Journal of Technology and Science Education

ICT AND INCLUSIVE EDUCATION: ATTITUDES OF THE TEACHERS IN SECONDARY EDUCATION

Jose Maria Fernandez-Batanero[1], Maria Jesus Colmenero-Ruiz[2]

[1]University of Seville, [2]University of Jaen
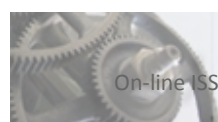
Spain

batanero@us.es, mjruiz@ujaen.es

Abstract

The inclusion and the Information and Communication Technologies (ICT) configure a field of great scientific interest in the current society. In this context, the attitudes of the teachers towards the ICT play an important role. The present article gathers the results of a study whose purpose was to determine how a teacher will use and integrate the 'Information and Communication Technologies' (ICT) in inclusive classrooms. This will also identify the factors that promote good educational practices supported by ICT. Towards this we prepared a case study of multiple cases. The questionnaire and group discussion are the techniques that are used for collecting required information. To validate the questionnaire, it was used the expert judgment method selected by the "Coefficient expert Competence" procedure or also named "K coefficient". The Reliability was established by Cronbach's Alfa method with a value of 0.87. The result shows that teachers in general have a positive attitude towards ICT, especially the male teachers with greater possibilities of interaction with ICT. This will also promote inclusive and cultures policies between networks of schools and it is presented as an important factor in developing good educational practice with the support of ICT.

Keywords – ICT, Inclusive education, Teaching attitudes.

----

1 INTRODUCTION

Inclusion and multiculturalism configure a problem of great scientific interest today, hence the increase in studies and researches worldwide. Currently, we know the development of inclusive education requires constant analysis of educational practices and processes of school change. It is essential to recognize the essential role that the teachers have in the process of inclusion, since it has to meet the needs of the students and provide a quality education to "all" these students. So, the professor and his attitude to certain agents or elements influencing in teaching-learning, stand as a key factor to consider in education. In this line, we are sure together with other authors (Mooij, 2004; Tejedor, García-Valcarcel & Prada, 2009; Sáez López, 2010; Área, 2008, 2010; Fernández-Batanero & Bermejo, 2012) of the importance of the role who play ICT in the attention of the diversity since they can be used as a powerful tool to favour the inclusion. It is critical to analyze the perceptions and attitudes that the teachers have about ICT, and specifically in response to diversity attention as the attitude of teachers, compared to the use of ICT is a key aspect joined to other aspects as the skills and resources available to carry out this integration, but also vital because the use of ICT promotes changes in the educational system (Krajka & Kleban, 2014). However, there are still many education professionals who have not developed a favorable attitude to ICT as part of the attention to diversity.

One of the causes that can influence negatively those perceptions towards ICT it's because the teachers do not feel trained enough or because they have no time or lack of knowledge to create specific activities (Konur, 2006). This may be one of the reasons for not to use them in the classroom, leading to a lack of use of the

Journal of Technology and Science Education. Vol 6(1), 2016, pp 19

On-line ISSN 2013-6374 – Print-ISSN 2014-5349 DL: B-2000-2012 – http://dx.doi.org/10.3926/jotse.208

benefits that these technologies can bring both into their work and the student learning (Hinojo & Fernández Granada, 2002).

Suriá (2011) reveals through his study including 116 teachers that the attitude of these teachers to the implementation and use of ICT it's mostly positive, although they reported to feel themselves unprepared for the use of some specific technologies. Similarly, it shows that younger teachers are more prepared for the application of ICT than those more experienced.

It is crucial the use of ICT for people in situations of educational exclusion because "encourage cooperative learning contexts, the realization of shared projects, the motivation, the opportunity to learn how to learn, from a much more individual attention and tailored to the real needs and interests of each student... "(Castañeda, Román & Barlam, 2015, pp. 104). Thus, teachers who participated in Cerrillo, Esteban and Paredes' study (2014) indicate that although the use of ICT in schools does not necessarily change the strategies of education, it favours self-regulation learning and immediate feedback to students.

To admit that we are equal neither in the biological thing nor in the sociocultural thing minimizes the risk of social exclusion for ethnic, religious and linguistic factors, between others. In this line, we verify that the technologies facilitate the respect for the diversity since they allow that every person should accede to the information from his own characteristics and conditions (Zarceño & Andreu, 2015).

The teachers compromised with the incorporation chase that all the pupils have attainable goals of learning and, also, that the planning and the educational evaluation go beyond the academic thing, to centre on the interpersonal relations, the emotional well-being, the social incorporation and other dimensions of the quality of life of the student body (Verdugo & Rodríguez, 2012). In addition, the teachers demonstrate a positive attitude, even openly enthusiast, towards the employment of the TIC, for what the TIC might help to create an environment of ideal learning, opened all, firmly inclusively (Cerrillo et al., 2014).

1.1 Establishment of the problem

The most critical factor for inclusive education is the teacher staff. There are still many teachers of Secondary Education (ESO) who are not skilled enough to face the profound transformation that requires the educational system under the challenge of this model. So, considering the need for teacher staff to incorporate ICT for development of good educational practices and the role of attitudes in the success of integration programs for these technological teaching tools in this study raised the following research questions. Which attitudes have teachers of inclusive classrooms to ICT? Which factors favour the development of good educational practices in teaching-learning processes with ICT support? Variables as the age, the gender or the fact of having computers at home, do they influence on the attitudes to be more favourable?

2 DESIGN/METHODOLOGY/APPROACH

2.1 Objective

The overall purpose of the study was to describe the attitudes of the teachers towards ICT, carrying out professional work in the inclusive classrooms and to identify those factors that favour the development of good educational practices of teaching-learning processes with ICT support.

2.2 Design

Regarding the type of design, it is a multiple case study, namely two schools, public ownership, Secondary Education (ESO) in Seville (Spain). The selection of cases was made intentionally considering the criterion of being inclusion-oriented schools and being catalogued by the Andalusian Educational Administration as "good practice" school. The focus of data collection and analysis has been defined as mixed, in which qualitative and quantitative techniques are integrated. These two techniques (questionnaire and group discussion) are used to collect necessary information.

2.3 General context

The first school has approximately hundreds of pupils, 18% are from foreign origin (Morocco, Sahara, Romania, China, Bolivia and Colombia). The student body is characterized by a high percentage of shortage of motivation, deficit of instrumental subjects, poor academic performance, disruptive and conflictive behaviors, and family

breakdown. There are in total 45 teachers in this school. The second school welcomes 420 students from 10 different nationalities. The total of teachers during the 2010/2011 academic year was 27. The school has a large number of students diagnosed with Attention Deficit Hyperactivity Disorder (ADHD), learning disorders and a student with Oppositional Defiant Behaviour.

In total 63 teachers participated in the study (38 women and 25 men) with an average of 18 years teaching experience. Regarding their stability valued from the administrative status of teachers, it shows that most of them are civil servants in a percentage of 84.4%, in addition to 12.5% of interim staff and 3.1% of workforce, so the continuity of jobs in these schools are quite stable.

2.4 The questionnaire «Attitudes to ICT»

A list of questionnaires were raised to measure the teachers attitude towards the usage of ICT, with answers in a Likert scale ranging from Strongly Agree (5) to Strongly Disagree (1).

To validate the questionnaire it was selected a group of experts including 10 university teachers, 6 of them were specialist in Educational Technology and the other 4 specialist in Education of Adult persons. To select them it was used the "Coefficient expert Competence" procedure or also named "K coefficient" obtained by the application of the following formula: K = ½ (Kc + Ka), where Kc is the "Knowledge coefficient" or information that has the expert about the suggested problem; and Ka is the "Argument coefficient" or Foundation of the criteria of the experts (Blasco et al., 2010). In our case, the coefficient K was upper to 0.8 in eight of the ten selected experts, denoting that there was a very acceptable competence degree. The estimations of the experts were carried out in consecutive rounds, anonymous, for the purpose of achieve the consensus but the maximum autonomy on the participants (Delphy method).

A factor analysis with oblique rotation method was performed to determine construct validity. KMO in .88 gives a proper adequacy to the model and Bartlett's test of sphericity significant (p = 0.000). Two factors were extracted to explain 49.9% of the variance of the construct.

Factor	Definition	Indicators
Supporting teacher professional development	Rating on aid offered by ICT to professional work and in the teaching-learning process	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 y 21
Ability and availability	Rating regarding the access and management of ICT	22, 23, 24, 25, 26, 27

Table 1. Specifications of questionnaire

Reliability was estimated using Cronbach's alpha by factor and overall instrument, obtaining a good internal consistency in all the cases: support the educational and professional development (.80); ability and availability (.81) and Global (.87).

SPSS 17 and descriptive and other inferential statistical programs were used to analyze the data.

3 RESULTS

3.1 The questionnaire

The data obtained shows that at global level also factors studied, teachers revealed a positive attitude towards ICT: Support in professional and educational development (X: 4.39); ability and availability (X: 3.80) and overall (X: 4.05).

Student-t test was used for related samples to establish whether there were significant differences in scores of different factors. The result confirms that there are significant differences in the scores of the factors, the greater the support for the factor in professional and educational development, which implies that the attitudes of teachers are more positive in this aspect.

Regarding teachers' attitudes towards ICT and its relation to variables such as "Gender", proceeded to conducting a Student-t Test for independent samples in order to establish whether there were statistically significant differences between factor scores and global instrument according to these variables. The result

shows that scores of men are significantly higher in the global (X: 3.86) and Ability and availability (X: 3.92), compared to women.

Implying that their attitudes in general are more positive especially with regard to perceived ability and availability in use of ICT (Table 2).

Factors	Gender	X	T	p
Supporting teacher professional development	F	4.34	-1.034	.301
	M	4.52		
Ability and availability	F	3.61	-2.290	.024
	M	3.92		
Global	F	3.54	-2.600	.045
	M	3.86		

* p≤ .05

Table 2. Gender comparisons

Regarding the variable "Age", two groups of teachers were established, first group included teachers aged from 20 to 40, and the second aged from 41 to 60. As with the gender variable Student-t Test for independent samples was used, no significant differences found in the scores for both the groups.

To study the interaction between the teacher and ICT two indicators were considered, as both can facilitate access to use of technologies. On the one hand, the fact that teachers have computer at home and the second point is that would impart the final years of compulsory secondary education. Regarding the former, although a large majority of teachers have a computer at home (95%), the scores of the instrument according to whether or not the teachers had computers at home, using a Student t test for independent samples were compared. The result shows that at the global level and at ease and availability, scores of teachers having computer at home are significantly higher than those not having one; this implies that those having computers at home have more positive attitudes towards ICT versus those not having one.

According to the course they teach in the classes, teachers were divided into two groups. Those who develop their teaching in the first cycle of compulsory secondary education (1st and 2nd) and those in the second cycle of compulsory secondary education (3rd and 4th). ANOVA test (analysis of variance) of a track in order to detect significant differences between the scores of the two groups was used. The results showed no significant differences between them, implying that the attitudes of both groups are similar in this respect.

3.2 Discussion Groups

The discourse analysis confirms and extends the results obtained in other studies (Canales & Marqués, 2007). In this regard, a number of factors of good educational practices with ICT support were removed and they were grouped into two main sections coinciding with the dimensions of the questionnaire (Table 3):

Teachers and Teacher Professional Development
Stimulate knowledge acquisition.
Enhance the socio-affective aspects of students.
Promote communication with students.
Designing and planning tasks or activities supported in ICT.
Evaluate educational tasks or classroom practices carried out by students with ICT support.
Enhance collaborative work.
Evaluate the educational practices implemented by the school in relation to ICT.
Promote adequate training of teachers, as an indicator of good practice.
Strengthen reflection on practice.
Administrative management, ability and availability
Providing with an efficient inclusive political, organizational and academic management.
Having the needed resources and infrastructure.
Favoring communication with families.
Promoting inclusive policies and cultures between networks of schools.

Table 3. Factors favoring good educational practices

The participants in discussion groups consider that their respective educative centers have committed executive teams, having good technological resources and the staff have positive attitudes and motivated to use and integrate TIC. However, despite optimal technological conditions gather to initiate processes of innovation and implementation of ICT in support of teaching aids in the classroom, the teacher shows the lack of specific teaching materials to support the teaching.

"My school has exceptional technological equipment and we cannot complain about it, but the problem I see is in relation to the use of specific software support for specific educational needs they presented our students. With this, I don't mean we cannot work with. But we have to be very creative" (Teacher #16).

Content analysis shows that among the factors that most stands out are the stimulate learning or acquiring knowledge using ICT in classroom practices where the vast majority of teachers believe that the use of ICT increases quality of learning.

"It is clear that the use of ICT is a revolution in the classroom, because it promotes a very positive acquisition of knowledge by students. It's a tool that motivates a lot, and therefore helps in the acquisition of knowledge" (Teacher #8).

Teacher education appears as a factor to be taken into account. We conclude that there is lack of knowledge on teachers, whether of a technical nature for some and teaching to others, perhaps by generational issues or problems with the training itself, but they are issues that may prevent making good educational practices with ICT support. This aspect is completed, to the extent possible, another factor that comes to light and is the presence in the two schools of the existence of a faculty ICT coordination, with the function of advising teachers and revitalize the educational use of technologies.

Teachers are aware that the reflection on practice advances and contributes to achieving best practices with ICT. It is important to share with colleagues the positive experiences where ICT can be used, investigate and reflect on classroom practices in order to improve the performances ICT to learning and collaboratively reflect on the department or faculty on the practice involving the TIC.

A large majority of teachers use assessment practices with ICT Support in the school, where they are discussed with the staff of the department.

Teachers report that despite their schools are welcoming communities do not involve parents in the education of students, although at present there are different programs and resources that enable the relationship.

4 CONCLUSIONS

In the following lines, we are going to explain the conclusions in a specific and precise manner in order to help in the understanding of the object of study of this article.

- The fact that sufficient computing resources, updated and in correct operation, it is an essential factor and necessary to qualify the possibility of applying technology in educational contexts requirement.

- There is a positive attitude of teachers in inclusive classrooms to the use of ICT. Teachers are aware that ICT is an essential tool to support attention to student diversity.

- Male teachers have more positive than female teachers towards ICT attitudes. By contrast, no differences between the genders are in the factor of the role of ICT in professional and educational development.

- Attitude toward ICT is positive in both factors (Support for teacher professional development, and ability and availability). This may be associated with the presence in both schools called ICT coordinating teaching teams. This constitutes a very important aspect, because the direct advice ultimately influence the decisions of teachers whether to use ICT in their educational practices (Lucas, 2008; Sime & Priestley, 2005).

- The faculty has very positive attitudes towards ICT and attention to diversity thus share with colleagues the positive experiences where ICT is used, investigate and reflect on classroom practices in order to improve performances with these technologies. The implementation of constructivist theories for the design and support of activities or tasks with ICT support contributes to the positive growth of such attitudes.

- Teachers who have greater access to ICTs and therefore a greater chance of interacting with these, have more positive attitudes towards them. It is noteworthy that surveyed teachers in the classroom have access to these technologies, thus contributing to increased positive attitude.

- Among the most important factors to provide good educational practice with the support of ICT power they are to stimulate learning and acquiring knowledge; adaptability of the tasks and activities to the heterogeneous characteristics of students; ability to enhance the autonomous individual and cooperative work of students, and its potential for evaluating educational tasks or classroom practices carried out by students.

- Teacher training and optimum technological conditions to initiate processes of innovation and implementation of ICT appear as important factors in developing good educational practices in inclusive classrooms.

- The commitment of the management team with inclusive education and ICT is a key factor in creating enthusiasm and motivation in the faculty.

- The use of ICT in classrooms allows a feedback from the student body, assuming one of the conclusions reached on Cerrillo et al.'s study (2014).

REFERENCES

Área, M. (2008). La innovación pedagógica con TIC y el desarrollo de las competencias informacionales y digitales. I*nvestigación en la Escuela*, 64, 5-17. Available online at: http://dialnet.unirioja.es/servlet/articulo?codigo=2593487

Área, M. (2010). El proceso de integración y uso pedagógico de las TIC en los centros educativos. Un estudio de casos. *Revista de Educación*, 352, 77-97. Available online at: http://www.revistaeducacion.mec.es/re352/re352_04.pdf

Blasco, J. et al. (2010). Validación mediante el método Delphi de un cuestionario para conocer las experiencias e interés hacia las actividades acuáticas con especial atención al Windsurf. *Agora para la educación física y el deporte*, 12, 75-94.

Canales, R., & Marqués, P. (2007). Factores de buenas prácticas educativas con apoyo de las TIC. Análisis de su presencia en tres centros educativos. *Educar*, 39, 115-133.

Castañeda, L., Román, M.M., & Barlam, A. (2015). Mundos virtuales e inclusión social y educativa: Estudio de caso en el IES Cal Gravat. *New Approaches in Educational Research,* 4(2), 98-105.

Cerrillo, R., Esteban, R.M., & Paredes, J. (2014). TIC e inclusión en aulas de Educación Secundaria de la Comunidad de Madrid: Análisis de las prácticas docentes en el modelo 1 A 1. *Profesorado. Revista de currículum y formación del profesorado*, 18(3), 81-97.

Fernández-Batanero, J.M., & Bermejo, B. (2012). Actitudes Docentes Hacia las TIC en Centros de Buenas Prácticas Educativas con Orientación Inclusiva. *Enseñanza & Teaching*, 30(1), 45-61.

Hinojo, F.C., & Fernández Granada, F. (2002). Diseño de escalas de actitudes para la formación del profesorado en tecnología. *Comunicar*, 19, 120-125.

Konur, O. (2006). Teaching disabled students in higher education. *Teaching in Higher Education*, 11, 351-363. http://dx.doi.org/10.1080/13562510600680871

Krajka, J. & Kleban, M. (2014). E-training in practical teacher development from local to global connections. *International Journal of Continuing Engineering Education and Life-Long Learning*, 24(1), 96-106. http://dx.doi.org/10.1504/IJCEELL.2014.059337

Lucas, J. (2008). La condiciones de formación de los maestros para el uso de las nuevas tecnologías en la escuela primaria. *Revista Electrónica de Tecnología Educativa. EDUTEC*, 27, 4-6. Avalaible online at: http://edutec.rediris.es/Revelec2/revelec27/articulos_n27_PDF/Edutec-E_JLMartinez_n27.pdf

Mooij, T. (2004). Optimising ICT effectiveness in instruction and learning: Multilevel transformation theory and a pilot project in secondary education. *Computers and Education*, 42, 25-44. http://dx.doi.org/10.1016/S0360-1315(03)00063-0

Sáez López, J.M. (2010). Actitudes de los docentes respecto a las TIC a partir del desarrollo de una práctica reflexiva. *Escuela Abierta*, 13, 37-54.

Sime, D., & Priestley, M. (2005). Student teachers' first reflections on information and communications technology and classroom learning: Implications for initial teacher education. *Journal of Computer Assisted Learning*, 21, 130-142. http://dx.doi.org/10.1111/j.1365-2729.2005.00120.x

Suriá, R. (2011). Percepción del profesorado sobre su capacitación en el uso de las TIC como instrumento de apoyo para la integración del alumnado con discapacidad. *Profesorado. Revista de currículum y formación del profesorado*, 15(2), 299-314.

Tejedor, F.J., García-Valcárcel A., & Prada, S. (2009). Medida de actitudes del profesorado universitario hacia la integración de las TIC. *Comunicar*, 33, 115-124.

Verdugo, M.A., & Rodríguez, A. (2012). La inclusión educativa en España desde la perspectiva de alumnos con discapacidad intelectual, de familias y de profesionales. *Revista de Educación*, 358, 450-470.

Zarceño, A.J., & Andreu, P.C. (2015). Las tecnologías, un recurso didáctico que fortalece la autorregulación del aprendizaje en poblaciones excluidas. *Perfiles educativos*, 37(148), 28-35.

AUTHOR BIOGRAPHY

José María Fernández-Batanero

José María Fernández Batanero is Professor of University of Seville, Department of Teaching and Educational Organization. The main lines of research have focused on different subjects as Special Education, Leadership and Educational Organization or ICT and Special Education.

María Jesús Colmenero-Ruiz

María Jesús Colmenero Ruiz is Professor of University of Jaén, Department of Pedagogy. The main lines of research are Special Education, Attention to Diversity and Teacher Training.