

Playing to learn is not learning by playing: gamification of learning processes

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pp. 15-24

RESUMEN En este artículo se explican las teorías que soportan la actividad ludificadora, se establecen las diferencias y similitudes pedagógicas fundamentales entre jugar, juegos educativos y ludificación, y se ejemplifican las posturas de los autores con tres estudios de caso sobre productos diseñados en el Laboratorio de Aprendizaje de la Institución Universitaria Ceipa, consistentes en un simulador computacional, un juego de mesa y un aplicativo móvil.

La aplicación de estrategias propias de los juegos se hace cada vez más común en el mundo educativo, así como en el empresarial, sin embargo, todavía falta profundizar en el concepto de ludificación y en las estrategias educativas ludificadas, de manera que impacte e inspire la forma en la que se diseñan estas actividades en el mundo escolar y laboral.

PALABRAS CLAVE educación, empresas, juegos, ludificación.

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Playing to learn is not learning by playing: gamification of learning processes

ABSTRACT This article discusses the theories that support gamification activity. We explain the fundamental pedagogical differences and similarities between playing, educational games and gamification. In addition, the positions of the authors are exemplified by three case studies on products designed at the Learning Lab of Institución Universitaria Ceipa, which consist of a computer simulator, a board game and a mobile application.

Application of gaming strategies is becoming more common in the world of education, as well as in business. However, a more in-depth approach is still necessary in regards to the concept of gamification and gamified educational strategies, so as to impact and inspire the way these activities are designed in school and work environs.

KEYWORDS education, business, games, gamification.

Brincar para aprender não é aprender brincando: ludismo nos processos pedagógicos

RESUMO Neste artigo se explicam as teorias que suportam a atividade lúdica, estabelecem-se as diferenças e semelhanças pedagógicas fundamentais entre brincar, jogos educativos e ludismo, e se exemplificam as posições dos autores com três estudos de caso sobre produtos concebidos no Laboratório de Aprendizado da Instituição Universitária Ceipa, que consistem em um simulador computacional, um jogo de mesa e um aplicativo móvel.

A execução de estratégias próprias dos jogos é cada vez mais comum no mundo educativo, assim como no empresarial; não obstante, ainda falta um maior aprofundamento do conceito de ludismo e nas estratégias educativas lúdicas correspondentes, de maneira que isso influencie e inspire a forma pela qual se organizam essas atividades no mundo escolar e do trabalho.

PALAVRAS CHAVE educação, empresas, jogos, ludismo.

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And just playing for the sake of playing
without having to die or kill,
and living upside down
where dancing is dreaming with our feet.
(Ad hoc translation)

JOAQUÍN SABINA

Play

A teacher nowadays will hardly question the social value of play as a cultural product and an educational tool; however, there is still resistance when using it formally within educational processes, particularly those concerning topics and levels of education traditionally considered “serious”, such as exact or natural sciences and higher education. Without trying to defend play as an educational tool, much less, promoting its use in every activity undertaken, the authors of this article are wondering how these conceptual and methodological differences could be settled in a way that could enrich the learning experience in university classrooms. Gamification is a methodology that has recently gained popularity, especially in the business world. As its name suggests, it is related to play, leisure or fun; however, it is much more than making students play or have a pleasant time. To avoid simplifications and, incidentally, approach a more comprehensive practice, it is necessary to analyze and establish relationships and exclusions of four fundamental components of the educational actions oriented from this methodology: play as a central axis of the activity; the toy as an instrument of the activity; gamification, in its attempt to become a teaching tool, and challenge, as a catalyst for the educational technique that brings us together.

The world of play covers a fairly wide range of activities that do not define it themselves. The number of participants does not define it, as there are games that involve one person or some that exceed ten participants. The duration is not a differentiating criterion either, nor does it necessarily characterize whether or not it demands competition between the participants. Additionally, there are similar activities that, depending on the scenario, can be considered play or not, for example sports or games of luck. Perhaps one of the most successful, and still current, definitions of play, is the one by Huizinga (1968, p. 49) who describes it as:

a free action or occupation, carried out within certain temporal and spatial limits, according to absolutely mandatory – yet freely accepted – rules; the action’s end is in itself and is accompanied by a feeling of tension and joy, and by the awareness of “being a different way” than in everyday life.

As it can be seen, it is a taxonomic statement that incorporates six basic elements:

1. Freedom as an interruption of limits, especially mental.
2. Closed time and place, excluding the present world.
3. Its own self-regulating order to which all participants adhere voluntarily.
4. Action that is consummated in itself as a temporary suspension of disbelief.
5. Agonistic emotional environment that generates tension, through uncertainty, seeking a resolution but whose pursuit produces a feeling of joy.
6. Regulations independent from the world, but coercive according to their innate prescriptions.

One characteristic that is considered in the Dutch philosopher’s study –but is not explicit in his definition– is that play, as a mentally parallel action to the empirical world, is a “representation that escapes the usual reality, transposing it to a higher order” (Huizinga, p. 29).

However, taking into consideration the topic discussed in this paper, it is important to point out that while Huizinga gives an important role to play in the formation of culture, at the same time that Freud (1900, 1908, 1920) recognizes in play a space in which individuals can develop their traumas, let out repressed feelings, prepare for real life and build their ideal selves, as well as Piaget (1961) states that play is a pleasant and controllable precursor to the process of assimilation and accommodation of ideas, skills and standards, in the same way that Bandura (1977) states that human beings acquire new patterns of behavior by observing and imitating other individuals or symbolic characters depicted in play and toys, it cannot be stated unequivocally that play is inherently – although intrinsically – educational. That is, the educational potential of play is only embodied in the intentionally edifying interaction with other

subjects, which requires a planned and systematic activity. Think about common recreational activities to illustrate this assertion. While practicing a sport, say football, you can bring the expected physical and psychological consequences of the game, as established by the cited authors, and it essentially meets with Huizinga's characterization of play, the results are not always predictable and much less positive. The transformation emanating from the constant practice of sports is subject to socialization – in the Piagetian sense of the word – that the player lives during the process. You could assert the same of rounds, street games, board games and even video games. The contradiction that seems to exist here with the assertion is saved by a fundamental fact: the etymology and practice of education refers to guiding (oneself), routing (oneself) or extracting the best of each other; there is a will poured in and towards perfectibility of man, which does not always exist in play and sports. Otherwise, professional athletes would be the epitome of integrity. Sports and spontaneous play, as a cultural creation, carry with them, feed and reproduce all the virtues and defects of the society that produces them. In some cases, they even exalt behaviors that actual culture considers unethical or even illegal. A good example is the high tolerance that certain countries show towards cheating and foul play in sports (considered cleverness) albeit these practices are condemned in their legislation, while in other countries the players actually compensate their opponent when one of their team mates acts improperly in the game, either by acknowledging their fault before the judge or, as we have seen, giving a point to the opposing team to equalize the imbalance that it generated. Regardless of how flexible, innovative or open an educational process is, it cannot deal with such a high degree of randomness. The solution, then, would be the guiding intervention of a teacher or of peers; however, it would not be free, it could break the internal temporality of the activity, bring the mind back to reality, and be linked to external rules, i.e., it would stop being play.

Toys

For Díaz Vega (1997, p. 170) toys are “any external or internal object or event, visible or intangible, with which the mind and body plays.” From this definition, play and toy form an indivisible block. Meanwhile, Smirnova (2011, p. 36) defines

toys as “objects that allow going beyond the limits of the perceived situation, embody another person and act on behalf of that person.” Note that in the first definition it is not something essentially material, while the second one does seem to need it. Considering that activities such as riddles, rhyming competitions and even some rounds are strict mental exercises which, due to their nature, can be considered games, and that, from Díaz Vega's definition, use words or ideas as toys, the first statement would be preferred for this exercise, although the second will not be rejected as it incorporates elements of the definition of play, such as the importance of boundaries and the symbolic nature of the “as if”. As a derivative and recipient instrument of the very action of play, the toy is also contemplated as an object whose purpose is to provide fun or recreation, concept that inspired most dictionary and encyclopedia definitions, as well as “an accessory that constitutes in itself the sufficient element of play” (Sarazanas & Bandet, 1972, p. 166). As you can see, despite the importance of the toy and its ancient tradition, being in its appearance as old as man, there is still no comprehensive, much less satisfactory definition that serves the purposes of this discussion; however, it is possible to extract some characteristics that can help delimit it. The toy, then:

- a. Can be an object or a physical or mental event.
- b. Transcends the boundaries of reality.
- c. Can acquire symbolic or representational meanings.
- d. Is a derivative and recipient instrument of the action of play itself.
- e. Serves the purposes of fun and entertainment.

However, although there seems to be a consensus in the pedagogical possibilities of the toy, there is no direct commitment to its inherent educational nature, to the point that it is hardly mentioned in its attempts for definition. This could be because education is recognized as an event of social nature. Thus, Smirnova (2011, p. 39) states that the possibilities of the toy becoming a psychological tool

are determined by the child's abilities to vitalize and animate toys and turn them into living creatures. This ability, like the ability to play, can only be communicated by an adult or older child who knows how to play and can involve the child in the game.

Along the same lines, according to Francis (2010), toys may eventually inspire and prolong certain knowledge or preferences, as well as patterns of thought and behavior, although they do not communicate them directly. Similarly, they can convey ideological or even moral speech, but not necessarily manifest a didactic purpose. Still, when there is no explicit purpose of educating, they are strictly recreational instruments. Thus, the author differentiates educational content, didactic content, and entertainment resources. For such purpose, the researcher introduces the term “didactic information” (Francis, 2010, p. 328), understood as said information explicitly intended for instructional purposes, and potentially connected to the school curriculum. Finally, continuing the vygotskian line, Veraksa (2011) argues that the patterns of perception, the way of learning, the structures of thought and the creative thinking skills are processes organized by the laws of human culture and the use of specific cultural instruments. In other words, they are mediated by culture and can, in fact, be intentionally developed through the appropriate cognitive tools.

The authors of this article then conclude that toys and other related resources are only educational under intentional mediation of a third party who fills it with meaning aimed at achieving previously established cognitive, psychological or social objectives. Without the intervention of the third party, there is only a recreational moment or, at best, an elucidation achieved by the fate of contingent paths. The authors will not demand the direct relationship with a curriculum, but the cohesive intention of educational and instructional content by a socializing and culturizing subject from the Piagetian and Vygotskian perspectives. Thus, when playing to learn, there is full awareness of the educational process that exists, although we not always learn by playing.

Gamification

Several authors tried to find and define a term to designate the activity by reflecting on the difference between playing to learn, learning by playing, and strictly recreational activities, as well as their potential use in activities far from playing fields. The term that found immediate worldwide acceptance was *Gamification*. Although a good part of the existing literature gives credit for the first meaning to Rajat Paharia in 2007, he himself

recently acknowledged that he heard the word from another colleague. Furthermore, Werbach & Hunter (2012) trace the term back to Nick Pelling, in 2003, to which it seems we have reached the end of the line. In any case, there is a general agreement to establish that this word refers to the use of inputs from the actual games in activities that are not directly related to them. This meaning was later enriched by Zichermann & Cunningham (2011), who defined it as “the use of thought and the mechanics of play in contexts that are not characteristic of it with the purpose of joining the users in solving problems”.

Along the same lines, Deterding, Dixon, Khaled & Nacke (2011) state that *Gamification* is:

The use (rather than the generalization) of elements (rather than complete sets) of design (instead of technology-based games or play-related activities) that are characteristic of play (more than playing or having fun) in foreign contexts (regardless of the specific intended use, context or means of implementation).

Now, we Spanish speakers have the challenge of finding a Latinized equivalent that not only expresses the concept behind the term, but that adjusts to our language’s own roots. We must therefore immediately discard the Castilianization of the English word, because “*gamificación*” has no linguistic or cultural basis in Spanish that alludes to the stated topic. Then, the proposal to use “*juguetización*” lacks weight when referring directly to the object of the action and not to the activity itself, as discussed above. Now, we have “*jueguificación*” and “*jueguización*” that, although are well built, are based in our Hispanic roots and come from a word that has expanded its meaning over time to several activities related to fun and leisure, dragging in their Latin root [iocus, iocari] a strong semantic link denoting joke and prank that would eventually limit the scope of the word. Finally, Latin actually offers us the root ludus, ludere, which covers the entire field of what we understand today by play, because it originally referred to public games, competition and exercise, and today also refers to “children’s play, recess, competition, liturgical and theatrical representations, and games of chance” (Huizinga, 1968, p. 60). Based on this linguistic framework, it is reasonable to assert that the adjective playful (lúdico, in Spanish) is the one that best describes everything related or pertaining to play in its broadest sense, that the verb gamify (ludificar

in Spanish) corresponds to the exercise of turning something into play or, as in this case, applying the elements of play to another activity, and that the noun *Ludificación* (gamification in Spanish) best expresses the action and effect of play, becoming thus the best translation for the term Gamification.

In its most simplistic practice, the gamifying action consists of mechanically applying the elements of play to other activities such as, for example, promoting competition between teams, awarding prizes, assigning scores or contextualizing in a symbolic framework that could even be fantasy. However, in a deeper sense, it also requires understanding the roots and the psychological, neuronal and sociological dynamics of the involved disciplines, to combine them in a balance that enhances its content and processes to be better used by the participant. To gamify, therefore, is not only making learning fun, making students jump, or lightening education, as some critics of the strategy assert. For this reason it is not said that games are designed, but that educational processes are gamified. The authors of this article believe that, this way, play and didactics are honored, as well as the toymaker and the pedagogue.

Challenge-based learning

Challenge-based learning is a methodology developed by Apple (Johnson, Smith, Smythe & Varon, 2009) that uses strategies known as problem-based learning, collaborative and cooperative learning, logical and critical thinking, among others, to promote learning initially for school-aged children, with subsequent adjustments for higher education. It basically consists of providing students with general information and concepts from which they must identify the challenges they will face as a team and formulate a way to overcome them. The use of electronic resources, ICT, the interaction with other teams, an interdisciplinary approach and the inclusion of communities are encouraged. Thus, it not only aims at stimulating social and environmental awareness, but also a proactive attitude. Parting from a general problem (for example, unemployment), the students are expected to gather information and, starting with a discussion, derive their fundamental components or questions. Once a more specific challenge has been identified, they go deeper into the data gather

additional information, now through direct action in the field and the relationship with the affected community. Combining qualitative and quantitative research tools under teacher supervision, they formulate their potential solutions. Generally speaking, it is a constructive tool because it starts from a significant learning y being located in the students' immediate reality, considering their previous knowledge and giving them the possibility to structuring those considered relevant. Similarly, it is located in the area of active learning (Huber, 2008) because it not only promotes student autonomy, moves the focus from teacher to the pupil, and has students regulate their learning speed and volume, but it also allows them to make decisions about the destination, the tools and contents they wish to work on.

This methodology, based on learning by doing, offers the advantage of promoting a professional that it critical, creative, cooperative, contextualized, and independent, among other skills. Perhaps the biggest problem lies in the difficult transition of teachers and students from a training through content, teacher-centered and focused on the accumulation of material; however, experience has shown that once they find the path, it becomes increasingly easy; additionally, its benefits for academic, professional and human training leave a lasting imprint that the accumulation model hardly manages to achieve.

It will be deduced from this point that the transition from a challenge to a game is not only smooth but almost natural. This is because the first one is located in the heart of the second, to the point that the challenge, on several occasions, is fun in itself. The mechanics of the challenge can thus be taken advantage of to suit both the educational purposes of the activity, in the manner explained, as well as the recreational purposes of play. The results of combining these two objectives would result in the gamification of an educational strategy.

Problem-oriented core: a potentially gamifying scenario

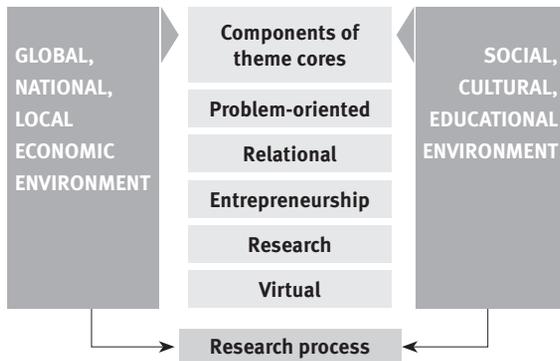
Ceipa's educational model is characterized by structural and methodological approaches, far from traditional classrooms.

The curriculum is organized in intensive two-month core blocks, for which the student has exclusive dedication. Each block is expected

to be structured methodologically from learning by doing, following the *practice-theory-practice-reflection* logic. Similarly, although they are core intensifications, these blocks must be organically linked to the rest of the curriculum and focused both on going deeper into a specific subject, and developing the human and professional skills proposed by the institution. Since the methodology is based on challenges and problems, and by the actual internal organization of the curriculum, which would elsewhere be a subject, in CEIPA it is a problem-oriented core that is defined as:

a basic and dynamic unit of analysis, planning, integration and continuous and improved construction of management knowledge, related to solving problems of the organization; and it is additionally the coordination of knowledge to give integrated solutions to social and business problems from different perspectives. [...] The thematic and problem-oriented core in CEIPA is a methodological option that is an alternative to a subject-based curriculum, it is planned and developed within the framework of the socioeconomic reality of the professional field and has the following components: thematic, problem-oriented, relational, entrepreneurship, research and virtual (CEIPA, 2011, p. 23).

FIGURE 1. Problem-oriented core components



Source: *Modelo pedagógico* (CEIPA, 2011, p. 24)

Thus, it parts from a challenging situation that must be solved through the collection, application and transformation of interdisciplinary knowledge. This situation is therefore called problem-oriented, characterized by being a trigger of concerns, pedagogically created or selected and contextualized based on a reality, presented in technical language. The problem-based core must:

- *Be rigorous*: although it parts form the business reality, its contents must be presented with scientific or disciplinary rigor.
 - *Relate discipline(s) with professional reality*, based on business situations that require intervention.
 - *Be contextualized* (time, space), so it must be current and reflect the actual situations that may arise in organizations in which the future graduates could work.
 - *It must describe the situation with a captivating narrative*.
 - *Be specific* (according to the degree-public): the problem-based core must reflect an understandable situation from a business perspective, refer to dynamics that can be intervened from the administration or management of the organizations; its structure and content must highlight specific challenges that deserve administrative intervention based on the mastery of certain professional performance skills.
6. *Direct concerns*: the didactic form of problem-based core and its narrative must involve concerns, problems, questions that account for the challenges ahead and for which certain predetermined training is required.

In addition to these indispensable conditions, the team that designs a problem-oriented core can unleash their creativity by choosing and defining both the format (video, case study, project, etc.) and the literary resources (tone and style) that the problem-based core will have. Similarly, a problem-based core can be enriched with teaching aids, tables, conceptual maps, visual aids and other resources that can make its presentation be clearer and more attractive.

As you can see, in the spirit of the problem-oriented core lies a gamifying intention.

Three gamification experiences within problem-oriented cores

Math Simulator

Simulators are mechanical or computer devices intended to reproduce a system, so that the

apprentice becomes subject to feelings, situations and experiences they will find in their professional practice. Once the core skills to perform the desired action have been mastered, the student is not only expected to have the knowledge, but the confidence to do their work in a real environment.

This computer simulator's main scenario is a company that collects, pulps, roasts, packages and distributes Colombian coffee, so that, based on a series of sub-scenarios, students use the concepts and the math and thinking skills they need to solve the different challenges that the program is presenting.

A story was developed from the previous scenario, which presents the participant with a number of challenges and problems that force him to bring both their math skills and their skills of deduction, reasoning, decision-making and ethical values.

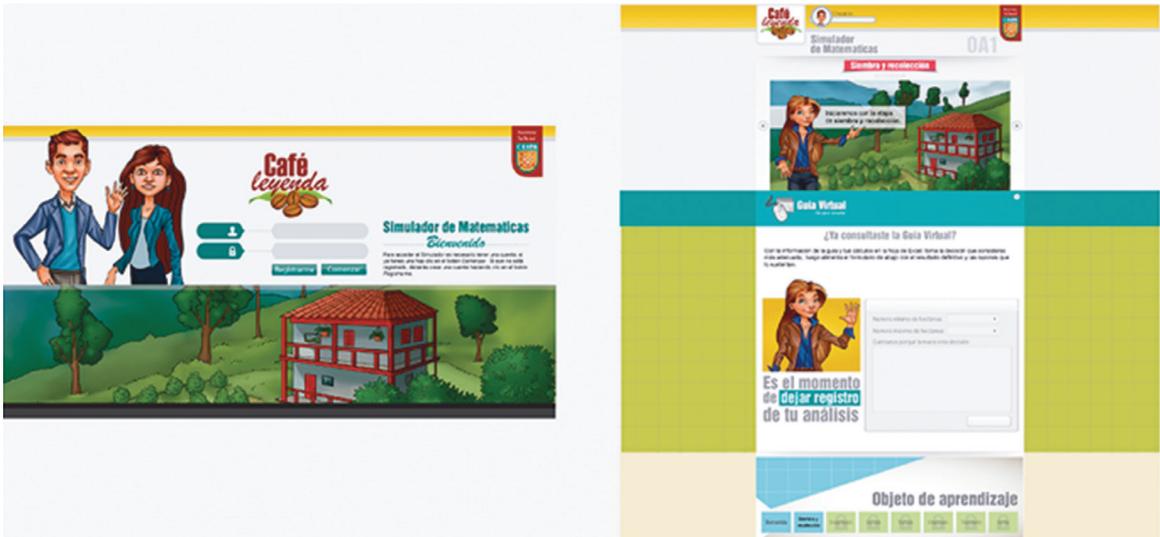
“Ideaventura” Mission

Ideaventura mission is a gamification strategy that immerses players in a deliberate metaphor for the appropriation of concepts and methodologies, using play mechanics in order to enhance motivation, concentration, effort, loyalty and other positive values that are common to all games to encourage the culture of innovation.

From this perspective, Ideaventura is an *educational aid* that gamifies the ideation process in order to provide participants with an understanding of the process that leads to the capture of opportunities and the generation of ideas, which will then be the raw materials for innovation and entrepreneurship.

Ideaventura aims at putting the participant in a situation that allows appropriating some fundamental concepts and practices in the ideation

IMAGE 1. Math simulator screenshots



Source: personally created.

IMAGE 2. Board, pieces and application of “Ideaventura” Mission.



Source: authors' design and photos.

process, so they can apply and expand them in their project or company creation process. Due to the nature of the mission, it is very useful to develop the skills of innovation and creativity.

This purpose is achieved by a board game whose symbolic framework is a space travel take innovative ideas to other planets that have been colonized by Earthlings. For this purpose, during their journey the participants must pass the steps of ideation and overcome their difficulties and impediments until they conclude with the formulation of an innovative idea.

Together

It is a multi-platform mobile application, whose function is to stimulate collaboratively knowledge among participants.

The game consists of a series of questions, either multiple choice, hanged man style, or True or False. The participant earns points with the correct answer. The questions are categorized, and a certain number of questions is formulated per category. As participants progress, they are given one of five possible levels: apprentice, junior, master, senior, organizational guru. Perk is granted as a further bonus, which is accessed only by collecting unlimited flags.

If they do not know the answer to a questions, they can ask for help (red flag). For each

group of questions (example 5), the player is entitled to request for help to someone in the group. If the person who is asked to help answer well, they get the flag and the one who is asking gets a point. Otherwise, no points are lost, but the one who is asking does lose the flag for that group of questions. To move from one level to another it is required to have helped other teammates, accumulating red flags; for example: 1 for the first level; 2 for the second; etc. To earn the last 5 points before reaching the maximum, 5 flags are required. The ultimate goal is to have the entire organization reach the guru level.

Play is accompanied by informative and motivational electronic messages to keep the player hooked by updating their and the organization's level, positive messages, and a message at the end of the game with their and the group's final positions, as well as a motivation to be better in the next game.

Conclusions

Play has an important cultural and psychological role, particularly in the educational world, which benefits both children and adults, which is why it is a vital training tool at any level and in multiple scenarios, as in the labor environment.

IMAGE 3. "Together" application screenshots



Source: personally created.

It is important to differentiate between play with educational purposes and gamification of educational processes. Although related, the first one draws lessons from the act of playing; the second uses its own selected components of the games to facilitate learning.

For etymological and technical reasons, the term “Ludificación” was used and proposed as the most appropriate translation to the original word in English *Gamification*.

In both cases (in play and the gamification of education processes) the compliance with the pedagogical purpose can only be guaranteed when there is a clear pedagogical intention leading to a methodology that concretizes the objective; otherwise there is danger that the activity could get diluted into an act of strict fun.

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