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Portuguese mathematics teachers who adopt digital technologies in their curriculum acts

Profesores portugueses de matemáticas que adoptan tecnologías digitales en sus actos curriculares

Professores de matemática portugueses que adotam tecnologias digitais em seus atos curriculares

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Abstract: The article aims to understand the curriculum acts of two Mathematics teachers of Basic Education in public schools in the District of Lisbon in Portugal, regarding the use of digital technologies based on recent reforms in the country. The case study has a qualitative methodological bias and analyzes of the speeches of these teachers were carried out, which showed the dynamics of digital technologies in the approach of interdisciplinarity, within the scope of the Information Technology discipline, through Curricular Flexibility in mathematical and non-mathematical contexts. It also emerged the dissonance between the teachers' curriculum acts, Mathematical Education and the curricular proposals in force in the country, as well as the need to expand studies and research in the field of Digital Literacy and Computational Thinking, so that may be promoted practices that develop students' autonomy and creative process.

Keywords: Digital Technologies. Mathematics Education. Curricular Reforms in Portugal.

Resumen: El artículo tiene como objetivo comprender los actos curriculares de dos profesores de Matemáticas de Educación Básica en las escuelas públicas del Distrito de Lisboa en Portugal, con respecto al uso de tecnologías digitales basadas en las recientes reformas en el país. El estudio de caso tiene un sesgo metodológico cualitativo y se llevaron a cabo análisis de los discursos de estos docentes, que mostraron la dinámica de las tecnologías digitales en el enfoque de la interdisciplinariedad, dentro del alcance de la disciplina de Tecnología de la Información, a través de la Flexibilidad Curricular en matemática y no contextos matemáticos También surgió la disonancia entre los actos curriculares de los docentes, la educación matemática y las propuestas curriculares vigentes en el país, así como la necesidad de ampliar los estudios y la investigación en el campo de la alfabetización digital y el pensamiento computacional, para que puedan promoverse prácticas que desarrollan la autonomía y el proceso creativo de los estudiantes.

Palabras clave: Tecnologías digitales. Educación Matemática. Reformas curriculares en Portugal.

Resumo: O artigo tem como objetivo compreender os atos curriculares de dois professores de Matemática do Ensino Fundamental de escolas públicas do Distrito de Lisboa, em Portugal, no que se refere ao uso de tecnologias digitais baseadas em reformas recentes no país. O estudo de caso possui viés metodológico qualitativo e foram realizadas análises das falas desses professores, as quais evidenciaram a dinâmica das tecnologias digitais na abordagem da interdisciplinaridade, no âmbito da disciplina Tecnologia da Informação, por meio da Flexibilidade Curricular em matemática e não matemática. contextos matemáticos. Surgiu também a dissonância entre os atos curriculares dos professores, a Educação Matemática e as propostas curriculares em vigor no país, bem como a necessidade de ampliar estudos e pesquisas na área de Alfabetização Digital e Pensamento Computacional, para que possam ser promovidas práticas. que desenvolvem a autonomia e o processo criativo dos alunos.

Palavras-chave: Tecnologias Digitais. Educação Matemática. Reformas curriculares em Portugal.

Introduction

In Portugal, the Ministry of Education and Science (MES) from Art. 6 of the Diário da República, regarding the purpose of the curriculum and its promotion, establishes principles, values and areas of competence that must obey the development of the curriculum due to globalization and technological development. The intention is to prepare students who will be young and adults in 2030, emphasizing that, “with a view to achieving that purpose, and without prejudice to the autonomy and flexibility exercised by the school, the concession of the curriculum underlies the following principles. Promotion of learning within the scope of Information and Communication Technologies” (MES, 2018, p. 2931).

Regarding Portuguese Basic Education, its objectives are highlighted in Article 7 of the Basic Law of the Educational System (BLES). Among others, it is proposed to ensure a common general formation that guarantees the discovery and development of interests and aptitudes, reasoning capacity, memory and critical spirit, creativity, moral sense and aesthetic sensitivity, promoting individual achievement in harmony with the values of social solidarity. It is also proposed to create conditions to promote the school and educational success of all students.

It is foreseen, by the guidelines in force in the country, that the competences defined for Teaching are guaranteed, being prescribed as one of the principles of learning in the context of the discipline Information and Communication Technologies (ICT). This presupposes literacy in ICT for the proper use of tools, reinforced by Art. 12, Autonomy and curriculum flexibility, paragraph 4: “In the 2nd and 3rd cycles, the basic curricular matrices integrate the Citizenship and Development component and, as a rule, the ICT component.” (MES, 2018, p. 2933).

In the presentation of the Mathematical Curriculum and Goals Programs for Basic Education (MCGPBE, 2013) perspectives are brought up regarding the use of technologies:

> Students are also asked to perform various tasks involving the use of drawing and measuring instruments (ruler, square, compass and protractor, dynamic geometry programs), and it is desirable that they acquire skill in the execution of rigorous constructions and recognize some of the mathematical results behind the different procedures (Bivar, Grosso, Oliveira & Timóteo, 2013, p. 13).

In the document “Curriculum management guidelines for the Basic Mathematics Education Program and Curriculum Goals” (General Directorate of Education-GDE, 2016), examples of work with digital technologies are also presented:

> Scratch, which, in addition to an introduction to a programming language, consequently involves mathematical logical thinking, an application, coordinates in reference and variables, among other aspects; numerical (for example, numerical lines) and algebraic (sequence generators, multiple representations, algebraic modeling,…) applets; Excel, as one of the

> possible digital applications, allows a transition between a numerical approach and a factory, including a reproduction in the table that offers several representations (GDE, 2016, p. 4).

In the last reform that took place with the document Essential Learning (AE) (MES, 2018), it is also recommended that the insertion of digital technologies in the context of students throughout basic education develop:

> […] the ability to appreciate aesthetic aspects of mathematics and to recognize and value the role of mathematics in the development of other sciences, technology and other areas of human activity; develop the ability to recognize and value mathematics as an element of humanity's cultural heritage. (MES, 2018, p. 3)

Based on these recommendations brought by the recent reforms in Portugal, Macedo (2013) corroborates that it is necessary to emphasize that, for the analysis of the contexts of educational practices with the use of digital technologies in the teaching of Mathematics, the concept of " curriculum acts "is a bias considered promising. These acts presuppose that, in order to try to evaluate the educational policies implemented and "honestly understand the curricular practices for any practical purpose, it is essential to start from their indexalities, descriptibilities, intelligibilities and analyzes made by the members who, in the daily thinking / doing of education , constitute their curricular 'orders' "(p. 431). "Curriculum acts contextualize, decontextualize, recontextualize, deny, betray." (Macedo, 2013, p. 23).

In this sense, the objective is to understand the curriculum acts of two mathematics teachers in Portugal regarding the use of digital technologies, based on recent reforms in the country. To this end, in this article, their speeches on the referred methodological bias will be analyzed, pointed out by the curriculum recommendations as a contribution to the promotion of mathematical learning.

The country's prescriptions, when considering the incorporation of digital technologies in the curricular components, have implications for the development of

Mathematics programs on the use by students. Recommendations are made about the development of digital skills for new generations.

The lack of studies that integrate curricular reforms, professional teacher development and digital technologies for teaching, as well as these observations, lead to justify and attribute relevance to the study on the adoption of this resource, pointed out by research as an indispensable tool for teaching in different areas to new generations.

For this reason, questions are raised about the use of digital technologies, highlighting the need for critical reflection on the challenges brought by the implementation of curricular programs on the curriculum of Portugal, which has been facing tensions in the processes of recent changes to current curriculum documents.

Literature Review

Investigations on Digital Technologies carried out by researchers, such as Dick and Hollebrands (2011), emphasize that strategic use strengthens the teaching and learning processes. Gadanidis and Geiger (2010), Roschelle et al. (2010) and Suh and Moyer (2007) place the same emphasis, adding that the strategic use of digital technologies can support the learning of procedures, as well as the development of advanced skills. On the attitudes of Basic Education students towards Mathematics and the role of teachers, it is corroborated that:

> School mathematics is often distanced from life mathematics, that is, what we learn at school is not used in our relationships, as members of a society, in which the mastery of technologies related to mathematics is necessary every day. On the other hand, professionals working in these areas need to master these contents in order to perform their duties (Soares, 2010, p. 5).

Therefore, the teacher needs to have theoretical knowledge that provides support for the action and that helps him to plan his classes with the use of technologies. The perspective is of a meaningful mathematical learning that allows the student to construct mathematical concepts through a reciprocal dialectic, awakening positive attitudes towards Mathematics in students.

Regarding the use of calculators in the classroom, it is evident by Faria (2007), Machado (2012) and Frant (2011) the technology-student interaction, which allows the student's autonomy during the tasks. Nunes (2011) emphasizes the use of “graphing calculators as a technological resource for Mathematics Education and that we should use them in the face of reflective planning, during the elaboration of activities that contemplate the exploration and potential of this resource in learning” (p. 19).

According to the opinion of the National Council of Teachers of Mathematics (NCTM) (2015), technology tools for the use of teachers and students are reinforced through decision making that keeps Mathematics, and not technology, as the teaching focus. To define the use of technology, teachers and curriculum designers must focus on the capabilities of the available tools and address the possibilities presented by emerging technology, while maintaining a focus on mathematical learning objectives. Uses should not be limited to those required by external assessments and students should develop procedures that include the use of technology.

The use of ICT in schools helps in the social promotion of the culture, norms and traditions of the group. At the same time, a personal process is developed that involves style, aptitude and motivation. The exploration of images, sounds and simultaneous movements are, for students and teachers, opportunities for interaction and production of knowledge.

Therefore, it is necessary to use technologies in non-mathematical contexts that allow integration between knowledge. The subjects' view of these devices, contexts, phenomena and the way they are presented to students are guiding elements of the policy for implementing technologies in school curricula.

Currently, the project “Future of Education and Capacities 2030”, of the Organization for Economic Cooperation and Development (OECD), is in progress, with speeches to focus on “technologies that have not yet been invented, and to solve social

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problems that have not yet been have been anticipated ”(OECD, 2018a, p. 1), highlighting the need to develop digital literacy and computational thinking, aiming to provide supposed support to countries in addressing common challenges in implementing curricula and in identifying critical factors of success.

Table 1: Learning frame of the Mathematics 2030 Project.

Digital Literacy	Information and Communication Technologies (ICT) are defined as all components related to digital technologies and computers. The term ICT refers to all devices, network components, applications and systems that allow people and organizations to interact in the digital world. Digital literate students have the knowledge, understanding, skills and willingness to use digital equipment effectively and appropriately at school and beyond the school. Students with this ability are able to provide, create and communicate information and concepts. They are able to adapt to technological changes and use technologies to achieve a purpose and communicate with others using this equipment.
Computational Thinking	Computational thinking involves formulating problems and developing solutions that can be accomplished by computer-based technologies. Programming and coding involve the development of knowledge, understanding and skills in relation to the language, patterns, processes and systems needed to instruct / direct devices such as computers and robots.

Source: OECD – Preliminary Document (2018b, p. 9).

The learning framework presents fundamentals for the development of skills considered relevant for future generations with regard to the use of digital technologies.

In Martin's (2006) view, digital literacy is the awareness, attitude and ability to use digital solutions and facilities to: identify, access, manage, integrate, evaluate, analyze and synthesize digital resources, build new knowledge, create expressions of media and communicate with others. Jenkins et al. (2009) highlight the importance of digital technologies for the construction of knowledge, where the student develops skills consciously and, in addition to usability, know how to use them in their life context in a critical way, intelacing the perspectives presented on mathematical literacy and digital literacy.

Wing (2006) proposed skills on Computational Thinking such as: conceptualizing instead of programming; fundamental and non-utilitarian skill; complements and combines Mathematics and Engineering; generates ideas and not artifacts; and for everyone, anywhere. In the same direction, Barcelos, Munõz, Villarroel and Silveira (2015) reinforce that Computational Thinking in Basic Education is important because it is a stage in which several priorities, ideologies and philosophies fight for attention (Computer Science Teachers Association [CSTA] & International Society for Technology in Education [ISTE], 2011).

The research in this session illustrates the need for studies on the strategic use of Digital Technologies through interactive processes that involve the subjects' autonomy and protagonism. Part of the preliminary framework of the 2030 Mathematical Project managed by the OECD, shows itself relevant for the establishment of global and contemporary criteria for the investigation of curricular acts, such as Digital Literacy and Computational Thinking, however it is worth noting that the entity has a connection with the business and economic world, which aims for qualified labor, according to its established standards and which do not always focus on enhancing knowledge, but rather on students' performances.

Metodology

Regarding the delimitation of the research method, two interviews were conducted with teachers of Mathematics in Basic Education from different public schools in the district of Lisbon in Portugal. The schools were chosen as part of contacts made for a post-doctoral research, whose objective was to study Mathematics Education in the official curricula in force in Brazil and Portugal, mainly with regard to the recommendations regarding the use of digital technologies.

Two interviews were carried out with teachers who work in schools in the District of Lisbon, who demonstrated the use of technologies in their practices and who revealed that they were in professional practice in the curricular reforms that occurred in Portugal in recent years.

In order to analyze the speeches of the interviewed teachers, a literature review and consultation on the prospects for the use of digital technologies present in official documents in force in Portugal were constituted. This analysis is configured as:

> […] a way to collect qualitative information from a primary or original source of written, printed and recorded materials to answer research questions in interpretive case studies. The documents provide evidence of authentic or real activities carried out in social and human thought organizations (Sharma 2013, p. 3).

Individual semi-structured interviews were used, considering that, through it, it would be possible, as pointed out by Bauer and Gaskell (2002), to allow interviewees to freely discuss fundamental points of the process related to curriculum acts with the use of digital technologies.

The interview took place in 2018 and was recorded on audio. The use of digital technologies in mathematics classes in their school context was one of the main points of the interview.

The method that underpins the data analysis was discourse analysis. According to Saraiva (2006, p. 157), "[...] the analysis of the texts is not carried out in the form of a hermeneutic, it does not aim to extract the true meanings from within the statements, but to change the way of looking, playing light in what was in the shadow ".

For the analysis of the speeches evidenced in the interview, categories were adopted after a first reading of the interview to be analyzed, it was intended to codify (highlight, classify, aggregate and categorize) excerpts from the interview transcribed with Portuguese teachers (PP1 and PP2), who presented work perspectives related to the connections of the use of digital technologies with: (1) Attitude towards Mathematics, (2) Use of the calculator; (3) Digital literacy; (4) Non-mathematical contexts; and (5) Computational thinking.

Data presentation and analysis

Regarding the category Attitude towards Mathematics, Portuguese teachers emphasized their views on the perspective of the relationship between digital technologies and a positive relationship between students in relation to Mathematics, signaling that:

> *"We live in a technological generation, and I believe that technology really came to stay and should be used in a constructive way" (PP1).*
> *"In my view, digital technologies in the teaching of mathematics serve as a motivation for students as long as they are well used" (PP2)..*

The interviewees' speeches reinforce that the strategic use of digital technologies (Dick & Hollebrands, 2011) strengthens the teaching processes as long as they are well used, being essential for the construction of new knowledge and serving as motivation for this generation inserted in a society more and more technological (Soares, 2010; Suh & Moyer, 2007; Martin, 2006).

Regarding the category Use of the calculator, the teachers were against the curriculum recommendation expressed in the Basic Mathematics Curriculum Program and Goals (BMCPG) (Bivar et al., 2013), which recommends that the calculator should only be used in more advanced school years, noting that:

> *"There is a setback, as it only values written calculation, when conjectures should be made, going further through the processes of discovery and validation. It should be used from the early years in an exploratory way, as [...] [in] successive additions translated as multiplication" (PP1).*
> *"I do not agree. The calculator is also linked to external evaluations, as is done in the 9th year (end of the 3rd cycle), where part of the test is using a calculator and another is not" (PP2).*

The professors highlighted the regression of the reform introduced by the BMCPG (Bivar et al., 2013) when emphasizing that the calculator should only be adopted in teaching situations in the most advanced years. Teachers reinforce that it should be adopted with an exploratory character since the first years of schooling. One of the teachers brought the prospect of its adoption since the first years of Basic Education, since the calculator is adopted in part of the large-scale evaluation of the Portuguese education system.

It was also asked if he remembered any class from the current or previous year in which he had used the graphing calculator, where the teachers explained how this digital resource is used with their students.:

> *"In the 7th year [it was used] to explore the slope of a line to study functions, verifying the role of the coefficients, varying parameters in an exploratory way. The students were invited to verbalize what happened through the explorations carried out on the graphing calculator" (PP1).*
> *Yes, in the third cycle with the study of Functions. Also in and also in a situation involving sensors that worked simultaneously with the graphing calculator. The data was collected and the sensors sent it to the calculators. The calculator must be used critically and graphing calculators are essential in the mathematical investigation of the tasks proposed to students" (PP2).*

One of the teachers exemplified the work in the classroom with varying parameters in the teaching of Functions and oral communication in an exploratory manner using graphing calculators and the other a didactic situation combined with sensors (Faria, 2007; Machado, 2012; Frant, 2011; Nunes, 2011). Interviewee PP2 highlighted the need to use graphing calculators critically (Jenkins et al., 2009).

Regarding the category Digital Literacy, the interviewee, from the recent approved document, "Essential Learning - Articulation with the student's profile" (MES, 2018), teachers were asked if it brings new perspectives of work in relation to the use of digital technologies, emphasizing that:

> *"Without a doubt, as it calls for the active participation of students with the use of digital technologies" (PP1).*
> *"I don't remember how the document brings it" (PP2).*

PP1 highlights prospects for active student participation presented by the document Essential Learning, which refer to the awareness, attitude and ability to use solutions and dynamisms offered by digital technologies so that students, in their mathematical activities, can come to identify, access, manage, integrate, evaluate, analyze and synthesize digital resources, build new knowledge, create media expressions and communicate with other colleagues (Martin, 2006; OECD, 2018b). The interviewee PP2 did not remember about the general perspectives that the AE, the most recent Portuguese curriculum program, brings about the adoption of digital technologies.

In the non-mathematical contexts category, respondents were asked whether, in terms of official curricular guidelines, the use of digital technologies was prescribed more for purely mathematical contexts or aimed at promoting mathematical reasoning and communication and signaled that:

> *“The 2013 Program emphasizes reproduction [and] memorization. And the document ‘Essential Learning’ emphasizes reality, context and experience (explanation of thought, reasoning) according to the profile of the students” (PP1).*
> *“The 2013 program is too extensive and demanding on the level and age of the students for whom it is intended. Even not recalling perspectives on the use of technologies, the document “Essential Learning” came to add to the 2013 program” (PP2*).

The report is a criticism of the BMCPG (Bivar et al., 2013) for emphasizing mechanical and plastered learning processes, which goes against the assumptions pointed out about the objectives of Basic Education, according to Art. 7 of the LBSE. This emphasizes that students should be placed in contexts conducive to the development of the development of reasoning. Similarly, Suh & Moyer (2007) emphasize on the strategic use of digital technologies to support the learning of procedures, as well as the development of advanced skills, such as problem solving, reasoning and justifications.

In another moment, it was asked if it uses digital technologies in non-mathematical contexts, as suggested by the curricular programs and if there was any field in the area where the use of digital technologies was more used in its classes. The interviewed teachers answered that:

> *"Yes. Interdisciplinary work with different areas, citizenship and health survey and data processing. Students have the discipline of Information and Communication Technology in their curriculum". I always use it in Geometry, Functions and Data Processing" (PP1).*
> *"I don't remember using technology in non-mathematical contexts and "There is no exact field that uses it most often" (PP2*).

On the question of the use of technologies in non-mathematical contexts, the interviewee's report PP1 meets the guidelines in force in Portugal. They provide that the skills defined for Basic Education are guaranteed, prescribing them as one of the principles of learning in the context of the ICT discipline. This presupposes literacy in ICT for the proper use of tools, reinforced by Art. 12, Autonomy and curricular flexibility, by highlighting that, in the 2nd and 3rd cycles, the basic curricular matrices integrate the Citizenship and Development component and, as a rule, the ICT component. This perspective is adopted by PP1 in the fields of Geometry, but also in Functions and Data Processing. PP2 reported not using technologies in other contexts and that there is no field in which to adopt them more often.

The question addressed in the category Computational Thinking dealt with respect to the space that is given in class on the development of this issue, how it is addressed in class and what is its importance in the school's curriculum proposal and in official programs. The interviewee showed that:

> *"Let's say that computational thinking is not the focus on Basic Education. There is the Programming and Robotics project, but it is not simple to insert this at this stage, but I recognize the importance of mathematics in programming, not only in binary language. Programming by conditions, as in Scratch, allows students to be more autonomous" (PP1).*
> *"I don't work with approaches that involve the development of Computational Thinking" (PP2*).

Only PP1 positioned himself on the development of Computational Thinking. His speech highlights the difficulty in approaching computational thinking in Basic Education, where it is possible for students to develop ideas, and not artifacts (Wing, 2006) in autonomous processes, such as using the Scratch language. However, it recognizes its importance (CSTA & ISTE, 2011) in the curriculum proposals for this stage of teaching (Barcelos et al., 2015).

The teacher also reports the existence of a Robotics Project in his school scope that serves to dispel some myths, such as programming is only for scientists and professional programmers or that resources such as robotics are not useful or possible to teach curricular content. Including robotics in educational environments, as a source of production of learning principles in Basic Education, can serve to motivate students to develop new knowledge (not just curricular), in addition to making the school environment more attractive (Mafra, Araújo, Santos & Meireles, 2017).

Results

The analysis of the speeches showed, from the adopted categories, that the connections between digital technologies and the adopted categories, according to the reports of the Portuguese teachers (PP1 and PP2) interviewed, that:

(1) Attitude towards Mathematics

Teachers' speeches show that the strategic use of digital technologies (Dick & Hollebrands, 2011) strengthens the teaching and learning processes of the current generation and can support the learning of procedures. They also corroborate the development of advanced mathematical skills and the construction of new knowledge in a current and future generation in a reflexive way, which tends to be increasingly immersed in technologies (Soares, 2010; Suh & Moyer, 2007; Martin, 2006), demanding mathematics teachers to make more and more connections of technologies in their practices.

(2) Using the calculator

The professors stated that there was a setback in the reform introduced by the BMCPG (Bivar et al., 2013), by emphasizing that the calculator should only be adopted in teaching situations in more advanced years, refuting what this perspective represents and that it should be adopted with an exploratory character since the first years of schooling. It exemplifies the work in the classroom with variation of parameters in the teaching of Functions and oral communication in an exploratory character using graphing calculators (Faria, 2007; Machado, 2012; Frant, 2011; Nunes, 2011).

(3) Digital literacy

The report of one of the interviewees corroborates the recommendations of the document Essential Learning (EL, 2018), which prioritizes the active participation of students through digital technologies, bringing principles about digital literacy so that Portuguese students develop awareness processes, attitudes and capacities to use solutions and dynamics offered by digital technologies to build new mathematical knowledge and to foster creative and communication processes (Martin, 2006; OECD, 2018b).

(4) Non-mathematical contexts

The teachers' reports are in line with the guidelines in force in Portugal. They provide that the skills defined for Basic Education are guaranteed, prescribing them as one of the principles of learning through interdisciplinarity and in non-mathematical contexts, within the scope of the discipline Information and Communication Technologies (ICT). This presupposes digital literacy for the proper use of tools, reinforced by Autonomy and curricular flexibility. This perspective is adopted by one of the teachers interviewed in the fields of Geometry, Functions and Data Processing.

(5) Computational Thinking

A professor's report highlights the difficulty of working with the perspective of computational thinking in Basic Education, but recognizes its importance (CSTA & ISTE, 2011) in current curriculum reforms (Barcelos et al., 2015). He also emphasized that computational thinking allows students to generate ideas (Wing, 2006) in autonomous processes, giving as an example the potential of programming in Scratch language and an ongoing Robotics project at school (OECD, 2018b), which configures itself as a paradigm break that programming is only for professionals or that this type of project does not have possibilities of association with curriculum content. It is inferred that this project can serve to motivate and build new curricular and extracurricular knowledge by students. (Mafra, Araújo, Santos & Meireles, 2017).

Final Considerations

The analysis of the speeches of Portuguese teachers reinforces the strategic use of digital technologies (Dick & Hollebrands, 2011), strengthens the teaching and learning processes of the current technological generation, fostering learning and procedures, developing advanced skills. These competencies culminate in the construction of new knowledge (Martin, 2006), and may provide positive attitudes towards the area of Mathematics.

The speeches of the two professors point out that the BMCPG (2013) took a step backwards when recommending the calculator in teaching situations in more advanced years, reporting the need to approach this perspective since the early years.

The analyzes also elucidate that the most recent curriculum reform in Mathematics in Portugal, through the document Essential Learning (MES, 2018), prioritizes the active participation of students with the use of digital technologies, bringing principles about digital literacy in mathematical and non-mathematical contexts, configuring a resumption of this methodological perspective, when alluding to the 2007 Mathematics Program.

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The analyzes also showed the importance of using digital technologies in connection with the students' reality to foster positive and responsible attitudes in the usability process for the construction of new knowledge. It corroborates the dynamics in the connections and approaches of various contents of the curriculum that the use of calculators can provide since the initial years of Basic Education.

The speeches also portrayed the complexity in proposing didactic situations that promote the development of computational thinking in Basic Education, highlighting its relevance in contemporary curricular reforms by enabling students to generate ideas and not artifacts, in processes that should prioritize the development of their autonomy .

In the process of finalization, it is highlighted that the analysis of the speeches of teachers from public schools in Lisbon highlights some dissonances between their curriculum acts in Basic Education regarding the use of digital technologies, Mathematics Education and the perspectives of curricular documents of Mathematics currently in force in Portugal.

In this sense, as a contribution, the case study elucidates the need for continuous discussion on the emphases given to Digital Literacy in recent curricular reforms and the approach of interdisciplinarity within the scope of the discipline Information Technology through Curricular Flexibility in the context of mathematical and non-mathematical practices. The need to focus on research and connections between Mathematics and Computational Thought in Basic Education is also ratified, so that more practices are developed that develop students' autonomy and creative process.

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