Revista Internacional Educon | ISSN 2675-6722
Volume 2, n. 1, e21021014, jan./abr. 2021
https://doi.org/10.47764/e21021014

Digital Technologies in the Extracurricular Enrichment of Students with High Skills/Giftedness

Tecnologías Digitales en el Enriquecimiento Extracurricular de Estudiantes con Altas Habilidades/Superdotácion

Tecnologias Digitais no Enriquecimento Extracurricular de Alunos com Altas Habilidades/Superdotação

CLEONICE DA LUZ DOS SANTOS[1], CLODIS BOSCARIOLI[2]

[1] State University of Western of Paraná
[2] State University of Western of Paraná

ABSTRACT *High Ability/Gifted Students are the target audience of Special Education, with Specialized Educational Service being guaranteed as a form of extracurricular enrichment. This paper aims to list Digital Technologies that can develop multiple intelligences and enhance the skills highlighted in the light of a bibliographic and documentary survey, based on legal documents, articles and books. In view of the analysis, it was concluded that the integration of Digital Technologies in teaching for High Skills/Giftedness meets the desire for meaningful and challenging activities, as they strengthen learning, enable extracurricular enrichment and provide the student with the role of researcher, expanding their knowledge and enhancing their skills in a dynamic and interactive way.*

HIGH SKILLS. GIFTEDNESS. DIGITAL TECHNOLOGIES. SPECIALIZED EDUCATIONAL SERVICE. MULTIPLE INTELLIGENCES.

RESUMEN: *Los estudiantes de Alta Capacidad/Superdotación son el público objetivo de la educación especial, con el servicio educativo especializado garantizado como una forma de enriquecimiento extracurricular. Este artículo tiene como objetivo enumerar las tecnologías digitales que pueden desarrollar inteligencias múltiples y potenciar las habilidades destacadas a la luz de una encuesta bibliográfica y documental, basada en documentos legales, artículos y libros. A la vista del análisis, se concluyó que la integración de las Tecnologías Digitales en la enseñanza de Altas Habilidades/Superdotación responde al deseo de actividades significativas y desafiantes, ya que fortalecen el aprendizaje, enriquecen los currículos extracurriculares y otorgan al estudiante el rol de investigador, ampliando sus conocimientos y potenciando sus habilidades de forma dinámica e interactiva.*

HABILIDADES ALTAS/SUPERDOTACIÓN. TECNOLOGÍAS DIGITALES. SERVICIO EDUCATIVO ESPECIALIZADO. INTELIGENCIAS MULTIPLES.

***RESUMO**: Alunos com Altas Habilidades/Superdotação são público-alvo da Educação Especial, sendo garantido o Atendimento Educacional Especializado como forma de enriquecimento extracurricular. Este artigo tem por objetivo elencar Tecnologias Digitais que possam desenvolver as múltiplas inteligências e potencializar as habilidades destacadas à luz de um levantamento bibliográfico e documental, tendo como base documentos legais, artigos e livros. Diante da análise, concluiu-se que a integração das Tecnologias Digitais no ensino para Altas Habilidades/Superdotação vem ao encontro do anseio por atividades significativas e desafiadoras, pois fortalecem a aprendizagem, enriquecem os currículos extracurriculares e proporcionam ao aluno o papel de pesquisador, ampliando seus conhecimentos e potencializando suas habilidades de forma dinâmica e interativa.*

ALTAS HABILIDADES. SUPERDOTAÇÃO. TECNOLOGIAS DIGITAIS. ATENDIMENTO EDUCACIONAL ESPECIALIZADO. INTELIGÊNCIAS MÚLTIPLAS.

Introduction

The National Policy of Special Education, from the Perspective of Inclusive Education (2008) and other legal documents employ the term High Skills/Gifted (HS/G), conceiving as a definition, high potential in areas such as intellectual, academic, leadership, psychomotricity and arts; and may have high creativity. Students with HS/G have the right to Specialized Educational Care (SEC) that aims at complementation and content supplementation, favoring their global development.

With regard to High Skills/Gifted (HS/G), it is contained in the Guidance Manual: Multifunctional Resource Room Implementation Program (Brazil, 2010), which the SEC guides and enables students with HS/G to be served in their specificities with pedagogical practices directed as needed, without a predefined form, requiring the teacher to have flexible planning, with a proposal for pedagogical intervention that will provide a challenging environment, in a dynamic process of valuing the initiative and non-standard responses of the students.

The Resource Rooms for High Skills/Giftedness are important in identifying, monitoring and evaluating the student's educational needs, as they are offered diversified activities in order to rescan the difficulties and/or potentiation of the skills presented, aiming at global development and autonomy, inside and outside the school, in line with the proposal of common education, because education systems must provide access to spaces, pedagogical resources and the promotion of learning, as well as the valorization of differences and meeting the needs of all students (Brazil, 2010). Thus, in order for the student with HS/G to be assisted in his singularity, it is necessary to recognize his/her potentialities. Freitas (2012) states that the student, since not being identified and stimulated, can stagnate in his/her potential development, becoming frustrated and disinterested.

Pedagogical practices should promote integrated learning environments for the promotion of knowledge in the different areas of interest, in addition to the programmatic contents established at each level or stage of teaching. For extracurricular enrichment, digital technologies meet this perspective of inclusion and boosting the teaching of HS/G, since we experience a significant technological evolution that enables the use of digital platforms, enabling different alternatives to assimilation and elaboration of new knowledge, as well as benefiting the collaborative learning process, and enriching the educational process.

This article discusses possibilities of extracurricular enrichment of students with HS/G with Digital Technologies (DT). The study described here is the result of a larger study (Santos, 2019), which aimed to elaborate an educational proposal for the use of digital technologies, considering the different intelligences, in which we've chosen to explore digital resources that provide conditions of innovation in teaching strategies, mobilizing the interest in learning and the progress of the creative potential of each student.

1 High Skills/Giftedness: definitions and indicators

Theorists of the line of psychometrics, an area of psychology that studies the measurement of intelligence, associated the gifted with the high Intelligence Quotient (IQ), above 130, resulting from the measurement of psychological tests. In such a way, they considered the term gifted for "children with very high IQ score, unusual creativity or exceptional specific talents" (Boyd & Bee, 2011).

Renzulli (1988) and Gardner (1995) resized studies on the subject, leading to the discussion of standardized intelligence tests in reduced areas such as logical reasoning and linguistics, valuing only academic skills, excluding non-metric skills such as music, art, leadership skills, social commitment and creative writing.

Gardner (2000, p. 47), before the need to analyze the subject and his intelligence from a new perspective, defined intelligence as "a biopsychological potential, one or more skills that lead to problem solving or the creation of significant products in the cultural space". Within this perspective, the author highlights Multiple Intelligences (MI), being: Linguistic intelligence; Musical intelligence; Logical-mathematical intelligence; Spatial intelligence; Body-kinesthesia intelligence; Intrapersonal intelligence; Interpersonal intelligence and naturalistic intelligence, which will be explored in the course of this article.

The terminology Gifted, High Skills, Talent, Endowment, Overdom, High Skills/Gifted, genius, prodigy and others are some terms adopted to identify the person who has superior skills. The existence of different definitions of the term, as well as the use as terminological synonyms, end up hindering the identification and specialized practice. The definition of students with HS/G, proposed by the National Policy of Special Education in the Perspective of Inclusive Education (Brazil, 2008), is characterized by the high potential in any area, isolated or combined: intellectual capacity, academic aptitude, leadership capacity, psychomotor potential and the arts, high creativity, involvement in learning and performing tasks in areas of interest.

The definition recommended in official documents of the Ministry of Education is based on the theoretical assumptions of Renzulli (1988), when it characterizes the giftedness by means of three groupings of human traits:

> [...] general or specific skills above average, high levels of commitment to the task and high levels of creativity. Gifted and talented children are those who possess or are able to develop these sets of traits and apply them to any potentially valuable area of human performance (Renzulli, 1988).

The heterogeneity presented in the group with HS/G intensifies the discussion around its definition, for Winner (1998), in the view of Ourofino and Guimarães (Brazil, 2007), the gifted is the individual who presents a higher than average performance in one or more areas, compared to the general population of the same age group, being in continuous development. Another concept that testifies to the idea of continuous development, according to the authors, refers to Silverman (2002), when defining the gifted as a subject who has an asynchronous development between intellectual, psychomotor skills, affective characteristics and aspects of chronological development, creating an internal experience qualitatively different from the normal standard.

With regard to the conception of endowment and talent, Gagné and Guenther (2012) highlight the Differential Model of Endowment and Talent, distinguishing them:

> Endowment – designates possession and use of remarkable natural capacity, "aptitude", in at least one domain of human capacity, to a degree that places the individual among at least the top 10% of the comparable group.
> Talent – implies a high level of performance and mastery in skills and skills systematically developed (knowledge or achievement), in at least one field of human activity, to a degree that places the individual among 10% better in the age group performing that activity (Gagné & Guenther, 2012, p. 21).

Pérez and Freitas (2016), in the light of Renzulli's theories (2014, 2016), state that above-average skills characterize information processing capacity with the integration of experiences that result in adaptive responses to new situations, and can be demonstrated in one or more performance areas.

For Renzulli (2018), the design of the Three Rings giftedness aims to show the main dimensions of human potential for creative productivity. Thus, the confluence between above average skill, creativity and involvement with tasks make it possible to create the conditions to develop the creative and productive process. Another aspect to be considered, according to the author, concerns creativity and commitment to the task, considering them, contextual, situational and time, while general intelligence, specific and academic skills tend to remain relatively constant.

The phenomenon of HS/G is a fact present in the day-to-day of school, because the potential of the gifted student can manifest itself in different ways in the school context, and it is up to the education professionals to know the concepts and indicators to start the process of identification of this student. The responsibility is not only of the teacher, but of the entire pedagogical team, because it provides the support so that the teacher can play his/her role in the classroom. For Lima and Moreira (2018):

> The gifted student is identified by the way he/she learns and expresses the learning, whether in academic, artistic, psychomotor aspects, among others that may present. Considering the indicators of high skills/gifted, enabling specific and appropriate care services, and creating effective pedagogical strategies in the common classroom should be a concern of the teacher, the coordination and direction of the courses, as well as the others involved in the pedagogical process (Lima & Moreira, 2018, p. 276).

The identification process involves continuous evaluation and monitoring, and it is insufficient to rely on a single source of information. It is important to clarify that public educational policy fosters the creation of pedagogical programs, projects and alternatives to meet the demand of students with HS/G, "but without the identification of these students, the demand ceases to exist, which discards the evidence of a care program" (Lima & Moreira, 2018, p. 275). Therefore, knowing and recognizing the indicators of HS/G provides the opportunity of attending to the child's peculiarities and provides specialized educational care.

In order to obtain greater legitimacy in the process of identifying HS/G, it is necessary to transpose various forms of ideologies, myths and misconceptions about the conceptions of HS/G, once this student may present academic and behavioral difficulties, learning disorders and other factors that may mask the higher potential (Santos, 2019).

The studies by Sabatella (2012) refer to some characteristics that show abilities, behaviors and recurrent reactions in gifted people that can be observed by parents and teachers. Among them are intensity, sensitivity, moral development, complexity, depth and perfectionism. According to the author, it is natural for a gifted to engage in situations and emotions intensely, and can cause anxiety, inadequacy and inferiority. The sense of justice and concern with social problems are also present in the characteristics of the gifted, as well as the ability to learn and process complex information quickly.

Other characteristics concern memory, the ease of focusing on many issues and solving issues at the same time, curiosity and longing for novelty. HS/G students search for meaningful or intellectually challenging activities and are discouraged by monotony. The challenge of rules and authority characterized by the willingness to perform and solve the challenges in its own way, seeking new approaches to resolution, energy usually accompanies high intelligence, and may seem distracted or inattentive, because it is involved in different activities of interest, starting much at the same time (Sabatella, 2012, p. 118-127).

In the conception of Perez and Freitas (2016), the individual with HS/G can evidence a more elaborate vocabulary than other colleagues, analytical and inductive capacity and very developed memory, highlighted in the area of his interest, abstract thinking and a very developed logical-mathematical reasoning. In creativity, curiosity, different ideas, criticality, solutions, unusual answers and a taste for challenges stand out.

Being creativity linked to HS/G, Alencar *et al.* (2016) explain that it is necessary to strengthen the cognitive abilities of the student, making room for the act of creating, not as something external, but part of their own experience, providing activities that stimulate the imagination, because creative skills can be developed through interventions, training and/or instructions.

Corroborating, Piske (2018) points out that students with creative-productive giftedness have sensitivity to details, creativity and originality, aversion to routines, seek new ways to solve problems and think by analogies. These characteristics are observable in the classroom and should be considered in the process of identification of HS/G.

It is essential to identify this student, not by a simple title, but to receive specialized educational care, making it possible to develop their skills in full. Thus, education professionals need to have theoretical knowledge about HS/G, because "theory is certainly the rudder and compass that should guide us in directions to practices that avoid randomness in the goals we seek" (Renzulli, 2018), to understand the indicators and elaborate interconnected educational practices, creating a challenging and motivating environment for the gifted, since students with HS/G need stimuli to identify and improve their potentialities. If there are no adequate educational practices, these students will hardly achieve success in their achievements (Sabatella, 2012).

2 Extracurricular enrichment for students with HS/G

The SEC contributes to the process of inclusion and the interconnection of pedagogical knowledge and practices with common education, in order to guide teaching and learning, providing resources for complementation or supplementation, strengthening the legal frameworks of an inclusive educational system. Members of Special Education, students with HS/G have rights to the SEC, taking place in the counterpart, in the school itself, in the Multifunctional Resource Room for High Skills/Giftedness (MRR- HS/G) or specialized center that offers this educational service.

Delpretto and Zardo (2010) highlight that the objectives of the SEC are defined by benefiting the student's interaction in the school context, boosting their skills through curriculum enrichment, expanding access to the use of digital technologies, promoting participation in activities focused on the practice of research and product development, as well as stimulating the development of projects with diverse themes in areas such as sport sciences, arts and others.

The documents of the Superintendence of Education (SUED in Portuguese) and The Secretary of State for Education (SEED in Portuguese), and representatives of special education in Paraná, Instruction nº 010/2011 (SUED/SEED, 2011), dispose that the teacher of the MRR-HS/G, initially, should identify the educational needs of the students, thus elaborating an individualized educational plan with differentiated methodologies and strategies, in order to meet individually or in small groups in a flexible way. Collaborative work, together with the teacher of the common class, should also be present, so that inclusive pedagogical practices are developed.

The MRR-HS/G should promote an environment conducive to the development of multiple intelligences, creativity and potentiality. The pedagogical action should consist of specific procedures, aiming to enrich learning, opportunistic interventions in the areas of students' skills and interests, promoting intrapersonal and interpersonal development (Instruction nº 010/2011 – SUED/SEED).

For Gardner (2010), each person has the ability to possess all eight intelligences, but what differs these capabilities among individuals is the degree of development. The potentials within the intelligence spectrum depend on the motivation and resources available, with the enrichment of intellectual qualities by the experiences lived and practiced. The author considers that, regardless of content, concept or idea, it is necessary to present them in various ways so that they can activate the different intelligences or combinations of these, because "only those who can think of a topic in various ways have a thorough understanding of this topic, those whose understanding is limited to a single vision have a fragile understanding" (Gardner, 2010 p. 21).

In his theory, Gardner (2010) emphasizes the importance of developing the ability to solve real problems, using all intelligences. Thus, the space for learning should be marked by a stimulating environment that allows cooperation and interaction between student-student and student-teacher, allowing to develop the creative process and multiple intelligences. In his theory, Gardner (2010) emphasizes the importance of developing the ability to solve real problems, using all intelligences. Therefore, pedagogical praxis in MRR-HS/G must articulate activities to offer meaningful learning, being open to the various resources that can present different ways of learning, respecting and valuing the skills of each student.

For Depizzol and Preto (2018), the use of interactive entertainment makes learning more attractive, allowing students to develop their potential, seek new strategies and solutions, thus acquiring diversified knowledge and improving the creative and critical process. In this context, digital technologies become an important resource, since they provide opportunities for the exploration of content of interest and information sharing enable to express creativity, as well as to develop creative-productive skills, increasing autonomy in their learning process (Santos, 2019).

For Smole (1999), in the light of multiple intelligences, the whole student has the potential to develop intensely in one or more areas. For this to occur, it is necessary to stimulate different abilities of individuals. To insert digital technologies in classes, it is necessary a mapping of interests of students and the selection of resources determining the quality and their contribution in the learning process "there are hundreds of websites, software, games and applications that can be used in the educational area, available in the market and the internet. When preparing a pedagogical activity with Digital Technologies of Information and Communication (DTIC), initially the teacher needs to know the resource that will be used" (Chacon & Pedro, 2016, p. 09). Therefore, digital technologies do not promote enrichment by themselves, it is up to the teacher to define educational goals and objectives to be achieved with them.

The suggestions proposed in this article are examples of the different types of digital resources that can be used in the classroom aiming at stimulating, discussing, sharing and producing ideas and content, ready to be used in different school levels and learning styles.

2 .1 Linguistic and Naturalistic Intelligence

Spontaneity, sensitivity to sounds, rhythms, the ability to report experiences rich in detail and the ability to excite, convince, demonstrate feelings and persuasion, through orality and writing (Gadner, 1995; Vieira, 2005), are a characteristic evidenced in students who present HS/G in the area of language. Thus, the work in MRR-HS/G should promote an environment that allows to develop the process of reading and writing, which favors developing the imagination, stimulates the creative process on various topics, once the attitudes of the teacher contribute significantly with the student for their social, cognitive and affective development, as well as in the enthusiasm for the search for new knowledge (Alencar, 2016).

The digital resources, presented here, aim to contribute, in a diversified way, to the production of comics (COMICS). This discourse genre has a consolidated language, because it has been present since the initial years, thus favoring the recognition and its textual structure, temporal ellipse, balloon, onomatopoeia and other subsidies for the development of narrative.

Features such as Pixton[1], ToonDoo[2], Strip Creator[3] and Make Beliefs Comix[4] are some platforms for creating COMICS that provide templates, characters and facial expressions that can be explored by the teacher, through debates and discussions on various topics. In the course of producing a text,

[1] Available at http://www.pixton.com/br. Access 04 mar. 2021.
[2] Available at http://www.toondoo.com. Acess 04 mar. 2021.
[3] Available at http://www.stripcreator.com/make.php. Acess 04 mar. 2021.
[4] Available at http://www.makebeliefscomix.com. Acess 04 mar. 2021

according to Geraldi (2003, p. 137), it is necessary that "(a) has something to say. (b) if you have a reason to say what you have to say. (c) if you have someone to say what you have to say. (d) the announcer is instituted as such, as a subject who says what he says to those who say it."

In the writing process, digital technologies as authoring tools that, according to Silva (2013, p. 31), correspond to an "application equipped with several multimedia tools that, from predefined models, allow the user to insert information, images and sounds, promoting autonomy and stimulating the cognitive development of those who create activities from it", can stimulate active and collaborative participation among students with HS/G, providing the sharing and sum of knowledge in the classroom.

Presenting challenges and problem situations that stimulate imagination and fantasy are ways to encourage and develop the creation of a product autonomously, enrich teaching, enable critical reflections on the context and intention of production, expanding the worldview and social responsibility, resulting in a significant learning that enhances autonomy and authorship.

Thus, digital narratives or storytelling make it possible to work in an interconnected way with various contents and disciplines, taking into account the learning style of each student. The narratives, which were traditionally oral or written, take a new format being produced with a combination of media such as images, videos, audios, enabling new forms of production, contributing to the diversity of representation of knowledge. Almeida and Valente (2012) ratify:

> The narrative is the creation that the storyteller uses to make sense of the world and its experience. It is one of the four rhetorical modes, in addition to exposure, argumentation and description; one of the constructive formats to describe a sequence of events [...]the narrative is composed of a beginning to capture the attention of the reader or listener, the medium that develops the plot of the characters, which does not necessarily need to be a person, but can be a phenomenon, a community. Finally, the plot is solved or explained and, thus, the final part is presented (Almeida & Valente, 2012, p. 333-334).

To Prado *et al.* (2017, p. 1172), "the use of digital narratives induces creativity, autonomy and participation, something that we always seek in our discourses for quality education, but which are still in a theoretical plane in the school reality". The authors complement that, through this production, the student plays an active role in the construction process, treading knowledge and interacting with their peers, in a collaborative learning process.

Platforms such as Powtoon[5], UtellStory,[6] Xtranormal[7] and StoryBird[8] allow the creation of presentations and storytelling that encompass sounds, videos, images and texts, including a set of characters and scenarios. The stimulation of skills in the area of language, both in orality and writing, requires strategies that enable the development and constant improvement.

It is up to the teacher to propose activities in which the skills can be developed, in order to create conditions for the student to express creative thinking and result in products, such as storytelling, involving suggested themes and/or of interest, and, therefore, are related to a narrative the ability and skills of storytelling (biographies, interviews, life stories among others) in an engaging and stimulating way (Santos, 2019)

Another digital resource are the tools for creating animated figures, as the Graphics Interchange Format (GIF), which allows to develop the creative production of content capable of involving and expanding knowledge on various subjects, in different situations. Animated GIF stores a series of images in a single file, displaying them in sequence, automatically, and looping. To create an animation, you need to provide a series of images with small differences in position, format, or color between the elements that make up the scene.

---

[5] Available at https://www.powtoon.com. Acess 04 mar. 2021.
[6] Available at https://www.utellstory.com. Acess 04 mar. 2021.
[7] Available at http://www.xtranormal.com. Acess 04 mar. 2021.
[8] Available at https://storybird.com. Acess 04 mar. 2021.

According to Nadal (2014, p. 38), "a GIF can then circulate through different points of the network and transform into various discourses from environments, manipulations and curatorities", so that digital images produced with an intentionality are manipulated by another subject in different contexts. According to Almeida (2015), the GIF transmit the daily sensations and represent emotions, through animation and rhythm starting from the frames, they also function as collective manifestations that end up establishing interest groups.

Its production can contribute to the development of creativity, interpretation of discourses and intentionality of language, besides revealing innovative contexts in the area of language, by mutually involving images, sounds and written texts. Thus, the creative process of a GIF requires the organization of ideas, the logical sequence of a subject and the coherence in the layout of images (Santos, 2019).

To add to enrichment activities, the language of animations, videos and films allow a practical and dynamic approach to content production, projects and collaborative activities, enabling to address information in a short period of time, enabling the sharing of experiences and knowledge. According to Melo (2018, p. 63), audiovisual resources "are, by nature epistemic, transdisciplinary, interdisciplinary and multidisciplinary, and cause ruptures in the disciplinarity of knowledge", favoring work in various areas of knowledge.

The themes may arise from the interest of the student and/or include cultural references, documentaries about the environment, favoring the stimulation of Naturalistic Intelligence, which aims to "differentiate and recognize members of a specie; map, formally or informally, the relationships between the various species" (Vieira, 2005, p. 9).

Children who present this intelligence demonstrate "a passionate and intense relationship with nature, in a sense of belonging and care for ecosystems and habitats, with animals and plants, in addition to their economic or aesthetic utility" (Carneiro & Lacerda, 2018). This interest in fauna and flora makes it possible to develop observation activities, ecological awareness, research and experiences that can be shared in social networks and communication channels.

The application of this resource in the classroom requires guidance for the elaboration of a roadmap that organizes the information and resources that will be used visually and sonorously. The video production includes narrations, audios and animation techniques, providing the ability to capture attention, through visual and sound memory, and can be used instruments such as camcorder, smartphone/tablet or computer/notebook with webcam.

Therefore, the production process of various discursive genres, the relationship between the exchange of ideas, information and knowledge enrich and awaken potentials for creation. The sharing of these productions for the school community is essential.

2 .2 Spatial-Mathematical and Spatial Intelligence

Logical-mathematical Intelligence is the ability to solve problems involving numbers and elements such as calculations, survey and hypothesis investigation, and may be related to Spatial Intelligence, responsible for the ability to guide, create, transform or modify images, and build visual and spatial ideas (Gardner, 1995; Vieira, 2005). For this reason, the suggested digital resources in this subsection enable the development of these skills, concomitantly, because they provide contact with activities that require logical reasoning and ability to create and modify a given space.

For the development of logical-mathematical and spatial intelligence, the elaborated activities should involve situations that allow the resolution of problems and the use of differentiated strategies, as well as the construction of spatial ideas, among them, the ability to recreate visual experiences in various forms.

Gee (2003) points out that the games are specifically designed to allow players, at the initial levels, to have contact with easy-to-solve issues by comparing the initial levels as hidden tutorials. This scale of difficulty favors, according to the author, the resolution of problems during the game, because, if the

child finds it very difficult to start the game, demotivation may occur in playing and, consequently, demotivation in learning.

The skills of designing, combining and organizing spaces can be developed from the game Minetest[17]. This digital resource proposes the construction of a world from the exploration of the environment, collecting blocks and objects for survival. Minetest allows the use of various skills for its construction, opening possibilities for the development of projects and approaches of various contents. Authoring software is a useful resource for pedagogical enrichment in MRR-HS/G to occur in a playful and creative way.

In accordance with the studies of Silva *et al.* (2016, p. 2480), "authoring tools are software that allows a user to create applications in various areas, using image, text, video and sound resources, among others", not requiring the student or teacher to have in-depth programming knowledge. According to Kaminski (2018, p. 20), the student "has the desire to create, interact and produce, since this cultural context, for some time, allows any subject to be not only a consumer of information and/or knowledge, but also a producer through digital technologies".

Desta maneira, alguns recursos permitem ao aluno desenvolver a capacidade de interação, iniciativa, raciocínio e criatividade, com ênfase em ferramentas de programação – ou de desenvolvimento do Pensamento Computacional (PC), que pode ser definido como um processo de resolução de problemas, envolvendo o projetar, planejar, ordenar e analisar cada situação, incluindo uma gama de ferramentas mentais (WING, 2006). Para Brackmann (2017), o processo do PC é composto por quatro pilares: decomposição, reconhecimento de padrões, abstração e algoritmos objetivando a resolução de problemas. Assim, complementa o autor que:

In this way, some resources allow the student to develop the capacity for interaction, initiative, reasoning and creativity, with emphasis on programming tools – or computational thinking (CT) development, which can be defined as a problem-solving process, involving the design, planning, ordering and analysis of each situation, including a range of mental tools (WING, 2006). For Brackmann (2017), the CT process consists of four pillars: decomposition, pattern recognition, abstraction and algorithms aimed at solving problems. Thus, the author adds that:

> Computational Thinking involves identifying a complex problem and breaking it into smaller pieces that are easier to manage (DECOMPOSITION). Each of these minor problems can be analyzed individually in greater depth, identifying similar issues that have been previously addressed (PATTERN RECOGNITION), focusing only on the details that are important, while irrelevant information is ignored (ABSTRACTION). Finally, simple steps or rules can be created to solve each of the subproblems encountered (Algorithms) (Brackmann, 2017, p. 893).

Some digital features allow authoring such as Scratch [18], visual and multimedia programming program, aimed at creating and promoting animated sequences for programming learning, being possible to work with images, photos, music, create drawings, change appearance, make objects interact. The Game Edito[19], interactive open source multimedia tool for game development, with a simple and intuitive interface and a rich set of features that allows to develop 2D games for personal computers and mobile devices.

According to Gee (2003), a good game consists, among other characteristics, in the quantity and quality of the player's involvement in manipulating and deciding the future of the character - feeling part of the game, will have greater motivation to devise strategies for problem solving. Therefore, the student, when creating his/her own game, programming and coordinating each level of difficulty, has the opportunity to develop skills and intelligences, both logical-mathematical and spatial, as well as linguistic, intrapersonal and interpersonal, taking into account that factors such as leadership, social and emotional responsibility applied in the production of the game influence the quality of the product.

Silva *et al.* (2015) investigated three skills explored about teaching and learning programming in schools, being cognitive ability, characterized by problem solving, logical reasoning and decision making; social ability, corresponding to cooperation, rule making, and emotional ability, such as self-esteem, self-

confidence and self-assessment. Creativity, thought structuring, responsibility, curiosity, trust and teamwork are also skills developed with programming activities.

The alignment of the CT with the planning of the classes will contribute to the stimulation of the practice of reasoning and problem solving, because the strategy of separating each problem into parts, as well as planning all the steps before putting it into practice were essential in the result. The Programaê[20], platform is a feature that introduces the programming language into a sequential docking of command blocks. LightBot[21] is a coding-based puzzle game that provides opportunities for logical programming learning in a playful way.

Since they need a dynamic and stimulating teaching focused on challenges, the teacher can use these processes to mediate enrichment activities, since the authorship software provides the freedom to choose themes for research and mediation for scientific development, expanding the way of learning and developing critical, creative and productive thinking.

2 .3 Body-kinesthetic, interpersonal and intrapersonal intelligence

Body-kinesthesia intelligence is manifested by the ability to solve problems or develop products using the body or its parts (Gardner, 1995). People with this intelligence have the ability to manipulate objects with extreme skill, perception of taste (gourmets, chefs) and expressive movements in responses to different musical rhythms or athletic body skills (Vieira, 2005).

Activities for the development of intelligences, in addition to interactive games, can occur through Educational Robotics, because they present situations that allow the child to manipulate and control concrete objects and, through these objects, observe the materialization of the commands given by him/her to the computer, a process from which the construction of knowledge is established (Santos, 2019).

For Zilli (2004), robotics includes the development of fine motor skills and the training of manual skills, as well as provides a dynamic activity for the construction of autonomy, independence and responsibility. With regard to Multiple Intelligences, the author explains that:

> in addition to the development of logical-mathematical intelligence that is the most evident, because working with computer programming and calculations in general, promotes the development of linguistic, interpersonal, intrapersonal and even spatial intelligence, as it involves aspects such as group work, action planning, model design to be built, reconstruction of the model and presentation of the result (Zilli, 2004, p. 77).

Both interpersonal intelligence, "the ability to understand others and work with them" (Gardner, 1995, p. 15), and intrapersonal intelligence, an ability that allows us to "understand ourselves and work with us" (Gardner, 1995, p. 15), are stimulated in the activities proposed with digital technologies, since mutual collaboration for problem solving and autonomy in product creation permeate all stages of elaboration.

Thus, integrating pedagogical practice with the construction of prototypes or robotic devices, as a mean of problem solving, allows stimulating the creativity of students who "interact, exchange ideas, test hypotheses by constructing and deconstructing their prototypes in search of the solution to the problem presented"(Fornaza *et al.*, 2015, p. 142), in this process "they learn, socialize and develop cooperative work with the division of tasks for the construction of the prototype" (Fornaza *et al.*, 2015, p. 142).sõs

For Queiroz *et al.* (2016, p. 2087), "Robotics allows students to work a great diversity of skills and abilities as it encompasses, in a single object of study, several areas of knowledge [...]", enabling the manipulation and control of concrete objects by the child and, through observation and materialization of the commands programmed by the child to the computer, the processes of knowledge construction are established.

Silva *et al.* (2018) report a teaching experience using the Arduino prototyping platform, which offers easy-to-use open source hardware and software for writing code in the programming language, recyclable materials such as butter pots, cardboard, EVA paper and scratch papers, as well as other electronic components for assembling soccer robot cars following the contextualization of a digital narrative.

After the construction of the prototypes, the students participated in a soccer game using their creations and, for this investigation, the authors observed greater interest, motivation and dynamism in the execution of the tasks. Educational robotics has also triggered student engagement, collaborative work, and knowledge sharing.

Therefore, the projects involving robotics and programming language contribute to the development of logical reasoning, hypothesis formulation, manual and aesthetic skills, in interpersonal and intrapersonal relationships, as well as in the concepts seized in several areas of knowledge. For Alencar *et al.* (2016), when the school environment enables fantasy and imagination, from a common core of knowledge, students are encouraged to create their own vision of what is taught to them. Thus, they are encouraged to share impressions and references.

2.4 Musical Intelligence

Musical intelligence "is the one that enables the understanding, discrimination, perception, expression and transformation of musical forms (rhythm, tone, melody and timbre of sounds)" (Gardner, 1995; Vieira, 2005).

For the stimulation of intelligence, the teacher of the MRR-HS/G should provide activities that awaken the auditory perception of the child, such as sung toys, songs from different cultures and games with different timbres that allow the discrimination of sounds, rhythms and others, contemplating the universe in which it is inserted, because, according to Chamorro *et al.* (2017), music can help develop concentration, reasoning, personal discipline, in addition to providing the child the time to express their feelings and ideas.

For Carneiro and Lacerda (2018, p. 134), "musical intelligence is a cognitive resort that can involve and, consequently, refine other types of intelligences" contributing to a global student development. The authors:complememt:

> Affectively, musical art broadens the consciousness of the subject through contact with oneself and with the other. Listening, analyzing and recognizing its sound production, denying or welcoming it is a gesture of self-knowledge and awareness of its potentialities and difficulties, while expanding creativity (Carneiro & Lacerda, 2018, p. 134).

Music provides the development of other intelligences, such as logical-mathematical intelligence. The use and reading of graphs and schemes, such as audio scores and conventional scores, are important for the fluency of logical thinking, and the execution of rhythmic patterns stimulates reasoning by dealing directly with time regulations, classification, comparison and deduction, in addition to the relationships between fast/slow, severe/acute duration, among others (Carneiro & Lacerda, 2018).

The aforementioned authors relate music to intrapersonal and interpersonal intelligences, because music becomes a nonverbal mean of communication and perception of the other in musical creations - children can learn to ponder their impulses, time, anxiety and fear in their productions, realizing the important role of the other both in the perception and orientation of work, as well as in the exchange of ideas and knowledge. Knowledge and deference to the sound manifestations of other cultures propitiate work about respect for early judgments and the establishment of labels and prejudices, especially with regard to musical styles and aesthetics.

Thus, the activities of exploration and expression such as singing, playing some instrument, using objects and the body itself musically, the contact with dance from different cultures can positively

influence the cognitive development of the child. As a resource, SOLFEGE 3.22.0[23], software is suggested, a program for auditory training, intervals, chords and music theory. Other suggestions are: LMMS[24], which allows to produce music through melodies and beats, synthesizing and mixing sounds, and Musescore[25], software for musical notation.

Games such as DÓ RÉ MI[26], Notas Musicais[27], Piano Online[28] and Chrome Music Lab[29] also offer productive resources for activities with students with HS/G from different areas, because they enable, in a playful way, to learn and/or improve their contact with the elements of music (sheet music, musical notes and others), assisting in the cultural and psychomotor development, in the integration of different languages and musical instruments.

The suggestions highlighted are not intended to train musicians, but to provide students with the opportunity to use digital technologies as a source of research, stimulus and ludicity, since, when playing, the child expresses feelings, desires and difficulties (Piske & Stoltz, 2018) and creativity.

Final thoughts

Students with HS/G require specialized educational follow-up so they can develop their skills. For this, the school needs to be structured to meet its peculiarity. Having knowledge about the concepts of the theme in question demystifies the mistaken association of HS/G with exceptional school performance, the absence of learning difficulties and the non-recognition of their educational needs.

It is known that high potential in the academic, intellectual, psychomotor and arts areas does not manifest in the same way in all individuals. Therefore, investment in teacher training and qualification is fundamental for inclusive practices.

O ambiente de aprendizagem necessita ser dinâmico, motivador e seguro, este último no sentido de permitir que o aluno possa expor suas ideias, seu processo de criação, originalidade e anseios individuais. Para isso, as práticas pedagógicas em SRM-AH/SD devem articular recursos que proporcionam o desenvolvimento cognitivo do aluno, de forma lúdica. Atividades que envolvem protagonismo, autoria e resolução de problemas são sugeridas pela criação de vídeos, GIF, *storytelling*, jogos de raciocínio, pensamento computacional e outros recursos, tal que o aluno com AH/SD tenha condições de expressar sua criatividade, opinião e uma diversidade de conceitos e pensamentos.

The learning environment needs to be dynamic, motivating and safe, the latter in order to allow the student to expose his ideas, his creation process, originality and individual anxieties. For this, pedagogical practices in MRR-HS/G must articulate resources that provide cognitive development of the student, in a playful way. Activities involving protagonism, authorship and problem solving are suggested by the creation of videos, GIF, storytelling, reasoning games, computational thinking and other resources, such that the student with HS/G is able to express creativity, opinion and a diversity of concepts and thoughts.

The production process and the relationship among the exchange of ideas, information and knowledge enrich and awaken potentials. The sharing of productions develops responsibility in creation, including the commitment of how, what, for whom to produce, and what the intention of this production is.

The above mentioned activities are possible alternatives for the stimulation of different intelligences and skills, because students with HS/G need creative and innovative strategies that make the school environment challenging and motivating. The digital resources explained can favor the student's protagonism, providing the learning of new concepts and developing skills for problem solving.

Digital technologies, when applied in a planned way and with clear pedagogical objectives, can provide stimuli that direct the student to think about solutions and to explore possibilities, contributing to the maturation of hypotheses, since such technologies allow access to different information and media, as well as interactive and dynamic content.

There is a need to continue systematically investigating the use of digital technologies in MRR-HS/G, in order to create subsidies that help teachers in the application of these in their pedagogical practices and, collecting more evidence about the assumption of enrichment of the students' potentiality by systemic and planned use, related to content and problem solving.

References

Alencar, E. M. L. S., Braga, N. P., & Marinho, C. D. (2016). Como Desenvolver o Potencial Criador: um guia para a liberação da criatividade em sala de aula (12a ed.). Petrópolis: Rio de Janeiro. Vozes.

Almeida, M. E. B., & Valente, J. A. (2012, set/dez.). Integração Currículo e Tecnologias e a Produção de Narrativas Digitais. Revista Currículo sem Fronteira (v. 12, n. 3, pp. 57-82). Recuperado 03 dezembro, 2020, de www.curriculosemfronteiras.org.

Almeida, M. L. (2015). GIFS: Educação Estética, Afeto e Ativismo Através da Imagem Animada. Dissertação (Mestrado em Artes Visuais), Universidade Federal de Pelotas, Pelotas, Brasil.

Boyd, D., & Bee, H. (2011). A criança em crescimento. Porto Alegre: Artmed.

Brackmann, C. P. (2017). Desenvolvimento do Pensamento Computacional através de Atividades Desplugadas na Educação Básica. Tese (Doutorado em Informática na Educação), Universidade Federal do Rio Grande do Sul, Porto Alegre, Brasil. Recuperado 03 dezembro, 2020, de http://www.lume.ufrgs.br/handle/10183/172208.

Brasil. (2008). Política Nacional de Educação Especial na perspectiva da Educação Inclusiva. Brasília: Ministério da Educação, Secretaria de Educação Especial. Recuperado em 02 dezembro, 2020, de http://portal.mec.gov.br/docman/dezembro-2014-pdf/16690-politica-nacional-de-educacao especial-na-perspectiva-da-educacao-inclusiva-05122014.

Brasil. (2010). Manual de Orientação: Programa de Implantação de Sala de Recursos Multifuncionais. Brasília: Ministério da Educação Secretaria de Educação Especial. Recuperado em 02 dezembro, 2020, de http://portal.mec.gov.br/docman/fevereiro-2012-pdf/9936manual-orientacao-programa-implantacao-salas-recursos-multifuncionais.

Carneiro, S. G. O., & Lacerda, A. D. (2018). Educação Musical e Psicopedagogia: Caminhos para o Desenvolvimento das Inteligências Múltiplas. Revista PAIDE'IA (ano XIII, n. 19). Recuperado 30 novembro, 2020, de http://www.fumec.br/revistas/paideia/article/view/6321/3135.

Chamorro, A., Gitahy, R. R. C., Terçarial, A. A. L., & Santos, D. A. N. (2017, jul./dez.). Educação Musical e as Tecnologias: O Uso de Objetos de Aprendizagem e Percepção dos Docentes. Revista Educação e Linguagens (v. 6, n. 11). Recuperado 04 março, 2021, de http://www.fecilcam.br/revista/index.php/educacaoelinguagens/article/viewFile/1651/1055.

Delpretto, B. M. L., & Zardo, S. P. (2010). Alunos com Altas Habilidades/Superdotação no Contexto da Educação Inclusiva. In: DELPRETTO, B. M. L.; GIFFONI, F. A.; ZARDO, S. P. A Educação Especial na Perspectiva da Inclusão Escolar: Altas Habilidades/Superdotação. Brasília: Ministério da Educação, SEESP; Fortaleza. Universidade Federal do Ceará (v. 10, p. 23).

Depizzol, F., & Pedro, K. M. (2018). No caminho da autoria: criação de jogos educativos no PowerPoint por estudantes com altas habilidades ou superdotação. InFor, Inov. Form., Rev. NEaD-Unesp, São Paulo (v. 4, n. 1, pp. 2-20). Recuperado 11 março, 2021 de o https://ojs.ead.unesp.br/index.php/nead/article/download/461/artigo1_infor_v4n1_2018.

Fornaza, R., Webber, C. G., & Villas-Boas, V. (2015). Kits Educacionais de Robótica: Opções para o Ensino de Ciências. Scientia Cum Industria (v. 3, n. 3, pp. 142-147). Recuperado 30 novembro, 2020 de http://www.ucs.br/etc/revistas/index.php/cientiacumindustria/article/.

Freitas, S. N. (2012). Altas Habilidades/Superdotação: Processos de Mediação com a Utilização das Tecnologias de Informação e Comunicação. In: Giroto, C. R. M., Poker, R. B., & Omote, S. (Org.). As Tecnologias nas Práticas Pedagógicas Inclusivas. Cultura Acadêmica (vol. 1, pp. 185-210). Ed. São Paulo.

Gagné, F.; Guenther, Z. C. (2012). Desenvolvendo Talentos: Modelo Diferenciado De Dotação E Talento - Dmgt 2.0. In: Moreira, L.C, & Stoltz, T. (Org.). Altas Habilidades/Superdotação, Talento, Dotação e Educação. (pp. 20-44, 2012). Curitiba: Juruá.

Gardner, H. (1995). Inteligências Múltiplas: A Teoria na Prática. Porto Alegre: Artes Médicas.

Gardner, H. (2020). Inteligência: um conceito reformulado. Rio de Janeiro: Objetivo.

Gardner, H., CHEN, J. Q., & MORAN, S. (2010). Inteligências Múltiplas ao Redor do Mundo. Porto Alegre: Artmed.

Gee, J. P. (2003, out.). What Video Games Have to Teach us About Learning and Literacy. ACM Computers in Entertainment (v. 1, n. 1).

Geraldi, J. W. (2003). Portos de Passagem. São Paulo: Martins.

Kaminski, M. (2018). Análise das Práticas Pedagógicas na Educação da Escola Municipal Aloys João Mann – Cascavel/PR. 2018. Dissertação (Mestrado em Ensino), Universidade Estadual do Oeste do Paraná, Foz do Iguaçu, PR, Brasil.

Lima, D. M M. P., & Moreira, L. C. (2018). O Professor Frente à Identificação do Estudante com Altas Habilidades/Superdotação na Universidade. In: VIRGOLIM, A. (Org.) Altas Habilidades/Superdotação: Processos Criativos, Afetivos e Desenvolvimento de Potenciais (pp. 271-286). Curitiba: Juruá.

Melo, M. A. V. (2018). O uso pedagógico do audiovisual. Revista Discurso e Imagem Visual em Educação. João Pessoa (v. 3, n. 1, pp. 38-65).

Nadal, H. D. (2014). A cultura do Gif: Reconfigurações de Imagens Técnicas a partir dos Usos e Apropriações de Narrativas Cíclicas. Dissertação (Mestrado em Comunicação e Linguagens), Universidade Tuiuti do Paraná, Curitiba, Paraná.

Ourofino, V. T. A. T., & Guimarães, T. G. (2007). Características Intelectuais, Emocionais e Sociais do Aluno com Altas Habilidades/Superdotação. In: FLEITH, D. S. (Org.). A Construção de Práticas Educacionais para Alunos com Altas Habilidades/Superdotação (V. 1, pp. 41-42). Brasília: MEC/ SEESP.

Paixão, W. P., Neto, C. S. S., Costa, R. J. S., & Ladeira, F. S. (2016, out.). Jogos educativos e ferramentas de autoria multimídia: um estudo exploratório sobre quebra-cabeças digitais no contexto do ensino-aprendizagem. Congresso Brasileiro de Pesquisa e desenvolvimento em design (pp. 2478-2488). Recuperado 14 dezembro, 2020, de https://www.researchgate.net/publication/311459994_jogos_educativos
_e_ferramentas_de_autoria_multimidia_um_estudo_exploratorio_sobre_quebracabecas_digitais_no_contexto_do_ensino.

Paraná. (2011). Instrução nº 010/2011 – SUED/SEED, Secretaria de Estado de Educação. Superintendência da Educação. Recuperado 01 dezembro, 2020, de www.educacao.pr.gov.br/arquivos/File/... /Instrucao0102011seedsued.PDF.

Pérez, S. G. P. B., & Freitas, S. N. (2016). Manual de Identificação de Altas Habilidades/Superdotação. Guarapuava: Apprehendere.

Piske, F. H. R. (2018). Altas habilidades/superdotação (AH/SD) e criatividade na escola: o olhar de Vygotsky e de Steiner. Tese (Doutorado), Universidade Federal do Paraná, Curitiba, Paraná.

Piske, F. H. R., & Stoltz, T. (2018). Afetividade e Criatividade na Educação de Superdotados: Uma Proposta A Partir da Ludicidade. In: VIRGOLIM, A. (Org.) Altas Habilidades/Superdotação: Processos Criativos, Afetivos e Desenvolvimento de Potenciais (pp. 201-2012). Curitiba: Juruá.

Prado, A. L., Laudares, E. M. A., Viegas, P. P. C., & Gourlart, I. C. V. (2017, ago.). Narrativas Digitais: Conceitos e Contextos de Letramento. Revista Ibero-Americana de Estudos em Educação (v. 12, n. esp. 2, pp.1156-1176). Recuperado 15 março, 2020, de http://dx.doi.org/10.21723/riaee .v12.n.esp.2.10286.

Queiroz, R. L., & Sampaio, F. F. (2016). DuinoBlocks for Kids: Um Ambiente de Programação em Blocos para o Ensino de Conceitos Básicos de Programação a Crianças do Ensino Fundamental I Por meio da Robótica Educacional. Anais XXXVI Congresso da Sociedade Brasileira de Computação (pp. 2086-2095). Recuperado 29 novembro, 2020, de http://ebooks.pucrs.br/edipucrs/anais/csbc/assets /2016/wei/10.p df.

Renzulli, J. (2014, set./dez.). Modelo de Enriquecimento para Toda a Escola: Um Plano Abrangente para o Desenvolvimento de Talentos e Superdotação. Trad.: PÉREZ, S.G.P.B. Título original "The Schoolwide Enrichment Model: A Comprehensive Plan for the Development of Talents and Giftedness". Revista Educação Especial (v. 27, n. 50, pp. 539- 562).

Renzulli, J. (2018). Reexaminando o Papel da Educação para Superdotados e o Desenvolvimento de Talentos para o Século XXI: Uma Abordagem Teórica em Quatro Partes. In: VIRGOLIM, A. (Org.). Altas Habilidades/Superdotação: Processos Criativos, Afetivos e Desenvolvimento de Potenciais (pp. 19-41). Curitiba: Juruá.

Renzulli, J. J. (1988). The Three-Ring Conception of Giftedness: A Developmental Model for Creative Productivity. In: Stemberg, R. & Davidson, J. Conceptions of Giftedness. Cambridge (EUA): University of Cambridge.

Sabatella, M. L. P. (2012). Expandir Horizontes para Compreender Alunos Superdotados. In: MOREIRA, L. C. & STOLTZ, T. (Org.). Altas Habilidades/Superdotação, Talento, Dotação e Educação (pp. 113-128). Curitiba: Juruá.

Santos, C. L. (2019). Altas Habilidades/Superdotação na Rede Municipal de Foz do Iguaçu/PR: Uma Proposta Educacional com Tecnologias Digitais. Dissertação Mestrado em Ensino), Universidade Estadual do Oeste do Paraná, Foz do Iguaçu, Paraná.

Silva, J. A. L., Oliveira, F. C. S., Martins, D. J. S., & Silva, W. N. A. S. (2018). Storytelling e Robótica Educacional: a Construção de Carros Robôs com Arduino e Materiais Recicláveis. Anais do XXIX Simpósio Brasileiro de Informática na Educação. Recuperado 10 dezembro, 2020, de http://www.br-ie.org/pub/index.php/sbie/article/view/8157/5845.

Silva, J. C. M. (2013). O Uso do Software de Autoria Jclic como Ferramenta Pedagógica no Processo de Ensino-Aprendizagem de Conteúdos da Matemática nas Séries Finais do Ensino Fundamental Por Meio da Construção de Jogos Educativos. Dissertação (Mestrado em Ciências e Matemática), Universidade Federal do Ceará, Fortaleza, Brasil.

Silva, T. R., Medeiros, T. J., Medeiros, H., Lopes, R., & Aranha, E. (2015) Ensino-Aprendizagem de Programação: uma Revisão Sistemática da Literatura. Revista Brasileira de Informática na Educação (v. 23, n. 1, pp. 183-196).

Smole, K. C. S. (1999). Múltiplas Inteligências na Prática Escolar. Brasília: Ministério da Educação. Secretaria de Educação a Distância.

Vieira, N. J. W. (2005). Inteligências Múltiplas e Altas Habilidades: uma proposta integradora para a identificação da superdotação. Revista Linhas (v. 6, n. 2). Recuperado 12 dezembro, 2020, de http://revistas.udesc.br/index.php/linhas/article/view/1270.

Wing, J. M. (2006, mar.). Computational Thinking. Communications of the ACM (v. 49, n. 3, pp. 33-35). Recuperado 12 dezembro, 2020, de https://www.cs.cmu.edu/~15110-s13/Wing06-ct.pdf.

Zilli, S. R. (2004). A Robótica Educacional no Ensino Fundamental: perspectivas e práticas. Dissertação (Mestrado em Engenharia de Produção), Universidade Federal de Santa Catarina, Florianópolis, Santa Catarina, Brasil.

About the Authors

CLEONICE DA LUZ DOS SANTOS
ORCID: https://orcid.org/0000-0003-2123-4028
Professora na rede municipal de Foz do Iguaçu/PR. Mestra em Ensino pela Universidade Estadual do Oeste do Paraná (Unioeste). Especialista em Educação Especial pelo Centro Internacional de Pesquisa e Extensão Universitária, especialista em Psicopedagogia Escolar pela Faculdade Espírita e Especialista em Didática e Metodologia de Ensino pela Universidade Norte do Paraná. Graduada em Letras e Literatura Brasileira pela Unioeste. É membra do Grupo de Pesquisa em Tecnologia, Inovação e Ensino (GTIE) da Unioeste.
E-mail: luzzcleonice@gmail.com.

CLODIS BOSCARIOLI
ORCID: https://orcid.org/0000-0002-7110-2026
Professor associado na Universidade Estadual do Oeste do Paraná (Unioeste). Docente permanente e orientador no Programa de Pós-Graduação em Ciência da Computação (PPGCOMP) – nível de mestrado e no Programa de Pós-Graduação em Educação em Ciências e Educação Matemática (PPGECEM) nível de mestrado e doutorado, ambos no *campus* de Cascavel e docente colaborador no Programa de Pós-Graduação em Ensino (PPGEN) - nível de mestrado no *campus* de Foz do Iguaçu/PR. Doutor em Engenharia Elétrica pela Universidade de São Paulo, Mestre em Informática pela Universidade Federal do Paraná e Bacharel em Informática pela Universidade Estadual de Ponta Grossa. É líder do Grupo de Pesquisa em Tecnologia, Inovação e Ensino (GTIE) da Unioeste.
E-mail: clodis.boscarioli@unioeste.br.

Submitted: Jan. 31, 2021.
Accepted: Mar. 4, 2021.