

# Training in Digital Skills in Early Childhood Education Teachers

## The Case of the University of La Laguna

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**Abstract**—Information and Communication Technologies (ICT) have become essential tools for the development of quality educational practices. The special situation of COVID-19 has evidenced the problem of the teacher training. This work investigates the perception of future teachers of Early Childhood Education about the use of ICT and the policies developed by the Government of the Canary Islands regarding the provision of resources, materials and training. The study had a sample of 110 teachers in training from the University of La Laguna, the results showed agreement regarding the quality and quantity of training received, however, despite not showing interest in continuous training in ICT, they consider fundamentally mastering this competence to improve the quality of the educational response in the Canary Islands.

**Keywords**—Digital competence, innovation, early childhood teacher, Information and communication technologies

## 1 Introduction

Today, information and communication technologies (ICT) are acquiring great importance at the global level, and we are no longer just talking about social and economic dependence, but also about what it means for the improvement of training processes. Schools, Universities, and in general all educational institutions have made Information and Communication Technologies (ICT) their great ally. The exponential leap and progress of advances in technological means and resources has been upward, happening at a speed that in many occasions differs from the processes of their implementation of the classrooms. ICTs have favored universal access to education, equality, and learning, but teachers are truly qualified to meet the challenge of teaching in such diverse and technical educational contexts. Mastering digital skills will be key to the success of the training of future students. Hence, in this research, the aim is to investigate the perception of teachers in training in the Autonomous Community of the Canary Islands on the influence of ICTs as tools for improving their teaching practice.

## **2 Background**

ICT tools are becoming more diversified and despite the relative ease of access, they represent changing scenarios that place both teachers and students in a context of adaptation and permanent change [1]. The integration of ICT into education has led to the emergence of new teaching methods, new moments and times, as well as scenarios and protagonist. The evolution of these technologies has generated paradoxical situations as regards the reality of teacher training, on the one hand, teachers in practice who try to adapt to technological changes and innovations, feeling that they do not have sufficient digital skills to meet the requirements of the technological development of learning scenarios, and on the other hand, teachers in training who are eager to learn and acquire digital skills that will enable them to develop in the future, after their incorporation into teaching, the best training practices. The presence of these technologies demands new digital competencies in teachers, hence the relevance of teacher training, which prepares them to integrate new didactic approaches, new methodologies, where the center is the students. Teachers need to be guides and facilitators of learning processes, to advise their students to be protagonists and responsible for their own learning, encouraging collaborative learning [3],[4],[5]. Teachers must therefore develop digital skills to help them face the new educational and social challenges that the Society of the 21st century demands of us [4][6].

Several investigations have been carried out on the teacher's digital competence at different educational levels, which justify the importance of our research. Thus, at the level of Higher Education, we have studies such as those of [7],[8],[9],[10],[11],[12].

At other levels of education [11],[13],[15],[16] emphasized the importance and re-launch of digital teacher education as a key aspect of improving education in the 21st century. Changes require greater involvement of teachers, changes often do not take place in tandem with the mastery of knowledge and skills of the pupils to be taught, which puts them at a clear disadvantage compared to their pupils. The use of ICT makes it possible to create, process, and disseminate information and to improve students' motivation [2] and thus contribute to the development of skills and competences using a variety of teaching support resources as teaching material, virtual environments, videoconferences, and other information channels, developing creativity, innovation, collaborative working environments [3],[4], promoting meaningful learning [5],[6],[7], active and flexible [9],[15],[16],[17]. Technological improvements encourage the constant search for information in order to create new knowledge and introduce it into social and educational practice [18]. We need more and more efficient use of ICTs if we are to really exploit their potential. As stated, [13] it is necessary to promote the use of educational resources that favor the creativity and independence of students, and for this, it is urgent to adopt the teaching role [15],[19] to place a student in the role of manager of technological resources and autonomous manager of his learning. Universities are the institutions responsible for preparing these teachers, who will teach at the various levels of education. Therefore, they must develop current curricula that are appropriate to the actual times and needs of the students, should train for an open and flexible school able to keep pace with new information and

communication technologies by adapting them to the training needs of its students [20],[21],[22].

ICTs have transformed educational practice: future teachers must be trained in skills needed to keep up with the advances of the digital age, which have become essential for the school and which should lead to improved teaching strategies and learning teaching processes [17],[23],[24],[25],[26],[27]. This training is of vital importance as it will prepare teachers to take on this new pedagogical model by creating spaces for motivation, innovation, collaboration, and student participation; by taking on new methods' active trends, selecting and developing digital teaching materials according to the needs and interests of their students [28],[29],[30], [31].

### 3 Objective

This study aims to investigate the perception that future teachers of Early Childhood Education have about the use of ICT for the improvement of educational practice, their willingness to use and degree of agreement on educational and ICT policies carried out in the Autonomous Community of the Canary Islands.

## 4 Methodology

### 4.1 Sample

The sample consisted of 110 teachers in training (6,4%, N=7 men and 93,6%, N=103 women). The ages of the students were between 18 and 36 years, in order to reduce the age data were established two intervals; from 18 to 24 years (83.3%, N= 94) and another of 25 years or more (16,8%, N=19).

Given the nature of the study and the sample that could be accessed, there were two sample groups, on the one hand, teachers who completed a self-reported questionnaire (N=110) and on the other hand a group of 4 teachers who were interviewed.

The sample, of the 110 teachers in training (6.4%, N=7 men and 93.6%, N=103 women), had ages between 18 and 36 years, namely 83.3%, (N= 94) had between 18 and 24 years and 16.8% (N=19) 25 years or more.

In addition, four active teachers participated in a discussion group planned for this study.

The characteristics of the teachers who participated in the teaching group can be seen in Table 1

**Table 1.** Characteristics of the participants in the interview

Participant	Age	ICT training	ICT use
Number 1	25	yes	Much
Number 2	29	yes	Anything
Number 3	31	no	No
Number 4	35	no	Something

## **4.2 Instruments and techniques**

The proposed instrument for the evaluation of the perception of future teachers of Early Childhood Education on the use of ICT for the improvement of the educational practice, their willingness to use, and degree of agreement on educational policies and ICT, was an Ad hoc test, whose content was evaluated by three ICT professors from the University of La Laguna.

The test consists of 49 items (2 of identification and 47 of evaluation of a scan-type Likert of 5 response levels where the value 1 expressed the lowest degree of agreement and the value 5 the highest degree of agreement) these items were grouped around 4 fundamental theoretical dimensions; a) ICT and teaching practice in the classroom, b) ICT and students, c) ICT and teaching staff and d) ICT assessment in the Canary Islands.

In addition, a discussion group was held with four working teachers from the early childhood and primary education stage, who willingly participated in it with the aim of clarifying, deepening, and deepening the different dimensions treated in the questionnaire. To identify the responses of the participants the name "Px" was used where "P" means teacher and "x" refers to the number of the participant who responded.

## **4.3 Procedure**

In order to obtain the data from this study, questionnaires were given to teachers in training. The questionnaires were made in the google questionnaire version and we send the link by email; with the subsequent answers we analyze the data whit Statistical Package for the Social Sciences (SPSS) Version 25.

For the holding of the discussion group, a meeting was arranged with the participants at the facilities of the University of La Laguna, adapting the times to their availability. The session of the discussion group was recorded with the consent of the participants for their subsequent transcription. A content analysis was carried out identifying the responses according to the dimensions that were investigated.

## **5 Results and Discussion**

The results were presented according to the 4 dimensions previously referenced.

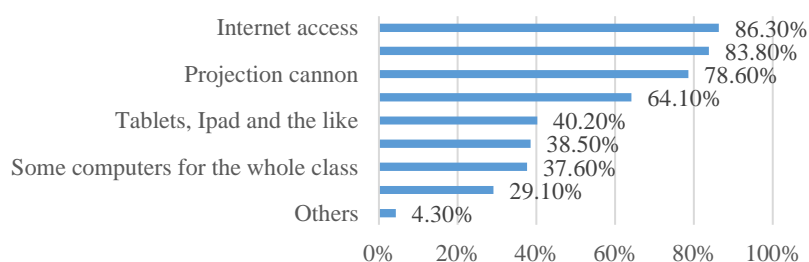
### **5.1 ICT and classroom teaching practice**

As can be seen in Figure 1, of all the media and ICT resources presented, 8 out of 10 future teachers considered it necessary to use an interactive digital whiteboard (IDB) in their classroom, a percentage that reached 85,11% among those polled between 18 and 24 years of age, and 73,68 percent among students aged 25 or over.

When choosing the various ICT media and resources suggested, there has been a high the coincidence between the two age groups regarding the use or not of these resources in their classroom. Thus, the future teachers considered that Internet access

was one of the main uses of ICT in the classroom, namely 8 out of 10 future teachers expressed this fact (86,3%), in addition the use of IDB was considered by 83,8% and the use of the projection gun by 78,6%.

In contrast, different percentages were observed in favor of the use of tablets, Pcs, iPads and the like between age groups, 37,23% for the 18-24 age group and 57,89% for those aged 25 or older. To a lesser extent, the use of computers for classrooms (37,6 % for both groups) or of one computer per pupil (38,5%) for both groups, was reported.



**Fig. 1.** Percentage of uses of devices and hardware that the respondent would use in his/her classroom

As for the types of actions to be carried out with ICT media, no differences were observed by age groups. In the case of "monitoring pupil evaluation", 57,8% of pupils referred to this task, with over 25 years of age (84,2%) insisting on its use, as against 53,2% of 18 and 25-year-old pupils.

This can be understood as the reason why all 25-year-olds reaffirmed that the use of ICT would have no significant effect on their teaching practice beyond the fact that students were more motivated and involved in-class activities. From the same analysis, only 7,4% of students aged between 18 and 25 considered that the use of ICT would involve an added effort of work and therefore did not compensate for its use, almost half of the students (46,8%) considered that it would be a major effort for them to innovate and change the methodology of traditional teaching methodologies.

Of other actions that would be developed by future teachers, we found that 9 out of 10 responded that they would use ICT to explain the contents of the lessons with the IDB; 7 out of 10, so that the student could carry out online activities; 6 out of 10, so that students could present their work, enhance information searches on the Internet and maintain teacher-student contact. Finally, to a lesser extent, between 4 and 5 out of 10, they would use them as consultation tools (Wikipedia and other websites) for collaborative work, multimedia presentations and online publication of works.

With regard to the use of ICT in teaching practice, teachers in office expressed the view that "the use of the interactive digital whiteboard (PDI) or other resources is mainly made, but with a similar use as when using the traditional whiteboard" (P2). Teachers (P3) and (P4) commented that "it is necessary to make adequate use of technological resources in the classroom, but for this to be done it is necessary to have a

specific and in-depth training", "it is not enough to have a projector and a digital blackboard and to project the lesson, to make appropriate use of technological means implies training and specialization that at least I did not get in the career". It seems curious, but as he said (P1) "it happens that my students' know-how to use ICT better than I do" (P1).

In general terms, teachers considered it necessary to use the interactive digital whiteboard (PDI), but as they stated (P3) "this resource must be used well to get true performance" and "teachers must be trained in its use to exploit its true potential" (P4). In this sense, the faculty was of the opinion that "to consult on the Internet or to seek information for a job, is not enough, for the improvement of the formation of our students" (P1) and "Unfortunately it is the main use that is made today in the schools" (P3).

It is necessary to provide the centers with computer materials, interactive digital blackboards, etc. so that "the passage through the school is not a mere transition due to the sporadic use of technological resources and materials" (P3), "The reality in the households of the Canary Islands is different from that of other autonomous communities with higher per capita income" (P1). "In the Canary Islands today, textbooks and paper are still the main means of learning" (P2), and "The digital gap between students from different areas and neighborhoods are very large, which clearly puts some at a disadvantage" (P4).

## 5.2 ICT and students

There was a tendency to take proper account of the ICT effect on students, especially on the motivation and involvement of classroom tasks ( $\bar{x}= 4,34$ ), see Figure 2.

This perception of pupils also did not differ according to age groups.

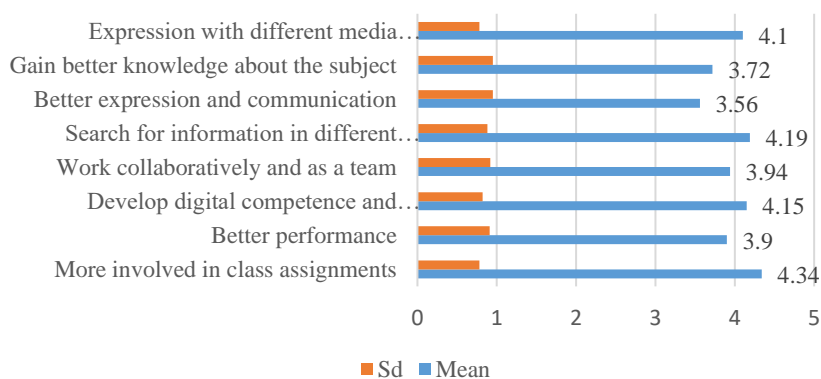


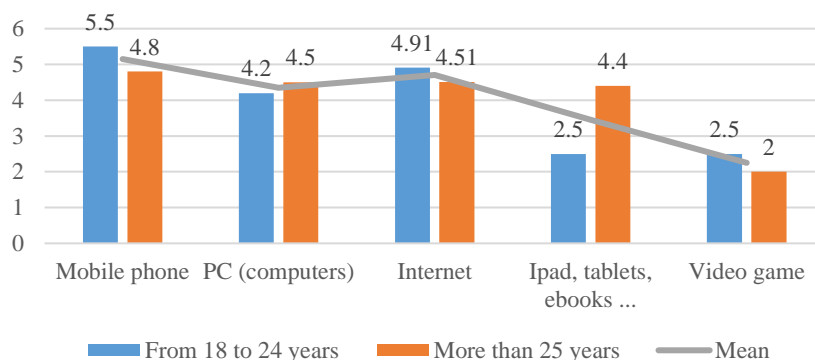
Fig. 2. Impact of ICT on student learning

In relation to the use of ICT and students, it was observed a coincidence of opinion on the motivating effect of ICT, the lecturer interviewed who stated that "my students

prefer the computer to learn than books" (P2) and as he stated (P3) "It is hard for them to start when we work with the book, however, the days we go to the computer room to some planned activity are arranged from the first minute" (P1). Making alumina competent in the proper use of technological means is essential, but as stated (P1) "requires an effort to equip schools" and "a commitment to the training and updating of teachers in the field of ICT competences" (P4)

### 5.3 ICT and teaching staff

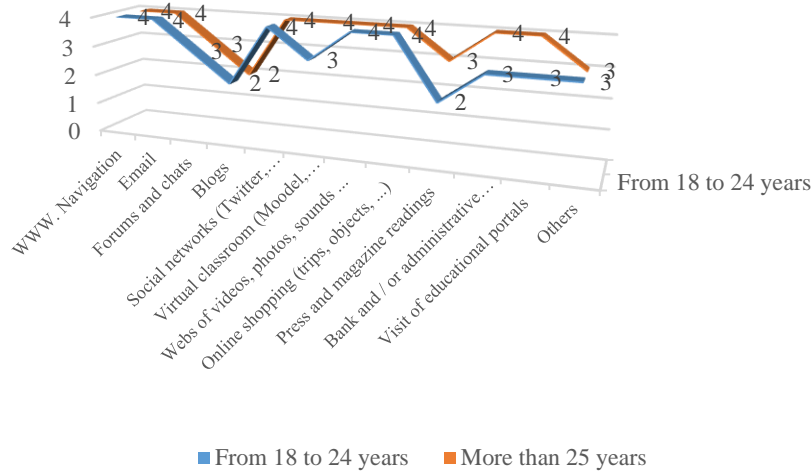
As expected, there was total agreement on the part of all future teachers regarding the frequency of the use of ICTs in everyday life. There was a predominance of the use of mobile phone and internet (daily in many occasions), followed by the use of the computer in their routines (4 to 5 times a week and with less daily use) and to a lesser extent the use of tablets, iPad, Ebooks, and the like (two or three days a week). Finally, the responses regarding the use of video games showed that a large part of future teachers almost never used them, which suggests that they did not show interest in the use of this type of resource. See figure 3.



**Fig. 3.** Average by age group of technologies used by respondents in their daily lives

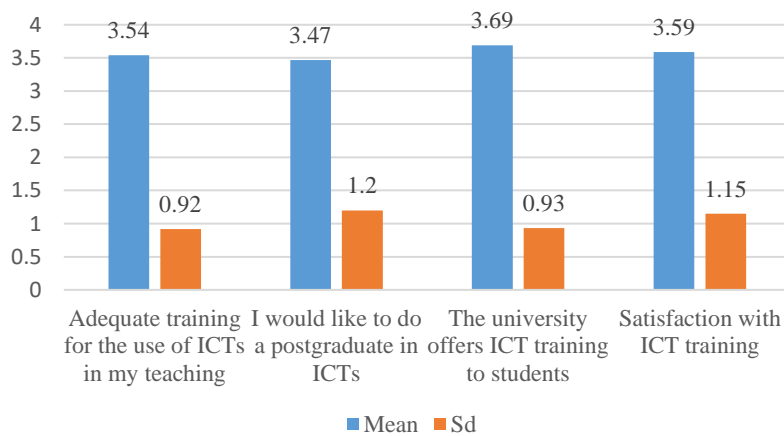
As stated by the teachers in training, there was a high predisposition to the daily use of the internet ( $\bar{x} = 4,71$ ). Specifically, students aged between 18 and 24 used to make use of virtual teaching classrooms such as Moodle, WebCT, Virtual Campus, etc. between two and three times a week. Those over 25 years of age said they make use of these means between 4 and 5 times a week.

A predominance of the use of the mobile phone was observed by the breadth of services and instantaneous access that this technology offers. In Figure 4, you can see that visits various web services (web browsing, emails, Social Networks, video websites, photos, music; YouTube, Spotify, etc. were carried out daily and very frequently. The same did not happen in relation to visits to press pages and digital magazines ( $\bar{x} = 2,91$ ); visits to educational internet portals with ( $\bar{x} = 2,71$ ), or blogs ( $\bar{x} = 2,32$ ).



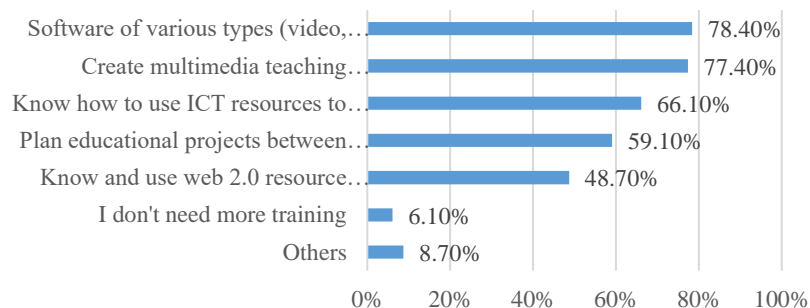
**Fig. 4.** Average frequency of Internet services used by trainees by age group

With regard to the use of ICT in the practice of future teachers, they expressed considerable agreement with the ICT training courses they had attended at university and with the ICT training offered in their respective undergraduate studies. With regard to the need for further training to improve their digital skills, they did not express an excessive interest in post-graduate ICT training. Preferably the age group of 25 or over considered that with a medium ICT qualification was sufficient for teaching. Only 6.1% of students said they did not need to use ICT. See Figures 5 and 6.



**Fig. 5.** Degree of agreement by the respondents towards the following statements





**Fig. 6.** Training aspect demanded by students

If we look at the figure above, we notice that 8 out of 10 wanted to receive training in the software of various types (video editing, image, etc.) and in creating and developing multimedia didactic materials and digital activities; 6 out of 10 in planning collaborative projects between schools via the Internet and the use of ICT to evaluate students; only half of future teachers expressed a desire for training uses and resources of web 2.0, social networks, blogs, etc.

Finally, the consideration of both age groups with respect to the various aspects of ICT on which they would like to be trained to improve as future teachers showed no notable differences. It was curious to see that all those over 25 did not express the desire to continue training.

In relation to the use of ICT and teachers, it was observed that in general there is a basic use of resources such as mobile phone internet and to a lesser extent tablets, iPad, eBooks. The teachers considered that the ideal would be to develop all teaching and training through “Moodle classrooms where students will find all the information, materials, videos, explanations...” (P2) But as he stated (P1) “this dream still lacks, at least in the public schools of the Canary Islands, much to go to become a reality”.

Although some teachers considered the training in digital skills, they received in their university studies to be appropriate, others expressed a certain degree of conformity and little desire to update their training. Thus (P2) commented that “I have companions who are not updated and say that since the students know more than them, it puts the one who knows with other boys and girls”, in this sense (P4) ratified that “I had companions who conformed with what they knew, which was little more than email and Moodle platform”. When asked about the age of these teachers, they indicated that they were mainly from teachers over 40.

#### 5.4 Valuation of ICT in its autonomous community

The total number of future teachers expressed strong agreement on ( $\bar{x}= 4.11$ ) the need to modernize education in the 21st century, it was necessary to develop a policy of investments to equip classrooms with technology (Digital whiteboards, Internet, one computer per student). See figure 7.

In turn, they responded with certainty on the need to provide each student with a computer. In this case, there was a greater degree of dispersion of responses (Sd=1.26).

In relation to the assessment of the adequacy of educational policies on ICT in the Canary Islands, a significant degree of discrepancy was noted ( $\bar{x}$ = 3.36).

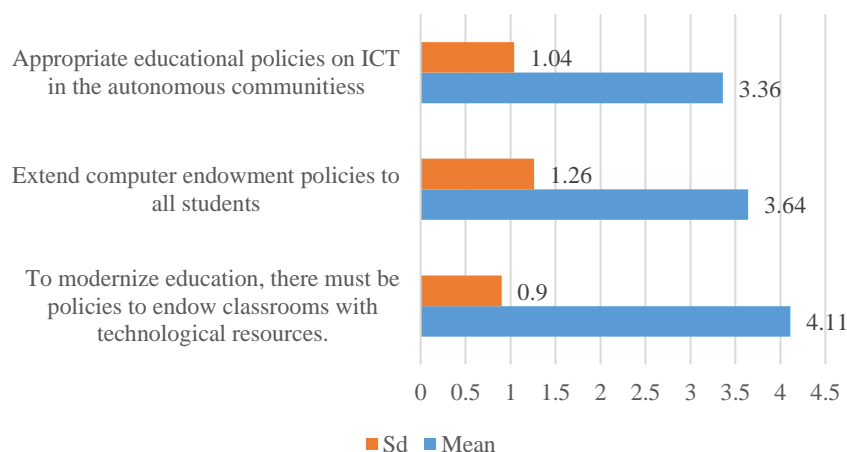
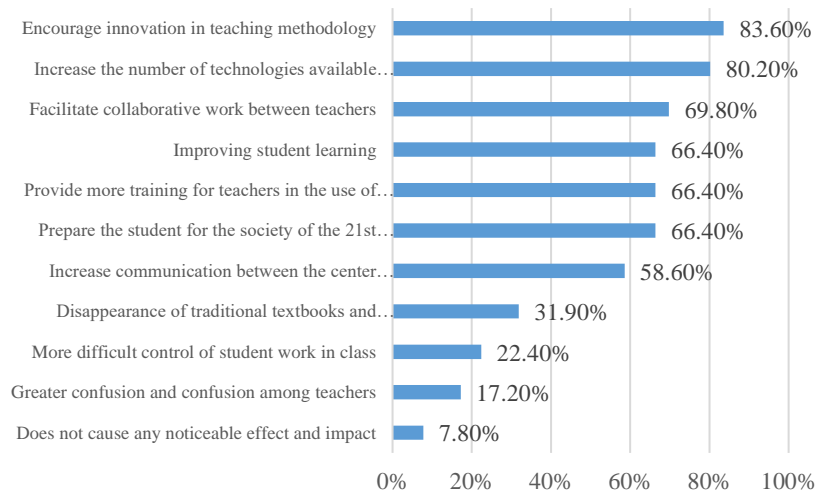


Fig. 7. Student agreement on educational policy and ICT

That said, we specified that for the group of future teachers, 8 out of 10 said that ICT would promote the innovation of teaching methodology and increase the number of technologies available in centers and classrooms in the Canary Islands; 7 out of 10 state that they would facilitate collaborative work among teachers, improve pupil learning, provide more teacher training in the use of ICT and, prepare learners for 21st century society; 6 out of 10 considered that they would contribute to an increase in communication between the school and families; to a lesser extent less than half of the future teachers considered that textbooks and teaching materials are likely to disappear, which will make it more difficult for the student to work in the classroom and cause further confusion and confusion among teachers. See figure 8.



**Fig. 8.** Percentage of the possible impact that the respondent believes that ICT will cause in the Canary Islands

In relation to the evaluation of the use of ICT and related policies, in the Canary Islands, it is observed that in general, they considered that there is not a sufficient investment policy in ICTs in the classrooms of the Canary Islands. He stated (P2) that “not all classrooms have a digital whiteboard” and that “most of the computer equipment in the center is out of date” (P3). “Equipping classrooms with ICT resources and materials is essential for the improvement of students’ learning as they arouse their interest” (P4) but as everyone unanimously stated, the success of improving teaching through the use of ICTs will depend on efforts to update and improve teacher training at all levels of education in the Canary Islands.

## 6 Conclusion

Therefore, and by way of conclusion, we would say that:

- The future teachers considered that access to the Internet is one of the main uses of ICT in the classroom, which indicates that we are facing generations totally integrated into the technological era, however, there is still a lack of means and resources in the classroom to make it possible to talk about universal access to ICTs
- With regard to the resources used in the classroom on a day-to-day basis, they demonstrate the continued use of the interactive digital blackboard and the projector gun, probably because these resources are those provided by the Autonomous Community of the Canary Islands, but not equally for all centers. These resources are used in a basic way and teachers do not have sufficient qualifications and training for the optimal use of it.
- They consider little the effect that the use of ICT would have in their teaching practice, although they point out that it could have a motivating effect on students

and a greater involvement in the tasks to be performed. They recognize in this respect that with more training and better digital skills they could optimize learning processes and improve student motivation and interest.

- In terms of age, there are generally no excessive differences between age groups, probably because the majority of the population surveyed belong to the same generation (more than 80% are between 18 and 24 years old).
- As for devices, there is a predominance of the use of mobile phone and internet (daily), while other devices such as tablets, iPad, eBooks, and the like are used to a lesser extent (two or three days in a week). This also has to do with the fact that in general future teachers feel more comfortable using the devices they use most in their daily routines (mobile) rather than those they use less (tablets, iPads, etc.).
- With regard to their training in the use of ICT for teaching practice, future teachers said that they were very much in agreement with the training courses received in ICT, although they did not express much interest in continuing to train in it. This situation was also observed among teachers in the field, who, while considering that their training was insufficient, expressed interest in it.
- Most of the students surveyed (80%) showed a high tendency to think that ICT will promote the improvement of teaching practices in the Canary Islands.
- The majority of teachers in training and in professional practice stressed the importance of the use of ICTs in improving teaching practice and educational innovation in the Canary Islands. The promotion of educational policies focused on updating the ICT resources of schools and teacher training was considered essential.

## 7 Acknowledgment

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