

# FUTURE TEACHERS' VISION TOWARDS TECHNOLOGIES IN EDUCATION

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## Abstract

At a time when Portugal is struggling with the problem of shortage of teachers in schools and trying to face the ongoing digital transformation through the integration of digital technologies in schools, we seek to know the vision of future teachers on these topics. The study carried out aimed to know the motivations of students for choosing the teaching profession, their view on digital technologies at school, namely in the pedagogical dimension, and what is the contribution of the Information and Communication Technologies in Education (ICTE) subject for the promotion of learning, the development of digital skills and critical and reflective thinking. The methodology followed is part of a qualitative approach and the study was carried out with a 1st year class of the Degree in Basic Education of a higher education institution in Portugal, which attended the subject of ICTE in the academic year 2021/22. Data collection was carried out through the students' digital portfolios, with content analysis being performed on them. The results show that: the motivations for the profession are mainly related to the fact that students love children; education tends to be increasingly digital, so it presents many challenges, but also opportunities for pedagogical innovation; the ICTE subject was very interesting, important, and useful for the development of their digital skills necessary for teaching and learning in this new digital context. In conclusion, the digital portfolio promoted the construction of knowledge within the subject, the development of digital skills and a critical perspective on the role of the teacher and digital technologies for high-quality education.

Keywords: future teachers, technologies, education.

## 1 INTRODUCTION

In Portugal, due to the marked ageing of the teaching profession and predictable retirements, as well as the unattractiveness of the teaching profession, as more and more teacher training courses are left with vacancies unfilled, we are witnessing a shortage of teachers in schools.

In fact, the teaching staff is aged. The study System for the Selection and Recruitment of Teaching Staff in Pre-School Education and Basic and Secondary Education carried out by the National Council of Education at the request of the Assembly of the Republic through Deliberation No. 4-PL/2018, of July 12, reveals that "The number of teachers aged 50 or over is very high, while that of those under 35 is low. In percentage terms, the first group represents 52.9% and the second 1.1%." [1] and, it adds, by 2030 more than half of the permanent teachers (57.8%) could retire [1]. These data are corroborated by EDUSTAT, stating that the vast majority of teachers currently teaching in Portugal are in the 50 to 59 age group (33.23%) and 13.44% of teachers are aged 60 or over [2].

Similarly, the attractiveness of the profession has been decreasing, with a progressive decline in the number of graduates in teacher training courses. According to the Study on the diagnosis of teaching needs from 2021 to 2030 [3]: "The annual number of masters graduates in teacher training is clearly insufficient to meet the cumulative recruitment needs of new teachers foreseen up to 2030/31 for the vast majority of recruiting groups.". Also, "Recruitment needs for new teachers will grow over time; between 2021/22 and 2030/31 it will be necessary to recruit the equivalent of 29% of the number of teachers who were in post in 2018/19." [3].

Given this scenario, it is urgent to adopt measures so that students are not left without classes, namely, to make the profession more attractive by improving the conditions of access to the profession and to promote greater stability of teachers in schools, as well as professional recognition and prestige.

In view of the challenges posed by the major changes underway, whether due to the technological revolution we are going through or the awareness of the need to change lifestyles for sustainable development, arising from environmental problems, climate change and pandemic crises, such as that caused by the outbreak of the disease caused by SARS-CoV-2 (Corona Virus Disease 2019 abbreviated to COVID-19) in late 2019.

The pandemic gave visibility to educational problems and inequalities, and new demands on schools, such as technological and digital, but also reinforce the confidence in the education system, given its resilience and adaptation. If on the one hand the COVID-19 pandemic has recognised the role of the teacher and awakened a view of a great appreciation of the profession, on the other hand, digital technologies have become fundamental resources in education and the mastery of digital skills a necessity.

At a time when digital transformation is considered a vital element of today's society when the crisis provoked by COVID-19 has compelled a rethink of the way education and training are set up and delivered, the need to enhance digital competences and skills in education and training systems is increasing.

The European Commission launched the Digital Education Action Plan for the period 2021-2027 to promote the development of a highly effective digital education ecosystem and enhance digital skills and competences [4].

In the context of the digital transition, Portugal is in alignment with the digital strategy of the European Commission which aims to ensure a digital transformation that benefits everyone. Portugal's Action Plan for Digital Transition [5] aims to be at the forefront of countries best prepared for the changes and challenges inherent to a global digital transition, investing in people, companies and in the modernization of the State. To achieve this in Education, the Digitisation Programme for Schools is being implemented, which aims to actively contribute to their technological modernisation, to foster innovation and the development of the education system through the transversal integration of technologies in the different curricular areas of basic and secondary education and the investment in teachers' digital competences. In this programme, the digital qualification of teachers is considered decisive for the development of innovative models associated with the teaching and learning processes. Thus, it is essential that teachers develop the necessary digital skills to be able to exercise active citizenship and use digital technologies in a professional context, at a pedagogical and didactic level, promoting the development of students' digital skills.

It is within this framework that a study is presented that aimed to know the vision of future teachers about these issues.

## 2 METHODOLOGY

The research was conducted with first-year students in Basic Education Degree who attended the subject of Information and Communication Technologies in Education (ICTE), in the first semester of the current academic year (2021/2022) at a higher education institution in Portugal. The objectives defined for this research were: to know the students' motivations for choosing the teaching profession; to know their vision of digital technologies in school; to identify the contribution of the ICTE subject to the promotion of learning, the development of digital skills, and critical and reflective thinking.

The methodology used fits into a qualitative approach to obtain interpretative-qualitative information. Data were collected through the students' digital portfolios. Data organization and analysis were performed using the content analysis technique [6] in a total of 18 digital portfolios, covering all students who prepared the ICTE digital portfolio. Coding was performed using the a priori categories (based on research objectives). In data processing, content analysis was performed on the *corpus* consisting of all data from the digital portfolios, according to the categories under analysis: motivation; technologies; and ICTE. Following the data analysis and for a better contextualization of the students' reflections, some speeches are presented. For their identification, an alphanumeric code was used (e.g., E1, E2, ... E18).

## 3 RESULTS

The research covered all students enrolled in the 1st year of the Basic Education Degree in the subject of ICTE in the 1st semester of the 2021/2022 academic year at a higher education institution in Portugal, in a universe of 19 students. Of these, only 18 students attended the whole semester of the ICT subject and produced their digital portfolio, which was the sample.

Concerning the sociodemographic data, female students are predominant (83%), and the age range is between 18 and 52 years, the average age being 24.8 years old. Most of the students are Portuguese (83%), although some are from other countries, namely Cape Verde (11%) and São Tomé and Príncipe (6%).

The analysis of the data also indicates that the choice of the course was the first option for most students in access to higher education, even though entry to the course was realized through different modalities,

namely: national access (73%), special access via a higher education course (20% already had a degree) and the access aimed at individuals over the age of 23 (7%).

The results of the research, considering the defined objectives, are presented below according to the categories of analysis (motivation, technologies, ICTE).

### 3.1 Category motivation

From the content analysis, it was possible to verify that the main motivation to be a teacher is related to the fact that students like children: "I chose Basic Education because I like children" (E1); "I have a big passion for children" (E7). Additionally, the students want to teach the children: "I really want to work with children to help them develop their learning skills" (E9); "... encourage children to do activities and things that arouse their curiosity" (E10). Another reason relates to an aspiration or needs to achieve a dream or goal. It refers, therefore, to the desire to be a teacher: "... finish a forgotten dream" (E4); "old dream...to be a teacher!" (E5) and the ambition to follow Basic Education Degree "my major goal was to follow Basic Education" (E12); "degree I always aspired to" (E14).

### 3.2 Category technologies

In this category, it was found that students share a similar view on technologies in education. In other words, there is consensus on the use of digital technologies in education with a view to motivating and engaging students in learning: "In education, the potential of technologies is immense: they work to arouse interest, increase participation" (E3); "use new technologies to increase the interest in learning and motivate students" (E7); "engage my students and make them feel like learning" (E9); "increased students' interest in studying and learning" (E18). But, also, to innovate teaching, enhance learning and the development of skills in students: "use of technology to innovate the classroom, an interactive teaching" (E10); "development of new skills, learning in a fun way, development of imagination, ability to assimilate content in an interactive and playful way, development of language and communication" (E11); "The use of technologies in the classroom ends up being an asset, preparing our students for the future" (E15).

Another vision that emerges from the students' reflections on technologies in education is related, on the one hand, to professional development, highlighting the need, as future teachers, to acquire and develop digital and pedagogical skills to put technologies at the service of education. For instance, "Digital skills for educators/teachers move at lightning speed and a constant teacher training in this area becomes necessary if they want to be successful." (E4); "It is essential that teachers acquire digital skills that allow them to use technologies effectively..." (E12). On the other hand, the development of digital competence in students, empowering children to use technologies appropriately for learning: "... it becomes essential to educate so that children learn how to use technology. This role falls within the teacher's/educator's competence." (E5); "... alerting children to a controlled, safe, and moderate use of technologies" (E8); "Identifying and understanding the use of digital and its potential in understanding the world around them" (E12).

Regarding the technologies category, several challenges and new opportunities emerged. The challenges, from the students' perspective, are: "One of the main challenges is the need to design new learning scenarios using the tools available on the social web." (E1); "It is fundamental that teachers make use of digital to adapt teaching strategies to students' needs... that facilitate collaborative learning and pedagogical differentiation." (E3); "The technologies allow the expansion of the classroom concept, which includes the virtual component, taking teaching and learning to other levels that are more comprehensive and more attractive and that privilege the student action." (E12). As opportunities, students mentioned: "... bringing to education innovative practices that facilitate the teaching process and students learning, using technologies and active methodologies." (E7); "Technology brings the possibility of greater development, learning and communication among people with special educational needs." (E11); "Technologies will make us have better professionals in all areas." (E13); "Technology in education leads students to success in school." (E15); "As a future teacher I hope that new technologies are present in education, that they help students to be good and respectful citizens and that everyone has the same rights." (E17).

### 3.3 Category ICTE

Concerning the ICT category, students recognise the importance of a subject within digital education, which guides them: in the knowledge of different technological and digital applications; in the exploration

and creation of digital educational resources; in the pedagogical use of technologies; as well as in the development of their digital skills. Some exemplary speeches are presented:

"The subject increased, of course, my perception of the importance of ICT in education." (E1).

"This subject was very important for a better knowledge about ICT in education, for the development of activities, different tools that I got to know. I really liked the topics discussed in the different classes." (E6).

"It allowed me to develop digital skills, to acquire more knowledge in the field of digital education." (E7).

"The subject was very productive because it gave me innovative ideas to use with children in the future. I learned about countless technologies, interesting programmes and websites to be used with children... I felt like innovating and experimenting with technologies in the classroom context." (E9).

"It promoted the construction of more open, creative, and entrepreneurial knowledge." (E12).

"This subject was essential to explore tools that were unknown to me until now; it was interesting because we approached topics derived from the subject and we understood better that we increasingly live in a society very connected to technologies." (E14).

"ICTE subject was a novelty for me because in a school context I had never been in contact with a subject that taught us how to investigate the technology around us. I acquired knowledge of new tools throughout the semester, as well as concepts that until now were completely alien to me. It was undoubtedly one of the subjects that helped me the most to have a broader vision of what my profession will be in a few years and showed me the tools on which I can rely to guide my future students." (E16).

"This subject was one of the most interesting I have participated in. The constant dialogue on topics that I did not even know existed, such as digital education at an early age. The alert to the education of the future, how it may be guided in the coming decades with the aid of technologies and having the opportunity to listen to people from various generations, made the subject very interesting in terms of information gathering and future applicability." (E17).

"The subject of ICTE worked in a way that I am a great fan because I have always felt more comfortable developing oriented projects, increasing my knowledge by solving the mishaps that might appear to me than exactly memorizing material without any sense or practical applicability." (E18).

## 4 CONCLUSIONS

The research was conducted with 1<sup>st</sup>-year students in Basic Education Degree who attended the subject of Information and Communication Technologies in Education (ICTE), in the 1st semester of the academic year 2021/2022, of a higher education institution in Portugal, on the topic of technologies in education allowed us to assess, based on their reflections, the following aspects:

- 1 The motivations for choosing the teaching profession are mainly related to the fact that students love children.
- 2 Digital technologies are an important resource for learning and education tends to be more and more digital, therefore it presents many challenges, but also opportunities for pedagogical innovation.
- 3 ICTE subject was very interesting, important, and useful for the development of their digital skills needed for teaching and learning in this new digital context. Therefore, a digital portfolio promoted the construction of knowledge within the subject, the development of digital skills and a critical perspective on the role of the teacher and of digital technologies for high-quality education.

Hence, it is extremely important to train future teachers in pedagogical innovation using digital technologies, preparing them for the challenges and new problems faced by society in general and education in particular.

Taking everything into consideration, quality teacher education requires innovation and flexibility in teaching with innovative pedagogical approaches and learning environments in which digital technology plays a crucial role in the use and promotion of pedagogies, materials and tasks that are personalized and appropriate to the diversity of learners and their active participation in learning.

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## REFERENCES

- [1] Conselho Nacional de Educação, Regime de Seleção e Recrutamento do Pessoal Docente da Educação Pré-Escolar e Ensinos Básico e Secundário. Lisboa: Conselho Nacional de Educação, 2019.
- [2] Edustat, Perfil de idade dos docentes em exercício de funções em Portugal, Accessed 22 April, 2022. Retrieved from <https://www.edustat.pt/indicador?id=17>
- [3] Direção-Geral de Estatísticas da Educação e Ciência, Estudo de diagnóstico de necessidades docentes de 2021 a 2030. Lisboa: Direção-Geral de Estatísticas da Educação e Ciência, 2021.
- [4] European Commission, Digital Education Action Plan 2021-2027 - Resetting education and training for the digital age, Accessed 22 April, 2022. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0624>
- [5] Resolução do Conselho de Ministros n.º 30/2020. Diário da República n.º 78/2020, Série I de 2020-04-21. Accessed 22 April, 2022. Retrieved from <https://data.dre.pt/eli/resolconsmin/30/2020/04/21/p/dre/pt/html>
- [6] J. Amado (coord.), Manual de investigação qualitativa em educação. Imprensa da Universidade de Coimbra, 2017.