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Research Article

The digital skills of teachers in the teaching practice with students with specific needs

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ABSTRACT

The use of digital technologies in the educational context has been reinforced by the importance they represent in the teaching-learning process of children with specific needs. In this sense it is important to understand the importance attributed by teachers regarding the use and training in this area. 108 teachers of the group of special education teaching in schools in the North of Portugal participated in this study. The study is quantitative in nature, the statistical analysis was performed using the IBM/SPSS program, version 26.0 with exploratory factor analysis. Ethical issues were taken into account, safeguarding the anonymity of participants throughout the process. The participants were informed about the research objectives and gave their consent for the publication of the results, as well as being free to leave the study whenever they wanted. The questionnaires were sent via email and collected by one of the study authors. The results point to a clear recognition of the advantages of digital technologies in the teaching-learning process of students with Specific Needs, not being so evident with regard to Technologies as a decisive factor in the process of inclusion of these students. It was verified that the teachers' perceptions do not always agree with the usefulness of their practices. An aspect that is not dissociated from the gaps highlighted in terms of specific training in digital technologies.

Keywords: Digital technologies, competences, teachers, students, specific needs.

INTRODUCTION

The evolution of digital technologies provides a strong influence on teaching. This use in education has been increasingly encouraged due to the contribution it can make to inclusive education (Comissão Europeia, 2020) helping teachers in their work in the classroom. However the use of technologies depends on the conceptions that teachers build in the context of their practices (Xavier, 2011). There are several advantages associated with the use of technologies in teachers' practice: the diversification of learning tools, better management of classes and of the school itself (Castro and Lucas, 2022). Knowing teachers' perceptions regarding the use of digital technologies and the role they attribute to them in the teaching-learning process, in particular students with specific needs, leads to an analysis of the results of studies carried out in this field. It is important to know the relationship and attitude that teachers show towards the complementarity of tecnologies in the teaching-learning process of the students they support (Ribeiro, 2012).

It is not surprising that teachers believe in the potential of new technologies as a support tool for students with Specific Needs. Several studies demonstrate the use of technologies to obtain better results in the students' learning process (Monteiro, 2013; Belusso and Peruchin, 2018; Diaz and Lee, 2020). However digital technologies are just the tools, their integration into teaching concerns the trainers involved in the process (Cassundé et al. 2017).

In this process, it is essential that teachers develop digital skills. The development of these skills is not only associated with the use and access to technologies but with the knowledge, skills and correct attitudes in this use. It is important for the teacher to be aware that the inevitability of the introduction of technologies

in teaching is leading to a new model of education.

The teacher must assume a positive attitude and an intermediary role between technological tools and new learning situations, in order to prepare for the resolution of new problems and promote the development of new cognitive abilities (Monteiro, 2013).

In this new paradigm of inclusive education, the teacher will no longer be the holder of knowledge and the student only the receiver; a pedagogical interaction must be created, promoting a collaborative field of learning, where the educator's role also becomes that of a mediator who encourages research and construction of knowledge (Pocinho and Gaspar, 2012).

The use of new technologies must be associated with a change in teaching strategies. Sometimes, despite using technological tools, the way they approach the contents is similar: for example, children, instead of carrying out the worksheets on paper, carry them out on the computer (Ferreira and Ferreira, 2012). The preparation of teachers in the educational use of technologies is essential for the full use of these tools in the pedagogical interaction with students (Xavier, 2011; Gândara, 2013; **Tarlow et al.,** 2020).

The introduction of technologies in the classroom does not bring automatic beneficial effects in the teaching-learning process of students with specific needs. It is necessary to realize that the introduction of digital technologies by teachers is a more methodological issue, since everything depends on how the programs were built and how they will be used and explored (Monteiro, 2013). The teacher has to metamorphose into a technological environment, becoming a facilitator of the use of resources and tools, a guide (Ribeiro et al., 2010).

There are countless potentialities of digital technologies, in the context of an inclusive school. However, its innovative solutions, given the heterogeneity of students with Specific Needs, are not enough if there are no competent professionals who use them.

Technologies require, from the teacher, new pedagogical skills, as well as knowledge in terms of their use and potential, in order to meet the needs of their students. Therefore, it is necessary to promote generalized and specialized training on the use of technologies by teachers; they need a permanent update of their knowledge, which follows the technological evolution (Fonseca, 2019; Martins et al., 2022).

With the use of digital technologies in schools, it is up to the teacher to encourage students to develop research and discovery. In addition, it is the teachers who, as always, have the obligation to bring about new learning circumstances. In teaching practice, there is an increased responsibility for adapting learning situations to technological tools, from which students can develop autonomy and critical thinking (Monteiro, 2013).

In an inclusive school there can only be an inclusive education. And in an inclusive education, the difference is blurred, not constituting an obstacle. Heterogeneity is a challenge to the creativity, proficiency and effectiveness of teaching practice. The insertion of digital technology came to redefine the educational space and pedagogical interaction, especially with regard to students with Specific Needs. The place of learning ceases to be just the classroom, extending to all spaces where these students can access knowledge, via new technologies.

Currently, digital technologies play a guiding role and promote thinking in the learning process of students with specific needs. For these reasons, teachers are directly struggling with doubts that call into question their motivation in the use of digital technologies at the teaching-learning level, for students with specific needs. For these reasons, teachers are directly struggling with doubts that call into question their motivation in the use of digital technologies in terms of teaching and learning, for students with specific needs. Therefore, it is necessary to question: What are the factors that facilitate or imped the use of technologies in the teaching-learning process of students with specific needs?; Are special education teachers aware of the importance of technologies, as a pedagogical tool, in the process of including students with specific needs?; How do teachers assess their skills in terms of digital technologies in their training path?; Do teachers use, in their teaching practice, technological means, facilitators of educational success, in students with specific needs?

METHOD

With this study, it is important to understand the importance attributed by teachers to the use and training in the area of digital technologies. It follows the assumptions of an investigation supported by a quantitative methodology, using the survey by questionnaire.

Participants

The study included 108 special education teachers from schools, belonging to the northern region of Portugal. Of the 108 Special Education teachers that make up the sample, 85 are female (79%) and 23 are male (21%). The most representative age group is that of 36-47 years old, which make up 57 teachers (53%), followed by the 48-59 age group, with 32 teachers (30%). The least representative age group is 24-35, with 19 (17%). In terms of years of teaching service, it was found that 57 respondents (53%) have between 12-23 years of service; 28 (26%) have more than 25 years of service; and 23 (21%) declare having less than 12 years of service.

With regard to academic qualifications, most teachers have a degree. There is a relatively smaller number of respondents with a master's degree and a small number with a doctorate.

As for the professional category, 52 teachers (48%) belong to the Cluster Board; 15 (14%) to the Pedagogical Zone Board; and 41 (38%) are hired.

Survey

A questionnaire survey was used, its development went through several stages. We resorted to a study of the

specialized literature regarding digital technologies and inclusive education and from which the following categories were traced: digital technologies in the teaching-learning process of students with specific needs; Training of special education teachers in digital technology; Digital skills in teaching practice. These categories included skills that were grouped, taking into account the organization established for each category, which we later converted into questionnaire items, in accordance with the norms and indications established for the preparation of a questionnaire (Hill and Hill, 2000) namely placing each item with a single specific aspect.

We then proceeded to prepare the initial version of the questionnaire, this version is submitted to the examination of other specialists; a pilot study was carried out with individuals similar to the target population and later the final version was applied.

The questionnaire is structured around 35 closed-answer questions.

In a first phase, it was intended to make a personal and professional characterization of the participants. The questions were formulated from a group of categories and subcategories previously established from the guiding questions of the investigation, which are now discriminated: Category A – digital technologies in the teaching-learning process of students with specific needs. (Subcategory A1 – Digital technologies as an inclusion factor; Subcategory A2 – Digital technologies as promotion of educational success for students with Specific Needs). Category B – Training of special education teachers in digital technology; (Subcategory B1 – Training in digital technologies; Subcategory B2 – Perception of the training path; Category C – Digital skills in teaching practice. Questions 9, 11 and 16 to 35 are contextualized in the Likert - ordinal self-assessment scale (expresses an order of factors). What you want to measure is the level of agreement or non-agreement with a given statement. Employs the scoring system from 1 to 5: where 1 is equivalent to “totally disagree” (unfavorable); 2 to “disagree” (not favorable); 3 “I neither agree nor disagree” (indifference); 4 “agree” (favorable); 5 “strongly agree” (very favorable).

Question 10 has 2 levels of answers, with evaluative items “yes” and “no”. Questions 13, 14 and 15 are composed of four response levels: “never”, “rarely”, “sometimes” and “often”; questions 8 and 12 are optional, in which more than one answer is given.

The questionnaires were sent via email and collected by one of the study authors.

Ethical issues were taken into account, safeguarding the anonymity of participants throughout the process. The participants were informed about the research objectives and gave their consent for the publication of the results, as well as being free to leave the study whenever they wanted.

Statistical analysis was performed using the IBM/SPSS program, version 26.0 with exploratory factor analysis.

RESULTS

The results presented show the responses of respondents special education teachers.

Table 1. Digital technologies in the teaching-learning process of students with specific needs

Subcategories	Questions	Averages	Standard deviation
A1 - Digital technologies as an inclusion factor	Use of digital technologies in the acquisition of cognitive skills	4,15	0,78
	Digital technologies and reduction of barriers and more differentiated intervention	4,13	0,8
	Use of digital technologies in the acquisition of behavioral skills	4,05	0,84.
	Contribution of technological means to the full inclusion	3,73	0,93
	Use of digital technologies in the acquisition of skills social	3,73	0,95
A2 - Digital technologies as promoting the educational success of students with SEN	Advantages of digital technologies in the teaching-learning process	4,35	0,75
	Elaboration of multimedia resources as facilitators of learning	4,27	0,77
	Digital technologies make children more motivated	4,25	0,73
	Educational software as a facilitator of the learning process teaching-learning	4,23	0,75
	Lack of specific technological means in special needs education in school, makes the teaching-learning process difficult	4,22	0,75
	Construction and application of multimedia resources facilitate pedagogical intervention	4,19	0,78
	Lack of technical means in the school make difficult the process teaching-learning	4,18	0,78
	Digital technologies as a facilitator of student attention	4.13	0,76
	Activities that involve digital technologies in the pedagogical space make it possible to achieve the proposed objectives	3,97	0,69
	Digital technologies as facilitators of student autonomy	3, 88	0,78

Table 1. Training of special education teachers in digital technology

Subcategories	Questions	FA	FR
B1 - Training in Technologies	Training level I	10	9%
	Continuous formation	20	19%
	Initial formation	30	28%
	Training level II	2	2%
	self-training	5	5%
	No training	41	38%
B1 - Training domains in the field of digital technologies	Training in generic ICT applications	85	79%
	ICT management in classroom activities	51	47%
	Specific applications in EN	46	43%
	Creation of contents for the digital environment	19	18%
	Content adaptation for the digital domain	19	18%
	Creating content for QIM	10	9%
	Identification of repositories of training objects	4	4%
	Other options	2	2%

Table 3. Perception of the training process

Subcategories	Questions	Averages	Standard deviation
B2 - Perception of the training process	The lack of specific training for teachers hinders the educational practices associated with digital technologies	4,13	0,82
	The type of training has implications for the effectiveness of digital technologies in the pedagogical space	4,0%	0,87
	Self-assessment of skills in the field of digital technologies	3,5%	0,68
	Self-assessment in updating in computer applications directed to specific needs	3,42%	0,87
	Self-assessment of skills digital technologies in specific needs	3,02%	0,85

With regard to digital technologies in the teaching-learning process of students with specific needs, there is an average value of around 4.07, so according to the results, teachers favorably recognize the contribution of digital technologies to the process of teaching-learning. Respondent subjects have a more favorable perception of new technologies as a factor for promoting educational success, compared to the appreciation of digital technologies as an inclusion factor.

Analyzing the results obtained in **Table 2**, training of special education teachers in digital technology - it appears that the item «Training in ICT» reveals that 10 respondents (9%) have level I training; 20 (19%) have ongoing training; 30 (28%) say they have done self-training; 2 (2%) state that training in technology comes from initial training; 5 respondents (5%) reveal having level II training; and 41 38%) say they have no training.

The item «training domains in the area of digital technologies» is based on an optional question; within 8 possible answers, respondents could select more than one option. Therefore, 85 (79%) respondents refer to «training in generic applications in digital technologies»; 51 (47%) to «management of digital technologies in classroom activity», 46 (43%) to «specific applications in specific needs»; with the same value of 19 (18%) for «creating content for the digital environment» and «Adaptation of content for the digital domain»; 10 (9%) to «creating content for QIM»; 4 (4%) to «identification of repositories of training objects»; and 2 (2%) mentioned other options.

In **Table 3**, perception of the training process, a total average value of 3.61 was obtained. These results show that the respondents' assessment is in the range between the opinions of «indifference» to «favorable». There is also an appreciable range of averages.

Table 4. Digital skills in teaching practice

Subcategories	Questions	FA	FR
Use of computers in the classroom with specific needs students	Educational games	91	84%
	Images	71	66%
	Reading and stories	66	61%
	writing	65	60%
	Others	9	8%
Use of the computer as a differentiated pedagogy in specific needs students	Frequently	51	47%
	Sometimes	49	45%
	Rarely	7	6%
	Never	1	1%
Elaboration of multimedia resources for students with specific needs	Frequently	53	49%
	Sometimes	44	41%
	Rarely	10	9%
	Never	1	1%
Use of digital technologies in a pedagogical intervention in students with specific needs	Frequently	58	54%
	Sometimes	46	43%
	Rarely	3	3%
	Never	1	1%

The data in **Table 4,** Digital competences in teaching practice reveal that in the item «use of computers in the classroom with specific students» - 91 answers (84%) indicate «educational games», 71 (66%) images, 66 (61 %) reading and stories, 65 (60%) writing and 9 (8%) mark «others»; item «use of the computer as a differentiated pedagogy in specific needs students» - 51 (47%) say they do it «frequently», 49 (45%) say they use it «sometimes», 7 (6%) revealed they use the computer «rarely» as differentiated pedagogy, and 1 (1%) says «never» use; item «elaboration of multimedia resources for students with specific needs education – 53 subjects (49%) answered «frequently», 44 (41%) say «sometimes», 10 (9%) say «rarely», and 1 (1%) «never» elaborates resources; item «use of digital technologies in a pedagogical intervention in students with specific needs education» - 58 respondents (54%) answered «frequently», 46 (43%) say «sometimes», 3 (3%) indicate «rarely», and 1 (1 %) «never» uses digital technologies in pedagogical intervention. In view of the findings, it is inferred that 90% or more of special education teachers use technological means in their teaching practice with students with specific needs.

DISCUSSION

This study aimed to establish a relationship between the perceptions and practices of special education teachers, regarding the use of digital technologies in students with specific needs.

In a first approach, it was possible to infer that the teachers strongly believe in the potential of technologies as an educational resource and consider themselves with sufficient training, which allows the usefulness of the application of these resources in students with specific needs. However, it was proven that these perceptions may contain some equivocality, which hides inhibiting factors at the level of a more efficient praxis in terms of inclusion, with regard to the educational success of those students.

Regarding the first question that guides this study, namely the factors that facilitate or prevent the use of digital technologies in teaching students with specific needs, it was found that teachers consider that there are more advantages than disadvantages in the use of technologies (Monteiro, 2013; Martins et al. 2022) With regard to the advantages, it was found that, for most teachers, digital technologies facilitate learning, make children more motivated and are resources that help pedagogical intervention, in line with several studies (Belusso and Peruchin, 2018; Diaz and Lee, 2020; Castro and Lucas, 2022;). It is also a general opinion that educational spaces that are not equipped with adequate technological resources make this process difficult. Aspects associated with digital technologies as a resource that facilitates attention and enhances the achievement of the proposed objectives are not so consensual in terms of the benefits they can bring. Finally, with regard to the disadvantages of using digital technologies, teachers associate them with their lack of specific training, which makes educational practices difficult. These conclusions seem to reflect a paradox in terms of teachers' perceptions: if, on the one hand, there is recognition of the advantages of new technologies, on the other hand, teachers themselves recognize that it is one of the causes that obstruct the maximization of benefits that technologies bring digital in special education. it appears that the respondents value the use of digital technologies in the classroom with students with specific needs, as this reduces their disadvantage in relation to other students, thus contributing to increasing school and social integration (Xavier, 2011). It is also noticed that the lack of updating or the inadequacy of Hardware and Software becomes much more penalizing for students with specific needs than for students in general, possibly due to the need for specific equipment and/or programs.

As for the assessment that teachers make of their ICT skills, associated with their training path, it was concluded that the vast majority of teachers have general training. However, few have specialized training and training in this area becomes fundamental for a better use of available resources (Gândara, 2013; **Tarlow et al., 2020).** The results make it possible to establish a parallelism between the teachers' perceptions and their training path. In fact, the aforementioned shortcomings in terms of quantity and quality of training in digital technologies at the level of specific needs are assumed by teachers, as many of them self-assess themselves only satisfactorily in their skills in the area of technologies, in their updating in computer applications aimed at students with specific needs. In this regard (Monteiro, 2013) he says that teachers' motivation for the use of digital technologies is important for student motivation. when the teacher feels the need to motivate students, he resorts to digital technologies, because they make it possible to obtain more positive results in learning and because they can serve as a positive reinforcement in the face of other activities (Xavier, 2011).

Another aspect to consider in the results obtained is that teachers demonstrate motivation to overcome their training gaps, when they believe that training, or the lack thereof, directly interferes with the proper use they make of technological means.

The above conclusions, in terms of teacher training, corroborate the studies (Monteiro, 2013) which indicate that the lack of teacher training in the area of new technologies may prevent technological tools from being introduced in teachers' pedagogical practice, especially in the classroom. living room; teachers need to understand the advantages of using computers before they are put on the sidelines. Other studies show that teachers felt training needs, according to the diagnosis of their students with specific needs. And in the context of these needs, there was a greater appetite for training actions within the scope of including support technologies for students with specific needs, in a more practical way (Fonseca, 2019).

With regard to the use of technological means by teachers in their teaching practice, it is possible to attest that they frequently use computers in the classroom. They do it predominantly to make educational games. This suggests the need to further enhance the benefits of digital technologies in the teaching-learning process of students with specific needs They should be used not only in playful terms, but also in other crucial areas for the development of these students' skills, namely motor, linguistic and communication skills (Belusso and Peruchin,2018; Diaz and Lee, 2020).

CONCLUSIONS

This study aimed to understand, on the part of special education teachers, the importance of using digital technologies in the teaching-learning process of students with specific needs and the digital skills of teachers in their teaching practice with these students.

The main conclusions of the study indicate: special education teachers consider digital technologies to be an advantageous resource as a factor in promoting educational success in students; Digital technologies are still not considered a determining factor in the inclusive process of students with specific needs; Teachers have a very satisfactory perception, both in terms of their training and in terms of the proficiency of their pedagogical practices; Teachers have training in generic applications of digital technologies, but much less are those with specialized training; Teachers' teaching practices related to digital technologies may be conditioned by an inflated perception of their capacities, by an attitude of accommodation and by a deficit in updating knowledge in terms of new technologies.

Digital technologies are a strong aid in teaching practice with students with specific needs, in obtaining better results in the teaching-learning process. Their use should lead to a change in teaching strategies, where teacher training is fundamental and a priority.

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