

The Playful Strategies and Their Contribution to Generation of New Knowledge in University Students

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Abstract---

The objective of the research is to carry out a characterization of the playful strategies that can be used to generate new knowledge in university students. The Desk Research methodology was used, under which a review was carried out on studies referring to the aspects that can promote the generation of knowledge, as well as the identification of characteristics present in play strategies, which can facilitate the development of capacities. cognitive and thought styles in university students. It was obtained as a result that the application of playful strategies is adequate for developing research skills and abilities in university students, due to the training generated in the repetition of activities related to their future professional practice, in a motivating environment and low stress.

Keywords---*game, thinking style, university gamification, cognitive abilities.*

Introduction

The cognitive function evolves as the individual is exposed to certain circumstances or conditions (exposure to the world), promoting a process where different levels of abstraction and consciousness are generated, which increase with experience and time, in which the processing of the available information and the solution of problems using the previous knowledge are involved (previous cognitive achievements). These continuous operating patterns of thought condition cognitive function, which in turn is influenced by the style of thought: inductive-concrete, deductive-abstract and experiential intuitive (Sternberg, 1999).

The styles of thoughts are intended to account for cognitive aspects, but also for the learning activities of each individual (Valadez, 2009), so the methods to organize cognition or ways of thinking used by each individual, are those that allow To solve a problem in a specific context or task, the style of thinking is not permanent in time, so the individual can make change throughout his life, being an element that stimulates change, experiences it resulting from the need for research, in which the generation of new knowledge allows people to move between things and experiences that move their ideas (Padrón, 2008; Padrón & Camacho, 2000).

The generation of knowledge, part of a set of characteristics, which have been defined, and which should be considered each as complementary, which include: a) measuring, counting or carrying out experiments, b) establishing the probability of occurrence or non-occurrence of events or characteristics based on statistical techniques, c) delimiting a topic and carrying out field work, d) studying facts that can be measurable or observable, e) conclusively explaining a problem without exhausting all study possibilities, f) the theorization developed under logical rules, the contents of which are evaluable and criticizable, g) the consideration of multiple approaches to the development scheme, as well as the work of communication of results, among other aspects (Moretta, 2018).

Due to the set of characteristics that must be gathered for the act of researching or for the generation of new knowledge, it is very useful to identify teaching-learning strategies that allow the development of cognitive abilities in students at the university level, and that also support to facilitate the flexibility in their styles of thoughts (Cicutti et al., 2019; Torres, 2019). Among the sets of teaching-learning strategies, which can be directed to the end described above, are playful strategies, which use play as a mobilizing instrument, providing participants with an inspiring environment for scientific production (David, Blasco, Machado, & Conde, 2006; El Motabit, 2020).

Playful strategies are characterized by guiding students to exploration and research around objectives, themes and content, making use of different resources such as: images, music, colors, movements, sounds, among others, while creating a favorable space, so that the student feels interested and motivated by what they learn (García, 2004). These strategies allow creating spaces, in which collaborative learning is a fundamental element (Pérez, Rodríguez, Rodríguez, & Villacreses, 2020), and in which the contents are consistently related and the student acts as a builder of new knowledge to build on previous knowledge (Pérez, Rodríguez, Vázquez, & Bowen, 2020).

The recreational strategy in the teaching-learning processes began to be incorporated at the beginning of the 20th century, based on the contributions indicated by Jean Piaget (1978), who stated that recreational activities are fundamental for the acquisition of language and the development of creativity, as well as, for the creation of new knowledge and levels of understanding, if these are related to their environment and / or experience (Piaget, 1978), likewise Lev Vygotsky, stated that it was through play that the individual forgot his environment and gets involved in the roles, assuming the development of the role as his main task (Vygotsky, 1979), a well-known statement by George Bernard (Hernández, 2015), indicates that 20% of what we hear is learned, 50% of what we observe and 80% of what we do, so it is possible to predict that the greatest knowledge will be generated in the individual from activities where they perform (play) an active role, allowing these dynamics to e students are able to carry out the different stages included in the generation of knowledge: descriptive, explanatory, contrastive or applicative that merits scientific research processes (Padrón & Camacho, 2000).

Some of the playful strategies are implemented from initial education where teachers use these techniques to get to know the emotional state of the students. There is experience of musical techniques that integrate children in the learning process (Mero-Alcivar, Zambrano-Santos, & Rodriguez-Gamez, 2020).

The application of playful strategies must be carried out with some considerations, based on the criterion of the presentation of the game method, because when it is applied to adults, they usually present rejections on some occasions, since these types of activities are usually stereotyped, such as experience for training exclusively at an early age, used for childhood or college education. For what is relevant, explain to the university student how through the repeated practice of recreational activities related to their future professional work, it is possible to develop skills and abilities that facilitate the performance of research activities, in a harmonious environment and with less stress (Sánchez, 2007).

It is useful to have an analysis of how playful strategies contribute to the creation of new knowledge and what are the advantages of this teaching-learning strategy for university students. Therefore, this research aims to characterize the playful strategies that can be used to generate new knowledge in university students.

Materials and Methods

From the defined objective, we proceeded to assess the type of research to be developed, which focused on the Desk Research methodology (Nazarko & Kuźmicz, 2017), and a review was

carried out on studies on the elements and dynamics that promote the generation of knowledge and the experiences of applying playful strategies, to encourage the development of cognitive abilities and styles of thinking in university students, later an analysis was carried out that allowed to draw valid conclusions regarding the characterization of playful strategies that can be used for this purpose.

This research was based on evidence, in the field of recreational pedagogical strategies of application in university students (Méndez & Monzón, 2019; Rodríguez Ávalos, 2019), aimed at promoting the creation of new knowledge at the university level. This technique includes a series of steps among them: a) planning the criteria for inclusion, extraction and synthesis of found documents, b) search using as criteria the keywords defined in the research, c) preliminary selection of suitable articles, d) evaluation of the quality of the article according to the context and search criteria (mainly last 5 years, languages, publication bases, among others), extraction of synthesis of the most relevant data, e) analysis of the different criteria and experiences found, for the elaboration of the conclusions. This procedure is systematized is presented in figure 1.

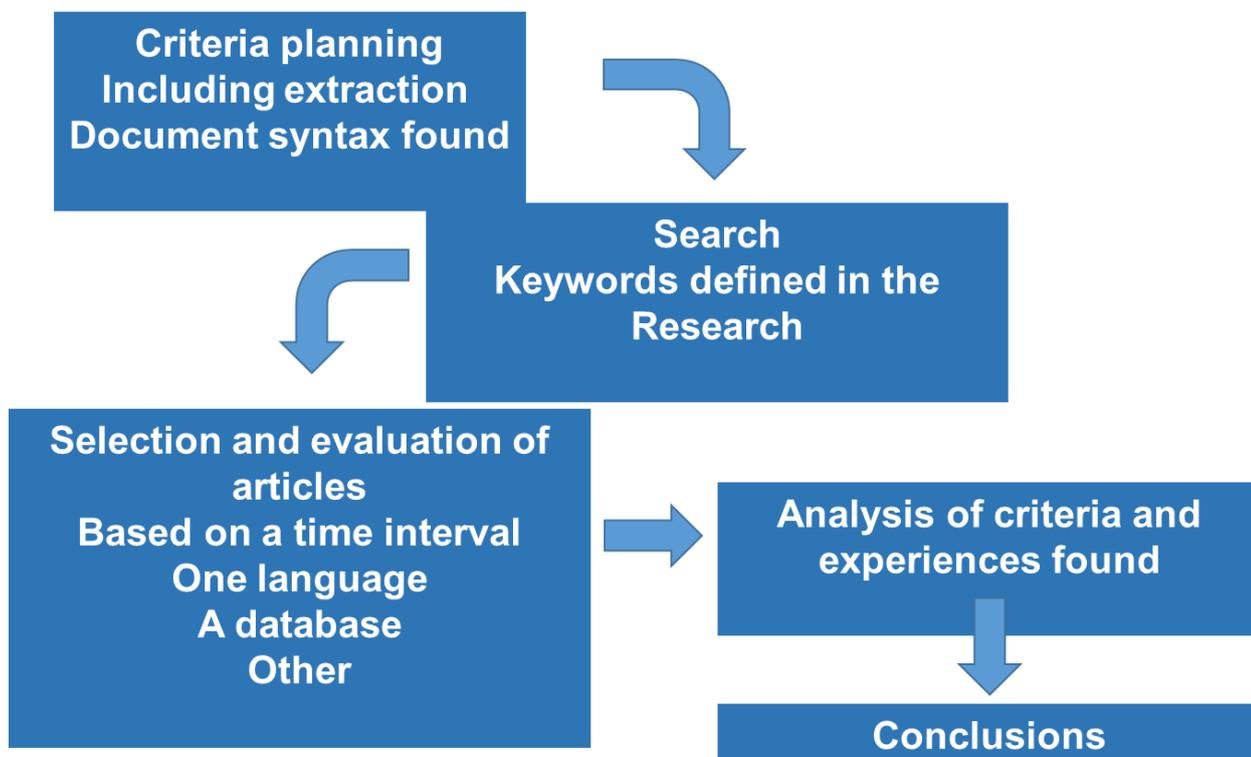


Figure 1. Steps for applying the Desh Research methodology

This type of selected research technique allows creating knowledge, based on publications made in primary and secondary studies (Revelo-Sánchez, Collazos-Ordóñez, & Jiménez-Toledo, 2018).

Analysis and Discussion of Results

The results found in this research are the results of the stated objectives, which are based on characterizing the recreational strategies that can be used to generate new knowledge in university students. A review of different databases was carried out, among which were considered: Redalyc, ScienceDirect (Scopus), Google Scholar, showing the number of publications arising from the topic, from 2010 to 2019, as shown in Figure 2.

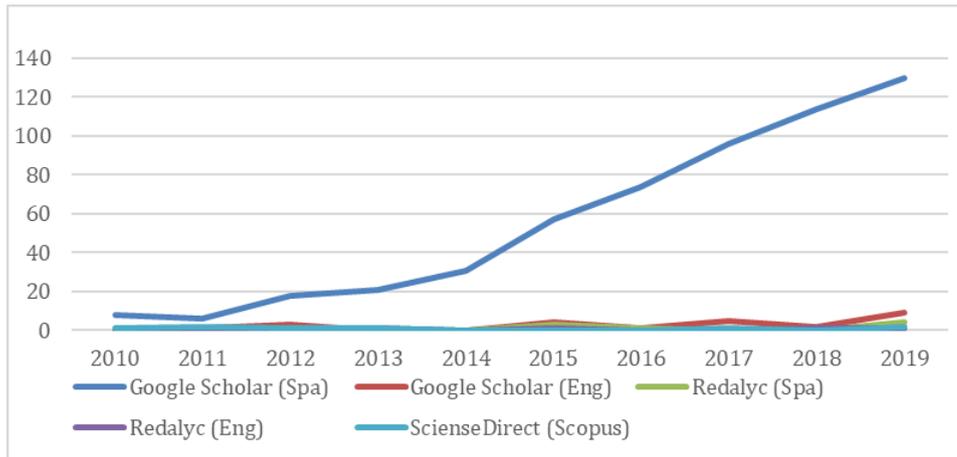


Figure 2. Publications found with the term "University play strategies".

Figure 2 shows an increase in the number of articles published with reference to the term "University play strategies", in regional and global databases, an increase in publications on this topic is evident, from the year 2011, In Google Scholar, it presents a growing trend, which shows an interest of researchers in recent years.

Currently, due to the development that information and communication technologies (ICT) and social networks have undergone, recreational activities are part of common day-to-day activities. The gamification in teaching understood as techniques and elements of games used in activities other than gaming has shown important other advantages, for its use for the training of personnel, in the field of marketing and sales, and has also proven to be an excellent strategy of motivation in educational environments, allowing students constant feedback, a generation of autonomous learners and a greater link between students and content (Calle, León, & Andrade, 2016).

In teaching-learning processes, through playful activities, it is possible to generate positive effects on students, since these are aimed at promoting two basic principles in scientific research: exploration and inquiry, in addition to other necessary aspects to be developed in students, for the generation of knowledge, such as: the need for validation and verification of scientific proposals, systematization, contrasting theory and practice, relationship between the concrete and the abstract, cognitive independence, the strength of the knowledge provided, among other relevant aspects to consider (Stöcker, 1964). The aspects that interact in play activities have been outlined as shown in figure 3, which represents the interrelation of the elements of strategy, technology and content.

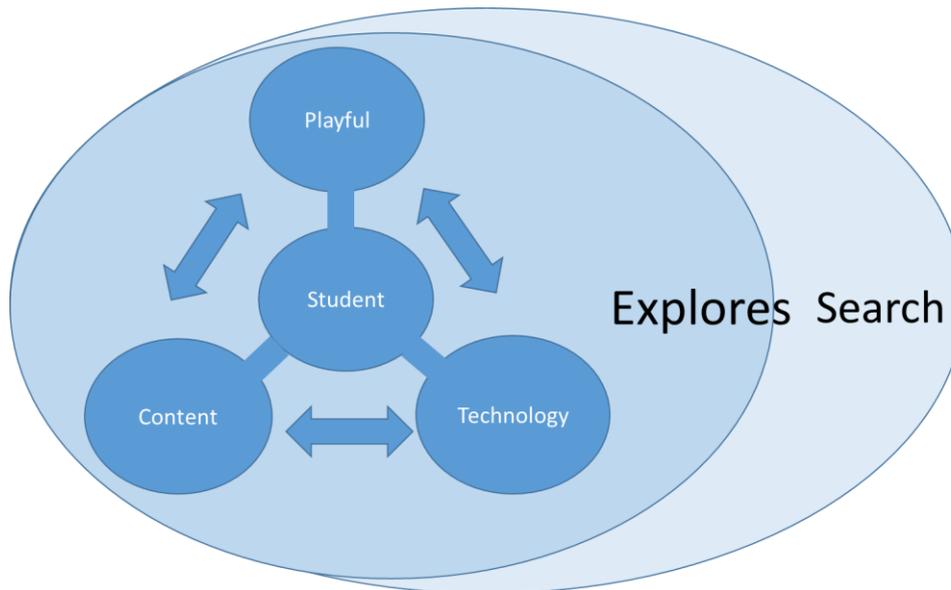


Figure 3. Interaction of learning elements with play strategies in activities of scientific research

The recreational activities used in the teaching-learning process give a different vision to the traditional teaching process, which is conceived as a rigid process where knowledge starts from a teacher, while in play strategies they are able to involve the students, in an interaction with the contents of the subject or task in particular to investigate, and technology, under a flexible, pleasant environment and even at times it is no longer perceived as a learning activity of the subject, due to the sensation that gives the student having more freedom and space for participation in their app endizaje (Square, 2019).

Among the advantages of teaching ludification, is the intrinsic motivation that is generated towards the contents of the subject and towards the learning process itself, the extrinsic motivation achieved despite the fact that the student initially shows little interest in the contents of the subject, but who finds that participating in the activity is retarding and for him, and permeates the content to achieve the desired end, both aspects facilitate meaningful learning and retention of the content, to allow for their participation Students, development of logical and creative thinking, stimulates collaborative work, and allows creative response to problems (Calle et al., 2016).

The lúdification applied to teaching, considers a design and a systematized process for its development, in order that it can meet its objectives, for this, 6 main objectives to be covered have been proposed, which are the following: a) definition of the objective of play and its pedagogical scope, b) simulation, in which the rules of the game and parameters for its replicability are established, c) definition of the interaction in the simulation, d) methodological route of problems and solutions (progression), e) decoration, made up of attractive elements for the players, among them can be considered multimedia objects, and enriching aspects of the experience, f) conditions of use and the rules that allow the learning objectives to be met (Lozada-Ávila & Betancur-Gómez, 2017). This proposed procedure for the design of the activities to be gamified has been represented in Figure 4.

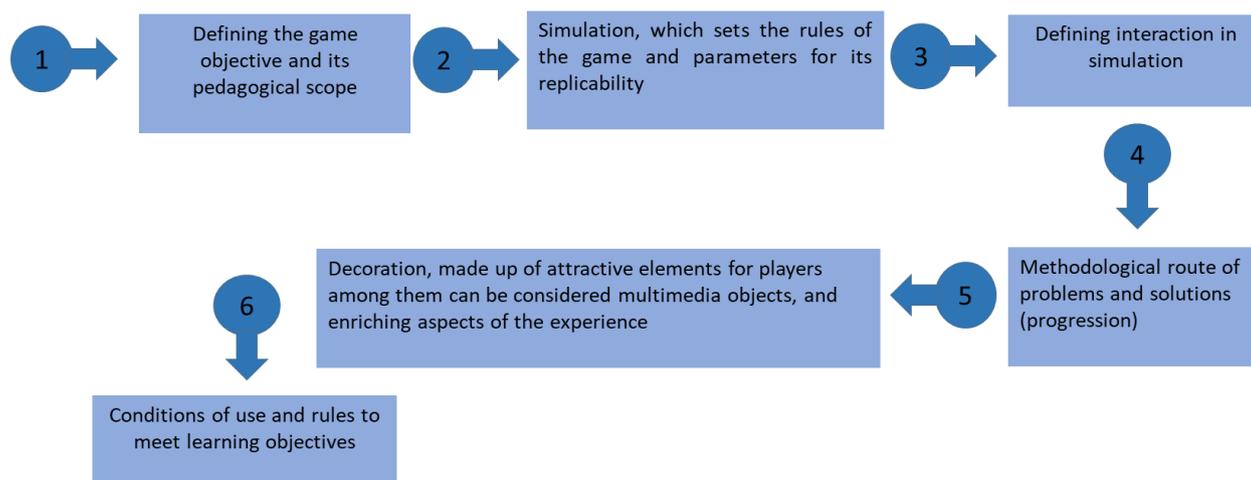


Figure 4. Procedure for carrying out the design of recreational activities
 Source: (Lozada-Avila & Betancur-Gomez, 2017)

The recreational activity applied to the area of science and the creation of new knowledge, has a particular characteristic, if it is seen as the role of the researcher, and is part of the teaching that students-apprentices will understand, in the area of research and generation of new knowledge, the game It never ends, and it is the critical spirit of the players, who make it advance, in their critical judgments of conceptual aspects, and in the hiring of reality, with the models to be represented, as a sequence of games, where each time they are closer to the truth. So this is the vision to be transmitted to those young people, who are starting out in the field of research, it is a significant contribution to make them understand that the game of science requires the acceptance of criticism from other players and even from his self-criticism on a path whose prize is summarized in a closer approach to the truth (Ballesteros, 2011).

This dynamic of iteration for the search for a new method of knowledge and approach to science and therefore to the truth, must be present not only in students, but also in teachers for the adoption of new motivational strategies. Among the teaching experiences found in which the application of playful strategies that have allowed the development of knowledge in the university environment, among them, those that have been directed to critical thinking, computational thinking, lateral thinking and others, to achieve solving problems posed and finally for the creation of new knowledge.

In studies carried out on the application of playful strategies in the university field, its application in students of the first semesters stands out, more specifically in the area of mathematics. Mathematics is a fundamental part of the early stages of a large number of careers, such as: Sciences, Engineering, Architecture, among others. The studies maintain that these courses, in general terms, do not present adequate levels of performance by the students, in addition to detecting methodological didactics developed by the teachers, which generate disinterest and rejection (De Rincón, 2005).

In Case 1: At the Simón Bolívar University (Venezuela), a study was carried out on students from the first trimesters of the University Initiation Cycle, in which play strategies were planned and executed, in a group of them (experimental group), maintaining to the rest as control groups, the ratings were on the scale of 1 to 5, obtaining the results presented in Table 1.

Table 1. Distribution of the final Ratings

Groups	Number	Frequency of ratings and percentage			
		1 (%)	2 (%)	3 (%)	4 (%)

Control	65	11 (16.9)	21 (32.3)	30 (46.2)	3 (4.6)
Experimental	62	1 (1.5)	19 (29.2)	35 (53, 8)	7 (4.6)

The results show how the students who carried out the playful strategies obtained better performance, both in the grades and the number of passers. Furthermore, during the process, better levels of socialization by sharing and team cooperation were evidenced, reinforcing significant learning was also evident, motivational improvement, and a change in attitude towards mathematics (De Rincón, 2005).

Case 2: At the Technical University of Manabí (Ecuador), as a final activity of the courses, in the subjects of Physics, Microcontrollers and Computer Aided Design (CAD), which consisted of competencies on “Creation and Designs of Robots ”, the tournament's objectives were established, and the pedagogical scope, fundamentally focused on motivation, cooperativism and organization, followed by the establishment of regulations and rules, the calendar. Different modalities and the corresponding award were defined.

Students organized themselves into teams and made their designs, which showed the learning and handling of techniques specific to the area of robotics, and then built their prototypes, all with the advice of a teacher in the area. The event was carried out as planned, participation was important, including other students from other courses as observers, as shown in figure 4, observations were made throughout the activity, evidencing a high degree of motivation, the climate It was for group integration and mutual help, including assistance between members of different teams. Once the activity was over, proposals were made for the creation of the robotics club.



Figure 5. Robot Creation and Design Competition at the Technical University of Manabí.

These described experiences and together with other equally significant ones, implemented in different universities around the world, have shown that the motivating elements of play strategies are aspects that must be taken into account, to increase performance and learning in different subjects, but particularly those aimed at science and the creation of new knowledge.

Conclusion

Scientific research is, in itself, one of the recreational activities that, carried out, generates in humans a satisfaction inherent in approaching the truth and discovering new knowledge, in a continuous cycle that must contemplate self-criticism and criticism. , to continue in his process of successive approach to the truth. The recent incorporation of this strategy in the university

environment, to support motivation in the teaching-learning process in subjects associated with science and the learning of scientific research techniques, has made it possible to verify its valuable usefulness for the training of young people. university students.

The application of recreational strategies should be carried out with considering the need to explain to university students, how through the repeated practice of recreational activities designed from content related to their future professional practice, they can manage to develop their skills and abilities for research and creating new knowledge, in a harmonious, flexible and low-stress environment.

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