Gamification and early childhood education in the context of the pandemic

Gamificação e educação infantil no contexto da pandemia

DOI:10.34117/bjdv7n12-272

Recebimento dos originais: 12/11/2021
Aceitação para publicação: 01/12/2021

Marcella Dantas Ribeiro
Educação Física
Mestranda em Educação Física Pela UPE
Docente Faculdade Alpha
Rua Gervásio Pires, 826, Santo Amaro

Ryta de Kassya Motta de Avelar Sousa
Pedagoga
Mestre em Educação Pela UFPE
Docente Faculdade Alpha
Rua Gervásio Pires, 826, Santo Amaro

Maria Betânia Cantalice
Pedagoga e mestre em Educação
Docente Faculdade Alpha
Rua Gervásio Pires, 826, Santo Amaro

Aldo de Moura Lima
Tecnologia em análise e desenvolvimento de sistemas
Especialista em produção de software
Docente Faculdade Alpha
Rua Gervásio Pires, 826, Santo Amaro

Marta Batista de Souza Neta
Psicóloga e mestre em psicologia da saúde
Docente Faculdade Alpha
Rua Gervásio Pires, 826, Santo Amaro

João Alves da Silva Neto
Graduado em logística
Especialista em Gestão de Pessoas
Docente Faculdade Alpha
Rua Gervásio Pires, 826, Santo Amaro

Marcela Maria de Sena
Professora da Faculdade Alpha
Pedagoga
Docente Faculdade Alpha
Rua Gervásio Pires, 826, Santo Amaro

Tiago Amorim Tripodi
Mestre em Ciências da Educação
Bacharel em Publicidade e Propaganda
Docente Faculdade Alpha
Rua Gervásio Pires, 826, Santo Amaro

Zorka Welkovic Vasconselos
Graduada em Fisioterapia
Especialista em Acupuntura
Docente UNIBRA – Centro Universitário Brasileiro
Docente Faculdade Alpha

Jaqueline Moura da Silva
Gestora de RH e doutoranda em Educação
Diretora da Faculdade Alpha
Docente Faculdade Alpha
Rua Gervásio Pires, 826, Santo Amaro

ABSTRACT
This article brings discussions about the characteristics o gamified classes and how they can be inserted in the context of Early Childhood Education. Gamification is a new concept, arising from new technologies associated with education. From this new concept, the teacher can use the concepts of games (games), used on the internet, in daily work in the classroom. When you read the term gamification, it is initially associated with the need for computers, smartphones and other technology-related hardware, but gamification brings a broad concept that can be used in different educational contexts. The general objective of the research, therefore, is to present the concept of gamification and how it can be used in Kindergarten classes. This is a bibliographical, qualitative research that analyzed the theme in question from the material produced and published in Brazil. The research concludes that gamification is an effective and interesting work proposal in Early Childhood Education, capable of bringing significant benefits to children's learning at this stage of schooling.

Keywords: Gamification. Child education. Learning

RESUMO
Este artigo traz discussões sobre as características das classes gamificadas e como elas podem ser inseridas no contexto da Educação Infantil. A gamificação é um novo conceito, decorrente das novas tecnologias associadas à educação. A partir deste novo conceito, o professor pode utilizar os conceitos de jogos (games), utilizados na Internet, no trabalho diário em sala de aula. Ao ler o termo gamificação, ele está inicialmente associado à necessidade de computadores, smartphones e outros equipamentos relacionados à tecnologia, mas a gamificação traz um conceito amplo que pode ser usado em diferentes contextos educacionais. O objetivo geral da pesquisa, portanto, é apresentar o conceito de gamificação e como ela pode ser usada nas aulas do Jardim de Infância. Trata-se de uma pesquisa bibliográfica, qualitativa, que analisou o tema em questão a partir do material produzido e publicado no Brasil. A pesquisa conclui que a gamificação é uma proposta de trabalho eficaz e interessante na Educação Infantil, capaz de trazer benefícios significativos para a aprendizagem das crianças nesta fase da escolaridade.

Palavras-chave: Gamificação. Educação infantil. Aprendizagem

1 INTRODUCTION

The COVID-19 pandemic has been signaled since December 31, 2019 to the World Health Organization – WHO. At the time, the first cases of a new strain (type) of coronavirus had been registered in the city of Wuhan, China. In the following months, SARS-CoV-2, the virus responsible for COVID-19, was identified (WHO, 2020).

The first case of COVID-19 in Brazil was registered in mid-February 2020. Since then, 15.4 million cases have been registered in the country; 13.9 million people recovered and about 428,000 deaths (MINISTÉRIO DA SAÚDE, 2021). Despite the fact that COVID-19 affects people's health more directly, evolving from mild symptoms (such as a cold) to more complex situations that compromise the lungs and lead to severe respiratory syndromes, hospitalizations and deaths. Due to these peculiarities and, taking into account the worldwide spread, the disease was considered a pandemic.

Pandemics do not only affect the health context, but are reflected in other social instances, implying losses related to education, economy, culture, work, social relations. With COVID-19, the pandemic context brought serious social problems such as an increase in unemployment, poverty and inequalities (LIBERATO, 2020).

In education, the losses related to the pandemic are also significant, as they caused 90% of children worldwide, causing learning deficits to increase dramatically (UNICEF, 2021). Amid the closing of schools, teachers needed to adapt to remotely take education to children, leaving aside the common routine of classrooms to make room for virtual contact, through the exchange of videos, photos and audio with students. This adaptation was not easy and required the teacher to resort to the help of a fundamental tool for the work during this period: technology.

Currently, technologies are innovating in the way in which teachers approach content to students. This is because society is evolving and, with it, teaching practice also needs to reinvent itself and keep up with new social demands. Education constitutes a space for the construction of knowledge and significant exchanges. This space can form children who will develop more autonomous and critical attitudes based on the consideration of the reality in which they live and the adaptation of teaching strategies to this reality (FREIRE, 1996).

Among the various variables found in technology, *games* or games in Portuguese can adjust to daily life, inserting aspects of the community where the student lives to work in the classroom. This posture is essential to develop meanings with the work in the classroom and make students internalize the concepts in an expressive way (SILVEIRA, 2012).

In this context, the research questions what gamification is and how it can be inserted in the context of Early Childhood Education. Its General Objective is to present the concept of gamification and how it can be used in Kindergarten classes; and as Specific Objectives study the concept and characteristics of gamification; analyze how gamification can be inserted in Early Childhood Education; and mention the benefits of using gamification in Kindergarten classes.

The COVID-19 pandemic brought irreparable losses, including in educational aspects. Many adaptations were necessary to provide the necessary means to maintain the teaching-learning process remotely. Teachers needed to reinvent themselves and include technology in their practices.

Thus, the research is justified because learning to use these mechanisms in everyday school life was a challenge, but the teachers managed to get acquainted with several tools that facilitated their work during this period, especially the applications and social networks, which disseminated practices, activities, ideas, information.

Furthermore, many children are already familiar with social networks and applications, a fact that contributes a lot to the inclusion of activities related to digital mechanisms. Regarding *games* or games in Portuguese, there is a large portion of children who already have contact with these games and who practice them at home in an intuitive way, aiming for fun.

Gamification means to adopt the logical process, rules and game designs to assist in a fun, attractive, meaningful and motivating learning experience, enriching the activities developed at each stage of learning. In Early Childhood Education, gamification can represent an effective and relevant teaching for the learning of children, even the smallest ones, therefore, dealing with this theme is relevant and can contribute to the pedagogical practice aimed at the new social reality.

2 TECHNOLOGIES IN EDUCATIONAL SPACES

Currently, technology has a privileged space in society. The most developed societies are those that have managed to develop their technological processes, whether

in the educational, business, academic or healthcare environment. Technological systems today have an accentuated importance in society's development processes. Without it, many social advances would not be possible.

Technology was essential for the process of industrialization and dissemination of fundamental knowledge for the development of learning. It was the technological advances that enabled production on a scale, the exchange of knowledge between various societies, culminating in what we currently call digital culture, that is, that spread through the internet, common in different societies around the world (BIANCO, 2014).

The school is a great space for processing and disseminating the culture of the community where it operates and it is from this culture, influenced by digital mechanisms, that the school incorporates the internet, social networks, smartphones, tablets, applications, games, to everyday teaching. These variables can be used on a daily basis, relating them to the teaching strategies built for working with the class (CARVALHO and FORT, 2017).

The culture of the society where the child is inserted, therefore, is also related to the digital mechanisms that can be decisive in the adaptation of school contents to guarantee a more autonomous and pleasurable learning. In this process, games or games are fundamental for teaching spaces, allowing children to use the basic mechanisms of these games in everyday learning situations.

3 FROM TRADITIONAL GAMES TO GAMIFICATION

Traditional games have been around since the dawn of humanity. With the expansion of the internet in the last century, the concept of game has grown exponentially, becoming relevant to today's society and starting to be used as a source of employment and income.

Despite its origins in the United States, in Brazil, the internet takes on characteristic features of Brazilian culture, emphasizing the importance of the players' talent for building new forms of mastery of games. Currently, games are known around the world and many people play online, interacting with people from different cultures and societies.

The popularization of *games* in Brazil makes the country improve and incorporate the basic concepts of these games in other social areas, such as in the production of media and also in education. In fact, *games* exert a great influence on the Portuguese language, triggering the construction of words, slang and entries that migrate from the internet to

people's daily lives. An example of this is “Buff / Nerf: improved power / lost power; GG (Good Game): good game, well played; GLHF (Good Lucky and Have Fun): Good luck and have fun; POG/ POGChamp (great move, impressive)” (UEMURA, 2020, p. 1).

It is possible to notice that games are part of children's daily lives, making them start to live with a new culture. In games, the child also learns to deal with technological tools, handling and controlling tablets, smartphones, computers, XBOX, and other devices that are used during such games.

> Using game-based learning, students learn while playing. Thus, making the learning process more interesting, causing a positive effect on cognitive development. Games are combined with traditional lessons because the traditional learning process can be monotonous, and game-based learning can improve students' motivation to learn. Game-based learning is not just about using games to review and reinforce concepts (KIANE, 2019, p. 1).

In this sense, it can be said that the mechanisms used at home for learning need stimulation in the classroom as a unique opportunity to work with the reality of children and the subsidies they are used to using on a daily basis.

It is true that games have become instruments of formation and social transformation, helping underprivileged classes to have work and growth opportunities, either directly or indirectly, in online matches, creation of games and content related to them. Games bring innovations to learning processes and represent important opportunities for acquiring knowledge based on the concepts of these games (BUSARELLO, ULBRICHT and FADEL, 2014).

> The word gamification (from English *gamification*) refers us directly to games. Because of this proximity, many people believe that it is a game in fact or a methodology that transforms something into a game. The term corresponds to the use of game mechanisms or elements aimed at solving practical problems and/or arousing engagement among a specific audience, in a non-game context (BIAVA, 2017, p. 2).

Gamification is not just about taking a ready-made game and using it in the classroom, but rather using the concepts, strategies, objectives, levels, scores, reward systems from these games to work the contents in the classroom. It is true that games such as *minecraft*, which are based on strategies to form an environment, for example, can be used in gamification, however, challenging students to learn and solve the proposed problems is the key part of the learning process based on this strategy (LORENZONI, 2020).

According to Lorenzoni (2020 p. 1) “the basic concepts of games can be understood by everyone”, therefore, in Kindergarten, gamification is a viable strategy and represents a fun way to learn. In these classes, gamification facilitates learning while favoring students' protagonism and creative teaching strategies.

4 CONCEPT AND CHARACTERISTICS OF GAMIFICATION

Gamification can be translated as the insertion of game resources in education. This new methodology arises in the context of digital technologies, in which games are increasingly used around the world, representing not only a form of entertainment, but a source of income and career in today's society. In addition, games are effective strategies for people to think and solve problems, and they can be introduced in the classroom in this perspective, that is, learning to solve and solving to learn.

Kiane (2019) reveals that game-based learning and gamification have small differences, as traditional games can include many problem-solving features, adding individual and collective elements of competition and opportunity; while gamification is “the practice of using game design elements, game mechanics, and game thinking in non-game related activities to motivate participants” (KIANE, 2019, p. 2).

Gamification brings out important representations in children's lives, and helps them to understand the world around them and the activities that surround them, showing itself to be an important instrument in the teaching-learning process, which can be used in Early Childhood Education. The child builds concepts and attributes meanings to the reality in which they live, strengthening their understanding of these spaces, as well as their capacity for creation (BRAGA and ARAÚJO, 2016).

For Vygotsky (1988), games, toys and games reveal to be influential structures in children's development, making them able to “learn and act in a cognitive sphere, rather than an external visual sphere, depending on external motivations and tendencies, and not because of incentives from external objects” (VYGOTSKY, 1988, p. 109). That is, from the games, children can understand the teaching proposals in a cognitive way, based on inferences related to the challenges and reward systems used in such proposals.

As children spend a large part of their time under the influence of new technologies, whether watching on TV, using video platforms available on the internet and using games, in these situations, there is indeed learning and concrete learning, which they start doing part of life.

Games today go beyond their physical tools and start to be incorporated into the social culture and the school itself, becoming increasingly relevant in the day-to-day of studies, mainly through the use of these games during classroom activities. This process, called gamification, comprises the use of games as a new, free and popular tool, which has revolutionized the pedagogical work with children in Kindergarten and is an effective methodology for working with children at this stage of learning (CASTELLS , 2009).

5 TEACHING WORK AND GAMIFICATION IN EARLY CHILDHOOD EDUCATION

The teacher's role is essential for the development of strategies that promote methodologies based on activities based on gamification in the classroom, because when the teacher believes that such strategies are capable of ensuring integral learning, they use games in their proposals education. Thus, it is the understanding that the teacher has about gamification and its importance for learning that will guarantee the insertion of such strategies into everyday school life.

Busarello, Ulbricht and Fadel (2014, p. 1) clarify that:

> [...] gamification starts from the concept of stimulating thought systematically, as in a game, in order to solve problems, improve products, processes, objects and environments with a focus on the motivation and engagement of a specific audience.

Gamification works on strategies related to the motivation of behavior that one wants to develop in the child, that is, it contributes to cognitive development when it encourages the child to think about strategies to efficiently solve games, as it creates an important learning environment.

Furthermore, gamification makes it easy for children to learn, identify with the school and transform the environment in which they live, because at these times, it is necessary to ensure activities that refer to the reality of Early Childhood Education students, so that they can develop understanding the reality in which they live and seeking means of adaptation and transformation (LORENZONI, 2020).

This means that, within the classroom, the teacher can encourage the child to understand how their community was formed, why certain customs are maintained, what meanings have the symbols they use to play. One of the effective proposals related to gamification is the use of playfulness linked to the technology chosen for the work (MOLINARI, 2019).

In Kindergarten classes, this reflection is accentuated by the analysis of proposals that reach all students, allowing them to be autonomous, creative, and able to get to know the world and themselves. The teacher's role is to ensure the engagement of the class in this process, in order to assist the development of children from individual and group work, with an emphasis on the importance of games for the development of their most particular characteristics, including understanding the world around her and the strategies she creates to solve her daily problems (BENJAMIN, 2012).

The integration of this process helps professionals to reflect on their practice and develop resourcefulness based on the characteristics of gamification, managing to create mechanisms based on this new methodology from the five fields of experience of Early Childhood Education arranged in the Common National Curriculum Base, namely: the self , the other and the us; body, gestures and movements; traces, sounds, colors and shapes; listening, speaking, thinking and imagining; spaces, times, quantities, relationships and transformations, singing, playing, encouraging children to learn and the student, which is the main focus of the pedagogical work (BNCC, 2017).

Kramer (2006) explains that Early Childhood Education is not just a hobby stage, but opportunities to challenge the child to solve 'difficulties' and 'problems' through diversification and expansion of learning experiences, which value the initiative, creativity and autonomy. Gamification is a unique opportunity to live such experiences, making the child experience different work proposals based on their reality.

According to Lorenzoni (2020, p. 1):

> mification (or, in English, *gamification*) has become one of the bets of education in the 21st century. The term complicated simply means using game elements in order to engage people to achieve a goal. In education, the potential of gamification is immense: it works to arouse interest, increase participation, develop creativity and autonomy, promote dialogue and solve problem situations. To make use of gamification, therefore, it is not necessary to use ready-made games – although they are one of the possibilities.

In gamification, the game seeks to improve the performance of students in a particular skill that you want to develop. Despite technology being the basis for the insertion of gamification in educational spaces, it is possible to work on the concept without necessarily using cell phones, computers or the internet, for example. This is because gamification permeates the game and becomes a teaching work strategy, which can be developed from simple working mechanisms, such as the use of a challenge, for example.

What matters in this case is to use the basic concept of the game, that is, to be a structured activity, with a predetermined objective, with rules, scores, levels, awards. In these opportunities, the teacher can make the child use these instruments to learn, becoming an expert in the skill worked, while evolving in the game used.

Sieves (2020), clarifies that gamification can bring several benefits to the class, among them, “encourage protagonism, develop skills and promote collaborative practices” (SIEVES, 2020, p. 1). It encourages protagonism because it helps children to make their own inferences regarding the teaching-learning process. In this process, skills are developed for organizing information, solving problems, creating strategies, which are important elements for the child's maturation in Early Childhood Education.

Thinking about the use of gamification combining physical and digital variables, in a coordinated way, in the context of Early Childhood Education helps teachers to reflect that we always need to innovate and that many innovative strategies can be based on simple ideas and with everyday instruments. It is possible to conclude that gamification makes you think differently and ahead of the strategies we are used to working with.

Gamification invites teachers to innovate, to reflect on their practice and how it can be adapted to the social reality of students. From this perspective, it is easier to meet the characteristics of current teaching demands, taking into account the students' reality and how it is possible to adapt to it with innovative practices based on digital technologies.

> The benefits of gamification in education are better learning experience; better learning environment; *Instant Feedback*; it promotes behavioral changes and can be applied to most learning needs (KIANE, 2019, p. 1).

Furthermore, interaction is another important skill developed at these times. Through it, the child is able to socialize and interact with peers, setting up collaborative practices that will help the group to win the game or challenge suggested. These skills are also important for decision making, a relevant process for learning and for the development of logical reasoning, so necessary for life in society (BUSARELLO, ULBRICHT and FADEL, 2014).

For the teacher, including gamification in their teaching strategies from activities consistent with the level of the class, mediating this entire process, is a way to help the development of children from Kindergarten to the most advanced classes.

6 CLASSROOM GAMIFICATION

Gamification can be worked on any content, adapting to the work proposals of the class where the interventions will be applied. In Kindergarten, geometric shapes can be used to explore the simple recognition of shapes, colors, separation of shapes, games to assemble paths (such as hopscotch), assembly of drawings (houses, cars, dolls, etc.) with the forms, among others (BNCC, 2017). The geometric shapes also allow the use of Tangram in its original form (the square in seven pieces) and its later use with the formation of animals from the pieces, making the lesson fun and interactive.

Games involving Tangram allow children to recognize the different geometric shapes that make it up and also stimulate creativity, allowing them to build, deconstruct the Tangram and the different possible designs with their pieces. The Tangram can also be assembled in a single color or each part of a color and this draws children's attention (PARMEGGIANI, 2019).

Tangram can be physically handled with geometric shapes built in different materials (plastic, EVA, Styrofoam, cardboard, wood) and can also be assembled and colored using computers, tablets and smarthphones, in simple applications such as *Paint*:

Children like to handle technological tools and the construction of Tangram proves to be an effective alternative for learning the basic concepts of geometric shapes, from gamification, exposed in the activity as the challenge of drawing and/or coloring the Tangram. At the time, the teacher can also ask the children to choose from the Paint taskbar which geometric shapes are needed to build the Tangram. which parts are needed to shapes figures, etc.

In schools that have few computers, the teacher can carry out alternative activities, taking the physical Tangram to do with a certain group, while another is at the computer. The children change their work spaces until all of them have had access to the physical parts and also the handling of Paint.

In addition to learning about the pieces and learning related to Geometry itself, it is also possible to make children work on motor coordination, when they need to control their hand on the mouse to draw and paint the figures. In this process, gamification contributes to working with different skills, ensuring holistic student learning.

Another simple way to effect gamification in the classroom is to implement a “History Club” with children. This activity can be carried out in any educational institution because it does not depend exclusively on digital technologies (switchboard,

tablet, cell phone, internet), but on basic subsidies found at school, such as children's literature books, present in different educational spaces.

In most schools, even if there is no school library, there are children's literature, comic books, educational books, which bring different textual genres in the form of stories, and which are available to children, generally, in Reading Corners. These corners are spaces organized in the classroom in a playful and inviting way, so that the child is interested in picking up the available books, reading them or taking them home for their parents to read.

The objective of the History Club is to ensure the development of the habit of reading and listening to stories, by valuing the Reading Corners, as well as the works available there. The idea is to make children take the available books home, read or listen to their parents/guardians read to them and socialize with the class the next day. Thus, the teacher introduces the game, explaining to the children how it will happen, presents the Reading Corner as the space for capturing books for the stories and organizes a daily moment, which can be called "Hour of history", where the children will socialize about the learnings.

For each story told, the child earns a point in a point system that can be analyzed weekly/fortnightly/monthly, according to the characteristics of the class.

The other children who tell the stories can also receive stimuli with other prizes for participating in the History Club. In other words, every effort and interest must be valued by the teacher. The central point of Clube da História are the books available in the classroom, as a way to motivate the use of these books, but the teacher can also consider other books available in the students' homes, as well as use these moments to socialize empirical knowledge of the everyday life.

The learning acquired with the History Club can prevent reading acquisition difficulties, promoting effective ways to draw children's attention to the use of language. Furthermore, it helps to create learning strategies related to behavior, interaction and social perception.

Gamification is a fun way to work in Early Childhood Education. They are effective strategies for motivating children and that can be worked on in different learning contexts. Having contact with this new methodology is very beneficial, because today's society lives connected and often, the child from Kindergarten comes to school influenced by these technologies.

In this context, it is important to be prepared to deal with these demands, inserting new work mechanisms that combine traditional pedagogical practice with available technologies. Often, there is a difficulty in working with technologies because the school does not always have subsidies so that technology can be inserted in a more complex way in the classroom. This becomes evident when one realizes that not all schools have enough internet or computers to work with all students.

In gamification, it is possible to reduce these weaknesses because games can be adapted to the school reality, being creatively incorporated into daily work, with mechanisms accessible to children. The concept of online games can be adapted to the classroom and, from this concept, the basic assumptions of gamified work can be extracted, that is, the organization of the game, the sequence of facts and activities to reach a final objective.

7 FINAL CONSIDERATIONS

Learning in relation to the concept and applicability of gamification in Early Childhood Education is extremely important for the teaching work in these classes. This is because, the current panorama requires that the teacher dedicates himself to new work strategies that are coherent with the social reality experienced by the students. In this process, the use of digital technologies has been widely discussed in academic and professional environments, showing that it is necessary to adapt to this reality by promoting effective means of relating such technologies to the educational process.

Gamification, therefore, shows that it is possible to use these mechanisms in the classroom in an adapted way, that is, both using the technologies themselves, and adapting the mechanisms found in these technologies in the classroom. Therefore, analyzing this theme is essential to encourage innovation in work in Early Childhood Education.

It is evident that gamification represents one of the instruments that make up the current teaching practice. Even if there is no technology in the form of computers and internet in the classroom on a daily basis, it is noted that learning related to this instrument is part of current society and, therefore, requires a welcoming look by education.

Today, many children, including Kindergarten age, already live with digital mechanisms, having access to video platforms at home, and handling various applications and digital devices. In a classroom context, therefore, the insertion of these mechanisms means understanding that the current reality already presupposes the use of these

mechanisms in daily activities, linking the systematic learning of the classroom to the children's reality.

Gamification can be worked with several strategies. Some examples mentioned in the research were the use of Paint, a basic application that can be used in a fun way with children, challenging them to use coordination to draw and color the Tangram, a piece that brings different geometric shapes and calls to children's attention.

Thinking about the use of gamification combining physical and digital variables, in a coordinated way, in the context of Early Childhood Education helps teachers to reflect that we always need to innovate and that many innovative strategies can be based on simple ideas and with everyday instruments. It is possible to conclude that gamification makes you think differently and ahead of the strategies we are used to working with.

Gamification invites teachers to innovate, to reflect on their practice and how it can be adapted to the social reality of students. From this perspective, it is easier to meet the characteristics of current teaching demands, taking into account the students' reality and how it is possible to adapt to it with innovative practices based on digital technologies.

REFERENCES

BIANCO, Denis Del. **Digital companies:** a new era in business. Article. 2014. Available at: <https://canaltech.com.br/mercado/Empresas-digitais-uma-nova-era-nos-negocios/> Accessed in Jun. 2021.

BIAVA, Ivan. **What is gamification?** Demystifying the concept. Article. 2017. Available at: < http://useronboarding.com.br/o-que-e-gamificacao/> Accessed in Jun. 2021.

BRAZIL. Ministry of Education. **Common National Curriculum Base – BNCC**. 2017. Available at: <http://basenacionalcomum.mec.gov.br/>. Accessed in June 2021.

BUSARELLO, Raul Inácio. ULBRICHT, Vania Ribas. FADEL, Luciane Maria. **Gamification and game systematics:** concepts about gamification as a motivational resource. Article. 2014. In: Gamification in Education. Organizers: Luciane Maria Fadel, Vania Ribas Ulbricht, Claudia Batista and Tarcísio Vanzin. São Paulo: Pimenta Cultural, 2014.

CARVALHO, Ana Paula Pinto de. FORT, Monica Cristine. **Virtual connections and face-face disconnections:** to-communication via WhatsApp in corporate environments. Article. 2017. Available at: < http://seer.uscs.edu.br/index.php/revista_comunicacao_inovacao/article/view/3814> Accessed in Jun. 2021.

CASTELLS, M. **The network society**. São Paulo: Paz e Terra, 2009.

FREIRE, Paulo. **Autonomy Pedagogy**: Necessary Knowledge for Educational Practice. Ega: São Paulo, 1996.

KIANE, Rayse. **Game-based learning or gamification**. Article. 2019. Available in: < https://via.ufsc.br/aprendizagem-baseada-em-jogos-ou-gamificacao-entenda-a-diferenca/> Accessed in jul. 2021.

LIBERATO, Silvany dos Santos Caldeira Zanetti. **Valuing Social Work during a pandemic**. Article. 2020. Available at: < http://www.cress-es.org.br/valorizacao-do-servico-social-em-tempo-de-pandemia/ > Access in Jul. 2021.

LORENZONI, Marcela. **Gamification:** what it is and how it can transform learning. Article. 2020. Available at: <https://site.geekie.com.br/blog/gamificacao/> Accessed in Jun. 2021.

MINISTRY OF HEALTH. **COVID-19 in Brazil**. 2021. Available at: < https://www.gov.br/saude/pt-br?utm_source=google&utm_medium=search&utm_campaign=MS_Vacinacao_Covid&utm_term=vacinacao_coronavirus_googleads&utm_content=gads001 > Access in jul. 2021.

MOLINARI, David. **Gamification in the classroom:** play to learn. Article. 2019. Available at: < https://revistaeducacao.com.br/2019/07/01/gamificacao-na-sala-de-aula/> Accessed in Jun. 2021.

WORLD HEALTH ORGANIZATION – WHO. **History of the COVID-19 pandemic**. 2020. Available at: < https://www.paho.org/pt/covid19/historico-da-pandemia-covid-19#> Accessed in jul. 2021.

PARMEGGIANI, Cassia da Costa. **Tangram.** 2019. Available at: < http://www.pequenosyogis.com.br/blog/a-lenda-do-tangram> Accessed in Jun. 2021.

SILVEIRA, DS **Experiences with concrete material for teaching Mathematics.** Rio Grande: FURG, 2012. Available at: < http://repositorio.furg.br/bitstream/handle/> Accessed in Jul. 2021.

UEMURA, Alan. **Dictionary:** GamerHyperX brings together the most common slang to celebrate Gamer's Day. Article. 2020. Available at: < https://observatoriodegames.uol.com.br/destaque/dicionario-gamer-hyperx-reune-as-girias-mais-comuns-para-celebrar-o-dia-do-gamer> Access on Jun. 2021.

UNICEF. **Children and teenagers cannot afford another year of school breaks**. Article. 2021. Available at: <https://www.unicef.org/brazil/comunicados-de-imprensa/criancas-e-adolescentes-nao-podem-arcar-com-mais-um-ano-de-interrupcao-escolar> Accessed in Jul. 2021.