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Perceptions of Students and Teachers about the Skills That are Developed by Videogames

Percepciones de estudiantes y profesores acerca de las competencias que desarrollan los videojuegos

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Abstract

This text gives an account of the perceptions of a group of gamers from Santiago, Chile, regarding how they perceive the competences that videogames help them develop and their influence on their actions in virtual and real life. The study is complemented with the perceptions of a group of professors, who have as a common characteristic, to know the world of videogames through their professional experiences. The research's design is of qualitative nature with emphasis on the interpretative -descriptive-microethnographic. The information was obtained through a self-application questionnaire, whose analysis showed as relevant findings that young people, through the practice of videogames, manage to develop a series of inherent and necessary competences in the virtual world, but very relevant and possible of exercising in the real world. Likewise, the teachers interviewed, reaffirmed many of the competences that young people highlighted contributes, from their educators' vision, the meaning and usefulness that they entail, despite the fact that in some school contexts the practice of videogames is restricted or prohibited.

Keywords: digital native, digital skills, gamer, gamification, videogame.

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Resumen

El presente artículo da cuenta de las percepciones de un grupo de videojugadores (*gamers*, en inglés) de la Región Metropolitana, Santiago, Chile, respecto de cómo perciben las competencias que desarrollan los videojuegos y de la influencia de estos en sus actuaciones en la vida virtual y real. El estudio se complementa con las percepciones de un grupo de profesores, quienes tienen como característica común conocer el mundo de los videojuegos a través de sus experiencias profesionales. El diseño fue de carácter cualitativo con énfasis en lo interpretativo-descriptivo-microetnográfico. La información se obtuvo a través de un cuestionario de autoaplicación, cuyo análisis mostró como hallazgos relevantes que los jóvenes, a través de la práctica del videojuego, desarrollan una serie de competencias inherentes y necesarias en el mundo virtual, pero muy relevantes y posibles de ejercitar en el mundo real. Asimismo, los docentes entrevistados reafirman muchas de las competencias que los jóvenes destacan, aportando desde su visión de educadores, el sentido y la utilidad que estas conllevan, pese a que en algunos contextos escolares la práctica del videojuego esté restringida o prohibida.

Palabras clave: competencias digitales, ludificación, nativo digital, videojuego, videojugador.

Introduction

The new visual culture resulting from technology has generated greater and more varied interactions between young people, particularly those who conduct common practices such as using electronic devices, accessing social media, and playing videogames. This has enabled them to share languages, discover alternatives ways of understanding reality, build new meanings for using time, communicate instantaneously, and play with people from any part of the world.

Born in around 1980, these young people have naturally acquired new technological devices, integrating them into their daily lives. Thus, the new advances achieved day by day via technology are part of a normal process in their lives, since they have recognized and taken part in technological language naturally from very early on, as something inherent to life. Nowadays it is common for the youngest people in society to teach adults how to use hardware and software, reiterating the idea of the comprehension and mastery that they have of these media, their languages, and the skills they develop. Unlike these young people, adults have gradually adapted to these advances, slowly introducing them into their working lives, communications, and pastimes, and as facilitators of their lives.

It is clear that the hegemony in the access and management of technologies is in the hands of young people, whom Prensky (2001) called *digital natives*, capable of constructing new articulatory codes for a new language, based on unprecedented words, interactions, and practices, that come from constant contact with devices, platforms, software, and the internet, in order to operate all kinds and modes of videogames. Therefore, the emergence of videogames and their practices pave the way for the manifestation of a series of structural skills, which allow them to develop qualified interactions with the surroundings, as well as promoting the acquisition of knowledge, and even allowing more efficient ways to handle certain tasks and improve work productivity. In short, the results of this research allow us to ascertain at first-hand what skills are developed by videogames and how they are manifested.

Reference framework

Digital natives

From their early years, digital natives have related to technology, developing a responsiveness to adapt quickly to digital language (Prensky, 2001) and having a natural predisposition to it. These, therefore, are people that have grown up surrounded by screens, keyboards, and mice, who play videogames for more than 20 hours a week in a manner that is entertaining, with skill, efficiency, and little effort (Cassany & Ayala, 2008).

The characteristics of these young people include digital skills, experiential learning, interactivity, collaboration, immediacy, and connectivity. Nevertheless, the digital native generation does not include all young people, as theorists explain that this reality cannot become a settled situation because technological media are not taken up en masse, since many of these young people are limited by social inequality, cultural differences, economic factors, and even geographical factors. In this regard, the observations made of digital natives carry the risk of abandonment and concealment of those who are most geographically isolated and have the least skills in the use of technologies. This would consequently lead to precariousness in terms of opportunities for access to information and entertainment, widening the gap and the socio-cultural impact.

On the other hand, detractors of the concept of digital natives have emerged. From their perspective, digital natives are people who use technologies superficially, ignoring efficient ways to search and select from the huge amount of information available on the internet (Martin & Vestfrid, 2016). That is, they show acritical use of technology because, although social networks function as a horizontal means of communication, interaction, and circulation of information, their use and potential is impoverished as a means of wide social linkage (Martin & Vestfrid, 2016). In that regard, and as the authors point out, the constant and efficient use they make of technology allows them to made productive advances, but this is not reflected when they are protagonists or in their autonomy for decision-making.

Similarly, the concept seems outdated when it comes to distinguishing between digital natives and digital immigrants, as Prensky points out (2001):

> So if Digital Immigrant educators really want to reach Digital Natives – i.e. all their students – they will have to change. It's high time for them to stop their grousing and, as the Nike motto of the Digital Native generation says, "Just do it!" They will succeed in the long run – and their successes will come that much sooner if their administrators support them (p. 7).

Two tables are shown below: one shows the names assigned by various authors to the generations related to the digital world and technology (Table 1), and the other links these generations to part of the history of the 20th century (Table 2).

Table 1. Names attributed to digital natives

Digital generation (Serge Vieux)	Net generation (Tascot)	Multimedia generation (Murdochowicz)	Millenials (Howe)
Generation Y	Generation Z	Echo boomers	Screenager
Generation @	Generation C (from click, connected to a computer)	Born digital	Generation copy paste
Generation Einstein	Generation internet	Generation now	Couch potatoes
Generation Google	Generation MySpace	Trophy kids	Avatars

Source: Barrio, Durán, Arroyo, Gálvez de la Cuesta, and García, 2010, p. 13.

Table 2. Evolutionary scheme of access to technologies according to Sinclair and Cerboni

Name	Characteristics
Digital aliens (silent generation).	Born between 1925 and 1945, not interested in technology.
Digital immigrants (baby boomers).	Born between 1946 and 1964. Averse to technology, but have adapted to some specific technologies: mobiles, email.
Digital adaptatives (Gen X).	Born between 1965 and 1979. The generation of videogames and the beginning of computers.
Digital natives (Gen Y/millennials).	Born between 1980 and 2000, have lived with technology all their lives. They live in hybrid worlds, a large part of which are online and a small part offline.
Digital avatars	Born in the 21st century. They live most of their lives online, maintaining a large number of virtual relationships and communications.

Source: Barrio et al., 2010, p. 5.

Videogames now

According to Roncancio-Ortiz, Ortiz-Carrera, Llano-Ruiz, Malpica-López, and Bocanegra-García (2017), a videogame is a construction of virtual worlds "with spaces of finite problems and based on rules that offer players different means to solve problems with a precise feedback and reward system" (p. 37). Videogames emerged in the world of new technologies and globalization, and have now had an established presence for more than 30 years. Supported by new technologies, they have gradually inserted themselves into people's daily lives, gaining ever more ground in visual culture, as a means of entertainment for thousands. Therefore, it is not incorrect to say that, in the entertainment industries, videogames have increasingly positioned themselves as one of the most powerful and pervasive industries, thanks to the publicity they have, affecting and influencing consumer trends among young people. According to the Spanish Video Games Association (Asociación Española de Videojuegos, AEVI), in 2018 some 8.5 million videogame units were sold. Of these, 849 million were physical sales and 680 million were sold online (AEVI, 2018).

Gamers and gaming environments

In the past, there were certain difficulties in categorizing the personalities of gamers in relation to their videogames. At that time, only one classification could be made according to groups of affinity. However, thanks to new tools and the evolution of games and platforms, it has become possible to relate the general characteristics of gamers to their preferred type of game (Marcano, 2012). Thus, younger individuals prefer to use consoles and arcade and conversational types of games, while older players prefer simulations, graphic adventures, and role-playing games, etc. That is, they are audiences that:

> should not be understood solely as passive consumers who are limited to receiving and proceокssing audiovisual products; on the contrary, they should also be considered active entities that autonomously seek to satisfy their psychological and social needs by selecting and choosing some content over others based on their expectations, needs, and personal values (González-Vásquez & Igartua, 2018, pp. 136-137).

According to sociological studies about online gamers, Griffiths, Davies, and Chappell (2006) state that the majority of gamers are men (85%) and over 19 years of age (60%). Likewise, the AEVI report (2018) shows that of the 16.8 million gamers, 59% are men and 41% are women, both genders with ages ranging from 6 to 64 years, with the preferred videogames (purchased) being action games (3.006.061 units).

Another relevant fact is that the time spent playing games ranges between 5 and 10 hours a week on average. Similarly, the supposed isolation of online video players is demystified, since many of them spend two hours a day on online gaming and interaction with other gamers, which favors the sense of a virtual community, forums, social networks, and coordination of roles, being able to manage emotional developments in these spaces that could have social and educational implications.

The practice of gaming and development of skills

Theorists claim that playing videogames develops skills that are applicable in school work, since it activates skills that go beyond winning, losing, or continuing to play, since the skills that originate from visual stimulation favor psychomotor control, hand-eye (visuomotor) coordination, and the development of a controlled spatiality. On the other hand, it stimulates deductive capacity, analysis skills, problem-solving, imagination, memory, and synthesis, further enhancing the development of manipulative skills, responsiveness, and problem-solving strategies (González-Vásquez & Igartua, 2018). Also, these types of games stimulate the development of attention, inductive reasoning, psychomotor skills, the search for information, organizational skills to solve simultaneous tasks and, among more advanced users, metacognitive skills. Teachers could take advantage of this to enhance their professional management, as videogames are attractive and stimulating to students and necessary in current education. The most tangible effect of their potential for education is provided by the acquisition of digital skills, since technological environments and their devices allow most children to access the digital universe for the first time through videogames (López, 2016).

Videogames and education

Inclusion of videogames in educational environments has had and still has critics, who consider them to be disruptive elements. Nevertheless, there are others who think they can be a means of generating new models and learning experiences (López, 2016). In particular, videogames with educational content can be understood as a resource that, when introduced into the world of children and adolescents, can directly influence their attitudes, behaviors, and cognitive structures, promoting the construction of knowledge in a novel way and the "skills that enable the person to function in a globalized world, in which communication and socialization are fundamental tools" (Roncancio-Ortiz, et al., 2017, p. 36).

Various studies (García, Cortés, & Martínez, 2011; Rodríguez-Hoyos & Gomes, 2013; Solano, Forero, Cavanzo, & Pinilla, 2013) on videogames in education point out that since the subject is integrated into the digital world, they are already learning, because to begin with they must have basic notions that will make them perform in a certain way and, as they commit themself, with practice they will acquire the digital information necessary to achieve their objectives within that virtual reality. In this regard, Gros (2000) states that the clearest educational potential of videogames lies in the development of skills that young people acquire in digital contexts, which has been demonstrated in several studies that claim that gamers have advantages in terms of the development of their abilities in comparison with non-gamers (Schaaf, 2012).

These skills could provide the keys to enable individuals to perform adroitly and enjoyably in the game and thus learn certain contents as a consequence. It is therefore essential to know which videogames to choose, how to use them, and for which educational purpose they are best suited. Incidentally, this implies that the teacher must be able to live up to the circumstances, demonstrating mastery and having a clear pedagogical itinerary.

Methodology

The research conducted was of a qualitative nature and had a descriptive, interpretative and microethnographic design. Using a self-applied questionnaire agreed with the participants, we sought to collect perceptions, ideas, and behaviors in formal, non-formal, and informal contexts where videogames were played, in order to reveal the skills acquired. This information was complemented with the perceptions of a group of secondary school teachers about videogames and their inclusion in education.

The textualities were subsequently analyzed and interpreted using open, axial, and selective coding matrices (by categories) which, in synthesis, gave rise to the dense description.

Subjects included in the study

The study included 10 videogame players aged 15 to 18 in the secondary and higher education system, and 10 teachers aged 25 to 35 who are related to the use of videogames in their teaching practices. Both groups of participants came from different districts of the Metropolitan Region of Santiago de Chile.

Instruments used to collect information

Due to the nature of the study and the type of information required, an 11-question self-applied questionnaire was designed for each group of subjects. In order to prepare the study, we received advice from expert gamers (Annex 1). This instrument was then sent by email to the subjects, who responded and returned it by the same medium.

In order to validate the information, we approached professional networks, considering the proven experience and level of the collaborators[1] and the coaching provided by one of them for the research that led to this paper.

1. The research was supported by a doctor in Psychology and Education who was an expert in research methodology and Director of Effectiveness of Teacher Development at the Directorate of Educational Quality of the Universidad Central de Chile. The other validator was a doctor of Arts and Education who was an expert in gender and feminism studies, an academic and researcher at the Universidad de Los Lagos. The international validation was carried out by a PhD in Pedagogy from the Universidad of Barcelona, with expertise in technology and education, with various papers published relating to the design of virtual and material learning environments for university teaching.

Information analysis matrices

For the objectives stated, we used qualitative analysis matrices (open, axial, and selective coding), which were structured based on relevant categories and textualities that were gleaned from the self-applied questionnaires that the subjects provided, grouping them into positive and/or negative frequencies, to produce the key ideas and their subsequent interpretation (Annex 2).

Results

Perceptions of gamers about videogames

Gamers are perceived as being people that are born and bred into technology and, therefore, given this favorable condition, they are possessors of knowledge that goes well beyond what is known by the average user. The friendly relationship between young people and technology could not occur so easily in the adult world, because the former see it as a form of cultural access and means of escaping from physical reality, an issue that is not perceived with the same clarity and intensity by digital immigrants. This situation makes the young subjects more tolerant, inclusive, and thoughtful about issues, environments, socialization, and the meaning of their practices. Cassany and Ayala (2008) add that these young people use software and hardware with skill and effort, both in their private lives and outside of school, and all of this takes place without any teacher or formal course that have taught them to do so.

The videogames that the subjects find most attractive and play most are strategy, fighting, exploration, and movement games, particularly those that give great relevance to the exploration of visual, auditory, and kinesics stimuli, and analysis skills. All of the respondents have played games regularly and mostly in multiplayer mode. To do this, they use various platforms, which also define their preferences towards strategy, adventure, puzzle, history, and cooperative genres. The aspects that attract them most are the designs and the presentation of scenarios, which are seen as true works of integral art, due to the graphic quality and level of representation.

As a complement to this, the subjects value the profound narratives that the games propose, being capable of generating the feeling of progress and direct participation in the construction of the stories. As they point out, this is due to the fact that many of the stories allow deep states of immersion that connect and abstract, implying that a well-told story allows interaction, which makes one game much more interesting than another that does not have such a good narrative as a guiding thread.

It can be assumed that action videogames, which also have a good story, are important and captivating, and even more so if they give gamers the possibility of playing in online multiplayer mode, as they promote the creation of teamwork, promoting the resolution of imposed or self-imposed challenges. Most of those surveyed believe that online multigame communities help build friendly networks, although it is common to see the appearance of players who adopt marginal behaviors that go against the sense of teamwork. In that regard, online communities are very important in the construction of democratic spaces for participation, as they promote associated roles and responsibilities. The subjects add that these features should be taken into account by game designers and developers.

It should also be emphasized that young people are very aware of what happens due to their relationship with videogames. They are not indifferent to the effects they produce, or to the potential skills they may develop. The symbiosis between the user and the videogame is a matter of positive and, to a lesser extent, negative effects and consequences.

Perceptions of gamers regarding the skills that videogames develop

In terms of the skills that videogames develop, young people highlight: spatial orientation, teamwork, patience, the ability to think rapidly, knowledge of electronics and computers, use of tactics, decision-making, tolerance to pressure, creativity, logical thinking, hand-eye coordination, critical analysis, perseverance, visual acuity, exploration of environments, and the ability to understand and rationalize information quickly and efficiently.

This notable list of skills indicates that gamers are people with the ability to act in an exceptional manner in all kinds of circumstances; however, some skills they develop cannot be extrapolated to the real world, since they are governed by other logics and times. Therefore, it can be argued that, in addition to demonstrable skills—such as speaking, writing and understanding English, forming efficient work teams, overcoming frustration, developing in the workplace, socializing to understand complex concepts, collecting information from different sources to resolve a problem, and choosing with whom to form a community—there are also other skills that are difficult to demonstrate in real life.

The appreciation of gaming experiences often forces young people to face the impossibility of demonstrating them in the real world. For example, the subjects surveyed state that school is predetermined in terms of levels and subjects, so it is impossible to form a community as is done in a videogame. Similarly, the school does not teach them to tolerate and understand frustration, to work under pressure, to stimulate concentration, and have profound understanding of language, or to begin again when they have made a mistake in a certain activity, as videogames do. What is demonstrable, according to the opinions gathered, is that practice with videogames favors the development of skills that are impossible to develop in other environments, which means that some skills used in games cannot be applied in the real world. For example, the gamer can make mistakes many times and then restart without that resulting in harm to someone or leading to a penalty or peer rejection, but this can instead be understood as an action of perseverance.

Perceptions of gamers about videogames and education

In addition to videogames being used to entertain young people, they can also be used to conduct serious analysis, especially those that portray scenarios of historical significance related to certain events or concepts and which, because of this facet, contribute to knowledge and visual culture, since there are videogames that comprehensively present and represent landscapes or places that go beyond mere gameplay, becoming integral landmarks in themes such as religion, philosophy, humanities, etc. They can thus be considered as tools that can possibly be used to create highly realistic scenarios, capable of displaying historical and cultural contextualizations, either representing fantasies or the actual history of certain historical periods, through the use of color, design, and graphics. The development of the plot is also relevant, as the fate of the main character could change depending on the decisions taken by the player.

Likewise, videogames contain themes that young people are familiar with as action genres, including adventure, strategy, and movement. Some of them are more popular, but, without a doubt, one noteworthy aspect on which there is a high degree of agreement among the survey respondents is the narrative, which can be based on a non-linear story, where the character in the game makes decisions that do not always produce the same conclusion. In short, it can be said that young players seek and value significant situations to solve, tests with immediate answers that allow them to give new meaning to the characters' stories and situations, and even modify the information presented in the interface.

As regards the most attractive aspects of videogames, it is essential to highlight the emotion created by the interaction that allows the user to progress by overcoming obstacles, obtaining rewards, and completing levels. Another feature is the simulation, which strengthens the feeling that the decisions taken during the course of the game have a direct relationship with the outcome, granting protagonism and control of the situation to the user, who has to choose between different paths, simulating aspects of real life that could not be experienced normally. A final aspect is the cooperation between players from all over the world, which promotes the creation of virtual groups and cooperative work, as an opportunity to experience new forms of play and socialization.

The majority of the subjects have not had experiences with educational videogames, but those who have emphasize that the educational aspect of the games acted as an obstacle to advancing and eventually led them to stop playing them. It is possible that videogames made for educational purposes (focused on content) bore young people. However, it can be considered as something positive that videogames do not allow the gamer to advance through the stages if they have not fully satisfied the requirements defined in the process. In the opinion of the young people, this stimulates perseverance and helps them to address frustration, making them very educational for this reason. It can thus be inferred that, if there is the intention to use videogames for education, they should consider a balance between content and entertainment so that players do not abandon them. An appropriately focused videogame can be a great tool if one takes into account that gamers are attracted to entertainment, not because they are looking to learn. From this perspective, it can be surmised that regular videogames could produce better results than those created to educate, by having gamification as a fundamental factor. For this reason, few educational videogames are interesting and those that do exist do not provoke interest or continued play because they are focused on the content. In addition to this they can be tedious, cause fatigue, produce a loss of focus, and create frustration as they are felt like a task.

The power of using videogames as a tool for education allows experiences to be transformed into something relevant, intimate, friendly, familiar, and interesting, which can help make learning something extraordinary. Another strength is associated with the low initial investment compared to the costs of books and other educational materials, which have to be renewed every year. In this regard, access to the internet and the possibility of downloading videogames provide the necessary inputs to play and learn. Likewise, it is possible that with well-chosen and well-focused games, concentration and entertainment can be produced, solving the endemic problem of motivation. Essentially, the issue has to do with the ways and purposes used to implement videogames at school, without demonizing them as a pointless juvenile practice. The intelligent inclusion of videogames in education could enable abstraction and profound experience of the story and music narrated (flow effect). This would be akin to the highest point that a player can experience, something like a state of concentration and extreme virtual experience. Which teacher or school system would not want such a deep state of concentration among their students when addressing certain content?

Perceptions of teachers about gamers

The teachers surveyed say that videogames are an intimate and familiar practice with which digital natives entertain themselves and learn, much more so than in the school routines that are often seen as being boring, monotonous, and meaningless. Teachers also perceive that young people are aware of the skills and competences that are developed by playing games, and even of the learning and knowledge that can be built based upon them. The time they devote to videogames and technological devices such as cell phones and computers can make them lose interest in the habitual activities proposed by teachers. However, it would not be a waste of effort to see the energy involved in playing videogames and the possible skills that they can develop as an asset to rethink teaching methods and interactions both inside and outside the school.

Likewise, the teachers believe that the experience of young people with videogames is very solid and has great potential for attaining skills, but school systems generally display contrasting positions, with a disparaging view often prevailing towards the possession, playing, and possible educational use of games. In spite of this, those teachers who are prone to such opinions understand that digital natives are a generation of individuals whose situations and living spaces are mediated by technologies, who do not need to be taught these things because they are competent, sometimes even more so than some of their teachers. They also understand that videogames make an important contribution to integral human development by favoring the generation of attitudes and decision-making that, in some way, prepare them for the larger and even more complex decisions in the future.

Similarly, in a macro context, the main target of the industries that develop videogames is young people, whom they value as intelligent individuals, and the final objective of their developments and products. The relevant elements in this relationship of mutual benefits are provided by the enhancement of rapid reasoning and multitasking, which is an issue of great importance when talking about versions of videogames or the release of new hardware onto the market. In this regard, the relationship between youth and videogames is an expression of a form of democratization of entertainment, because they can be accessed from any device and, similarly, they can be downloaded from the thousands of sites enabled for this purpose, without this implying—in most cases—any cost to the potential players. The availability of mobile smart phones, the technical feasibility of coverage, and the facilities to enable their acquisition reaffirm the existence of an enormous and interested public that is growing constantly.

Skills that videogames develop according to teachers

Through their direct and indirect experiences, teachers acknowledge that videogames can develop relevant skills. They mention communication, ease of writing, orality, and the possibility of developing and managing efficient and dynamic communication systems. They add that there are very well-informed young people, who are capable of developing more elaborate responses than some teachers.

Regarding cooperation and teamwork, they say that videogames can develop skills to work in collaboration to solve problems and challenges, both in virtual and real worlds. They do not explain how the school could stimulate collaborative dynamics by taking advantage of the abilities of young people to solve problems in the virtual world. They also value skills such as creativity (culture to solve problems), perseverance (understood as the constant maintenance of focus on a certain goal), learning and practice of English, the proposition of challenges and their solution, the development of intellectual abilities, and critical thinking.

Relationship between videogames and education, according to teachers

In the opinion of teachers, one of the most attractive elements of videogames in terms of education is the ability to involve the player in virtual worlds, which work according to rules that are different from those in the real world. In this sense, the interactions are varied, since they generally occur with communities of people with whom the player wants to be, which allows them to exercise roles very different from those in the real world. Another attractive aspect of videogames is that in the communities where they are played, each player has the chance to identify with characters and thus build deep and meaningful substitution experiences.

If this is considered in relation to the classroom, some teachers point out that there are schools that prohibit the use of devices like smartphones, tablets, or laptops. In these contexts, technology does not bear fruit, because there are managers and teachers who cannot manage to move away from their traditional practices, demonstrating their lack of awareness of the innovation, opportunity, and novelty that videogames represent

for teaching and the life of their students. It also indicates ignorance of their cultural imaginaries, leading to asymmetries in dialogues and poverty in responses, as well as a waste of their interest, which would favor the refocusing of teaching practices. An annoying or bored young person will not carry out activities that promote learning of the subjects or contents, while, on the contrary, a motivated and interested student will, thus favoring the construction of their learning.

On the other hand, there are some school systems that allow the use of gaming devices in classes, more fruitfully experiencing the autonomy and self-regulation to learn in an entertaining way. In these contexts, teachers admit that they need to rethink the potential of videogames as part of young people's culture, with a desire for new paradigms and policies that accommodate updated practices that also promote meeting and communion between them and their teachers.

As regards the relationship between electronic devices and learning, the teachers point out that they are essentially used to create, search the internet, communicate, take photographs, develop fine motor skills, and make certain tasks more simple, which has effects on the quality of processes and products. On the other hand, young people constantly use them in class to chat with peers, watch videos, communicate, and listen to music.

The strengths of videogames for education include the possibility of linking game practices with issues of daily life, since, because they are motivating, they allow very significant learning experiences that can be applied in the real world. An exercise like this requires the teacher to have certain technical skills, knowledge, and mastery of the game, so that it is used corrected with the group and the activity can produce positive results.

In terms of the weaknesses created by the inclusion of videogames in education and the time devoted to them by students, the teachers point out that a sedentary lifestyle is a risk. In this regard, the few hours of play that can possibly take place at school (traditional games) are not comparable with the practices of the extracurricular communities to which the gamers devote many hours. It has been proved that long videogame sessions could have an impact on the physical health of young people and, in extreme cases, may lead to detachment and isolation from others. Another of the weaknesses acknowledged by teachers is the frustration that young people could feel due to the impossibility of progressing because of the demands set by certain game systems. However, trying multiple times to pass a stage in a game will not have negative repercussions, because the possibilities are endless, which is an issue that could not occur at school, because its configuration is diametrically opposed to that of a virtual community, which implies that issues such as frustration and the lack of motivation are usually (sometimes) addressed through established mechanisms and regulated, and eventually with palliative measures, which is very different to gaming communities.

The teachers also highlight the possible influence of images that can generate stereotypes as a weakness, but youth visual culture is built, par excellence, on the basis of stereotypes with some time of obsolescence, with Chile currently being the best example of a situation of Mestizo and hybrid visualities. There are no images that define a local or cultural identity, since it is a changing dynamic and subject to media influences, mainly from the United States, Mexico, and Central America, so the fear of stereotypes cannot be attributed to videogames. In the past, the widespread manifestation of these practices came heavily from Japan with manga and anime culture, and with television being the broadcasting medium and the subject of debate. Nowadays it is the internet and in the future it will be Web 3.0. At the end of the day, visual culture is a dynamic mosaic that is under constant construction.

Discussion

With respect to the perceptions of the gamers and teachers, there is agreement between them regarding what is understood by digital natives. Matters such as the space-time situation in which they were born, the ability to handle technologies efficiently, have fun, escape, access culture, and learn vicariously, but with a high level of realism, are some of the characteristics highlighted by young people and corroborated by teachers, who also appreciate the help and training that young people routinely give to many of them. They also state that the versatile and flexible way in which young people build their relationships greatly helps the development of communication between peers and with adults and, at the same time, rapid decision making on what, how, and with what to carry out certain tasks or actions. Teachers also recognize that these profile characteristics could help young people when faced with complicated real life situations.

The congruent way in which digital natives and teachers construct their perceptions could come from the search for the equalization of cultural imaginaries regarding technologies, since it is common among the teachers surveyed for them to have or have had young people among their students who, with their actions, have in some way influenced the way in which adults relate to technologies. Therefore, it is not difficult for a teacher to recognize certain characteristics of students who are adept with technologies, since the cultural experience provided by the profession can allow the student to be viewed with interest in terms of the skills they demonstrate and which the teacher does not always possess.

Regarding the skills that videogames help develop, it should be noted that all of those mentioned below can be applied in real life, except sometimes the real world scenarios are not as friendly as the virtual ones, where the meaning is in itself, while in the real world everything is different, fluctuating, and ambiguous, which does not always allow individuals to project their actions and view them as something that is possible.

For this reason, both the young people and teachers agree on the friendly and symbiotic relationship between videogames and players, being for many a practice ingrained in youth culture and a key component of the architecture of leisure time, cultural access, and learning manifested in various skills.

Another characteristic that defines the relationship between videogames and young people is the accessibility and democratization of games, which, in the case of Chile, is supported by the mass ownership of mobile telephones, which means being able to play anywhere and at any time, in conjunction with the existence of storage provision and free Wi-Fi networks almost all over the city. Nevertheless, teachers argue that there are school systems where the possession and use of gaming devices is prohibited, providing examples of cases, particularly in elementary education, where students have been systematically stopped. This means that young people are forced to develop their gaming practices outside the school environment, which is demonstrated by the existence of online gaming communities, where most of the respondents claim to have built structural skills such as teamwork, creation of friendly networks, and participatory democracy, relevant factors which, at school level, could be considered as strengths for the design of a new teaching system that is positively disruptive.

According to the young people, and in the view of some teachers, attainment of skills through videogames is related to the quality of the designs, the scenarios, the narratives, the possibility of profound abstraction, and the variety of genres and game modes, which, among many other qualities, are highly interesting and motivating. It can also be said that the visual characteristics of videogames constitute a powerful attraction, and these, once explored, can be transformed into a starting point for interesting ways of supporting learning, as long as the focus is not on the contents, but on recreation.

Table 3. Summary of the skills identified in the research

Skill	Description
Creativity	The practice of playing videogames is constantly associated with problem-solving. It can be stated that, over time, gamers can develop a creative culture, as individual and community games constantly encourage them to do their best in a never-ending activity. This can be extended to professional activities to make them more efficient. Without being regular players, teachers are able to recognize creativity as a recurrent strategy among their students for problem-solving, highlighting that the practice of playing videogames puts young people in situations that involve actively creating and recreating, considering problem-solving skills as a useful medium for teaching and learning experiences. Therefore, the ability to imagine feeds creativity, because anyone that has no imagination will find it more difficult to suggest solutions to either complex or simple problems.
Critical thinking and analysis	These emerge as key skills that, although not being exactly the same, are aimed in the same direction. For gamers, playing is an exercise that allows you to highlight reading, analysis, and constant decision-making on which results and future actions depend. Together with creativity, this skill is often mentioned by the questionnaire respondents for the educational value it provides. It also contributes to an attitude of being informed, alert, critical, and in a constant relationship with the cultural contents of the school and the extracurricular world.
Intellectual abilities	These are related to the previous skill. Deduction, induction, rationalization, and logical thinking have a constant presence in the playing of videogames. In fact, in the formation of virtual communities, use of these skills is key to the functionality and productivity of the changing challenges that they imply, since outside the world of videogames, they allow solvent, efficient, and high-level functioning regarding the tasks in the school or working world.
Tolerance to frustration	This is a skill mentioned by the majority of young people surveyed and some of the teachers. They stress that playing videogames is a practice that helps overcome frustration and which is stated as an essential condition to become a gamer, because by definition, the process of a game must be addressed in stages that have to be passed to reach the next stage. Therefore, making a mistake, quitting, and not persevering is a bad sign. An individual who does not persevere, because he is frustrated and does not have palliative mechanisms, may miss opportunities for development, learning, even failing courses, leading to new frustrations. In videogames, making a mistake does not entail punishment, and there are only incentives to try again and overcome the frustration. Therefore, this skill works very tangibly in the virtual and analogue worlds.
Tolerance to frustration (cont.)	Persevering and being constant make a lot of sense if you believe that something that invites you and pushes you to continue is important. In the world of videogames, the idea of continuing to achieve a certain objective and being rewarded is attractive and challenging. The environment of perseverance in the virtual world will always result in gratifying results, since one is able to perform a task many times. In the real world, a large dose of constant self-regulation and re-enchantment is required, because in order to achieve goals, there are normally limited opportunities.
Hand-eye coordination	There is an overlap between the perceptions of young people and teachers, in stating this as the most relevant skill, since it favors visual thinking skills, visuomotor coordination, and the sense of spatiality. Apparently, the emergence and refinement of these are of capital importance for the player, while in the real world they allow more substantive and practical interaction, especially when driving vehicles, playing football, or taking part in other action sports.
Teamwork	Considering players in virtual communities, this is a basic and highly desirable skill. Collaboration favors the achievement of common goals and the gratifying feeling of having taken part in the attainment of larger objectives. In the real world, this skill supports insertion, tolerance, responsibility, and respect, which can certainly be a good characteristic for students if the school wants to generate profound and constructed learning relationships with the conscious and enjoyable participation of all members of the community.

Rapid thinking	This is associated is with the ease of response, because it is basic for a gamer and natural in their practices. In the real world and at school it could be a valuable contribution for debates, defending ideas, and presentation of simple and complex issues by providing individuals with rapidity in their search for creative and appropriate answers. The existence and use of this skill can promote self-regulation for solid intellectual constructions that can be used in any area of life and work.
Learning English	This is a skill recognized by young people and teachers, because anyone devotes themself to playing videogames has to learn English to understand the instructions, the language of the games, and interactions with the different individuals in the virtual communities. Being a gamer implies knowing English, so, the positive thing about this is that the focus is not on language learning, but on peripheral learning of the language and what can be done to learn it. Therefore, placing attention on how to solve the stages of a game puts the content into the background, allowing the player to learn and access more intensive and profound levels of playability. Teaching English in schools is exclusively focused on content, with few connections to other intertexts. However, videogames are a motivator that can allow learning of language, among other skills, in an entertaining and functional way.
Knowledge of electronics and information technology	The respondents indicate that Chilean players also value instrumental and technical skills. This means that they are not only playing, but also building and operating hardware to make their systems more efficient. The players surveyed repeatedly referred to the machines that enabled them to play, highlighting close collaboration links in terms of the circulation, access, purchase, installation, operation, and update of gaming systems, with this being a very useful and desirable skill in the real world.
Ease of writing, reading, and management of communication systems	This is one of the skills most often mentioned due to its direct relationship with the school world, which indicates that the scale of their perceptions is delimited by the world of their professional practices and in reference to their cultural constructions. In the virtual world, reading comprehension is used as a fundamental medium for interfaces, allowing interactions between man and machine, and to enable the fulfillment of goals and challenges.
Reflection on the consequences of actions	This skill provides the value component to which various young people indirectly alluded in their perceptions, implying that the network and the spaces for games are not a no-man's land; on the contrary, there are rules that ensure coexistence, collaborative work, the achievement of common goals, and resolution of conflicts. The ethics derived from the virtual world teach that its practices are governed by codes and that there are punitive measures if one does not act in accordance with the agreed regulations. Making mistakes and reoffending, among other behaviors, does not involve any punishment in videogames, but in the real world these can have complex repercussions, and this is one of the first issues that gamers learn: to clearly differentiate which skills and behaviors have a place in one world or another and which are comparable in both.

Source: Prepared by the author.

Lastly, regarding the strengths and weaknesses of videogames for education, few students have played educational videogames and their infrequent experiences involved boredom and premature abandonment due to the importance of the content over the playability. In the case of the teachers, several of them argue that the influence of a well chosen videogame in teaching can be very powerful. They add that they do not understand why there are school systems that reject these practices and, moreover, that they are rejected by some without reflecting on the pedagogical value and methodological richness that they can contribute. The young people and teachers agree that the inclusion of video games in teaching can allow access to the construction of simulations and scenarios that are capable of enabling more solid understanding of complex issues related to history, science, art, physical education, etc., as in the cases of Wii platforms, which involve the use and exercise of the body, among other possibilities.

The young people also underline that the strategy of the school, as long as it has used videogames, has been erroneous in trying to highlight content and methodology factors over the matter of playability, which, by definition, is the function of a videogame. Young people do not play to learn, but to have fun, so if the school manages to understand this equation, the videogame and its potential will most likely make more sense as a way to enable a change of methodology in the classroom. The young people say—and the teachers support them—that rigorous analysis should be done of the games that can be used to support teaching tasks, and not attribute an educational nature a priori to something that is intended for a different purpose.

Another relevant issue highlighted by students is that videogames emphasize processes as a sustained and constructivist way of advancing. A player who does not respect these orders is punished, as they cannot continue until they achieve the goals and objectives. The implicit punitive nature of the game is good, as it helps young people to persevere and discipline themselves in order to attain goals and validate themselves before their peers. This is very positive as training for education.

As regards the strengths of videogames, the teachers and students agree that the most relevant thing is that many of the situations proposed in videogames can be extrapolated to daily life, through meaningful and transformative experiences, which would even allow them to be assessed. On the other hand, the questionnaire respondents point to the weakness that playing videogames in uncontrolled situations can lead to isolation, a sedentary lifestyle, and deterioration in the quality of family relationships.

As for the aspects that make video games attractive, the young people and teachers mention that color, design, and the possibility of creating a story that is built step by step in a way that allows the player to influence the characters' destinies is very motivating. This is even more so if the constructed narratives are compelling, since it is the player who writes the story and its significance.

Every time one plays a videogame, there is the possibility of resignifying the story constructed and even creating a new one. In conjunction with this above, the teachers mention that videogames allow performativity and self-identification for the player, while the various actions they undertake create spaces for participation, the nature of which is different from that of the real world.

Conclusions

The skills outlined by the young people are more varied than those mentioned by the teachers and there are few correlations. This may be explained because the practices developed by videogame players are more consistent, wide-ranging, varied, and continuous than those of the teachers, because of the continuity and concentration they imply. On the other hand, the scenarios where they occur, in the case of the teachers, are more restricted in terms of their quantity and quality. For gamers, playing is a natural act tied to their youth and visual culture, but not for a teacher or digital immigrant.

Nevertheless, both players and teachers agree that using videogames in education is a positive strategy and a revolutionary practice, insofar as their entertainment qualities can be extrapolated to teaching. Likewise, it is also argued that using educational videogames (those created for this purpose), with emphasis placed on the content, is perceived as boring and demotivating by young people. The correct thing to do, then, would be to evaluate normal videogames to establish them as possible tools to be used in classes, taking advantage of the potential they imply and the value that the users give them in relation to their visual characteristics and playability, among other factors.

However, the context of Chilean schools does not favor working with videogames and their use is not understood, and much less their educational value. Although the school system does not consider videogames as an official tool, there are teachers who, based on their actions, do not hesitate to endorse them as a revolutionary tool capable of generating meaningful, profound, and transformative learning. Several of the young people surveyed had not had educational experiences with videogames, but they were able to recognize their contribution to teaching, identifying influential technical and motivational reasons in the achievement and failure of certain experiences in the school context.

In a broader field, playing videogames as an individual and community practice allow the development of innumerable skills. It is significant that issues such as tolerance, inclusion, and reflection allow us to experience principles of democracy and respect, which are not always easy to achieve in other contexts. However, the other dimension to which young people allude is the narrative area (which is valued as the main feature), that is, the story the games tell, the stories they involve, and the possibilities of immersion and management of the story that allow the development of different endings. This factor is more relevant than the design, color, and playability. In addition, the study participants state that, just as it is possible to extrapolate videogame skills to the real world, there are others that are not applicable in reality and which, similarly, could be considered in the education (school or university) of strong work teams in light of the difficulties, measured in terms of the responses and creativity for problem-solving.

On the other hand, the game players and teachers recognize the ability of videogames to allow substitution experiences, since the possibility of creating a scenario with great detail and realism facilitates immersion in complex issues, favoring significant learning that would be more difficult to achieve in other contexts and with other media.

What has been said so far is based on the fact that access to software and hardware has democratized gaming, so the possibility of playing videogames is a relevant and novel fact in young people's visual culture, since it creates recreational spaces in the development of skills. This is appreciated by the students and teachers, who underline that all players, regardless of their location and age, develop skills such as the ability to control frustration, creativity, intellectual abilities, teamwork, and visual-motor coordination, among others. There are also skills that only the Chilean videogame players or teachers perceived, such as the construction of hardware and learning English. The latter is the basic language of videogames and stands out as a specific skill of local players, regardless of their school education. Undoubtedly, addressing language learning in an entertaining and motivating context could be considered an original methodological device for teaching in collective or individual instances of education.

And finally, it is clear that the dimension that unites all of these skills is the body. From it and with it, all of the actions, manifestations, and interactions are carried out that allow us to envisage the particular way in which gamers build their relationship with the virtual space and with the real world, allowing the reinvention of the student's performative sense in the classroom and its repercussions in the processes of teaching and learning.

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Annex 1
Interviews for young videogame players and teachers

Research objective

To interpret and describe the perceptions of a group of students and teachers regarding the skills that are developed by playing videogames.

Objective of the instrument

To collect information on the perceptions that a group of young people have about videogames and the skills that they develop.

Presentation

In the context of the study "Perceptions of Students and Teachers about the Skills That are Developed by Videogames", I would like to ask you to answer the following self-applied interview, considering the perceptions you have about videogames and the skills that are developed by playing them. Please answer by writing a response below each question. When you have completed it, please send it in Word format to the email address: zenitram58@gmail.com

Instrumentos de recogida de información

Interview of young people	Interview of teachers
How would you define digital natives?	How would you define digital natives?
What are generally the most attractive aspects of videogames?	What are the most attractive aspects of videogames?
What importance would you give to the pairing of young people and videogames at present?	What importance would you give to the pairing of young people and videogames at present?
Which videogames have helped you in learning certain topics? Which topics were they?	Which videogames could help with learning of certain subjects?
Which skills have you developed by playing videogames?	Which skills could be developed by young people by playing videogames?
In which aspects or areas have the skills attained helped you?	How have you confirmed the digital skills of your students in the classroom?
Have you had any educational experience with videogames? Explain.	How would you use videogames in teaching-learning?
How could videogames be used as a tool in education?	What are videogames used for and how do they impact learning?
What have you learned through videogames that school has not taught you?	What responsibility does the teacher have in implementing teaching systems supported by videogames?
What strengths and weaknesses could videogames have as a learning tool?	What could be the strengths and weaknesses of videogames as a learning tool?
When and which game did you last play and in what way?	When and which game did you last play?

Annex 2

Example of interview matrix for young people

Category	Questions	General textualities (young people)	Core ideas
Digital native	1. How would you define digital natives?	Individuals who, without previous training, make fuller use of systems than would be expected by an average user (G1).	Young people who know about technologies and how they work better than the average user. Due to this condition they are more tolerant and inclusive and reflective about the topics of their practices.
		Individuals who have had access to technology since they were born (G2).	
		Generation that was born after digital technologies came into existence. They have been able to access them without problems and grew up/developed at the same time as they were evolving (G3).	
		Individuals born after digital technologies became widely available and were accessible to normal people (G4).	
		People born in the era of digital technology (1980 and after) and which are familiar with and naturally interested in this culture (G5).	
		Individuals born in recent years with all of the new digital developments (G6).	
		They are people who are more inclusive and tolerant, due to the large amount of information to which they are exposed and which allows them to reflect better on various topics (G7).	
		Young people (up to 40 years of age) who are interested in keeping up to date with technological advances (G8).	
		Individuals who have mastery and high levels of knowledge about digital media (G9).	
		They know and practice the English language as part of the conditions of their game-playing activities (G10).	

Note: G = Gamer or videogame player.
Source: Prepared by the author.

Example of interview matrix for teachers

Category	Questions	General textualities (young people)	Core ideas
Digital native	How would you define digital natives?	They are the people who, in relation to their current age, have been raised within the current period of technological evolution (P1).	They are a generation of individuals whose situations and living spaces are mediated by technologies. Therefore, it is not needed to teach them anything because they are competent, even more so than some of their teachers.
		Their context is technology, especially the internet and its devices, with which they build their normal relationships (P2).	
		They are always in communication, they are always in communication because they always play a lot online (P3).	
		They were born into the digital age, the digital era, they no longer need to be taught anything that has to do with technology. They know it by nature (P4).	
		The digital native is constantly developing with technological devices: mainly cell phones, internet, online games (P5).	
		They use technologies much more efficiently that the teachers (P6).	
		They have photo applications that teachers often don't know about. They teach us certain things (P7).	
		They have greater interest and are quicker in searching for information, they are familiar with the technologies, because they always look for lots of other tools that can serve them for various purposes (P7).	

Note: P = teacher.
Source: Prepared by the author.