

## Games and Gamification: A Proposal for a Creative Learning Process in Education

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### Abstract

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This article proposes to discuss the theme of docent formation in the perspective of creativity and emergent technologies pointed by the Horizon Report 2103, specifically games and gamification. Based on a literature review about the themes, through a systematic research and reading of authors which refer to these, it presents reflections, inquires and provocations with the objective to contribute with the change of the actual paradigm in the purposes of the Licensure courses in the Superior Teaching Institutions, with a cutout to the Federal Institutes of Education, Science and Technology from Brazil. These considerations are made from the principle that we live in a digital age and that the education did not follow the step and, because of this, it still needs a more creative view to the docent actuation in this aspect. It concludes that the use of games and specifically the gamification as an example of emerging technology can be a possible step to remit the schools, the space of knowledge construction, to creativity with a view to innovate the forms of teaching and learning.

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**Keywords:** games and gamification, creativity, professors' formation

### 1. Introduction

Since 2002, the NMC –New Media Consortium and its partners are dedicated to the Horizon Project. Three reports are annually published.

One of them focuses on High Education, the other K-12 and the third one, the Museums. These reports identify and describe the emerging technologies and the main tendencies that might have an impact on education all over the world during the following five years.

Specifically in the Horizon Report –High Education of 2013, one of the presented technologies is the use of games and gamification in education. The period from two to three years, since the report publication, is the estimated time for the adoption of this technology. This report also brings tendencies and challenges in the context of emerging technologies, and the formation of graduation institutions to this universe is one of them. The report affirms that there is an established agreement regarding the importance of technology utilization. The challenge lies in the effective capacitation of the professional on using these technologies.

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It argues that, in consequence of professors' formation, there is a possibility of more creative professors and, due to that, more creative students.

Also the Horizon Report 2014 brings as a challenge imposed to High Education the transformation of "consumer students to creator students". It attaches this challenge to the need of new teaching methodologies and, consequently, new forms of evaluation. In this challenge field, the use of technologies in education, according to the report, is mostly not in university's programs when it comes to the learning process.

A relevant question is now brought: if High Education (HE) is challenged to search for creator students that are beyond costumers, it means that HE must reformulate the formation of professors that will perform on basic education. Looking for a deeper scope for this discussion, it is presented the degrees offered by the Federal Institutions, in a total number of thirty-eight in Brazil.

Since Aristotle until the creation of universities, the objective of education is developing reasoning, language and thinking. Later, the dialectics –Aristotelian principle – was supplanted by Industrial Revolution, which included as "educating" the acts of training, memorizing and manual abilities. It made millions of people act only as a body without freedom and mind expression.

With digital era, a replacement of model happens again: now the market requires an ability called mental acuity.

Since press times until dressing technologies, technology allows the improvement of education dynamics –in and outside schools –attaching it to the creativity need and developing the necessary innovations to the evolution of a personalized learning process. This way of learning –personalized by emerging technologies – has been pointed as a tendency by specialists that compose the NMC Horizon Report.

To Pearson Education of Brazil (2011, p. 8), creativity is the master spring of innovation and has been very requested by organizations as a professional skill. In addition, it is necessary to demystify it in order to insert it in an environment of development skills.

In this context, it is possible to relate this discussion with the High Education Institutions (HEI) from Brazil, since creativity should be one indispensable skill to demand from a professor.

To speak of "professors' formation" unfortunately is no longer a matter of idiosyncrasy; this theme, which composes the necessary reflections on school and professors' functions is now consensual, and there is unanimity on affirming that it is necessary to overcome pedagogic postures and search for a new design for scholar curricula. There is a central question: this task is not easy for professors, having the Communication and Information Technologies (CITs) as a origin of the main challenges related to education, learning and creative investigation, a triad that means the school as the 'former of formers'.

To overcome pedagogic postures and resize the current curricula is certainly not an easy task either for our High Education. Especially considering a possible internal resistance in Brazilian institutions, where is the own educational process that limits the adoption of new technologies as an ingredient of creativity in the construction of the methodological draw of many offered courses that graduate future professors.

Considering that nowadays the kids enter earlier in school than a little time ago, there is the necessity of teachers be conscious and efficiently prepared to this 'invasion' of social demands. Not yet, humanity is submerged in a digital world of ubiquity times and is emergent the investment in other ways and times to learn and teach.

In this context, this article also focuses on games and gamification as an element to be considered and used in the Brazilian scholar universe.



### 3. Creativity: Literature Resumption

In the last few years the world has been thru financial, social and cultural changes, which are being developed in big proportions. This scenery is a fertile field for creativity, the master spring of innovation. Inside this transformation process there are ideas boiling up, which means that there is a production of ideas and, consequently, knowledge generation.

On the other hand, but not paradoxically, even though the world has been thru technological renovations, reaching unimaginable levels in at least ten years from now, it is important to remind that creativity has always been the world's biggest mover. Just remember our ancestors, since the nomadic people, which by survival instincts, used creativity in order to search for better life conditions. Also the past genius opened the way, creating conditions for this now living evolution.

It is possible to affirm that creativity generates the necessity of knowledge and seeds innovation; in other words, innovation depends on knowledge generation, and consequently, creativity.

According to Vygotsky (1982, p. 7), the creative imagination is a result of the capacity of fantasize situations. The individual will create accordingly his capacity of imagining and fantasizing, based on factors – among them, there is the accumulated experience.

It is possible to perceive in this arguing the existence of personal aspects that are important to creativity; cognitive skills, personality lines, motivation, styles of learning and creativity. It means that, in order to be creative, the person needs reasons, ways and opportunity. In the center of all human evolution there is the capacity of innovating and continually creating; knowledge is the spring of all productions.

According to the Psychologist Mel Rhodes (in Rickcards, 1999, p. 68 ), creativity is a phenomenon that the person can communicate a new concept thru – a new product. He says that the person gets to this product by a pressure from the environment where he lives and that demands from him. In 1962, he presented a model of the four dimensions of creativity: person, product, process and environment (pressure).

Guilford is considered the first to see this theme with a scientific eye (Pearson Education of Brazil (2011, p. 18). Until then, the studies about creativity were focused mainly on mensuration: intelligence, creativity and capacity of learning, this was the focus brought by Cognitive Psychology. By that time, 1950, Guilford called attention to the necessity of researching this subject.

In his Creativity Psychology theory, he divides in two the thought capacities: the capacity of memory and the capacity of thinking. This last one, he subdivides in three categories of cognitive capacities, and among them (in the scope of this discussion), the productive capacity that would be responsible for the convergent and the divergent ways of thinking. From that, the divergent thinking moves in several directions searching for a certain answer.

In this same line, more recently, Ribeiro (2013, p. 67) argues: "the exploration of verisimilitude and the different points of view about an object or situation have been the mover for the great advance of science and technology". It is noticeable here an appropriated semantic to the concept of divergent thought in the scope of this article. The author affirms that every science is speculation and the truth itself does not exist, there are only conjectures of it. In science, however, each one of them "brings to itself the competence of pronouncing the last truth".

The divergent thought always comes from a problem, since without this situation there is no need of innovation. For every answer or idea there is always an opposite idea. This is the first step to discuss creativity, which happens with no barriers and inhibitions.

This brief journey about creativity brings the possibility of inserting it in the education sphere. School necessarily has to instigate the student to the divergent way of thinking in order to build a future where knowledge is no longer transmitted, but generated, created along with all the people involved on building it. This is actually the theme of the following section: creativity and education.

### 3.1 Not Only Creativity, but Creativity and Education

Fava (2014, p. 101) affirms that schools are for excellence banks of talent and future incubators. This affirmation strengthens questions that concern education; the educator, while being the instigator of knowledge: why models are still being reproduced and there are no deep reflections about the education practice?

Reflection will certainly bring the dialog with other educators, linguists and philosophers that constitute the pedagogic speech. It does not mean to forget the past, ignore the present nor disregard the future; on the contrary.

Considering this perspective, the act of educating goes beyond teaching and embraces ingredients that generate ideas (knowledge + creativity = innovation) that exemplify and mean a teaching program, a curriculum proposal, a pedagogic intervention, or simply the act of being in a classroom.

There it is: the divergent thought. To ask and to obtain diversified answers to a certain problem is what explain why human beings, with an atavistic desire, have the necessity of innovating and interacting between themselves.

On the other hand, the 'new' is scary and intimidating. School needs to be aware to the fact that creativity facilitates the personal and collective transformation in several contexts (Rank, Pace & Frese, 2004).

Alencar & Fleith (2008) present some barriers pointed by professors concerning the promotion of adequate conditions to the development/expression of creativity of/in the student. According to the authors, after making the research with 398 teachers from Elementary School, the five most quoted items were: (1) elevation of number of students in class (51,4%); (2) students showing learning issues in class (47,3%); (3) low recognition of the teacher's efforts (43,8%); (4) "disinterest of the student for the presented subject" (our emphasis) (38,5%) and (5) lack of didactic materials available at school (38,5%). The authors add that several barriers that were pointed by most of the teachers were more directly related to the student.

The student is a potentially creative person. The creative person presents some personality lines: self-discipline, persistence, independence, tolerance for ambiguities, non-conformism, self-motivation and the desire of taking risks. On the other hand, some characteristics inhibit creativity, such as: rewards, restrict choices, competition and external evaluation. Besides, the excess of work and lack of time are the biggest enemies of new ideas.

Taking in consideration the presented reflections, let's go back to the beginning of this section by questioning the school environment. If the business world expects creative people, why for so many years has the school focused on forming workers, but not thinkers?

While society needs creative and innovating people, most of the schools insist on treating students like robots. In most of schools, problems show up very consolidated. Students are taught to act and think the same way, to have a logic pattern. When they run out of this "pattern", they are punished.

On the other hand, technologies are becoming even more accessible on the student's routine. The question is: in which way the teachers use these technologies and in what way they contribute to form a creative and innovative student?

Questioning the creativity level of teachers takes this discussion to another very pertinent theme, considering that this work is based on emerging technologies to a reality of until five years in the Brazilian Superior Education. By consequence, this is the theme of the following section.

### 3.2 Creativity, Education and Technology

The new communication technologies go along with what Paulo Freire (1987, p. 48) once said, when exhaustively criticized the current educational model where education is not made by A and B, but from A to B or A about B.

The learning of using new technologies in the education universe is more than essential and why? Based on the semiotic theory, it is known that the world is filled with languages that are not settled only by oral and written codes of each society, which is what is called idiom. There are also codes for dressing, eating, producing cars, everything. The hope for this step, for a great transformation of communication ways we have nowadays, is the school. It is the school's responsibility to form citizens able to create their own vehicles within the already existent ways of communication. This transformation will not happen until there are qualified professors to this job.

The use of technology in education allows a proper treatment for students from wherever they are; they only need to be connected on the Internet. According to the Horizon Report 2013, the mobile technology amplifies even more the opportunity for games, allowing the players to participate anywhere, anytime.

Education nowadays no longer reminds an atmosphere where the teacher was the most important figure in the organization and formation of a student. The interaction time makes the "educators and students share the same hybrid, analogic, digital and self-organized environment; this is the school universe after Internet (a.I.); teachers need to define in which period the companies prefer to live: before Internet (b.I) or after Internet (a.I) (Fava, 2014, p. 102).

Having that said, academic proposals cannot be generally evaluated; conditions where they are being developed must also be considered, as well as the context and circumstances where the school is.

The a.I. school must present to the educators the concerns about the classroom environment.

Beyond the clear lag of pedagogy and the classroom obsolescence explicit in this student reporting, it is important to establish the students' profile of Y or Z generation, also known as the digital natives. It is a generation shock: there are still a lot of "baby boomers" teachers, some of them from X generation, that aim to interact with students from another generation that was born already connected. The worst part is: the teachers know that and insist on walking on their speed. But how?

In order to allow the emerging technologies to conquer the space they already occupy in a clandestinely way –at least for educators –it is necessary to go beyond common politics that make an inconsequential buy of equipment and give them to baby boomers teachers or those from the X generation. Without an adequate immersion of the teacher in the world of massive medias, without a teacher able to identify the languages of communication ways in order to use it creatively on his pedagogic interventions, these buys become useless. And this is a part of these professionals' formation.

It is important that professors face their difficulties and utilize technological resources as pedagogic support. Technology does not replace the teacher, although he must know how to make a good use of it.

Having that said, it is important to discuss now about professors' formation, since the conception of academic proposal for it, until the establishment of the educators' and students' profile, necessary to draw the current society previously presented.

## 4. Professors Formation

In Brazilian educational history, the formation of education professionals has always been connected to several conceptions and varied shades, considering the conception of professor, student and the education still preconized.

The fragility of actions that aim to value this career only aggravates the situation, considering the big lag of habilitated professionals in certain areas.

Some studies show that the formation of teachers has not been enough to satisfy the complex social solicitations that have been presented to school and teachers in the past decades.

Following this line, here are some questions: 1) what are the purposes 2) what are the graduations' objectives if considered the social responsibility that concerns education? 3) Besides, what about the social and financial expectations of the scholar system? 4) How is it possible to conciliate these questions in the academic and professional formation plan?

According to the Teacher Matters Report (OECD, 2005), "in order to improve the performance and scholar equity it substantially depends on the certainty that the most competent people have the desire of working with teachers, that their teaching ways achieve high quality levels and that all students have a high quality education".

Therefore, it is possible to say that education reforms must be focused on the human capital, since the professors quality is the most direct influence on students' learning processes" (OECD, 2009).

These approaches have stimulated very important reflections about what is and what could be the teachers' formation, both in pedagogic action and investigation perspective to researchers.

A brief look over the texts and referential bibliography shows, on one hand, a sign of development the investigational production that has been observed in this subject during the last two decades; on the other hand, there is the existence of an approach plurality, and consequently not being a global reality, neither homogenous.

School, University, the teaching system and the classroom are not simple realities, but socially settled; they are totalities in constant development for the will of searching the knowledge, the interrogation and sense of reality, the human formation (Coelho, 2003).

Fava (2014, p. 69) affirms that each time more the teachers must "develop, guide, transform, innovate, substitute new mental models, archetypes, habits, culture, search for the productive discomfort, be flexible, accept, adapt, sometimes only accept, but most of all help to transform".

This generous list of transitive actions modify significantly the teachers' skills; it incorporates new roles, moves and motivates the classroom walls, replacing it for an interactive space, connected and dipped in participating and interactive medias. The Superior Education institutions must also get into this.

Both real and digital worlds need a system that can offer causes, much more than just contents, in order to promote challenges, generate the necessity, stimulate and not only demand.

If curriculum proposals to teachers' formation do not assimilate this scenery, a transformation does not happen or happens only to that educator or institution that is in the same vibration, or to baby boomer professors.

The Horizon Report 2013 presents exactly this challenge when talks about emerging technologies. The Report says: "the simple capitalization of new technologies is not enough; the new models must use these tools and services to interact with students on a deeper level".

It is time to rethink about teachers' formation, to adequate the academic profile to a globalized, digitalized, interactive and connected world. Provoking the institutions that are responsible for their graduations might be a way to achieve these changes.

#### 4.1 Graduation of Teachers and the Federal Institutions

The Federal Institutions of Education, Science and Technology were created by the law 11.892 from December 29<sup>th</sup> 2008. Currently, there are thirty-eight federal institutions all over the federal state. There are 491 campuses in the Brazilian territory.

There are also the Federal Institutions (FI), which are specialized in offering professional education; they are considered institutions of superior education, basic and professional.

Having that said, among its objectives, the FI have to offer a professional education, basic education integrated to the professional education and superior education, considering that the last one is where the formation of teachers fits in. these courses have a quantitative normative and a tendency of focusing in specific knowledge areas –nature sciences, mathematics and professional education –showing that there is a specific space for teachers' graduation in FI.

The FI constitute a web, the Federal Web of Professional and Technological Education (FWPTE), which includes:

I –Federal Institutions of Education, Science and Technology –Federal Institutions;

II –Federal Technological University of Paraná –UTFPR;

III –Federal Centers of Technological Education Celso Suckow da Fonseca –CEFET-RJ and Minas Gerais –CEFET-MG;

IV –Technical Schools related to Federal Universities.

The creation of these FI brought significant transformations to the FWPTE. A new scenery is drawn: a great enlargement of the federal web. The obligatoriness character of the Institutions reserve vacancies to teachers' formation relate these Institutions to this responsibility, engaged on keeping the dialog and articulation between professional and educational areas.

As previously said, among the creation of federal institutions, there is the necessity of reserving certain percentages of vacancies to several educational areas. According to the law 11.892/2008, the institutes must save at least fifty percent of vacancies to technical professional education of medium level, and at least twenty percent of vacancies to "graduations with a teaching certificate, as well as special programs to pedagogic formation, focusing on forming teachers of basic education, specially in areas like science and math, and to professional education".

The proposal of consolidating in federal institutions the offer of teachers' graduation courses thru the Law is not about moving the formation of teachers from its original place (mainly universities). The Law does not establish federal centers as the only possible environment; it allows the technological educational centers (public, private and communitarian ones) to offer it as well.

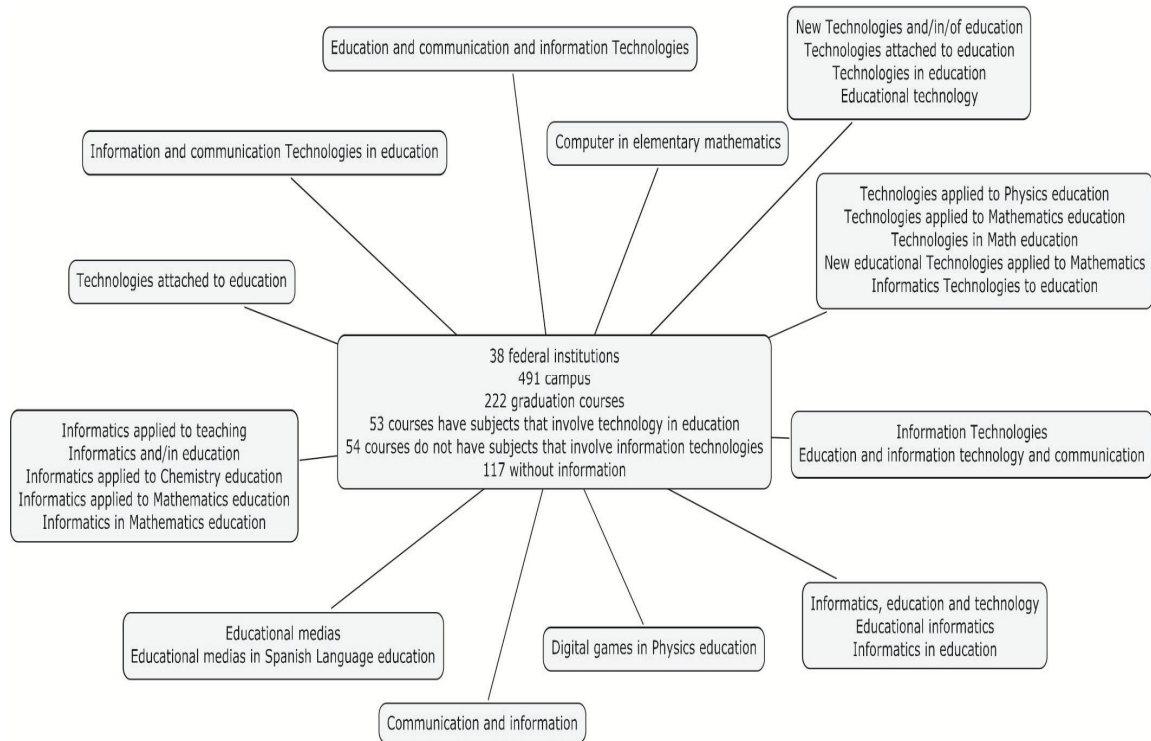
To finish the insertion of FI on the focus of this discussion in order to associate these considerations to this article's scope, it was considered the curricular proposal of teacher's graduation of FI to perceive if they offer digital inclusion disciplines in their programs or if this theme is unperceived, treated just like one more theme to be discussed, but not as deep as it should.

On a research made by the Ministry of Education, it is noticeable that Federal Institutions are now in a state quite far from ideal when it comes to graduating teachers accordingly to the effective use of technologies. The research methodology that was used to make this affirmation adopted the following steps: 1. Search for the Federal Institutions that offer graduation for teachers thru the campuses websites of each Federal Institutions. 2. Research in websites of campuses that offer teaching certificates, the curriculum matrices of each offer. 3. Search within the curriculum matrices disciplines related to new technologies. This research had some limiters: the impossibility of access in some website, of consulting the curriculum matrix of some courses, almost total lack of access to the discipline summary and description in order to perceive its focuses.



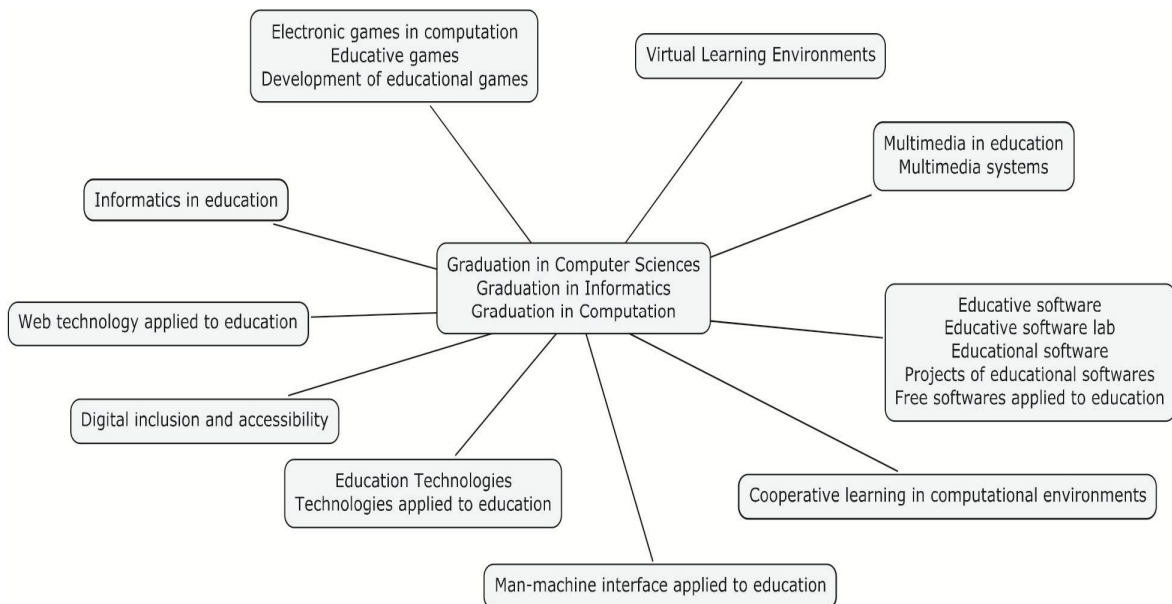
The obtained result is presented by the following figures:

**Figure 2: Teaching Certificates in Fis and New Technologies in Curriculum Matrix**



Source: By the Authors

**Figure 3: Teaching Certificates in FIs, in Computing Courses and New Technologies in Curriculum Matrix**



Source: by the authors

## 5. Horizon Report: Games and Gamification

According to the HR 2013, a report focused on Superior Education, technologies are capable to offer a personalized education and have been very requested; besides, they represent a big challenge for the educational system. According to the report, many teachers and researchers yet do not use digital technologies to learn, teach or even organize their researches.

Games represent an opportunity of involving the students. Already in 2008, the Pew Internet & American Life Project affirmed that 97% of children between the age of 12 and 17 were weekly playing some kind of digital game; around half of them played daily. Games should get the players' attention and this is what the companies focus on. They search for difficult but fun situations, persuading the player to be persistent and seek solutions.

Therefore, games in education can be used in order to improve the learning and teaching processes, considering that it is becoming frequent to hear about disinterested students, with lack of concentration and desire, as well as boring classes.

Still in the same document, it is possible to find the affirmation that companies already have adopted this technology as an incentive to its employees, by offering rewards; although in education it is still in initial steps, it has been gaining space and support between researches and educators that recognize that games stimulate creativity and the creative investigation from students.

Following this line, it is important to bring the reflection that is not enough to create favorable environments to application of new technologies if the current established culture does not follow the knowledge construction.

The author's argument shows that technology and, being the focus of this article –the emerging technologies, takes the classroom and education to a web perspective, where insights will flow spontaneously and improve the scholar activities, and consequently bring the necessary innovation.

Therefore, the Horizon Report 2013 once again warns for the fact that simply playing already motivates the students, once it challenges their knowledge about a specific subject. It adds: recently, it appeared also the need of inserting gamification in this tendency. Gamification is the integration of game elements, such as levels, symbols and competition, to the curriculum. In previous editions of Horizon Report, this dimension was called as education based on games, although it was amplified according with the insertion of tools that were necessary to support learning processes; this tendency is also surrounded by a culture and specific design forms.

The main question here is the 'provocation' that Horizon Report makes to Superior Education: utilize the computer, internet, blogs, cellphones, tablets, podcasts, projectors, cameras and other resources in order to improve education and the contents of each subject. It consequently brings concepts of game techniques in order to attract, motivate, teach, learn, know, create and innovate.

Gamification should work as a teacher extension. Abstract ideas can become possible to visualize, the microscopic becomes big, past becomes present and it all helps to learn and transform the subject in something curious and interesting. It is important that classes follow an order of ideas that guide the student thru what is being learnt. Each class is no longer just a class, but now it is a class that came before one and after another. The subjects must all be connected and it is all being proved possible by designers, games and gamification.

The following topic continues the discussion.

## 6. Gamification and Education

In 2011, the Gartner Group (Viana et al, 2013, p. 7) previewed to 2015 that more than 50% of organizations that manage innovations will insert game methods in these processes and more than 70% of the 2000 biggest world companies are using at least one game application in their business.

Gamification means the tendency of using these techniques in situations that are not essentially entertaining, such as innovation, marketing, training, employees' performance, health and social change. Also in a report published in 2012, the company pointed that in 2016 the gamification market will correspond to about US\$ 2,8 billion (Viana et al, 2013, p. 11).

According to the Gartner Group analysts, games help to obtain more commitment from employees through the performance evaluation cycles the company must be submitted to; being clear on objectives and rules, extinguishing ambiguity and possible uncertainties from working processes; present a more persuasive speech about the tasks that need to be developed; dividing big tasks in smaller parts that can be reached in shorter periods of time, keeping the employees committed all the way through the project.

Also an approach made by north American MTV along with people from the Y generation (people that were born between the beginning of 80s until 2000), 50% of the respondents affirmed that recognized the game aspects applied to several aspects of daily life, considering that nowadays this group represents 25% of the economically active people all over the world. It means that one quarter of world's wealth is generated by people who grew up skipping mushrooms, fighting monsters and saving princesses, conducting balls through surreal ways and collecting coins to obtain extra life.

There are some very interesting facts about games: the average age of players is 37 years old; 97% of teenagers play it, 77% of American homes have videogames and 68% believe that games provide mental and/or educational stimulation; 57% believe that games stimulate families to spend more time together; 55% play games in cellphones or other mobile devices; 2.600.000 games are downloaded in Germany every year; players have already spent 5.930 years playing World of Warcraft collectively. Brazil is currently the fifth country with largest amount of active players (47%).

What if we bring these numbers to the educational environment, as Horizon Report 2013 points? To reinstate the discussion, it is important to notice that the meaning of 'knowing' has changed: instead of being able to remember and repeat information, the person must find them and use them, because any information can now be found on web.

In practical terms it means that educational institutions should find effective ways to select contents based on what they intend to teach, leave behind concerns about the past and pay attention, effort and energy on what is coming (Fava, 2014, p. 53).

The future? Would not the teacher be already living in classroom a future related to his formation without even noticing it? In this future, in this current digital society, technologies, professions and knowledge are so ephemeral, transitory, fleeting and easily become obsolete and archaic.

The gamification theme indeed can be ingredient to more creative pedagogic intervention models, developed in groups in order to provide the adequate adaptation for several medias, by the clearance of contents with methodologies filled with games and simulated animations, by the capacity of teaching and create challenges and consequently pulling other types of knowledge.

It is relevant to say that there are many people who have already thought about the use of games in education and describe meticulously this subject, specially providing the teacher the possibility of planning the classes more safely and in a more creative way.

What about gamification? The subject is relatively new. In our systematic research in Capes gateway we found 265 articles concerning gamification and education. From those, 132 were revised. Unfortunately, most of them do not have free access and do not talk about Basic Education.

The revision's result shows that using games in education came to replace the lack of fast information and dynamism that students had while learning. The tendency is settled by a new concept that unites game experience and pedagogy. Gamification brings the game logic to classroom, incentivizing creative behaviors and practical results.

By comparing facts, it is possible to say that classes now have a similar structure from an electronic game. Overcome challenges, finish missions and fight a warrior in order to reach the next step. During ten weeks per semester, the students could reach objectives established by their teachers. Students could overcome challenges in an attractive environment, having the teacher as an activity guide.

Gamification instigates the motivation of personal objectives and external rewards, combined with psychological factors such as challenge, fear and the necessity of pleasing someone (Fava, 2014, p. 57).

In most of educational environments, the student is not allowed to fail. Consequently, not many of them can actually deal with a wrong answer or attitude. It is not allowed to "fail and see what happens". Now with gamification, taking risks is healthy. The student can make mistakes and try once again.

Gamification can provide an innovative, creative and investor student, someone who actually tries, takes risks and eventually makes mistakes. By that way, he is no longer just an information receiver and become active in processes of knowledge construction.

#### Final Considerations

The considerations here presented concern this study and aim to contribute with reflections divided in three lines: the necessary creativity as an ingredient in the search for innovation, to new teacher and student profiles; the discrepancy between education and emerging technologies and, yet, the urgent evaluation of graduations courses –in a general way –offered by Federal Institutions of Education, Science and Technology in Brazil, which the obligatorily is expressed by the Law.

These reflections will be presented following the article order and for several times it will all appear connected, aiming to provoke and relate the presented theme to pedagogy and education. The formation of teachers should not be focused only on theories, methods and pedagogic interventions, but also must add to this person self-knowledge and the reality of his future work environment. The personal knowledge is directly connected to the professional ones. They both actually complete each other in a person's life.

Concerning technology attached to education: if it can be settled as a big web, a group of elements that relate within each other in several forms, it provides the mixing of knowledge, actions, techniques and methods; to think about education and teachers formation considering this aspect means certainly connecting it do a future that embraces teachers, educators, universities, institutions without damaging the natural structure of teaching and learning methods.

The fact is: for which generation are the current teachers being formed? The answer is one: to the generation that realizes information as something malleable, controllable and reconfigurable; something new and more interesting. It is now possible to be much more creative than the teachers are used to see from their students.

Educators might even have doubts of these changes will bring good or bad consequences, but one thing is certain: they are permanent and will adjust to the upcoming technological advances.

Students spend a lot of time interacting with/in the virtual world. However, are parents, teachers and other educators actually following this change? Formal education needs to focus on the new generation, the new world. Today we see still the traditional school type of many years ago, confronting the technological revolution we are living now.

The 2013 and 2014 Horizon Report editions point the use of gamification in education as a strong tendency for the following years. The reason is that companies are each time more using it as an encouraging strategy for its employees. Schools need to be ready; this is the new business world.

The information here presented show a lack of capacitation when it comes to formatting teachers according to the use of technologies. A group of actions is necessary in order to chance education effectively. The teaching certificates must prepare teachers that are able to deal with new methodologies and it certainly involves technologies.

Schools need to prepare their physical structures in order to supply new necessities. Computers, Internet, appropriated software are always within some of them.

A few more questions come up. How will the teachers be prepared by these graduation courses? In order to prepare them to the upcoming technologies, they also need capacitation. What about the education for those who are already working in Basic Education? It is necessary to break the traditional educational system.

Federal institutions must save 20% of vacancies to courses that habilitate teachers. This percentage can be offered for both who are still in graduation and for those who are already working as teachers. This is one possible solution.

Another consideration that must be made is: everyone must have the will of changing. Change demands availability, dedication and perseverance. As a future subject for these questions, this research points the necessity of researching more about gamification in education, gamificated curriculum that are already inserted in graduations. This is an aspect that cannot be left aside: basic education.

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