

# Digital competencies of educators: from praxis self-assessment to training needs

***Competências digitais dos professores: da autoavaliação da práxis às  
necessidades formativas***

***Competencias digitales del profesorado: de la autoevaluación de la praxis  
a las necesidades formativas***

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ARTICLE



## Eniel do Espirito Santo

Federal University of Bahia's Reconcavo (Brazil)

Doctor in Education. Professor at the Center for Culture, Languages and Applied Technologies (CECULT) of the Federal University of Bahia's Reconcavo (UFRB), Brazil. Deputy Coordinator of the Brazilian Open University System at UFRB. Researcher with studies in Didactics and Pedagogical Innovation and Digital Technologies in Education. Evaluator of the National System of Evaluation of Higher Education of the Ministry of Education.

eniel@ufrb.edu.br  
orcid.org/0000-0003-0589-1298

## Tatiana Polliana Pinto de Lima

Federal University of Bahia's Reconcavo (Brazil)

Doctor in Education. Professor of undergraduate and postgraduate courses in the areas of Knowledge and Teaching Practices, Teacher Training and Pedagogical Innovation. Ado-hoc evaluator of the Brazilian National System for the Evaluation of Higher Education and the National Textbook Program, both from the Ministry of Education.

tatianalima@ufrb.edu.br  
orcid.org/0000-0003-2896-5616

## Adriano Dantas de Oliveira

Federal University of Bahia's Reconcavo (Brazil)

Doctor in Philology and Portuguese Language. Professor and researcher in the lines of Didactics and Pedagogical Innovation and Rhetoric and Semiotics applied to singing.

adriano.dantas@ufrb.edu.br  
orcid.org/0000-0002-2146-634X

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## **Abstract**

Today's connected society demands digital competence from teachers in their pedagogical work. This study analyzes the digital competence required for teachers, based on the common self-assessment framework of digital competence of teachers (DigCompEdu). Using a quantitative approach, the DigCompEdu CheckIn self-assessment scale was applied to 145 Brazilian teachers in the first years of primary school. The teachers obtained a score of 40.9 points, classifying them as B1 - Integrative, revealing gaps in their professional and pedagogical competence, as well as in the development of the competence of the students. It is urgent that teacher training includes the pedagogical use of technologies as drivers of learning and the emancipation of students.

## **KEYWORDS**

Digital competence, Teachers, DigCompEdu, Teacher training.

## **Resumo**

A atual sociedade conectada demanda dos professores competências digitais no seu fazer pedagógico. Este estudo analisa as competências digitais requeridas para os professores, baseando-se no quadro comum para a autoavaliação das competências digitais dos professores (DigCompEdu). Com abordagem quantitativa, aplicamos a escala de autoavaliação DigCompEdu CheckIn com 145 professores brasileiros dos Anos Iniciais do Ensino Fundamental. Os professores alcançaram escore de 40,9 pontos, classificando-os como B1 - Integrador, revelando lacunas nas suas competên-

cias profissionais e pedagógicas, bem como no desenvolvimento das competências discentes. Urge que a formação docente contemple o uso pedagógico das tecnologias como promotoras da aprendizagem e emancipação dos estudantes.

## **PALAVRAS-CHAVE**

Competências digitais, Professores, DigCompEdu, Formação docente.

## **Resumen**

La actual sociedad conectada exige competencias digitales a los docentes en su labor pedagógica. Este estudio analiza las competencias digitales requeridas para los docentes, a partir del marco común de autoevaluación de las competencias digitales de los docentes (DigCompEdu). Con un enfoque cuantitativo, se aplicó la escala de autoevaluación DigCompEdu CheckIn a 145 docentes brasileños de los primeros años de la escuela primaria. Los docentes obtuvieron una puntuación de 40,9 puntos, clasificándolos como B1 - Integrador, revelando brechas en sus competencias profesionales y pedagógicas, así como en el desarrollo de las competencias de los estudiantes. Es urgente que la formación docente incluya el uso pedagógico de las tecnologías como impulsoras del aprendizaje y la emancipación de los estudiantes.

## **PALABRAS CLAVE**

Competencias digitales, Docentes, DigCompEdu, Formación docente.

# 1. INTRODUCTION

The COVID-19 pandemic, caused by the SARS Cov-2 coronavirus, threw teachers and educational institutions around the world into virtual learning spaces, demanding the development or improvement of digital competence with a view to the continuity of educational activities, in amid the chaos of the health crisis caused by the pandemic.

In this disruptive context, knowing how to use the pedagogical potential of digital technologies has become a condition for teachers, especially when considering the methodological specificities of online teaching and, above all, avoiding the mere transposition of pedagogical practices from face-to-face, facing the school space to the virtual “universe”.

It is noteworthy that the need to use digital technologies to support pedagogical mediation in the teaching and learning process precedes the demands of the COVID-19 pandemic. It is important to remember that the debates in the 1990s in Brazil about the “New Technologies in Education”, later called “Digital Information and Communication Technologies”, did not fully reach the basic educational units through continuing education or even the initial preparation derived from teacher training courses in Brazilian universities.

On the other hand, the distance education modality has long used the potential of emerging digital technologies successfully in the teaching and learning process. Hernandes (2017) affirms that the unidirectional relationship used previously in traditional distance education models evolved with the emergence of online education, since digital technologies allowed a high level of dialogic interaction between educator and student, allowing “virtual encounters

among all the participants in the educational process in the social network” (p. 287).

However, although the use of digital technologies is not something new in the field of Education, the pandemic has opened gaps in the digital competence of educators, since many were not prepared to implement teaching methodologies in accordance with the specificities of the educational cyberspace, as revealed by the studies of Dias-Trindade & Santo (2021).

Now, the Common National Curriculum Base (BNCC), by establishing the recommended learning for Basic Education in Brazil, defines that pedagogical decisions must be based on the development of competencies through the selection, production, application and evaluation of teaching resources and technologies to support the teaching and learning process, so that students are able to critically use digital technologies “in various social practices (including school) to communicate, access and disseminate information, produce knowledge, solve problems and exercise leadership and authority in personal and collective life” (Brasil, 2017, p. 9).

Given the above debate, this study aims to analyze the digital competence demanded by teachers from the self-reflection of their educational praxis and mapping the gaps that arise in order to propose indicators for continuing teacher training. The research is based on the proposal of the common framework for the self-assessment of digital competence of educators (DigCompEdu), prepared by the Science and Knowledge Service of the European Commission (EU Science Hub), presented by Redecker (2017).

Thus, this study is descriptive research with a quantitative approach, using the self-assessment scale of digital competence of educators (DigCompEdu CheckIn) as a data collection

instrument. It was carried out between 2020 and 2021 with 145 Brazilian basic education teachers who were working in the first years of primary school (1st to 5th year).

## 2. TECHNOLOGIES, DIGITAL COMPETENCE AND TEACHER TRAINING IN BRAZIL

To understand the training gaps oriented to the pedagogical use of digital technologies, it is important to know the context of the training of teachers who work in the first years of primary school in Brazilian public schools. Throughout the 20th century, what predominated in teacher training courses in Brazil was training based on the ideal of technical rationality. This rationality hierarchized the knowledge learned in the academy, making the future professional of education a teacher who reproduces knowledge historically selected by textbooks and hegemonic pedagogical material (Lima, 2019).

From this perspective, we can ask ourselves: does the training of these future teachers permeate the pedagogical uses of technologies? Faced with this question, we can argue that in a country where there are still a large number of lay teachers (without specific training for teaching), the answer is negative.

Studies carried out in the first decade of the current century show us that:

22% of the 2,101,408 Brazilian professors (450,874) did not make it to university. Of this total, 8,339 completed only primary education, 115,456 completed regular secondary education, and 335,418 completed teacher education. Among the 1.6 million graduates, 223,777 did not complete a degree, a modality that prepares teachers. (Figueiredo, 2013, p. 88)

When analyzing the curricular structures of the undergraduate courses responsible for the training of future teachers at the Federal University of Reconcavo da Bahia, located in Reconcavo Baiano, Brazil, we infer that when this debate is discussed it is through a specific discipline, generically called Information and Communication Technologies, which is not mandatory. In this sense, there is no concern to train teachers prepared to mediate the learning of digital native children in a technological society.

So, how can we expect in a context in which we need a lot of technological knowledge, interrelated with pedagogical, curricular and content knowledge, that teachers in this stage of Basic Education can become “silently” mediators of online learning through of virtual environments? There is no way to demand from a professional an undeveloped skill in their initial teacher training courses.

In their survey on teacher training and related policies, Gatti, Barreto and André (2011) showed that the training offered to teachers is, to a great extent, neglected and offered in a timely manner and far from the reality of teachers. (Souza and Schneide, 2016, p. 419)

However, there has been some investment in the acquisition of televisions, computers, image projection equipment, and the installation of computer labs by successive Brazilian governments since the late 20th century. At the same time, there was no adequate training in higher education courses, either in the context of initial training or in the field of postgraduate courses (Master's and Doctorate) focused on the area of Education, therefore, teachers are not prepared to appropriate these spaces and their full potential.

In the field of postgraduate studies and referring specifically to the specialization courses known in Brazil as *lato sensu* postgraduate courses, there are still a very insignificant number of courses focused on the debate on Digital Technologies and their uses in education in public and superior institutions.

In light of this, technology investment for schools over the years has become futile to some extent, as teachers are often unprepared or have difficulty bringing technologies into their classrooms. Such difficulties prevent the transformation to a teaching in which knowledge is built collaboratively and that considers the prior technological knowledge presented by children of the 21st century, compared to traditional teaching based purely on technique.

Lima (2019), considering the studies of Tardif (2011), tells us that knowledge learning is slow and complex.

[...] Consequently, an adequate formalization and systematization in the teaching process is required for the learning process to take place, conceiving teacher training as something fundamental for the production and updating of this knowledge. (p. 67)

Research such as that of Lima (2019) shows us the fragility of the training of teachers who work in the initial years of primary education in Brazil, when considering curricular and specific knowledge of areas of knowledge, since these teachers are considered multidisciplinary teachers, that is, they are in charge of teaching the different subjects that make up the curriculum of this teaching stage.

Also considering the study by Lima (2019), it is possible to observe that the informant teachers do not mention technological knowledge, since they are neglected in their pedagogical

practices, either due to the total lack of initial training in their higher education courses, or because of the invisibility of the need to constitute a pedagogical practice also supported by the use of technologies, or even by the absence of material conditions (computers, internet, laboratories) for technologies to be present in everyday school learning.

Thus, initial training for the pedagogical use of technologies carried out in an innovative, meaningful and instigating way for learning continues to be a challenge in the face of the so-called globalized knowledge or information society. The absence of this training, therefore, affects teachers who are illiterate in knowledge and media and information skills, a fact even more evident in the context of the COVID 19 pandemic.

These teachers, digital migrants, according to Figueiredo (2013) will not be able to empower their students, digital natives, to use cyberspace, internet, programs, games, television, radio, among others, so that they develop diverse competence and abilities to become in critical and well-informed citizens.

Given this, one wonders: what are the digital competence that teachers who work in the first years of primary school should have? This will be the topic that will be discussed next.

Even considering the polysemy of the term digital competence with different approaches in different contexts, in this study we consider the concept presented in the Sales & Moreira (2019) studies when they state that:

[...] digital competence is the sensory, cognitive, motor and affective exercise of skills, values, knowledge, information, experiences of the subjects in practices of knowledge, recognition and use of digital and connected ICT,

in order to make decisions, pose attitudes and act autonomously in the processes of intervention, mediation and resolution of problems derived from the context of the learning society, enabling transformation, social, political and economic change in the different daily lives and sectors of the society, including education. (p. 18)

In this sense, the digital competences of teachers go beyond the fetishism of the technique of knowing how to use digital interfaces in the educational context, since it is necessary to reflect on their pedagogical intentionality aligned with the socioeconomic, cultural and political context in which students and educators are inserted, as highlighted by Pesce (2014).

Therefore, the digital competence of educators include all pedagogical activities with the support of digital technologies in environments and other virtual learning spaces, enhancing the teaching and learning process. In the words of Dias-Trindade & Ferreira (2020), digital teaching competence constitute a process of evolution from literacy to digital fluency, stating that:

[...] This construct naturally encompasses the ability to work in digital environments, associating the pedagogical component with the technological and digital component. However, this “digital competence” must materialize in the ability to mobilize knowledge and attitudes for an effective use of digital technology in a professional context. (p. 169)

Thus, in this pandemic beginning of the 21st century, initial (undergraduate courses) or continuous teacher training (postgraduate courses and throughout life) cannot ignore the development of specific competencies for digital

technologies as a support for pedagogical mediation. In addition to the potential of digital technologies in the educational process, we must also consider that both students and educators are inserted in a hyperconnected society with the thumb up (Serres, 2015), despite the lack or deficient access to broadband internet, unfortunately continues to be part of daily life in many contexts of population marginalized by public policies.

However, the mere access to computers and digital devices connected to the internet does not ensure the development of digital competence, because as Santos (2019) states, in the context of online teaching, it is essential that teachers know to “[. . .] seek and process information online, transform information into knowledge, communicate online, produce texts in various languages and support [...]” (p. 19), demanding skills that go beyond technicalities and are capable of leading them to digital fluency that promotes the emancipation of students who are inserted in a hyper-connected and networked society.

On the other hand, even considering that the majority of students are from a generation called digital savants (Prensky, 2012), facing the sea of information available online, they increasingly need the pedagogical mediation of teachers to help them extrapolate the use of technologies beyond social entertainment and knowing how to “extract meaning from information, understand the difference between what is important and what is not, and above all, combine the multiple fragments of information in a broad image of the world”, in Harari’s words (2018, p. 322).

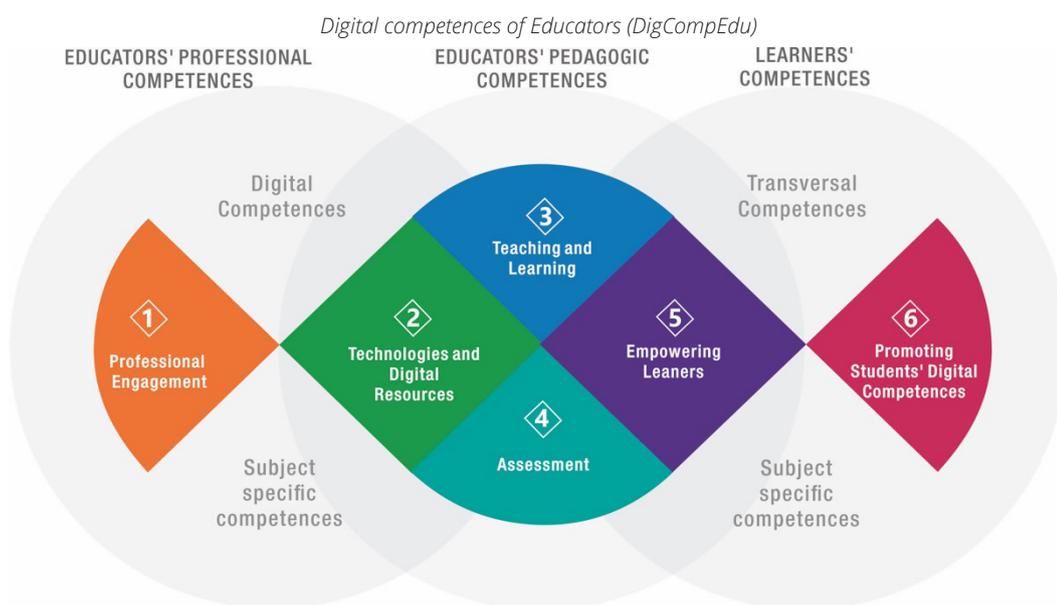
Especially in these times of pandemic and given the complexity of liquid modernity introduced by Bauman (2001), teachers are required to continuously develop and improve their digital

competence, so that they can use digital technologies to promote learning and the critical and reflective emancipation of education. Certainly, a huge challenge that teachers cannot avoid!

Regarding the evaluation instruments that seek to map the stage of development and improvement of the digital competence of educators, we find in Brazil the so-called "Matrix of Digital

Competences CIEB", elaborated by the Center of Innovation for Brazilian Education (CIEB). The matrix consists of a teacher self-assessment scale subdivided into 3 (three) areas, that is, pedagogical, digital citizenship and professional development, providing subsidies capable of guiding the development of teachers' digital competence, Sales & Moreira clarify (2019).

**Figure 1**



Source: Dias-Trindade, Moreira & Nunes (2019); Redecker (2017)

In the European context, the European Commission's Science and Knowledge Service (EU Science Hub) launched in 2017 a Common Framework for Digital Competences of Educators, called DigCompEdu. Based on a theoretical model, DigComEdu considers the specificities of pedagogical practice with the support of the

potential of digital information and communication technologies (DICTs) in the teaching and learning process, points out Redecker (2017). In Figure 1, we can see the areas of digital competence covered by DigCompEdu with their developments.

**Table 1***DigCompEdu Digital Skill Levels and Areas*

Competence Level	Area of competence	Description
<b>Teacher professional competencies</b>	Professional participation	Use of digital technologies to communicate, collaborate and promote professional development.
	Technologies and digital resources	Use of technologies to select, create and share digital resources.
<b>Competências pedagógicas</b>	Teaching and learning	Ability to manage and organize the use of digital technologies in the teaching and learning process.
	Evaluation	Way of using digital technologies to evaluate and / or improve student evaluation processes.
	Student empowerment	Use of technologies to improve inclusion, personalization and student engagement.
<b>Desenvolvimento das competências dos estudantes</b>	Promotion of students' digital competence	Support students in the use of digital technologies in a creative and responsible way.

Source: Adapted from Ota & Dias-Trindade (2020) and Redecker (2017)

In the DigCompEdu model, the digital competence areas are distributed in 3 (three) levels that are subdivided into 6 (six) competence areas, as shown in Table 1.

For the self-assessment of digital competence, the DigCompEdu model is structured in the format of a self-reflective questionnaire, classifying the stage or level of development of digital competence based on the score obtained, as detailed in Table 2. In addition, it provides individual feedback with suggestions to improve teaching practice, enriched with the use of digital technologies (Dias-Trindade & Santo, 2021).

We observe that the DigCompEdu teacher digital competence self-assessment model goes beyond mere mapping of the level at which teachers are, as it provides guidance feedback so that they can advance to later levels, in the face of digital fluency. The authors Dias-Trindade and Ferreira (2020) affirm that the questionnaire also allows evaluating what type of training may be the most appropriate for each teacher, that is, the areas in which they need to dedicate themselves to their continuous training, as well as those in which they approach a level of digital fluency.

**Table 2***Levels of digital competence in the DigCompEdu model*

Competence Level	Profile
A1 - Newcomer (up to 20 points)	They assimilate new information and develop basic digital practices in their pedagogical work.
A2 - Explorer (between 20 and 33 points)	
B1 - Integrator (between 34 to 49 points)	They apply, expand and critically reflect on their pedagogical practices with the use of DICTs.
B2 - Specialist (between 50 and 65 points)	
C1 - Leader (between 66 and 80 points)	They share their knowledge, reflect critically and develop new practices with digital technologies.
C2 - Pioneer (more than 80 points)	

*Source: Adapted from Dias-Trindade & Santo (2021).*

In this study, the DigCompEdu digital competence self-assessment model was used, considering its theoretical contribution and its structuring, in addition to its potential in terms of feedback to teachers, as well as indications of continuous training in the gaps found.

### 3. METHODOLOGICAL PROCEDURES

This study is configured as descriptive research with a quantitative approach, having as a data collection procedure the survey, operated through an electronic questionnaire. According to Prodanov & Freitas (2013), descriptive research outlines the characteristics of the observed phenomenon, seeking to classify, explain and interpret the facts through standardized data collection techniques.

In this sense, the Brazilian version of the DigCompEdu CheckIn scale was used, originally developed within the scope of the EU Science Hub, whose validation for the Portuguese language was carried out by the authors

Dias-Trindade, Moreira & Nunes (2019). It is a questionnaire that includes 21 questions for the self-assessment of digital competence of educators, applicable to all educational levels and subdivided into 6 (six) areas of the DigCompEdu model.

For each of the 21 competencies in the DigCompEdu CheckIn instrument, a competency statement or item is submitted and participants must select one of the five options that best characterize their position relative to the statement. The chosen options are scored in a range from 0, for the first answer, to 4 points, for the last, totaling 84 possible points in the instrument, resulting in the classification of the competence score presented in Table 2 (Dias-Trindade & Moreira, 2020; Dias-Trindade & Santo, 2021).

It is noteworthy that Dias-Trindade, Moreira & Nunes (2019) carried out the statistical validation of the DigCompEdu CheckIn instrument and concluded that it presents good global indicators of validity “with interpretable factorial structures, thus assuming that they consistently evaluate the variables they intend to measure, constituting a scale capable of contributing to the evaluation of the digital competences of educators” (p. 157).

Study participants were invited to voluntarily access the DigCompEdu-UFRB platform, developed in the EU Survey digital interface, within the scope of the Collaborative Learning Network (RCA). The survey was conducted between the months of March 2020 and March 2021, reaching 145 Brazilian teachers surveyed in Basic Education, all working in the initial years of primary school (EF1), that is, from the first to the fifth year of school.

In compliance with the resolutions of the National Research Ethics Council (CONEP), which establish the Brazilian ethical guidelines for re-

search with human participants, the research project was presented and approved by the Research Ethics Committee (CEP) of the Federal University of Bahia's Reconcavo (UFRB) and approved under the resolution n. 3,582.41.

## 4. RESULTS

The research had the participation of 145 basic education teachers who constituted the sample for the analysis of this study, being 118 (81.4%) women, 26 (17.9%) men and 1 (0.7%) non-binary.

The participants had a weighted average of 39.8 years, ranging in age from 24 to 63 years. It is noteworthy that 82 (56.5%) respondents were between 32 and 43 years old.

Regarding the training area, the majority come from the Human Sciences area with 93 (64.1%) participants and 36 (24.8%) from Linguistics, Letters and Arts. The rest were subdivided into the areas of Human Sciences, Agriculture, Biology, Sanitary Science, Exact and Earth Sciences.

Regarding continuing education at the postgraduate level, Table 3 shows that 97 (66.9%) participants have a lato sensu specialization course, which indicates interest in training and improvement. In addition, 88 (60.7%) research participants work in the municipal or state public education system, and specialization courses are often required in functional progression plans.

However, the data reveal that 33 (22.8%) participants do not yet have any postgraduate degrees. It is noteworthy that in Brazil, postgraduate courses at the master's and doctoral levels do not have universal access due to limitations in the number of places offered, which results in frequently competitive selection processes.

**Table 3**

*Continuing education of participants (postgraduate)*

Postgraduate training	Number of teachers	%
Does not have	33	22,76%
Specialization	97	66,90%
Master's / Ph.D.	15	10,34%

All participants work in the Initial Years of Basic Education in Brazil, with 87 (60%) exercising their teaching activity in the state of Bahia; 12 (8.3%) in the state of Sergipe; 9 (6.2%) in the state of Minas Gerais and the rest is subdivided between the states of São Paulo, Ceará, Mato Grosso, Espírito Santo and Rio de Janeiro.

**Table 4**

*Time of teaching experience of the participants*

Teaching time (years)	Number of teachers	%	Accumulated %
Up to 6	53	36,55%	36,55%
6 to 12	35	24,14%	60,69%
more than 12	57	39,31%	100,0%

In Table 4, we observe that the sample included 53 (36.55%) beginning teachers with up to 6 years of teaching experience, as well as 57 (39.31%) teachers with more than 12 years of teaching experience.

## 5. DISCUSSION

Considering the data collected with the DigCompEdu CheckIn self-assessment instrument, in the general average, the sample of teachers who responded reached an average score of 40.9 points, classifying them in category B1 - integrator.

According to Lucas & Moreira (2018), integrators already use a variety of digital technologies in their practices and are willing to expand their repertoire. However, the authors note that they are at the stage of analyzing which digital interfaces and technologies work best due to the pedagogical methods and strategies they wish to implement. "However, Integrators just need a little more time to experiment and reflect, complemented by collaborative encouragement and knowledge sharing to become Experts" (p.30), the authors state.

The general level of digital competence revealed by the surveyed teachers is consistent with the results found in the studies by Dias-Trindade & Moreira (2018) with a sample of 147 primary and secondary teachers in Portugal. In this study, the average score of the teachers was 49.0 points, classifying them as B1 - Integrator; however, very close to level B2 - Specialist, which starts with 50 points.

A similar classification was also observed with 182 higher education teachers in Brazil, in the Bahia's Reconcavo region with an average score of 41 points, classifying them at level B1 - Integrator (Dias-Trindade & Santo, 2021). Another study with 141 Brazilian teachers of Basic, Technical and Technological Education carried out in the state of Tocantins, reached

the same general level of digital competence (Melo, 2019).

These studies of digital competence of educators, using the same DigCompEdu CheckIn self-assessment scale, revealed that teachers from Primary to Higher Education face the urgent challenge of developing and improving their skills with a view to digital fluency in order not to become "digital aliens" integrated in a hyperconnected society.

In Table 5, we observe in detail the average responses for each of the 21 competencies, being the dimensions related to professional teaching competencies and student competence those that present the largest gaps that need to be addressed through continuing education.

When analyzing in detail the average of the competency items, we found that only 1 competency item was considered good (with an average value greater than 2.50 points), related to participation in online training programs, revealing the concern of the sample of teachers with their continuing education. They also present 7 (seven) items with median results (with average values between 2.49 and 2.0 points).

Finally, the survey has a group that has just entered teaching (36.55%) and an older group (39.31%). We highlight, in relation to this data, an important phenomenon: the time of experience in teaching is not, by itself, an indicator of the level of experience or ability to reflect on their teaching practice with the use of digital technologies, because experience is the result of constantly reflect on their pedagogical praxis in a critical way.

**Table 5**

*General results of the sample by level of competence*

Dimensão	Área	Item avaliado da competência digital	Média ponderada	Valoração do nível
<b>Professional Teaching Skills</b>	Professional participation	1. Use of different communication channels	2,39	Medium
		2. Continuous digital development	2,01	Medium
		3. Participation in online training	3,12	Good
		4. Find strategies and resources online	2,12	Medium
	Technologies and digital resources	5. Use of technologies in internal / external work	1,87	Low
		6. Security and protection of personal content	2,34	Medium
<b>Teach pedagogical skills</b>	Teaching and learning	7. Teaching	2,21	Medium
		8. Orientation	2,02	Medium
		9. Collaborative learning	1,68	Very low
		10. Active digital methodologies	1,85	Low
		11. Activities with digital content creation	1,78	Low
	Evaluation	12. Self-regulated assessment	1,57	Very low
		13. Various evaluation strategies	1,82	Low
		14. Feedback and planning	1,69	Very low
	Student empowerment	15. Evidence analysis to back up	2,20	Medium
		16. Assistance with technology problems	1,92	Low
<b>Student skills</b>	Promotion of students' digital skills	17. Activities adapted to students	1,72	Low
		18. Guidelines for Identifying Fake News	1,95	Low
		19. Internal / external communication	1,77	Low
		20. Responsible behavior online	1,65	Very low
		21. Solving specific problems with technologies	1,74	Low

Note: scale used to assess the level of the competence item: Good - above 2.5 points; Medium, between 2.49 and 2.0 points; Low, between 1.99 and 1.70 points; Very low, below 1.70 points.

We observe in Table 5 that the surveyed teachers presented 9 items of competencies at the level considered low (with average values between 1.99 and 1.70 points), encompassing the areas of technologies and digital resources, teaching and learning, evaluation, empowerment and development of the students' digital skills.

In addition, 4 competency items are at the level considered very low (below 1.70 points), that is, I) collaborative learning: encouragement for students to work in groups using digital technologies to generate and document the data that they present; II) self-regulated assessment, through the use of digital technologies that allow students to plan, document and monitor their learning autonomously; III) feedback and planning: use of digital technologies to provide effective feedback and IV) responsible behavior online: recommendations and guidance for students to behave safely and responsibly in online spaces.

Thus, the 4 previously mentioned competence items considered "very low" together with the 9 items classified as "low" constitute the priority points of digital competences in which the surveyed teachers have specific gaps that urgently need to be eliminated through continuing education actions. According to Figueiredo (2013), without the development of such digital skills, teachers will hardly be able to develop in their students the empowerment for the reflective and critical use of cyberspace, promoting learning and autonomy.

**Table 6**

*Relationship of digital skills with teacher training*

Postgraduate training	Number of teachers	Score	Category
Does not have	33	42,5	B1 - Integrator
Specialization	97	39,1	B1 - Integrator
Master's / Doctorate	15	48,9	B1 - Integrator

As shown in Table 6, the data collected from the responding teachers also revealed that continuing education at the graduate level had a small impact on the ranking of the digital competencies category among teachers with master's or doctoral degrees.

We also observed that taking specialization courses did not significantly affect those who did not take them, since the 33 (22.7%) who declared not having specialization achieved a slightly higher average score with 42.5 points, but close to 39.1 points obtained by the 97 (66.9%) who have specialization, both classified in the category B1 - Integrator.

Also in this context, the 15 (10.34%) respondents who completed a master's degree or a doctorate achieved a score of 48.9 points, also being classified in category B1 - Integrator, but with a result very close to the later level, i.e., B2 - Specialist (from 50 points).

Thus, the data collected points to the fragility of the training (initial or continuous) of the

Brazilian teachers of the initial years of primary education who participated in this study, revealing emerging training needs related to the development of digital skills that lead them to the digital fluency in the face of teaching in a connected and networked society, especially in times of the COVID-19 pandemic.

In this context, “[...] training must provide teachers with useful intellectual tools for understanding and interpreting the complex situations in which they find themselves [...]” (Imbérnon, 2011, p. 42).

In the above scenario, we cannot ignore the level of scrapping of public schools, which often fail to provide the minimum infrastructure conditions so that the teaching plans and their didactic sequences are enriched with the daily use of digital technologies, in words by Lucas & Moreira (2019).

## 6. CONCLUSIONS

In this study, the digital skills demanded by Brazilian teachers in the early years of primary school were analyzed, especially in light of the pedagogical challenges posed by the COVID-19 pandemic, using the common framework for self-assessment of digital competences of educators as a reference (DigCompEdu).

The survey of 145 teachers showed that they are in category B1 - Integrator. That is, they need more time to experiment and reflect on the use of digital technologies, counting on the encouragement and collaboration of their peers to move forward. The study also revealed that these teachers have emergency gaps, especially in dimensions related to technologies and digital resources, teaching and learning, evaluation, empowerment and development of students' digital skills.

The study pointed out the urgent need for initial and continuing education courses to contemplate the knowledge related to the pedagogical use of technologies in an innovative and meaningful way, promoting learning and the

emancipation of students, encouraging teachers to a continuous knowledge construction and considering the formative communities (Imbérnon, 2009).

Additionally, the data showed that the impact of initial and continuing education on the development of digital skills is still small, revealing the need for such knowledge to be inserted in a transdisciplinary way in teacher training so that they do not become digital aliens, increasingly excluded from an integrated education connected to the information that circulates at the “speed of light”, to which the majority of our students continuously access in the first years of primary school.

In addition to teacher training actions linked to digital technologies for pedagogical practice, it will hardly be possible to achieve satisfactory levels of digital skills for teachers without universal access to the broadband internet network and the provision of equipment for teachers and students, especially those in situations of social vulnerability.

Finally, it should be noted that there is access to technologies and their use by teachers. However, this access and use is precarious if

we consider the demands of education and today's society, especially in the context of the pandemic. Let us remember, for example, that this use at a “good” level occurs in dimensions that are limited to acting more in the field of self-training (3.12 - Participation and online training). The gaps are evident in other dimensions in which more active subjects are needed and considering teaching and the use of technologies for this exercise. According to the studies presented and contrary to what is postulated as ideal, we have teachers in education who are still passive in relation to the use of technologies for didactic-pedagogical purposes. For this action to take place in an articulated way with our time, it must combine the traditional exhibition class, the chalk, the blackboard and the physical classroom, for example, with other units of time and place (the virtual) and their available technological potentials. Otherwise, pedagogical practice will be relegated to an anachronism and will lose opportunities to reinvent itself over time.

Let us be careful not to widen the gap of social inequality and access to technologies, which affects Brazil and other poor and developing countries. It is urgent that we have effective public policies for digital inclusion and teacher training.

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