1) To consider the success of the measures taken by the Andalusian Provincial Government to bring us closer to a society with specific knowledge by means of ICT schools plan, it only makes sense to take into account the point to which ICTs are incorporated in a normal way into the everyday life of academic establishments. Without doubt, this is a natural process that should not be forced. Otherwise, the shock of students seeing classrooms full of computers on their return from holidays can lead to anxiety, fear or phobia, uncertainty, hopes, etc.

2) A project of this nature requires a monitoring policy. The teaching staff has put in a lot of effort, both in and out of school, motivated by their professionalism and often working outside their stipulated timetable. However, due to the lack of incentives (not economic but time considerations), encouragement and support on the part of the Administration, the risk is that the teaching staff involvement will wane. Projects like this one cannot only be limited to supplying materials, equipment, furniture and technical support. They should also plan the design and set-up of a logistical system that makes the development of innovative projects easier.

3) The figure of the ICT coordinator as energizer of the processes of didactic innovation is essential and indispensable for the impetus of these projects. However, the lack of support, resources and monitoring measures has corrupted the role of the coordinator, and his/her work mainly tends towards technical assistance to the detriment of energizing working parties. This situation leads to disillusionment and in "many cases" the coordinator to give up this post. Due to this, steps need to be taken such as the creation of the post of computer maintenance technician, as well as making the ICT coordinator a part of the school

management team, and the consideration of a reduction in teaching hours so that these coordinators can devote their time to the tasks that this post was created to deal with. Likewise, the important role of the ICT coordinators and the complexity of their duties oblige the Administration to plan a system that provides these people with the necessary skills to carry out their work. This is an important aspect that cannot be left to the good will of those workmates who have a certain level of computer skills. This willingness to help must, at least, involve the collaboration of these teachers in training programmes which are systematized and regulated by the Administration, either through the Teacher Training Centre, working parties or in collaboration with specialized university departments.

4) The job instability of the staff is another factor that determines the progress of the project. The processes of professional development based on working parties (area or department) are slowed when these groups are broken up due to the internal transfer of staff, which brings with it a drop in motivation of those workmates that continue in the school.

5) The assessment and monitoring of the projects is a fundamental aspect for the improvement and growth of these projects at a teaching level as well as at an organizational and administrative level. In this regard, many educational establishments have felt neglected and 'abandoned' due to assessments which lack the rigor that these expensive projects deserve, and due to the lack of committed improvement plans. On the other hand, this situation seems understandable if there is no assessment system with qualified staff to carry out valid, reliable and constructive assessments. It might be appropriate to strengthen the ICT inspector's role and his/her specialized training, which would allow the inspectors to assess the ICT projects with firm criteria.

6) The presence of ICT in its different formats involves the need for a new spatial organization allowing for the full use of its didactic possibilities but without affecting other appropriate dynamics. Nevertheless, there has been an improvement with respect to the supply of equipment and

materials thanks to a more flexible policy which supplies equipment and materials that the institution needs, adapted to the requirements set out in the ICT project.

7) The creation of a centralized and updated software database must be one of the basic pillars of the impetus behind ICT in educational establishments. This is an initiative that, although a little late, is now being developed by the Administration.

8) The development of new materials which are adapted to the institutions and the students is an essential aspect in order to make the most of ICT. There are many available materials, but only a few that are suited to real needs. The computer programs designed for the creation of didactic material make these tasks easier, but on the other hand, they need an additional commitment not considered in the educational organization. The agents of the ICT projects emphasize the need to encourage, in some way, the development of materials, at least until production systems are established (an aspect linked to the gradual improvement in the skills of the teaching staff with these tools), and until the schools are provided with sufficient materials.

9) One of the main values and appeals of ICT is its communicative potential. However, this potential is not being taken advantage of sufficiently. ICTs, in themselves, allow unprecedented professional development. The growth of these projects, taking into consideration the aforementioned, will be quicker insofar as, and with the support of new technologies, the Administration promotes the spread of teaching staff networks (Ely 1995; Gairín 2000; Kagel 2003) from different schools, and with different roles, whether they are advisors, ICT coordinators, disciplinary or interdisciplinary working parties, material developers, etc.

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Resumo: O trabalho que se apresenta integra o projecto "Observatics: the implementation of free software in ICT centres in Andalusia: na analysis of its effect on the teaching-learning process" e tem como objectivo descrever o mais recente impacto das tecnologias de comunicação *online* na educação no contextos dos centros TIC da Andaluzia (Espanha), decorrentes do investimento em grande escala de tecnologias para a educação primária e secundária. Combinando métodos quantitativos e qualitativos, o estudo aponta no sentido de que a presença das TIC nos centros educacionais a frequência de uso dos computadores aumentou juntamente com uma expansão da formação dos professores no sentido da promoção de modelos de aprendizagem contextualizada. A investigação dos factores mais relevantes por detrás do sucesso do processo de instalação de computadores em grande escala, são apresentadas um conjunto de recomendações no sentido de maximizar o potencial destes recursos tecnológicos

Palavras-chave: Formação de professors, TIC, Educação Primária, Educação Secundária.

Texto:

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- Aprovado: Maio de 2010.

MINISTERIO DE EDUCACIÓN Y CIENCIA

Universidad de Huelva

@gora

Questionnaire for teaching staff
Free software implementation in Andalusian ICT centres
Analysis of teaching and learning processes impact
Ministry of Education and Science – (Plan Nacional I+D 2004/2007) – Proyecto I+D SEC2004-01421
GRUPO ÁGORA - UNIVERSIDAD DE HUELVA

Dear teacher,

The main aim of this investigation is to get to know the impact of using free software in learning and teaching processes in Andalusian ICT centres. Your centre has been chosen for being a pioneer using ICT in Andalusia.

We need to count on your support so that this project's results are useful and so that we can share them with you afterwards. For this reason we would earnestly appreciate you answering the following questionnaire truthfully. We obviously guarantee anonymity in your answers and thank you in advance for your collaboration in this project.

Centre	
City	

1. TEACHING STAFF DETAILS

1.1. Stage which you teach:

☐	Second stage of Primary Education
☐	Third stage of Primary Education
☐	First stage of Secondary Education
☐	Second stage of Secondary Education
☐	College
☐	Vocational courses
☐	Others

1.3. Administrative situation :

☐	Acting teacher
☐	Civil servant

1.4. Teaching experience (years): [ ]

1.5 Age (years):

1.2. Subjects you teach more hours(say which ones]):

1.6. Years working in this centre:

1.7. Gender:

☐	Male
☐	Female

1.8. Have you got a computer at home?

☐	Yes
☐	No

1.9. Have you got Internet access at home?:

☐	Yes
☐	No

2. ICT RESOURCES AT THE CENTRE:

2.1.. What is your level of satisfaction Please mark with a cross (0 lowest level of satisfaction and 5 the highest):

		Level of satisfaction					
Network	Speed	0	1	2	3	4	5
	Stability	0	1	2	3	4	5
	Security	0	1	2	3	4	5
IT equipment	Tower (CPU)	0	1	2	3	4	5
	Laptops	0	1	2	3	4	5
	Monitors	0	1	2	3	4	5
	Printers	0	1	2	3	4	5
	DVD drives	0	1	2	3	4	5
	Centre Server	0	1	2	3	4	5
	Junta Server	0	1	2	3	4	5

3. DIDACTIC USE OF ICT

3.1. Do you use ICT regularly in you classes?

☐	Yes
☐	No

If you answered "no" g to section 6.

3.2. What has you personal progress using TISs in class been?:

	2000	2002	2003	2004	2005
Never	☐	☐	☐	☐	☐
Occasionally	☐	☐	☐	☐	☐
At least once a month	☐	☐	☐	☐	☐
At least once a week	☐	☐	☐	☐	☐
Daily	☐	☐	☐	☐	☐

3.3. What school year and subjects do you use the IT resources in at present? (State all the school years and subjects you teach and their use and frequency):

School year	Subjects	I don't use it	Daily	At least once a week	At least once a month	Occasionally	Never
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐

3.4 Asses the organizational change that computers have made in your Centre:.

In the classroom	It has improved	It has worsened	Indifferent
Communication among the students	☐	☐	☐
Teacher – student communication	☐	☐	☐
Group dynamics	☐	☐	☐
Atmosphere in the classroom	☐	☐	☐
Students participation	☐	☐	☐
Individual work	☐	☐	☐
Other learning activities (specify)	☐	☐	☐

In the centre	It has improved	It has worsened	Indifferent
Communication among teachers	☐	☐	☐
Communication with parents	☐	☐	☐
Communication with the management team	☐	☐	☐
Staff participation	☐	☐	☐
Collaboration among staff	☐	☐	☐
Collaborating duties with parents	☐	☐	☐
Others (specify)			

3.5. Put in order the reasons why you use ICT (1 the most important and 5 the least important)

☐	Practise skills
☐	Learning reinforcement
☐	Work in co-operation with other centres
☐	Search for information
☐	Others (specify)

3.6. Has the incorporation of ICT resources in your classroom generated a change in the methodology you use?

☐	Yes, always.
☐	Yes, depending on the subject
☐	Sometimes.
☐	No

3.7. If you answered "yes" to question 3.6., say how your methodology has changed:

3.8. Mark the frequency with which you use each of these applications:

	Level of use					
Webquest y Treasure Hunt	0	1	2	3	4	5
Web-blog	0	1	2	3	4	5
Presentations	0	1	2	3	4	5
Tutorials	0	1	2	3	4	5
Image creation programme	0	1	2	3	4	5
Educational games	0	1	2	3	4	5
Practice	0	1	2	3	4	5
Simulation	0	1	2	3	4	5
Cooperative learning projects	0	1	2	3	4	5
Other appliactions:	0	1	2	3	4	5
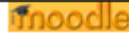
Please, mark with a cross (0 is the lowest level of use and 5 the highest)

4. USE OF THE EDUCATIONAL PLATFORM

4.1. What educational platform do you use in your centre?

E-ducativa	Moodle	Interact	Pasen	Seneca	Others

4.2. Which ones do you use and what is your level of satisfaction regarding these platforms?

		Not used	Used					
			Level of satisfaction					
E-ducativa		☐	0	1	2	3	4	5
Moodle		☐	0	1	2	3	4	5

4.3. Do you upload materials to the platform?:

	Yes
☐	
☐	No

			0	1	2	3	4	5
Interact	interact	☐	0	1	2	3	4	5
Pasen	Pasen	☐	0	1	2	3	4	5
Séneca	SÉNECA	☐	0	1	2	3	4	5
Other portals (please specify):		☐	0	1	2	3	4	5

Please mark with a cross (0 is the lowest mark and 5 the highest)

4.4. Give a mark to the platform you use more often. *Please mark with a cross (0 is the lowest mark and 5 the highest)*

	Not used	Used					
		Level of satisfaction					
Browsing	☐	0 1 2 3 4 5					
Easy to use	☐	0 1 2 3 4 5					
Visually attractive	☐	0 1 2 3 4 5					
Materials organisation	☐	0 1 2 3 4 5					
Communication with students	☐	0 1 2 3 4 5					
Cooperative work tools	☐	0 1 2 3 4 5					
Tools for communications between students	☐	0 1 2 3 4 5					
Tools for the students to organise their work	☐	0 1 2 3 4 5					
Types of materials on the platform	☐	0 1 2 3 4 5					
Others (please specify)							

5. FREE SOFTWARE EDUCATIONAL APPLICATIONS

5.1. Mark your satisfaction regarding the following tools:

	Not used	Used — Level of satisfaction					
Hotpotatoes	☐	0	1	2	3	4	5
Clic	☐	0	1	2	3	4	5
Openoffice	☐	0	1	2	3	4	5
Composer	☐	0	1	2	3	4	5
GIMP or image editor	☐	0	1	2	3	4	5
Impres	☐	0	1	2	3	4	5
Mozilla	☐	0	1	2	3	4	5
Evolution	☐	0	1	2	3	4	5
E-ducativa	☐	0	1	2	3	4	5
Moodle	☐	0	1	2	3	4	5
Interact	☐	0	1	2	3	4	5
Pasen	☐	0	1	2	3	4	5
Séneca	☐	0	1	2	3	4	5
Andared	☐	0	1	2	3	4	5
Others (please specify):							

Please mark with a cross (0 is the lowest level and 5 the highest)

5.2. What is your level of satisfaction with the following applications?

	Not used	Used — Level of satisfaction					
Practice	☐	0	1	2	3	4	5
Presentations	☐	0	1	2	3	4	5
Educational games	☐	0	1	2	3	4	5
Educational platforms	☐	0	1	2	3	4	5
Webquest	☐	0	1	2	3	4	5
Treasure hunt	☐	0	1	2	3	4	5
Browsers	☐	0	1	2	3	4	5
Tutorials	☐	0	1	2	3	4	5
Simulation	☐	0	1	2	3	4	5
Others (please specify):							

Please mark with a cross (0 is the lowest level and 5 the highest)

5.3. ¿Do you develop or design any free software?

	Yes	No
Develop	☐	☐
Design	☐	☐

5.4. If so, what kind of free software do you develop or design?

	Develop	Design
Practice (Clic, Hotpotatoes)	☐	☐
Presentations	☐	☐
Tutorials	☐	☐
Educational games	☐	☐
Webquest	☐	☐
Treasure hunt	☐	☐
Educational platforms	☐	☐
Webpages	☐	☐
Other applications (please specify):		

6. TEACHER TRAINING FOR THE USE OF ICT

6.1. After the approval of the ICT Project in your centre, have you participated in organised training activities?

☐	Yes
☐	No

6.2. How much do you know about and how important are the following didactic applications for you?

	Knowledge						Importance					
Information/data search on the web	0	1	2	3	4	5	0	1	2	3	4	5
Webquest	0	1	2	3	4	5	0	1	2	3	4	5
Treasure Hunt	0	1	2	3	4	5	0	1	2	3	4	5
Co-operative learning environments	0	1	2	3	4	5	0	1	2	3	4	5
Practice programmes	0	1	2	3	4	5	0	1	2	3	4	5
Evaluation pages	0	1	2	3	4	5	0	1	2	3	4	5
Tutorials	0	1	2	3	4	5	0	1	2	3	4	5
Digital video and diaporams	0	1	2	3	4	5	0	1	2	3	4	5
Multimedia presentations	0	1	2	3	4	5	0	1	2	3	4	5
Use of training platforms	0	1	2	3	4	5	0	1	2	3	4	5

Other didactic applications (please specify):

Please mark with a cross (0 is the lowest level and 5 the highest)

6.3. How much do you know about each of these tools? Please mark with a cross (0 the lowest level and 5 the highest):

	Knowledge					
Hotpotatoes	0	1	2	3	4	5
Clic	0	1	2	3	4	5
Openoffice	0	1	2	3	4	5
GIMP or image editor	0	1	2	3	4	5
Composer	0	1	2	3	4	5
Impres	0	1	2	3	4	5
Mozilla	0	1	2	3	4	5
Evolution	0	1	2	3	4	5
E-ducativa	0	1	2	3	4	5
Moodle	0	1	2	3	4	5
Interact	0	1	2	3	4	5
Pasen	0	1	2	3	4	5
Séneca	0	1	2	3	4	5
Andared	0	1	2	3	4	5
Others (please specify)						

6.4. How has the didactic use of ICT changed? Mark with a cross the activities that were carried out each year:

	2000	2002	2003	2004	2005
No training	☐	☐	☐	☐	☐
CEP courses	☐	☐	☐	☐	☐
Blended course	☐	☐	☐	☐	☐
Online course	☐	☐	☐	☐	☐
External course	☐	☐	☐	☐	☐
Self-teaching	☐	☐	☐	☐	☐
Innovation projects	☐	☐	☐	☐	☐
Training in centres	☐	☐	☐	☐	☐
Others (please specify)					

6.5. What is your level of satisfaction with the training in the didactic use of ICT you have received? (Please mark with a cross: 0 is the lowest level and 5 the highest):

	Satisfaction					
Through CEP	0	1	2	3	4	5
External courses	0	1	2	3	4	5
Blended course	0	1	2	3	4	5
Online courses	0	1	2	3	4	5
Self-teaching	0	1	2	3	4	5
Teaching innovation projects	0	1	2	3	4	5
Training in centres	0	1	2	3	4	5
Others (please specify)						

6.6. The training you have received about the use of ICT was based on (choose the three most significant ones):

☐	Theoretical and practical sessions with good professionals
☐	Good materials, well-illustrated and clear
☐	Acquiring knowledge and abilities to make the most of the ICT
☐	Theoretical mastering of author tools.
☐	Assimilation of suitable models of use.
☐	Simulations of the different models of use and materials
☐	Finding a model of use suitable for our programmes
☐	Develop our own models of use with the help of tutors
☐	In the debate and team work of our groups of teachers
☐	Reflection about the direction of innovation with the use of ICT
☐	Constant reflection about the effects of innovation
☐	Innovation that involves all the education fields and staff
☐	Others (please specify)

6.7. Mark the importance that the use of ICT in the centres has in an innovating process (Please mark with a cross: 1 is the lowest mark and 5 the highest)

	Importance
The staff	0 1 2 3 4 5
The administration	0 1 2 3 4 5
A group of teachers	0 1 2 3 4 5
The school council	0 1 2 3 4 5
Management team	0 1 2 3 4 5
Others (please specify):	0 1 2 3 4 5

6.8. Mark the three aspects that you consider most important in your training. (Underline them. Then in the left column mark 1 to 3 according to its importance):

☐	Theoretical and practical sessions with good professionals
☐	Good materials, well-illustrated and clear
☐	Acquiring knowledge and abilities to make the most of the ICT
☐	Theoretical mastering of author tools
☐	Assimilation of suitable models of use.
☐	Simulations of the different models of use and materials
☐	Finding a model of use suitable for our programmes
☐	Develop our own models of use with the help of tutors
☐	In the debate and team work of our groups of teachers
☐	Reflection about the direction of innovation with the use of ICT
☐	Constant reflection about the effects of innovation
☐	Innovation that involves all the education fields and staff
☐	Others (please specify)

7. STUDENTS' ABILITIES

7.1 Mark the abilities you think your students should acquire through ICT as a learning method (Please mark with a cross: 1 the lowest mark and 5 the highest)

	Mark
Know how to download software	1 2 3 4 5 6
Know the hardware, software and file formats	1 2 3 4 5 6
Know reliable information sources	1 2 3 4 5 6
Find information on the Internet (knowledge of search engines)	1 2 3 4 5 6
Digital organisation of information	1 2 3 4 5 6
File and information exchange	1 2 3 4 5 6
Team work through the Internet	1 2 3 4 5 6
Use of forums and chats	1 2 3 4 5 6
Knowledge of educational platforms	1 2 3 4 5 6
Information analysis and synthesis	1 2 3 4 5 6
Information spreading (website design)	1 2 3 4 5 6
Knowing how to surf the Internet and use the software	1 2 3 4 5 6
Generate ideas	1 2 3 4 5 6

8. ATTITUDE TOWARDS THE USE OF ICT IN TEACHING

8.1 To conclude, here are 30 statements. We would like you to mark them carefully (Please mark with a cross: 1 is the lowest mark and 5 the highest)

	Mark					
The access to ICT is a person's right	1	2	3	4	5	6
The use of ICT can bring us closer to knowing other cultures	1	2	3	4	5	6
Equality in the access to ICT can reduce socio-cultural differences	1	2	3	4	5	6
When they are used correctly, ICT can help us change humanity	1	2	3	4	5	6
They allow me to be connected with other people from other educational centres	1	2	3	4	5	6
I use them when I see that my colleagues use them and get involved	1	2	3	4	5	6
ICT make students communicate less	1	2	3	4	5	6
ICT do not live up to our expectations	1	2	3	4	5	6
They make class routine more stressful	1	2	3	4	5	6
They make it difficult to separate free time from working time	1	2	3	4	5	6
The Internet is a dangerous resource to be used by children	1	2	3	4	5	6
I do not use them and do not believe I will end up using them either	1	2	3	4	5	6
We can make ICT evolve at the service of values such as solidarity	1	2	3	4	5	6
I would use them if we previously thought about the moral sense we want to give their use	1	2	3	4	5	6
I always use them if we periodically evaluate their results	1	2	3	4	5	6
I always use them if we have a reasonable educational project in which we can integrate them	1	2	3	4	5	6
I use them if the school council gets involved in this decision	1	2	3	4	5	6
Before using ICT I prefer studying where this decision can lead us to	1	2	3	4	5	6
Using technological progress is good for education	1	2	3	4	5	6
I am one of the first people to use ICT in my classes	1	2	3	4	5	6
ICT make learning easier	1	2	3	4	5	6
The Junta de Andalusia should introduce ICT in every educational centre	1	2	3	4	5	6
Knowing ICT is essential in today's education	1	2	3	4	5	6
ICT are important to socialise	1	2	3	4	5	6
Using ICT in teaching makes active learning easier	1	2	3	4	5	6
With ICT we can learn through investigation and collaboration	1	2	3	4	5	6
With their use it is possible to create new innovating learning models	1	2	3	4	5	6
I would use them if I was taught how to do it	1	2	3	4	5	6
They allow me to learn from any place at any time	1	2	3	4	5	6
It is a fantastic excuse to professionally retrain	1	2	3	4	5	6

9. GLOBAL MARK

9.1 Mark from 1 to 10 your technical training in ICT

1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

9.2 Mark from 1 to 10 your didactic training

1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

9.3 Mark from 1 to 10 your centre colleagues' technical training in ICT

1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

9.4 Mark from 1 to 10 your centre colleagues' didactic training

1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Thank you very much for your collaboration