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## Development and validation of an instrument for evaluating the ludicity of games in health education

Desenvolvimento e validação de instrumento para avaliar a ludicidade de jogos em saúde  
Desarrollo y validación de instrumento para evaluar la ludicidad de juegos en salud

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### ABSTRACT

**Objective:** Developing and validating an instrument to evaluate the playfulness of games in health education contexts. **Methodology:** A methodological, exploratory and descriptive research, developed in two stages: 1. Application of an open questionnaire to 50 graduate students, with content analysis of the answers and calculation of Kappa coefficient for defining items; 2. Procedures for construction of scales, with content validation by judges and analysis of the consensus estimate by *Content Validity Index* (CVI). **Results:** 53 items regarding the restless character of the games in the dimensions of playfulness, the formative components of learning and the profiles of the players. **Conclusion:** Ludicity can be assessed by validated items related to the degree of involvement, immersion and reinvention of the subjects in the game along with the dynamics and playability of the game.

### DESCRIPTORS

Health Education; Play and Playthings; Education, Higher; Creativity; Personal Autonomy; Validation Studies.

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## INTRODUCTION

Knowledge on the interface of recreational activities with education in health often reports using games as a tool for learning. A literature review on this subject highlights the importance of games for clinical, investigative or educational activities<sup>(1-4)</sup>. International studies show different approaches for games in health<sup>(1-8)</sup>: a- ludic activities promoting healthy lifestyles; b- risks of suffocation and similar games; c- damage caused by video game addiction; d- the importance of games for scientific thinking; e- games in the training of health professionals; f- *exergames* (physical exercises motivated by computer games) for health promotion; among others. Specialized journals have multiplied, developing a corpus of its own knowledge known as *Serious Games*, which synthesize the understanding of entertaining characteristics into the production of *edutainment*<sup>(5-8)</sup>.

Much has been investigated about the contribution of games towards disease prevention, behavioral changes or educational processes in health. A certain imprecision in results can be noticed in these investigations, explicating limitations or instigating recommendations, thereby impeding generalizations. In an extended analysis of this scenario, it is argued that the hermeneutic irreverence of recreational activities, such as the human spirit, resists to be restricted to utilitarian purposes, whatever they may be<sup>(9)</sup>. In other words, despite the importance of investing in games for the demands of health, it is argued that this form of dialogue about ludic activity restricted to behavioral purposes inhibits its creative, inventive and autonomous driving force<sup>(9-11)</sup>.

In the dialogue of games and education, it is necessary to maintain the restless spirit of play if one wants to release the creative impulse that shapes human autonomy. Ludic activity is a cultural trait inherent to subjectivity; therefore it is to remain free of capitalist purposes if critical reflection is to be prioritized. The ludic element is moved by inventiveness, fantasy and the reinvention of reality. When recreational activities meet a conducive learning environment, it is worth asking to what extent the disciplinary power of the technique, characteristic of educational processes in health, limits the irreverence and spontaneity of the game. In other words, the more the game/activity and its playfulness remain, the more we move toward the dimension of training, the center of critical education<sup>(9-14)</sup>.

Thus, it is necessary to examine the issues occasioned by games in healthcare from a different angle, as it is still poorly discussed in scientific publications on the subject<sup>(1-8)</sup>. Instead of investigating whether playing contributes to the purposes of education and health, it must be asked what happens to the inventive character of the game when they are set in different contexts of spontaneity, imagination and rebelliousness that characterize them. By reversing the question, we seek to identify the exercise of creativity and autonomy for subjects of knowledge in the restlessness of the game<sup>(13-14)</sup>.

There are few instruments which evaluate the playfulness of games in educational settings, given the multitude

of studies that are directed to behavioral or clinical purposes<sup>(1-8)</sup>. In general, the methodologies used for game development are based in interaction design and computer science<sup>(15-16)</sup>. Thus, this study aimed to develop and validate an instrument to evaluate the playfulness of games in health education contexts, based on the investigative analysis of a board game aimed at training health professionals of the SUS (National Brazilian Healthcare System).

## METHOD

This is a methodological, exploratory and descriptive research for validating the content of items in a questionnaire about the playfulness of health education games, based on the investigative analysis of a board game focused on training health professionals of the SUS. The methodological character is justified since it describes the validation steps of a research instrument and its exploratory aspect, and there is a lack of studies on the topic<sup>(17-18)</sup>.

### PHASE 1 – CLOSING OF ITEMS AND INTER-RATER RELIABILITY BY KAPPA COEFFICIENT

Initially, an open questionnaire was applied to 50 graduates. The answers were subjected to content analysis. Next, the questions were defined from the Kappa Inter-rater Reliability Test for the inclusion of items<sup>(17-20)</sup>.

This phase took place in the Faculdade de Ciências da Saúde at the Universidade de Brasília (UNB). The subjects were all 50 students enrolled in the Public Health Policy Management course in (Gestão de Políticas Públicas de Saúde – GPS), offered in two consecutive semesters by the Nursing Department of UNB, who agreed to participate in a game of “*Banfisa*” (Banco Fim-Saúde), which involves the construction and financing of SUS healthcare networks<sup>(21)</sup>. These students were chosen due to the adequacy of the educational context of the course which discusses SUS management and financing, thereby being in consensus with the themes of the *Banfisa* game. Therefore, the choice of subjects in an environment that favors dialogue of ludic activities within an education context was prioritized, being necessary to research the items being validated.

An open questionnaire that had been developed in previous studies was used, with the dimensions and variables being<sup>(14)</sup>: a) the profile of players (gender, education, age, occupation, affinity for board games, study habits); b) training components of learning (learning by association, perception of learning, self-assessment, understanding concepts, interaction and group discussion/active participation); c) emotions and attitudes during the game (willingness and satisfaction of achievement, motivation to study, ambiguity in feelings of pleasure and tension in the game, disinterest/willingness to abandon the game, concern/frustration); d) tactics of the game (understanding of the rules, quality of the cards, clarity of the board, reinventing the game).

Data collection occurred in the classroom of the GPS class, between November 2012 and June 2013. Students

were asked to play *Banfisa* and, soon after playing they answered the aforementioned questionnaire containing 12 open items. The average answering time was 15 minutes. The 50 responses were transcribed and organized by items. Next, a floating evaluation of the material was conducted, defining a matrix for content analysis according to the columns<sup>(17-18)</sup>: a- dimensions (playfulness; training components of learning, profiles of the players); b- categories (variables of the previously referred to dimensions); c- empirical subcategories (extracted from the content analysis of responses from the open questionnaire); d- number of responses that confirm the subcategory (unit of analysis that ratifies the subcategory).

The content analysis was done by two researchers of educational technologies for health. The responses were grouped according to their empirical subcategory, following the criteria of a single rating response, followed by the simple frequencies of these units of analysis. The consensus estimate was calculated by the Kappa coefficient, estimating the percentage of inter-observer agreement beyond what would be expected solely by chance<sup>(20)</sup>. This measure has one as a maximum value and values close to or below zero (no agreement or as expected by chance). For inclusion of the item, an agreement above 0.60 ( $p < 0.005$ ) was considered substantial<sup>(17-20)</sup>.

## PHASE 2 - CONSTRUCTION AND CONTENT VALIDITY OF THE ITEMS

For the construction and content validity of items, the procedures of scale construction were used with a focus on the theoretical pole, which addresses the underlying theory of the research<sup>(22)</sup>. The items from Step 1 with a Kappa higher than 0.60 were included for constructing the items. The items were reviewed in light of the concepts:

a- Playfulness/Ludic character: free expression inherent to the game, constitutive of human culture. It is characterized by irreverence, imagination, being external to everyday life, being not-for-profit and immersing the players in the game. The playing occurs in boundaries of space and time, according to certain rules accepted among participants in an enthusiastic, festive or sacred environment in the midst of tension and pleasure, ambiguously. Characteristics inherent to the game are repetition, situation of choosing, proper language and transience between seriousness and triviality;

b- Formative Learning Components: aspects of learning centered on the subjects of knowledge which are capable of their own projects. The necessary attributes for transforming education and other social relations in a given training context, based on the characteristics of autonomy, creativity, capacity to elaborate, and critical reflection on the reality of those who learn;

c- Profile of players: specificities of the players such as their study habits and the degree of affinity for games in general. It includes identifying variables as gender, age, education and occupation.

The validation of item content to verify the degree to which each element of an instrument is representative of a theoretical concept was performed by a judges'

analysis<sup>(23-24)</sup>. The judges were specialized professors and researchers from public universities with production in the area of education on health. The analysis was done through an electronic form constructed in Google docs containing the described concepts, followed by the related items. The questionnaire was sent to 14 experts, and 10 were returned completed. Each item was assessed on a four point scale, according to relevance criteria (importance, correspondence) and clarity (unambiguous meaning, objective) with respect to the concept of the item<sup>(22-23)</sup>.

For data analysis, *Content Validity Index* (CVI) and *Reliability Index* or *Inter-rater Agreement* (IRA) were used. CVI assesses the content of the items (CVIA - *Content Validity Index* Applied to each item) and of the instrument (CVI) in relation to the representability of the measurement and it is considered valid with an agreement above 0.80. IRA evaluates the extent to which judges are reliable in rating the items (above 0.80 of agreement on the total dimension). To overcome the limitation of the CVI which does not include agreements by chance, the following literature recommendations were followed<sup>(23-24)</sup>: a- number of judges between 8 and 12; b- CVI of the item higher than 0.78; c- calculating IRA. The criteria for the final review were<sup>(22)</sup>: a- CVI of the item; b- redundancy; c- balance between positive and negative statements in each dimension; d- frequency of spontaneous responses to the open-ended questionnaire (Phase 1); e- coherence between the item and the theories that the playfulness of games are based on in the literature.

The study was approved by the Ethics Committees of the UNB Faculdade de Ciências da Saúde (number 322.709/13) of the Research and Education Foundation of the Federal District (Fepecs-SES-DF N193/11) and integrates the research project "Violets game: ludic and educational technology in confronting violence against women" financed by CNPq (process number 405302/2012-6).

## RESULTS

### CONSTRUCTION OF ITEMS BASED ON RESPONSES OF THE OPEN-ENDED QUESTIONNAIRE

Among the respondents of the open questionnaire, women ( $n=45$ ; 90%) were more frequent than men ( $n=5$ ; 10%). Most were young, aged between 18 and 22 years of age ( $n=45$ ; 90%) and with just a few being older than 23 ( $n=4$ , 10%). All subjects were undergraduates in health, some had already completed a technical course ( $n=2$ ; 4%), and others were post-graduates ( $n=4$ , 8%). From the content analysis of the open answers, 44 empirical subcategories were defined that reported possible items for the instrument on the playfulness of games for health education. Regarding the consensus estimate of empirical subcategories extracted from the content analysis (Table 1), almost all obtained Kappa above 0.60, with the exception of the self-assessment ( $k=0.485$ ;  $p < 0.001$ ).

**Table 1** – Frequency and Kappa concordance of the open-ended questionnaire responses to define the items on the playfulness of games – Brasília, DF, Brazil, 2014.

Dimensions	Categories (variables)	Subcategories (possible items)	N (%)	Kappa	p-value
LUDIC CHARACTERISTIC	Reinventing the game	The rules were reinvented during the game	34 (68)	1.0	< 0.001
		We followed the rules completely	13 (26)		
		Blank/no answer	3 (6)		
		Subtotal	50 (100)	1	< 0.001
	Degree of involvement and immersion in the game	Willingness to win the game	40 (80)	0.935	< 0.001
		Willingness to abandon the game	4 (8)	1.0	
		Willingness to win and abandon the game	4 (8)	1.0	
		Blank/no answer	2 (4)	0.658	
		Subtotal	50 (100)	1	< 0.001
	Cooperation among the players	I remembered to cooperate with other players	24 (48)	1.0	< 0.001
		I did not remember to cooperate with other players	14 (28)	1.0	
		I only helped my partner	4 (8)	0.79	
		Blank/no answer	8 (16)	0.922	
		Subtotal	50 (100)	1	< 0.001
	Understanding the Rules	Clear and objective	19 (38)	0.956	< 0.001
		Difficult/confusing	19 (38)	0.917	
		Average understanding	10 (20)	0.752	
		Blank/no answer	2 (4)	0.38	
		Subtotal	50 (100)	0.853	< 0.001
	Quality of the Cards	Difficult/Specific	22 (44)	0.757	< 0.001
		Easy/Well-designed	12 (24)	0.783	
		Relatively hard	8 (16)	0.731	
		Blank/no answer	8 (16)	0.672	
		Subtotal	50 (100)	0.743	< 0.001
	Game dynamics	The game is good/fun	45 (90)	0.847	< 0.001
		The game is competitive	1 (2)	1.0	
		Blank/no answer	4 (8)	0.791	
		Subtotal	50 (100)	0.849	< 0.001
TRAINING LEARNING COMPONENTS	Learning perception	The game helped my learning	39 (78)	1	< 0.001
		The game was indifferent to my learning	5 (10)	0.898	
		The game hindered my learning	3 (6)	1	
		Subtotal	50 (100)	0.946	
	Reasons favorable or unfavorable to learning	Understanding of concepts/content	13 (26)	0.662	< 0.001
		Active participation	9 (18)	1.0	
		I made associations during the game	8 (16)	0.669	
		It helped and hindered learning	6 (12)	1.0	
		I thought the cards were difficult	5 (10)	0.728	
		Did not help my learning	4 (8)	1.0	
		It was indifferent to learning	2 (4)	1.0	
		Self-assessment	1 (2)	0.485	
		Blank/no answer	2 (4)	0.658	
		Subtotal	50 (100)	0.809	< 0.001

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Dimensions	Categories (variables)	Subcategories (possible items)	N (%)	Kappa	p-value
TRAINING LEARNING COMPONENTS	Feelings and thoughts during the game	Fun and relaxing	24 (48)	0.879	< 0.001
		Ambiguity between tension and pleasure	7 (14)	1.0	
		I reflected on life’s challenges	6 (12)	0.834	
		I felt incapable	5 (10)	1.0	
		Boredom/without emotion	3 (6)	1.0	
		I was lost/confused	2 (4)	1.0	
		I felt anxiety and tension	1 (2)	1.0	
		Motivation to study	1 (2)	1.0	
		Blank/no answer	1 (10)	0.79	
	Subtotal	50 (100)	0.919	< 0.001	
PROFILE OF THE PLAYERS	Study and Learning Habits (I learn better when ...)	I study alone	24 (48)	0.96	< 0.001
		I participate in participatory techniques	10 (20)	0.883	
		I associate learning and in practice	7 (14)	0.834	
		I attend classes	3 (6)	0.847	
		There are group discussions	2 (4)	1.0	
		I’m interested in the subject	2 (4)	1.0	
		I express my creativity	1 (2)	1.0	
		Blank/no answer	1 (2)	1.0	
	Subtotal	50 (100)	0.915	< 0.001	
	Affinity for Board Games	I like board games	39 (78)		< 0.001
		I don’t like board games	11 (22)	1	
		Blank/no answer	1 (2)		
Subtotal	50 (100)	1	< 0.001		

#### PRELIMINARY VERSION OF INSTRUMENT AND CONTENT VALIDITY OF THE ITEMS

The review of 43 defined items in the first stage resulted in a preliminary version with 62 items, submitted to analysis by 10 experts. Regarding the relevance criteria (Table 2), 54 (87%) items obtained an estimated CVIA and IRA above 0.80, and eight were below 0.80. The

items were clear (IRA above 0.90), with the exception of 5. The content of the items was validated as relevant (n=54; 87%) and clear (n=62; 98.3%). The experts were confident in the assessments (IRA above 0.80). The items of the instrument measured by the CVA obtained values higher than recommended (CVIA relevance 0.88; CVIA clarity 0.96).

**Table 2** – Agreement of judges according to the relevance and clarity of the items by the instrument dimensions, based on CVI and IRA tests – Brasília, DF, Brazil, 2014.

Items by dimensions	Criteria and indexes*					
	Relevance		Clarity		CVA	
	CVIA	IRA	CVIA	IRA	Relev.	Clar.
<b>Ludic characteristic</b>						
1- Rules were reinvented during the game	0.6		1			
2- We followed the rules of the game completely	0.6		1			
3- I wanted to win the game	1.0		1			
4- I wanted to leave the game	0.8		0.8			
5- I wanted to win the game, but I also wanted to leave it	0.5		0.5			
6- I had fun while playing the game	0.9		0.9			
7- I turned off what was going on around me while playing	0.9		0.9			
8- I felt more in the game than in the real world	0.9		0.9			

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Items by dimensions	Criteria and indexes*					
	Relevance		Clarity		CVA	
	CVIA	IRA	CVIA	IRA	Relev.	Clar.
9- I felt encouraged to learn from the game	1.0		1.0			
10- There was something interesting in the game that captured my attention	0.8		0.8			
11- I was hoping for the game to end soon	0.7		1.0			
12- The game left me feeling tense	0.8		0.9			
13- The game design caught my attention	1.0		0.6			
14- I liked the game	1.0		1.0			
15- The game made me feel anxious	0.8	0.86	0.9	0.93	0.88	0.96
16- The game kept me motivated to continue playing	1.0		0.9			
17- The challenges of the game made me feel demotivated from the start	0.8		0.9			
18- The game offers new challenges at an appropriate pace	1.0		0.8			
19- I found the game too long	0.8		0.9			
20- I would play this game again	1.0		0.9			
21- I was bored from the beginning	0.8		0.9			
22- My performance improved over the course of the game	0.9		0.8			
23- The rules are easy to understand	0.9		0.9			
24- The rules are more complicated than I'd like them to be	0.8		0.8			
25- The content of the cards are difficult to understand	0.8		1.0			
26- I quickly understood the objectives of the game	0.8		0.9			
27- The content of the cards is clear	0.8		0.9			
28- The questions on the cards are difficult to answer	0.7		1.0			
29- The subject on the cards caught my attention	1.0		1.0			
30- I had a hard time concentrating on the text on the cards	0.9		1.0			
<b>Training learning components</b>						
31- The game helped my learning	1.0		1.0			
32- The game content is irrelevant to my interests	0.7		0.9			
33- After the game, I can understand the content better	0.9		0.9			
34- I actively interacted with other players during the game	0.9		0.9			
35- I associated the game's content with other things	0.9		0.9			
36- The game inhibited my participation in the group	0.8		0.9			
37- The game was indifferent to my learning on this subject	0.8		0.9			
38- The difficulty of the cards compromised my learning	0.8		0.8			
39- During the game, I reflected on the challenges we face in life	1.0		1.0			
40- Some characteristics of the game annoyed me	0.8		0.9			
41- The game motivated me to study	0.9		0.9			
42- I was relaxed during the game	0.8		0.9			
43- The game did not make me feel any emotion	0.8	0.90	1.0	1.0		
44- I felt a mix of relaxation and tension in the game	1.0		1.0			
45- I thought of myself as incapable for not knowing how to answer the questions	0.8		0.9			
46- I felt a sense of accomplishment from the achievements of the game	0.9		0.9			
47- I learned amazing things from the game	0.9		0.9			
48- I felt frustrated during the game	0.7		0.9			
49- I remembered to help other players during the game	0.8		1.0			
50- I only helped one person during the game	0.8		0.9			
51- I forgot to help other players during the game	0.8		0.9			
52- I made pacts with some players to prevent others from winning the game	0.9		0.9			

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Items by dimensions	Criteria and indexes*					
	Relevance		Clarity		CVA	
	CVIA	IRA	CVIA	IRA	Relev.	Clar.
<b>Profile of the players</b>						
53- I have a habit of self-study, by reading and summarizing	1.0		1.0			
54- I learn best through group discussion	0.9		0.9			
55- I realize I learn better when I make associations to the practice	1.0		0.9			
56- I learn better when I express my creativity	0.9		1.0			
57- Attending classes is indifferent to my learning	0.9	0.9	0.9	1.0		
58- I learn when I'm interested in the subject	0.8		0.9			
59- I like board games	0.9		0.9			
60- Board games remind me of my childhood	0.6		0.9			
61- I'm impatient with games in general	0.9		1.0			
62- I prefer video games to board games	1.0		1.0			

\*CVAI- Content Validity Index applied to items; IRA- Inter-rater agreement applied to dimensions; CVI- Content Validity Index applied to the instrument.

Of the 62 items submitted to the validation, nine were excluded for the following reasons (Table 2): a- one CVI below 0.80 (items: 5; 11; 28; 32; 48; 60); b- redundancy with other items (items: 11 and 41) and c- low response frequency of the students in Phase 1 (item 56). Two items (items: 53 and 54) had the headings modified, one to make the sentence shorter and the other to change the statement from positive to negative in view of it being balanced in the same respective dimension. The final instrument contains 53 items (Chart 1), distributed in the dimensions ludic characteristics (items 1-26), training components of learning (items 27-45) and profile of the players (items 46-53).

**Chart 1** – Items of the instrument to evaluate the playfulness of games in health education contexts – Brasília, DF, Brazil, 2015.

1- Rules were reinvented during the game
2- We followed the rules of the game completely
3- I wanted to win the game
4- I wanted to leave the game
5- I had fun while playing the game
6- I turned off what was going on around me while playing
7- I felt more in the game environment than the real world
8- There was something interesting in the game that caught my attention
9- The game left me feeling tense
10- The game design caught my attention
11- I liked the game
12- The game made me anxious
13- The game kept me motivated to continue playing
14- The challenges of the game made me feel demotivated from the start
15- The game offers new challenges at an appropriate pace
16- I found the game too long
17- I would play this game again
18- I was bored from the beginning
19- My performance improved over the course of the game

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20- The rules are easy to understand
21- The rules are more complicated than I'd like them to be
21- The content of the cards are difficult to understand
23- I quickly understood the objectives of the game
24- The content of the cards is clear
25- The subject on the cards caught my attention
26- I had a hard time focusing on the text on the cards
27- The game helped my learning
28- After the game, I can understand the content better
29- I actively interacted with other players during the game
30- I associated the game's content with other things
31- The game inhibited my participation in the group
32- The game was indifferent to my learning on the subject
33- The difficulty of the cards compromised my learning
34- During the game, I reflected on the challenges we face in life
35- Some characteristics of the game annoyed me
36- I was relaxed during the game
37- The game did not make me feel any emotion
38- I felt a mix of relaxation and tension in the game
39- I thought of myself as incapable for not knowing how to answer the questions
40- I felt a sense of accomplishment from the achievements of the game
41- I learned amazing things from the game
42- I remembered to help other players during the game
43- I only helped one person during the game
44- I forgot to help other players during the game
45- I made pacts with some players to prevent others from winning the game
46- I have a habit of self-studying
47- I am lazy about group discussions
48- I realize I learn better when I make associations to the practice
49- Attending classes is indifferent to my learning

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50- I learn when I'm interested in the subject
51- I like board games
52- I am impatient with games in general
53- I prefer video games to board games

## DISCUSSION

The exploratory study in the first phase is relevant to defining the possible items on the playfulness of games in health education contexts, given the lack of this kind of instruments in the literature<sup>(1-8)</sup>. The establishment of an open questionnaire in order to define items from the answers is recommended in order to build phrases closer to the spontaneity of statements of the determined target audience, providing greater identity between the items and the statements<sup>(17-19)</sup>.

The profile of subjects, mostly young undergraduates of health care courses, contributed to contextualize the restlessness of a playful learning environment<sup>(13-14)</sup>. The high estimate of intra-judge agreement measured by the kappa coefficient is based on previous research that confirmed the variables used in this study<sup>(14,21)</sup>. The low agreement of the judges in the subcategory of *self-assessment* is consistent with the literature, since this feature is not inherent in the ludic/playfulness component. Unlike the discipline required in self-assessment, the attraction of the game lies in the fact that it is inherently spontaneous, fun and uncertain, distinct from any purpose other than to strengthen his innate restlessness<sup>(9-13)</sup>.

In the second phase, eight items were not considered relevant to the study by the judges. From these, six items were excluded from the final version of the instrument for not expressing significant relevance to the concept of playfulness or they displayed redundancy with other items that were evaluated as better. In the critical review, the item "1- Rules were reinvented during the game" and its opposite, "2- We followed the rules of the game completely," remained on the instrument, despite having reached an agreement below the adopted cutoff point. This decision is justified on the theoretical concepts that are the basis of ludic activities, in which the inventive, creative and indeterminate character of the game is widely recognized<sup>(1,7,9-16,25-26)</sup>. That is, the reinvention of the rules by the participants during a match is inherent to the ludic activity, since it is from this ambivalence between normativity and subversion that is needed for the game<sup>(12-14)</sup>.

The subjectivity expressed in the subjection to the rules and the renunciation of impulsive action as a gateway to the imaginary world fostered by the game is constituted in

a reinvention of reality that is immersed in the desire and castration of relationships, inherent to the formation of the human psyche<sup>(27)</sup>. Moreover, the perspective of playfulness sought in this study focused on the disruptive and inordinate character of the game – a trait necessary to train subjects of knowledge. So, the more players reinvent rules while immersed in ludic activities, the greater the chance of imaginative, restless and creative character being revealed – and these are the attributes of the ludic activity that are intended to be measured, aimed at the formation of autonomous individuals<sup>(9-16,21,25-26)</sup>.

The item *I learn better when I express my creativity*, although it had a successful consensus rating among the judges (CVIA/relevance 0.90 and CVIA/clarity 1.0), was excluded for having a low frequency of responses among the subjects who answered the open questionnaire. In all these cases, the criteria of objectivity, simplicity, clarity, precision and variety of items were prioritized in decisions, as recommended in the literature<sup>(22)</sup>. The use of the various ways to calculate the CVI for the validation of items and the method adopted to overcome the limitations of this index has increased the reliability when using this statistical measure, according to published recommendations<sup>(23-24)</sup>. The final version of the instrument, with 53 items distributed in three dimensions that allow for the operationalization of ludic activity/playfulness, includes an adequate amount to measure this construct as a minimum of 20 items is recommended<sup>(22)</sup>. The designed instrument can be applied to evaluate the playfulness of other educational games in different health contexts, especially those focused on the critical training of professionals.

## CONCLUSION

The inventive feature of playfulness as a substrate of critical education is little explored in studies on the subject, which gives originality to this study. To assess the playfulness of ludic games/activities, 53 validated items check the degree of involvement, immersion and reinvention of the subjects in the game, along with the dynamics and gameplay. In conjunction with playfulness, the educational context is measured by the perception of learning, the feelings, the thoughts and the degree of cooperation between the players, among other items. Finally, study habits, their affinity for games and sociodemographic characteristics of the participants make up the profile of players measured by the validated instrument. One limitation of this study points to the need to make advancements in the other planned stages for elaborating the scales, and the empirical and analytical procedures necessary for validating the construct and criterion of the instrument.

## RESUMO

**Objetivo:** Elaborar e validar um instrumento para a avaliação da ludicidade de jogos em contextos educativos da saúde. **Método:** Pesquisa metodológica, exploratória e descritiva, desenvolvida em duas etapas: 1. aplicação de questionário aberto a 50 graduandos, com análise de conteúdo das respostas e cálculo do coeficiente Kappa para fechamento dos itens; 2. procedimentos de construção de escalas, com validação de conteúdo mediante análise dos juízes e estimativa de consenso pelo *Content Validity Index* (CVI). **Resultados:** Foram validados 53 itens acerca do caráter irrequieto dos jogos nas dimensões da ludicidade, dos componentes formativos da aprendizagem e

do perfil dos jogadores. **Conclusão:** A ludicidade pode ser avaliada por itens validados relacionados ao grau de envolvimento, de imersão e de reinvenção dos sujeitos na partida, ao lado da dinâmica e da jogabilidade do jogo.

## DESCRIPTORES

Educação em Saúde; Jogos e Brinquedos; Educação Superior; Criatividade; Autonomia Pessoal; Estudos de Validação.

## RESUMEN

**Objetivo:** Elaborar y validar un instrumento para la evaluación de la ludicidad de juegos en contextos educativos de salud. **Método:** Investigación metodológica, exploratoria y descriptiva, desarrollada en dos etapas: 1. aplicación de cuestionario abierto a 50 estudiantes universitarios, con análisis de contenido de las respuestas y cómputo del coeficiente Kappa para cierre de los ítems; 2. procedimientos de construcción de escalas, con validación de contenido mediante análisis de los jueces y estimación de consenso por el *Content Validity Index* (CVI). **Resultados:** Se validaron 53 ítems acerca del carácter irrequieto de los juegos en las dimensiones de la ludicidad, de los componentes formativos del aprendizaje y del perfil de los jugadores. **Conclusión:** La ludicidad puede ser evaluada por ítems validados relacionados con el grado de involucración, inmersión y reinvencción de los sujetos en el partido, al lado de la dinámica y la jugabilidad del juego.

## DESCRIPTORES

Educación en Salud; Juegos e Implementos de Juegos; Educación Superior; Creatividad; Autonomía Personal; Estudios de Validación.

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