

Full Length Research Paper

Teachers' and students' thoughts on the integration of information and communication technologies (ICT) and its use in adult centres: The case of the Canary Islands

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This study presents the results of an investigation carried out with teachers and students of adult centres of the Canary Islands, Spain. The main goal of the investigation was to determine the opinions and the formation of both teachers and students about information and communication technologies (ICT) and whether they use these technologies in their daily life. For this purpose, two questionnaires were created, one for teachers and one for students, with some questions especially designed for each group and a common section for both groups. A total of 760 people participated in the study investigation to a total of 31 adult centres in the Canary Islands. Similarities and differences in their way of thinking about ICT were established from their responses to the common section, and this will help us to improve their teaching-learning process in adult centres of the Canary Islands, as well as to determine the necessary resources to implement some processes with technology.

Key words: Adult learning, lifelong learning, ICT.

INTRODUCTION

Into the 21st century, we have witnessed diverse changes in our society according to Drucker (1969). We are currently immersed in a society of information and communication (Castells, 2002) in which information is considered the greatest power one can achieve (Fontcuberta, 1992). Whoever has information will have power, but such information arrives through diverse channels, and we should be capable of analyzing it and turning it into knowledge (Ortoll, 2007). The development of our society has promoted the creation of information and communication technology (ICT), to which important changes are attributed (Castells, 1986).

As education is a part of society, it cannot be left behind, and we are therefore witnessing the introduction of technology in the classrooms (Hartley, 2007). Many teachers trained in ICTs are using them in their classes, training their students digitally to use and acquire them as a part of their lives, as well as promoting their use in open education (Nworie et al., 2012). Adult education cannot be left behind either. Although, adult students are very different from children and youth (Rodríguez, 2002), they should also be digitally trained to become familiar with and know how to use ICT (Area and Pessoa, 2012).

Therefore, in the adult centres of the Canary Islands

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(ACCI), some people, especially teachers, are involved in providing adults with the necessary competences in ICT material (Ertmer, 2005). But total integration cannot be achieved until we determine these people's opinions of this topic (Wengrowicz and Offir, 2013), which is the reason for this study investigation.

THEORITICAL FRAMEWORK

Development of ICT

Nowadays, technology, developed by the society of knowledge, is a prerequisite for the development of people and communities (Xiaoyan and Xiaoxia, 2011). According to Jiao and Miao (2010), this is the future, and hence, we should prepare to use it. It is constantly changing the way we learn, work, and live. According to Jiao and Miao, the computer is a synonym of technology, and we could not perform many of our current tasks without it. Teachers who have a computer in their classroom are better prepared, their syllabus is less restricted, and they hold personal beliefs related to constructivism (Ertmer, 2005). Clinton and Rieber (2010) also refer to constructivism, relating it to cooperative learning.

Not all teachers have this technology in their classroom but, according to Ertmer, this situation is beginning to change. As could be expected, education has also become involved in this change through the integration of ICT in the classrooms, progressively replacing traditional teaching (Hartley, 2007). For this purpose, diverse tools have been used, such as tablets, digital blackboards, and computers, all anchored to the Web 2.0., which also helps us to carry out open education (Jelfs and Richardson, 2013), offering many didactic possibilities (Palomo et al., 2008). The society of information introduced the concept of education for life, the need of formation and to continue learning (Yang, 2008). This topic has been extensively studied in various educational areas (Freitas et al., 2006).

The growth of internet and the development of ICTs have provided new learning environments (Gedik et al., 2013). In addition to the most well-known, face-to-face learning (Dawson et al., 2013), other types have emerged through the development of internet, such as mixed learning—which uses face-to-face learning and online learning—or online learning, which is completely distance learning. According to Gedik et al. (2013), mixed learning provides more interaction among the students, and the learning is much more flexible. Therefore, ICT can be used to improve the teaching-learning processes (Tsai, 2010).

Teachers' formation and role with regard to ICT

Diverse investigations (Barron et al., 2003) shows that

teachers are beginning to incorporate ICTs in their classes. Although their use is still not very common for all teachers, it is experiencing a slight increase (Ertmer, 2005). In fact, teachers do not usually resist the integration of ICT, but instead they use them on a daily basis (Castro and Chirino, 2011). Thus, the teachers who use ICT have noted a positive impact on their students and an increase in their own process of teaching-learning, as observed by Tondeur et al. (2013). According to these authors, many teachers have felt the need to learn to use ICT in their classes and they are highly motivated about their potential in education. On the other hand, Tondeur et al. also find that many teachers feel no need to use ICT. Some studies show that the main reasons for this are their experience with their own computers, their beliefs and their own education. Concerning beliefs, Prestridge (2012) considers that thoughts affect the behavior of teachers in the classroom. Another important factor to take into account is that, if teachers are working in a center that implements an ICT plan (Gobierno de Canarias Government of Canary Islands, 2011), they will use ICTs more in their instructional task than teachers working in centres that do not implement this plan.

Therefore, the vision of the educational centres is essential for its teachers to use ICT more or less successfully. Perrota (2012) also agrees that some teachers perceive the benefits of technology more than others. Some teachers feel they are too old, they lack interest, or feel too incompetent to integrate ICT in their classes. With regard to age, some teachers think that the gap between them and their students, who are native to the digital era, is too wide (Perrota, 2012).

Kennedy et al. (2013) consider it is essential for instructors of teachers to prepare them to teach online, because only 2% of the programs for teachers provide such formation. Teachers' preparation should rise to the occasion, offering theory and practice in the field of study itself (Ertmer, 2005). Fluck and Dowd (2011) state that teachers' beliefs are essential for better efficacy.

Adult education and use of ICT in the Canary Islands

Through ICT, adults can have access to information with no barriers due to time and space and their training needs can be better determined (Jiao and Miao, 2010). It is not necessary for adults to attend regular classes; they can carry out their process of teaching-learning in other places or from their homes, by means of the computer and virtual education, with a virtual platform designed for this purpose (Chen et al., 2010). Online learning should be offered as a flexible option, in which adults can choose when to study (Cornelius et al., 2011). According to Knowles (1984), adults are motivated to learn but it is necessary to maintain that motivation by providing adequate materials and by respecting their role as adults.

According to Jiao and Miao (2010), the majority of adults participate in educational processes for professional reasons. For this purpose, it is necessary to individualize each adult's learning, because each one has unique characteristics: they have experience, they have already undergone teaching processes, they are highly motivated and self-directed, they know what they want to learn and value it highly. Hohlfeld et al. (2013) studied the differences between men and women when using ICT, discovering that women perform better than men in all the digital literacy areas of ICT. Even so, assessment of ICT use in adults with basic skills shows that, using multimedia games, males reach greater levels of skill (Kambouri et al., 2006). With regard to age, Broady et al. (2010) note that various studies (Laguna and Babcock, 1997; Timmermann, 1998) show that adults and older people are not well adapted to computers. These negative thoughts can decrease their learning capacity, and other studies indicate that novice adults commit more errors than novice youths (Charness et al., 2001).

There are currently more than 51 adult education centres in the Canary Islands (including adult centres, secondary education institutions, and the classrooms assigned to them) and there are more than 1,000 teachers (Government of the Canary Islands, 2011). Participation of adult students in these teachings has also increased. These students are aware of the importance of ICT use because they realize ICTs are essential to work and live in this society of information and communication.

METHODOLOGY

Sample

The teachers and students of the adult centres of the Canary Islands were invited to participate. According to the most recent data of the 2011/2012 course, there were 344 teachers of adults in the Canary Islands (Ministerio de Educación Ministry of Education, 2013). Out of them, 207 male and female teachers participated in this study (95% confidence level with a 4.5% margin of error). With regard to the students, all the students who belonged to the public ACCI network of the Autonomous Canarian Community were invited to participate. According to the data of the 2011/2013 course (Ministry of Education), 23,378 people were registered in the surveyed studies (Initial Basic Professional Training, Post-initial Basic Professional Training, High school, and Access to Higher Formative Cycles). Finally, 553 students participated in the study (95% confidence level with a 4.5% margin of error). A total of 760 people participated in the study investigation to a total of 31 adult centres in the Canary Islands.

Survey tool

For both groups, teachers and students, two questionnaires were created ad hoc with various differentiated parts. For the teachers, the questionnaire had seven sections, aimed at obtaining information about their formation, use of ICT in their daily work, and their thoughts concerning ICT. For the students, a shorter questionnaire, with three differentiated parts, was created to determine their formation and opinions of ICT. Both questionnaires

were rated on Likert-type scales ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaires were created and distributed on paper, although the teachers were given the opportunity to respond online.

The teachers' questionnaire consisted of 60 questions divided into 7 sections. Section A focuses on the teacher's resources at home and in the classroom. In Section B, the teachers rated the formation they received. Section C refers to the use, modalities, and frequency of use of ICTs. Section D shows the teachers' rating of the curricular integration of ICTs. Section E refers to the teachers' demands for formation. Section F is dedicated to the consequences, according to the teachers, of the generalized use of ICT tools, and, lastly, section G shows the frequency of use that teachers make of the platform in their center.

The students' questionnaire had 47 items divided into 3 sections. Section A collected students' personal data, and asked whether they had access to a computer and internet at home. Section B refers to access to the platform at the center and its use. That is, whether or not the students know about the existence of a virtual platform in their center and whether they have used it, either for educational purposes or for some other purpose. Lastly, section C refers to the consequences, according to the students, of the generalized use of ICT.

The instruments were based on questionnaires used in other prior investigations, mainly those carried out by Chirino (2009) and Castro and Chirino (2011, 2013).

Design and procedure

The study contacted all the directors of the ACCIs of the Canary Islands by telephone before administering the questionnaire to the teachers. The purpose of the study was investigation to the representatives of the centres and requested their collaboration. After calling all the ACCIs, 31 of them agreed to participate, and only one director refused to do so. The following procedure was carried out with these 31 centres. A member of the team went to the centres of Gran Canaria and left the questionnaires for the teachers to complete, allowing two or three weeks for this purpose. After this interval, the questionnaires were collected. Some of the questionnaires were completed by the teachers during a meeting on the same day. For the remaining ACCIs that did not belong to Gran Canaria, the questionnaires were sent by e-mail for them to download and print. They sent the completed questionnaires back by ordinary mail. Two centres received the questionnaire by ordinary mail and returned it through the same channel. Twenty-two teachers completed the questionnaire online and the rest on paper. The teachers in all the centres were well disposed and they sent the completed questionnaires back in time. Secondly, the same procedure was employed to administer the questionnaire to the students, with the same results, although this time, 30 centres participated; one center could not participate due to schedule problems.

RESULTS

The study present the results of the common part of the questionnaire for teachers and students (obtained with Student's *t*, as it is the most adequate for this kind of study) in which they express their thoughts and opinions of ICT and the consequences involved in its daily use in education. A descriptive analysis of the data was performed, and the data were transferred to the statistical package for social sciences (SPSS) statistical program, version 19.0 (2010), to create the tables.

Table 1 shows the common results obtained by teachers and students in the common part of the questionnaire. One can observe the similarities and differences with regard to their thoughts about the integration of ICT in the classrooms. On the one hand, teachers and students coincide that ICT generates more effort and work for the teacher. They do not think that the workload is greater, but instead, that new materials must be created, and teachers must learn to work with new tools. In contrast, the same table presents differences between teachers' and students' opinions: whereas the teachers believe they should be trained in new teaching-learning strategies and should therefore change their role in this new society, in contrast students do not consider this to be so important and they think that teachers will be able to continue to perform their work as they have done till now.

Teachers and students both expressed their disagreement with the statement that ICT could cause confusion because they would have to consult various sources of information, stating that there is no reason to expect this difficulty.

Students claim that ICT will generate more work and effort and that the student group may be divided in two groups. One group constitute the students who use technology frequently and other who do not. However, the teachers do not think that this will occur.

The following two consequences related to ICT use were opposed both by teachers and students. First, they do not think that ICT will contribute any novelty or that teaching quality will be the same, and secondly, do not believe that ICT will be used more socially or ludically than academically, as teachers and students are the ones who decide about the functionality of ICT.

It is unthinkable for teachers that ICT could be a waste of time; they completely disagree with this statement. Students were also disagreed, although their mean was higher because many of them do think that ICT could be a waste of time.

Teachers and students expressed discrepancies with regard to all the consequences related to ICT use. The teachers highly agree that technology will expand our knowledge of ICT, but they believe that one must possess adequate knowledge, have the necessary equipment, and the students will have to make an effort to access the Internet. Students' rate of agreement with these statements was lower. The effort would be economic—having the resources, a computer, a connection to internet—and intellectual—learning to use it. The teachers': they agree, but they do not consider ICT to be so necessary.

Teachers and students also disagree about all the consequences related to the contents of the diverse study subjects. Teachers state that with ICT, the contents will be easier to understand and students will have more and better access to such contents, although some contents will be difficult to explain non-presentially.

Students agreed to a lesser measure.

Teachers and students both feel that the use of ICT will not produce a decrease in presential social relations. They also think it will promote collaborative work among the students because they will have more contact with each other. On the one hand, the teachers were highly with the statement that the use of ICT will increase the number of interactions among students and teachers, and it will be easier for the students to express their opinions. Students think that the teaching-learning process with ICT will be more personalized and it will be easier to raise their doubts and consultations.

Students think that with the use of ICT, it will no longer be necessary either to attend classes or to come to the tutorships. However, teachers consider both aspects to be very important. Teachers highly agree that ICT will allow consultation without the need of physically attending a class; one will have access to information with no barriers of time and space, and the adults will be able to reconcile their studies with their tasks and obligations. They do not think that the number of students in presential classes will drop. The students agree with these statements, but to a lesser degree.

DISCUSSION AND CONCLUSIONS

After determining the opinions of teachers and students about the consequences of the generalized use of ICT on education, the following conclusions could be reached. Most of the teachers have opinion that, generalized use of ICT would increase our knowledge about ICT. Because the more knowledge about ICT, lead to the better use of it. As stated by Castells (2002), it should not be forgotten that having information it is of utmost importance in our society of information and communication. The same can be said about the introduction of ICT in education, to which we are witnesses, according to Hartley (2007). The adult students agree with this, but to a lesser degree. There would be specific spaces for interaction, besides promoting cooperative learning and constructivism so students could interact more with each other (Ertmer, 2005).

The adult students think that ICT use would facilitate comprehension of the study contents, as they would have access to different sources of information to learn what the teachers wish to teach. However, the teachers do not think that ICT will help to simplify the contents and they believe that some contents will continue to be difficult to explain non-presentially. Therefore, they do not think that ICT should replace presential teaching, but it can help to reinforce the class learnings, and the students can review the information at home, through the virtual platform. As stated by Gedik et al. (2013), the development of ICT has created new learning environments. The students agree with the teachers, although to a lesser degree. Both teachers and students think that the teachers will have to

Table 1. Thoughts and opinions of ICT and the consequences involved in its daily use in education.

Item	M		SD		T	p
	Teachers	Students	Teachers	Students		
It will generate more work and effort for the teacher	3.51	3.04	1.09	1.27	4.78	.123
The teachers will have to be trained in new teaching strategies	4.22	3.62	0.77	1.23	6.61	.000*
The teachers will have to change their role	3.96	3.45	0.99	1.16	5.60	.000*
It will confuse people because, in order to be well informed, one must consult other sources of information in addition to the presential classes	2.58	2.95	1.09	1.22	-3.87	.584
It will generate more work and effort for the students	3.51	3.34	1.09	2.08	-2.49	.016*
It will divide the class into those that use ICT frequently and those who have no access to it	2.96	3.00	1.09	1.26	-.42	.003*
It will be used more in a social or ludic way rather than academically	2.40	3.05	1.15	1.16	-6.88	.289
ICT will be a waste of time	1.73	2.36	0.99	1.28	-6.37	.000*
Working with ICT will also expand our knowledge of ICT	4.22	3.72	0.83	0.99	6.43	.001*
Adequate equipment is necessary	4.44	3.96	0.78	1.06	6.00	.000*
One needs some basic knowledge about working with ICT	4.26	3.74	0.91	1.12	5.95	.000*
The students will have to make an effort to access Internet	3.41	3.39	1.11	1.36	.16	.000*
ICT will make the study contents easier to understand	3.78	3.75	0.85	1.04	.38	.000*
Certain contents will be difficult to explain non-presentially	3.74	3.37	1.06	1.19	3.97	.011*
ICT will facilitate greater and better access to the study contents	3.83	3.80	0.93	1.06	.37	.016*
The use of ICT will decrease presential social relations	3.06	3.16	1.20	1.29	-.91	.225
The use of ICT will promote collaborative work among the students	3.57	3.58	1.01	1.09	-1.33	.087
The use of ICT will increase the number of interactions among the students	3.77	3.59	0.87	1.05	2.24	0.000*
The use of ICT will increase the number of interactions among teachers and students	3.69	3.67	0.97	1.08	.15	.018*
The teaching-learning process will be more personalized	3.50	3.64	1.00	1.12	-1.62	.023*
It will be easier to express opinions	3.48	3.48	1.10	1.21	-.02	.044*
It will be easier to raise doubts/consultations	3.75	3.79	0.92	1.22	-.43	.000*
With ICT, presential attendance will no longer be necessary	2.32	2.70	1.19	1.31	-3.58	.081
It will not be necessary to come to so many tutorships	2.63	2.83	1.13	1.22	-2.06	.597
ICT will allow consultations without having to travel	4.14	3.91	0.93	1.09	2.72	.003*
ICT will allow access to information with no barriers in time and space	4.22	3.61	0.80	1.12	7.15	.000*
Students will be able to reconcile their studies with other tasks or obligations	4.11	3.73	0.85	1.08	4.47	.000*
The number of students who attend presential classes will drop	3.07	3.04	1.11	1.31	.27	.002*

be trained in new teaching strategies and they are not mistaken, because, according to Tsai (2010), ICTs can be used to improve the teaching-learning process. Teachers and students agree in

stating that the students will have to make an effort to access the Internet, either by acquiring a computer at home, or travelling to libraries or study halls, which frequently have computer halls

with access to the Internet. Teachers also agree that generalized use of ICT may promote an increase in the interactions among students and with teachers because, if the teachers have a

virtual platform on which to propose debate forums, activities, and information for their students, there may be more interaction than that achieved in presential classes.

ICT will help to promote collaborative work among the students. Students think that with ICT, the teaching-learning process will be more personalized, because when teachers use the virtual platform, they have access to their students' data, and can see how often the students have signed in, what activities they have carried out, how their studies are going. These help the teachers to guide the students and show them where to improve. As commented earlier, it is very important for the students, as adults, to be able to choose when to train, as noted by Cornelius et al. (2011). Although the teachers agree, they do so to a lesser degree than the adult students. The use of ICT in a standard way requires adequate computer equipment. Teachers agree that they must change their role, because of the demands of the society of information and communication.

The students may feel that ICT generates more work but, this would only occur at the beginning. Not being used to the virtual platform, they would have more difficulties performing their activities by computer and sending them through the platform at first, but once they learn to work with this system, this feeling of burden and workload would decrease consequently. The teachers and students both agree that one of the benefits of ICT is that it will allow them to consult without having to travel, which is positive for the adults who, for various reasons, cannot travel to the center. It will be easier for students to express their opinions because they will not have to confront their classmates face-to-face, but instead by computer. This favors shy people, who feel incapable of asking questions in class. In order to perform these activities, the students must obviously have some basic knowledge of the use of ICT.

Presential social relations should not decrease, according to the teachers, because the students will still come to some classes. The opinion of the students on this point was unclear. Neither the teachers nor the students think that ICT use would divide the class into users and non-users, because the teachers should promote the participation of all the students. Both teachers and students agree that, although ICT is not so much a novelty in itself, it is definitely not a waste of time, as it will no longer be necessary to attend all the tutorships. Students will still have to attend some tutorships and meet their teachers. ICT provides new ways to view education and its contribution is therefore still unimaginable. If ICT is used with educational ends, it will logically not make us waste time; to the contrary, we will gain time in many aspects. As mentioned, ICTs have been introduced little by little in the classrooms by means of diverse tools such as digital blackboards and computers (Jelfs and Richardson, 2013), offering diverse didactic possibilities (Palomo et al., 2008). Thus, people do not believe ICT will be a waste of time; quite the

contrary. The last item stated that ICT would have a more social than academic use. The teachers disagreed with this statement because technology will be used to support presential teaching in the classroom or open education so, its use would be educational.

Teachers and adults were observed to have similar thoughts about the curricular integration of ICT. Both groups confer much importance to this and consider that such integration is necessary in order to avoid being left behind. They would like to integrate ICT in the classrooms but this is not possible due to the current limitations of the ACCL, as commented on. We only observed discrepancies with regard to the possible ludic aspect of ICT in education, expressed by the students. However, the teachers expressed their fear that the adults would drop out of the classrooms or not attend the tutorships because they might think classes and tutorships were no longer necessary because of the virtual platform. This is actually fear of the unknown, because using a virtual platform does not mean that students will leave the classrooms; presential attendance will continue to be essential to explain some kinds of contents, take exams, raise doubts, work with classmates, etc. The use of ICT will not turn education into a game, as many adults believe. The teachers are trained to make good educational use of ICT, so they will use it wisely and when it is warranted. The idea is not to change the methodology completely, doing everything with ICT, but to know how to choose the appropriate moments to use ICT. However, until ICT is integrated, such fears will not disappear; it is all a question of time.

Conflict of interests

The authors have not declared any conflict of interests.

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