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Design and Validation of an Instrument to Evaluate Teaching Practices and Conceptions Regarding the use of Cultural Video Games in the Classroom

Diseño y validación de un instrumento para evaluar las prácticas y concepciones docentes sobre el uso de videojuegos culturales en el aula

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Abstract: Over the last decade, video games have established themselves as teaching resources capable of promoting meaningful cultural learning, critical thinking and digital literacy at different educational levels. However, the effective incorporation of these playful experiences depends to a large extent on teachers' perceptions of their pedagogical value, as well as on how often and how they decide to use them in the classroom. In the absence of rigorous instruments to measure such perceptions and teaching behaviour. This study presents the validation of the Questionnaire on the Use, Definition and Educational Application of Cultural Video Games (QUDEACV), in order to provide empirical evidence to guide teacher training and enhance the critical integration of these resources in the curriculum. An expert judgement (n=10) was applied for content validation and an exploratory factor analysis (EFA) was carried out to explore the internal structure, as well as the calculation of reliability using Cronbach's alpha coefficient. The factor analysis led to the readjustment of the instrument and revealed a new structure composed of three factors related to: teacher characteristics, training, resources available to teachers and elements that are interrelated to their teaching practice and professional profile. The validated questionnaire constitutes a useful tool for the analysis of educational practice, analysing the real interactions that take place in the classroom with the cultural video game and providing the academic community with a replicable model that can be adapted to other research projects.
Keywords: Evaluation, Video Games, Design, Questionnaire, Teachers.

Resumen: Durante la última década, los videojuegos se han consolidado como recursos didácticos capaces de promover aprendizajes culturales significativos, pensamiento crítico y alfabetización digital en distintos niveles educativos. Sin embargo, la incorporación efectiva de estas experiencias lúdicas depende en gran medida de la percepción que el profesorado tenga sobre su valor pedagógico, así como de la frecuencia y el modo en que decide utilizarlas en el aula. Ante la ausencia de instrumentos rigurosos que midan dichas percepciones y comportamientos docentes. Este estudio presenta la validación del Cuestionario Sobre el Uso, Definición y Aplicación Educativa de los Videojuegos Culturales (CUDAEVC), con el fin de proporcionar evidencia empírica que oriente la formación docente y potencie la integración crítica de estos recursos en el currículo. Se aplicó un juicio de expertos (n=10) para la validación de

contenido y se llevó a cabo un análisis factorial exploratorio (AFE) para explorar la estructura interna, así como el cálculo de la fiabilidad mediante el coeficiente alfa de Cronbach. El análisis factorial condujo al reajuste del instrumento y reveló una nueva estructura compuesta por tres factores relacionados con: las características del profesorado, la formación, los recursos de los que dispone y los elementos que se interrelacionan con su práctica docente y perfil profesional. El cuestionario validado constituye una herramienta útil para el análisis de la práctica educativa, analizando las interacciones reales que desde el aula se realizan con el videojuego cultural y dotando a la comunidad académica de un modelo replicable y adaptable a otras investigaciones.

Palabras clave: Evaluación, Videojuegos, Diseño, Cuestionario, Profesores.

1. Introduction

Over recent decades, Information and Communication Technologies (ICT) have reshaped how people interact, learn, and teach. Education has changed in parallel. Methods and pedagogical strategies have shifted as ICT expands access to information and enables interactive, collaborative learning (Cabero Almenara, 2010). Within this context, video games have emerged as a promising educational resource that can enrich teaching–learning processes and motivate students (Fernández-Lanza, 2022; Martinez, Gimenes & Lambert, 2022; Mayer, 2019).

The relevance of video games in education lies in their ability to actively engage students, promoting experiential learning and the development of critical skills such as strategic thinking, problem solving and collaboration (Gros, 2007). Several studies have shown that video games can improve student motivation and engagement, which are key aspects of effective learning. Moreover, educational video games, being designed specifically for pedagogical purposes, can facilitate the acquisition of knowledge and skills in a playful and engaging way (Kirriemuir & McFarlane, 2004).

This design and validation process forms a core component of a doctoral thesis at the University of Extremadura. The thesis examines the intersections between video games, human culture, and education. To that end, we analyse teachers' perceptions of using video games in the classroom. As primary actors in the teaching–learning process, their experiences are the first and central object of study in educational research (Dorado Gómez & Gewerc Barujel, 2017; Martínez, 2019).

To collect this information, one of the main tools used are surveys and research questionnaires, which provide very specific data on a given study population (Cohen, Manion & Morrison, 2017), which has traditionally made them widely used in educational research, due to their characteristics and adaptability; in fact, Barroso Osuna and Cabero Almenara (2010) describe them as one of the most frequent elements in the field of educational technology research.

In this sense, although the area of video game studies already has some experiences or questionnaires carried out on teaching practices mediated by video games (Lorca-Marín, Cuenca-López & Vázquez-Bernal, 2019), the truth is that these have not been extrapolated to the proposed research, which seeks to delve not only into the techniques and practices commonly used, but also to interrelate them with the cultural and educational value of video games.

Accordingly, this study must generate and answer its own questions. It is essential to understand the fundamentals of instrument development (Holmes, 2023; Lietz, 2010). Clear design and implementation objectives guide the validation of our questionnaire. This tool will provide data to describe current educational practices mediated by video games. It will also allow us to examine the notion of the "cultural

video game" and its application.

To guarantee the quality of the tool, the questionnaire is subjected to expert judgement or validation by judges, thus having an informed opinion of people with experience in the subject, who are already recognised by others as qualified experts in this field, and who can provide information, evidence, judgements and evaluations of the tool (Escobar-Pérez & Cuervo-Martínez, 2008) through an assessment of the degree to which the instrument measures the variable in question (Hernández, Fernandez & Baptista Lucio, 2014). Judges assess the tool in relation to the clarity, relevance, pertinence and sufficiency of the questions posed, while at the same time making observations on the degree of achievement or possible improvements to be made (Gravetter & Forzano, 2012).

This procedure is thus recognised by numerous authors as a strategy with numerous advantages, including the ability of expert-judges to generate quality responses, improve the tool and distinguish those items or questions lacking value, complementing or improving the final tool (Galicia Alarcón, Balderrama Trápaga & Edel Navarro, 2017; Robles Garrote & Rojas, 2015; Ruiz Bolívar, 2008).

2. Purpose of the Study

The intention of this work is to offer the validation procedure of a questionnaire aimed at measuring the interrelation between learning mediated by cultural video games and the teachers' conception of this paradigm. In this way, it is possible to state the following research objectives in order to achieve this questionnaire validation process:

1. To validate the research tool by guaranteeing its reliability and construct validity.
2. To compare the theoretical structuring of the questionnaire on the basis of the results obtained by means of a confirmatory factor analysis.

3. Method

This study presents a mixed research design (Hernández et al., 2014), associated with the process of developing and validating a questionnaire for teachers, the Questionnaire on the use, definition and educational application of cultural video games; hereinafter referred to as (QUDEACV), although initially conceived under its Spanish acronym CUDAEVC. This tool was designed to understand the relationship that teachers at all educational levels establish with video games, understanding them as a learning tool that allows for a deeper exploration of their potential as an element of learning that helps to investigate the cultural perspective of video games and their educational applications.

To achieve this objective, a validation tool was developed, constructed in several Excel spreadsheets, which gathered mixed data on the quality of the questionnaire, allowing it to be subjected to an inter-judge judgement (Dillon & Mulani, 1984; Ruiz Bolívar, 2008). On the one hand, it should be noted that a quantitative approach was used, focusing on the data relating to the clarity, relevance and pertinence of the items provided by the Aiken V test. On the other hand, the qualitative comments are those that helped to rework the questionnaire. A structured validation process was carried out based on expert judgement (n=10), maintaining criteria of clarity, pertinence, relevance and sufficiency (Martín Arribas, 2004). In this case, given that

the scientific literature has not provided a tool that meets the intended objectives, we opted for the construction of our own questionnaire, which was developed according to the following criteria:

1. Initial 'ad hoc' drafting of the questionnaire. In this phase, through initial brainstorming and a review of similar questionnaires, the sections and questions that will form the backbone of the questionnaire are defined.
2. Validation of the questionnaire. In order to guarantee the scientific validity of the research process, a validation process is carried out by means of expert judgement. The experts (10 researchers and university professors) assessed the pertinence, clarity and relevance of the items proposed, as well as the sufficiency of each of the sections of the form. This action allows corroborating the relevance of the teachers' answers, as well as improving the level of terminological comprehension and quality of the information collected through the questionnaire; improving, with their evaluations, the questionnaire itself.
3. Adaptation of the questionnaire. Once the different expert judgements had been made, the questionnaire was adapted and redesigned for its final preparation and publication, using the European Commission's EU Survey platform.

3.1. Description of Instruments

In this validation process we mainly rely on two instruments or research tools. The first instrument (1) is the Questionnaire on the Use, Definition and Educational Application of Cultural Video Games (QUDEACV). The questionnaire is composed of a total of 5 sections: S1, Information about the participants, focuses on the categorisation of the sample; S2, Previous teacher training and incidence on their teaching practices; S3, Use of video games in the classroom; S4, Conceptualisation and use of video games as a cultural product; S5, Subsequent studies and prospective. This research tool is carried out as part of a doctoral thesis study, within which it is considered appropriate to undergo a validation process. The final version of the questionnaire can be reviewed at: https://osf.io/jm9th/

On the other hand, a validation tool or guide was developed (2), which was used in the validation phase of the questionnaire to gather the perceptions of the different experts consulted. This tool is structured around 6 study dimensions or sections, 5 of which correspond directly to the sections or dimensions of the questionnaire, while the last one assesses the validity and adequacy of the instructions, the preparation of the informed consent and the platform used to publish the questionnaire. In each section, validators reviewed up to 47 items. For each item, they rated clarity, relevance, pertinence, and sufficiency on a 1–5 scale (1 = absent; 5 = fully present). The tool also captured comments for every rating. Experts used these notes to propose changes to the final questionnaire. The final version of the validation guide is available at: https://osf.io/qavd7/

3.2. Mode of Application

The physical separation between the researchers and the experts led to the selection of e-mail as the ideal means of exchange for the validation process. The selected experts received the validation template, as well as the relevant instructions, and were asked to return the template once they had issued their assessments.

4. Results

It should be noted that the results are presented for two different processes, the first being the validation of the questionnaire by means of expert judgement (Ruiz Bolívar, 2008), which was carried out using a tool that allowed for the collection of quantitative and qualitative data. For this purpose, a panel of 10 experts from national and international universities where they carry out research in the area of study in question was formed. In the first instance, the judges assessed the instructions received, the informed consent and the tool used to launch the questionnaire by means of a dichotomous variable, concluding that, given the high degree of agreement (see Table 1): 1. The instructions were clear, concise and adequate; 2. The informed consent clearly described the objective of the research and the data processing to be carried out; and 3. The EUSurvey platform offered users convenient and easy access to the questionnaire.

Table 1: Analysis of the Elements Associated with the Questionnaire Design.

	Frequencies	
Elements of assessment	**Yes**	**No**
Instructions	100%	0%
Informed consent	100%	0%
Use of the EU Survey Platform	100%	0%

Each validator assessed the degree of characterisation of each section of the questionnaire. They indicated the degree of definition in the first round of validation. Section 3 received the lowest score, with an average of 3.80. Specifically, it was necessary to adjust the wording of the questions in this section and their response options. For example, the validators indicated that it was necessary to expand the response options for question S3P3 and clarify the question itself. Thus, the final version of the questionnaire that is published has already solved this problem by improving the wording of the questions in this section. For this reason, the indicators associated with clarity were so low. Table 2 shows the means and standard deviations for all sections in the first round. (see Table 2).

Table 2: Characterization and Sufficiency of the Different Sections of the Questionnaire.

Section of the Questionnaire Analysed	**Characterisation of the Sample**	
	M	**SD**
Section 1. Information about the participants	4.50	.53
Section 2. Previous training of teachers and its impact on their teaching practices	4.40	.97
Section 3. Use of video games in the classroom	3.80	.92
Section 4. Conceptualisation and use of video games as a cultural product	4.50	.71
Section 5. Subsequent studies and foresight	4.80	.42

However, in the detailed analysis of each of the questions posed in each section, the validators identified the questions with the lowest ratings, adding in the qualitative comments section suggestions for improvement, substitution or reformulation. The statistical data and the dispersion trend for each of them are presented below, reflecting values higher than 4.50 in the relevance of all the elements, something that is maintained

in the relevance; with the exception of questions S3Q5, S3Q6, S5Q2 and S5Q9, which were revised accordingly; finally, the clarity factor is the one with the most disparate values, in relation to the questions posed with gender, experience and use of ICT and clarity in the wording of the questions, which were duly adapted after validation.

In order to obtain statistically contrastable values, the responses of the group of judges were taken to obtain Aiken's V coefficient for each item. For the calculation, the Penfield and Giacobbi (2004) formula was used, making decisions based on a confidence interval determined by the research team (n.s.=.05, criteria of Rodriguez, 2015), and allowing the exclusion of those items whose coefficient is lower than V=.50 (Aiken's V) (criteria of Cicchetti, 1994) (See Figure 1).

Figure 1: Aiken's V Formula.

$$V = \frac{\sum (X - l)}{n(k - l)}$$

Note: Source: (Rodríguez-Cordón, 2015). X is the score given by each judge, l is the lowest possible score on the scale, usually 1, k is the highest possible score and n the number of judges.

The results have shown a high index in the clarity of the tool, with an average of 0.87 among all the results, which declines when analysing item by item the clarity of the same in specific questions, .68 in S1Q7, .50 in S3Q5 or .73 in S3Q3; something that is attributed to the degree of definition of the questions or the answer options, an aspect in which the questionnaire needed improvement. Meanwhile, all the values referring to relevance are above .75 and in the case of relevance all are above .77, so that this test stands out and offers guarantees of validity to be implemented (see Table 3).

Table 3: Analysis of the Clarity, Relevance and Pertinence of the Instrument.

Valuation Elements	Clarity			Pertinence			Relevance		
	M	SD	V	M	SD	V	M	SD	V
S1Q1. Age	4.80	.63	.95	4.80	.63	.95	4.8	0.63	.95
S1Q2. Teaching experience	4.2	1.32	.80	4.5	1.27	.88	4.5	1.27	.88
S1Q3. Gender	3.90	1.29	.73	4.60	.84	.90	4.90	.32	.98
S1Q4. Ownership of the institution	4.90	.32	.98	5.00	.00	1.00	5.00	.00	1.00
S1Q5. Teaching staff	4.70	.48	.93	5.00	.00	1.00	5.00	.00	1.00
S1Q6. If you selected other, please specify your area of work	4.80	.63	.95	5.00	.00	1.00	5.00	.00	1.00
S1Q7. ICT experience: Do you consider that your work is directly linked to ICT and do you use or include ICT in your classes?	3.70	1.06	.68	4.70	.95	.93	4.70	.95	.93
S1Q8. What type of ICT technologies and/or experiences do you introduce in your classroom?	3.80	1.32	.70	4.60	1.26	.90	4.60	1.26	.90
S1Q9. If you selected the other option, specify which one	5.00	.00	.98	5.00	.00	1.00	5.00	.00	1.00
S2Q1. Did you receive previous training in the use of video games in the classroom?	4.90	.32	.98	4.90	.32	.98	4.90	.32	.98
S2Q2. Which organization or body provided this training?	4.90	.32	.98	4.70	.67	.93	4.70	.67	.93
S2Q3. If you selected other, please specify which	5.00	.00	1.00	5.00	.00	1.00	5.00	.00	1.00
S2Q4. Was receiving this training a determining factor in your subsequent inclusion of the video game in your classroom?	4.80	.42	.95	4.90	.32	.98	4.90	.32	.98
S2Q5. Why? Describe your answer	4.90	.32	.98	5.00	.00	1.00	5.00	.00	1.00
S3Q1. Do you use or have you used video games in your teaching practice?	4.80	.63	.95	4.80	.63	.95	4.80	.63	.95
S3Q2. How long have you been using video games in the classroom?	4.30	1.34	.83	4.50	1.27	.88	4.50	1.27	.88
S3Q3. Do you consider yourself to be: (List of types of video games)	3.90	1.29	.73	4.60	.84	.90	4.50	.85	.88

Valuation Elements	Clarity			Pertinence			Relevance		
	M	SD	V	M	SD	V	M	SD	V
S3Q4. More specifically, which titles do you use?	4.70	.48	.93	4.90	.32	.98	4.90	.32	.98
S3Q5. What kind of introduction of video games did you develop in your classroom?	3.00	1.33	.50	4.00	1.49	.75	4.10	1.52	.77
S3Q6. If you selected other, please specify which one.	4.20	1.69	.80	4.20	1.69	.80	4.20	1.69	.80
S4Q1. Are you familiar with the term cultural video games?	4.70	.67	.93	4.80	.63	.95	4.80	.63	.95
S4Q2. What do you understand by cultural video games?	4.60	1.26	.90	4.60	1.26	.90	4.60	1.26	.90
S4Q3. Can you name any video games with a strong cultural content? If yes, please give the full title if known	4.60	.84	.90	4.80	.63	.95	5.00	.00	1.00
S4Q4. What elements of video games do you identify as cultural transmitters?	4.70	.48	.93	4.90	.32	.98	4.90	.32	.98
S4Q5. If other, please specify below	5.00	.00	1.00	5.00	.00	1.00	5.00	.00	1.00
S5Q1. Do you have problems identifying and introducing cultural video games in the classroom?	4.50	1.08	.88	4.50	1.08	.88	4.70	.95	.93
S5Q2. Which ones?	4.50	1.27	.88	4.40	1.35	.85	4.60	1.26	.90
S5Q3. Do you consider it necessary to develop and disseminate a tool for the analysis of cultural video games?	4.70	.48	.93	4.70	.48	.93	4.70	.48	.93
S5Q4. Do you consider interesting the elaboration of a guide for the identification of cultural video games?	4.40	1.26	.85	4.50	1.27	.88	4.50	1.27	.88
S5Q5. Which of the following aspects are you interested in?	4.80	.42	.95	4.90	.32	.98	4.90	.32	.98
S5Q6. If you indicated that you are interested in another aspect, please specify which one:	4.80	.42	.95	4.90	.32	.98	4.90	.32	.98
S5Q7. In which province is your work centre located? (Including Autonomous Cities)	4.60	.70	.90	4.80	.63	.95	4.80	.63	.95
S5Q8. You have chosen to be interested in one of the aspects listed above, so that we can contact you in the future, please provide a contact method or e-mail	4.60	.70	.90	4.90	.32	.98	4.90	.32	.98
S5Q9. Other means of contact	4.20	1.03	.80	4.40	.97	.85	4.40	.97	.85

To determine the reliability of the tool, Cronbach's Alpha method was used, obtaining a total Alpha value of (.978), a high index that indicates that the relationships between the different elements of the tool are very high (Peterson, 1994). Finally, in order to establish an underlying dimensional structure of the tool that allows us to define the construct validity, the internal structure of the instrument was studied by means of an Exploratory Factor Analysis. The extraction methods were selected using principal components and Varimax rotation. On this basis, the suitability of these procedures was checked through the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity, which led to detect that the correlation matrix did not meet the conditions to be considered positive defined, obtaining the result of a not certain positive matrix.

Given this result, it was decided to carry out an analysis of correlations, focusing on the total variance explained, which amounted to 82.189%. This data allowed us to identify a total of three factors; it should be noted that, during the selection of the model, several alternative designs with 4, 5 and 6 factors were tested, all of which were discarded due to lack of theoretical support. Similarly, all variables whose variance was equal to zero were excluded from the analysis. This implies the exclusion of S1Q4PER, S1Q4REL, S1Q5PER, S1Q5REL, S1Q6PER, S1Q6REL, S1Q9PER, S1Q9REL, S2Q3CLA, S2Q3PER, S2Q3REL, S2Q5PER, S2Q5REL, S4Q3REL, S4Q5CLA, S4Q5PER, S4Q5REL, S5Q7REL. Table 4 summarises this analysis:

The results of the negative factor loading (loading only in negative) are not included in the factor analysis, as the three-factor model does not explain their interrelationship, so S1Q4, S1Q5, S1Q6, S1Q9 and S1Q3 are excluded. This decision improves the fit but may reduce content validity if it affects theoretical facets of the construct and introduce bias in convergent/discriminant validity; therefore, we document the semantic justification for each elimination and maintain traceability for eventual review.

Table 4: Rotated Component Matrix.

Item	Component		
	1	2	3
S1Q1. Age	,990		
S1Q2. Teaching experience	,990		
S1Q3. Gender	,990		
S1Q4. Ownership of the institution	,990		
S2Q1. Did you receive previous training in the use of video games in the classroom?	,990		
S2Q2. Which organisation or body provided this training?	,990		
S2Q5. Why? Describe your answer	,990		
S4Q5. If other, please specify below	,989		
S4Q5. If other, please specify below	,989		
S5Q8. You have chosen to be interested in one of the aspects listed above, so that we can contact you in the future, please provide a contact method or e-mail	,990		
S1Q7. ICT experience: Do you consider that your work is directly linked to ICT and do you use or include ICT in your classes?	,990		
S1Q6. If you selected other, please specify your area of work	,990		
S1Q8. What type of ICT technologies and/or experiences do you introduce in your classroom?	,990		
S1Q9. If you selected the other option, specify which one	,990		
S2Q1. Did you receive previous training in the use of video games in the classroom?	,990		
S2Q4. Was the fact of receiving this training a determining factor in the subsequent inclusion of the video game in your classroom?	,990		
S2Q5. Why? Describe your answer	,990		
S3Q1. Do you use or have you used video games in your teaching practice?	,990		
S3Q6. If you selected other, please specify which one.	,990		
S4Q1. Are you familiar with the term cultural video games?	,990		
S4Q2. What do you understand by cultural video games?	,990		
S4Q3. Can you name any video games with a strong cultural content? If yes, please give the full title if known	,990		
S2Q1. Have you received previous training in the use of video games in the classroom?	,990		
S5Q1. Do you have problems identifying and introducing cultural video games in the classroom?	,990		
S5Q4. Do you consider the elaboration of a guide for the identification of cultural video games to be interesting?	,990		
S5Q5, In which of the following aspects do you consider yourself interested?	,990		
S5Q6, If you indicated that you are interested in another aspect, please specify which one:	,990		
S5Q8. You have chosen to be interested in one of the aspects listed above, so that we can contact you in the future, please provide a contact method or e-mail	,990		
S5Q9. Other means of contact	,990		
S5Q9. Other means of contact	,968		
S1Q8. What type of ICT technologies and/or experiences do you introduce in your classroom?	,968		
S5Q2. Which ones?	,968		
S1Q1. Age	,968		
S5Q2. Which ones?	,957	,251	
S3Q5. What kind of video game introduction did you develop in your classroom?	,951	,276	
S2Q3. If you selected other, please specify which	,951	,276	
S3Q6. If you selected the other option, please specify which one.	,882		,316
S3Q3. Do you consider yourself to be: (List types of video games)	,861	,486	
S1Q2. Teaching experience	,858		
S5Q5. Which of the following do you consider yourself to be interested in?	,849		-,319
S3Q1. Do you use or have you used video games in your teaching practice?	,842		,302
S4Q4. What elements of video games do you identify as cultural transmitters?	,812		,367
S3Q2. How long have you been using video games in the classroom?	,787	,597	
S2Q3. If you selected other, please specify which one	,751		-,548
S5Q4. Do you consider interesting the elaboration of a guide for the identification of cultural video games?	,751		-,548
S1Q8. What type of ICT technologies and/or experiences do you introduce in your classroom?	,746	,366	
S1Q1. Age	,688		
S4Q2. What do you understand by cultural video games?	,669		,435
S1Q9. If you selected other, please specify which one	,688		
S1Q2. Teaching experience	,646		,344

Item	Component		
	1	2	3
S1Q7. ICT experience: Do you consider that your work is directly linked to ICT and do you use or include ICT in your classes?	,561	,412	,311
S3Q3. Do you consider it to be: (List of types of video games)	,549		
S5Q6, If you indicated that you are interested in another aspect, please specify which one:	,271		
S2Q4. Was the fact of receiving this training a determining factor in the subsequent inclusion of the video game in your classroom?		,968	
S4Q5. If you indicated other, please specify below		,968	
S4Q1. Are you familiar with the term cultural video games?		,968	
S2Q5. Why? Describe your response		,968	
S1Q7. ICT experience: do you consider that your work is directly linked to ICT and do you use or include ICT in your lessons?		,968	
S1Q5. Teaching staff		,773	
S3Q5. What kind of introduction of the video game did you develop in your classroom?		,773	
S2Q3. If you selected other, please specify which one		,773	
S1Q4. Ownership of the centre	,469	,754	
S5Q3. Do you consider it necessary to develop and disseminate a tool for the analysis of cultural video games?	,637	,752	
S2Q2. Which organisation or body provided this training?	,458	,748	
S3Q4. More specifically, which titles do you use?		,655	,453
S4Q3. Can you name any video games with a strong cultural content? If yes, please give the full title if known	,563	,588	-,528
S5Q1. Do you have problems identifying and introducing cultural video games in the classroom?	,492	,587	,330
S3Q4. More specifically, which titles do you use?	,492	,587	,330
S2Q2. Which organisation or body provided this training?	,492	,587	,330
S1Q3. Genre	,262		,549
S3Q2. How long have you been using video games in the classroom?	,262		,549
S4Q4. What elements of video games do you identify as cultural transmitters?		,355	,546
S3Q2. How long have you been using video games in the classroom?		,355	,546
S5Q7. In which province is your workplace located (including autonomous cities)			,517
S1Q5. Teaching staff	,372		,499
S5Q7. In which province is your workplace located? (Includes Autonomous Cities)	,372		,499
Note: Extraction method: Principal Component Analysis, Rotation method: Varimax with Kaiser normalization, a. Rotation has converged in 5 iterations			

The structural clarity of the tool is identified in terms of 3 factors or research approaches:

Factor 1. This first factor, which explains 60.34% of the variance of the criterion, refers to those general aspects referring to the participating teachers, their characteristics, knowledge of the subject, as well as the resources and methodologies they use, in relation to the object of study.

Factor 2. Training and available resources. It contributes 13.87% of the variance, referring to the training and resources available to apply video games in the classroom.

Factor 3. Other interrelation factors. With 7.96%, items or elements are identified that do not influence the approximation made, such as gender, the elements of the video game and their identification; the time of use or the location of the centre. They are considered to be less representative elements after the analysis.

As a conclusion to the validation, the researchers met to accept or reject the suggestions made by the group of judges, with an acceptance rate of 85%, which served to make decisions to improve the tool.

Most of the changes were changes in wording and style, qualifying or subdividing questions such as S1Q7, which is subdivided into two different questions; or adding and correcting the possible answer options. However, there are more notable changes, such as in S2, where the validation detected the need to include a new question: How was this subsequent implementation? How did it change with respect to the one

previously carried out? Section 3 began directly by asking about the previous use or non-use of video games in the respondents' teaching practice, but the validation suggests the suitability of knowing whether or not they are regular players, including a new question in this respect, which will enable a relationship to be established between the fact of being a player and introducing video games in the classroom. In this sense, S3Q3 had to expand its response options, while new questions were added to classify the didactic objectives of the implementation, the type of groupings carried out, the environment in which the game is used and the role of the teacher in it. This was undoubtedly one of the sections with the highest number of contributions.

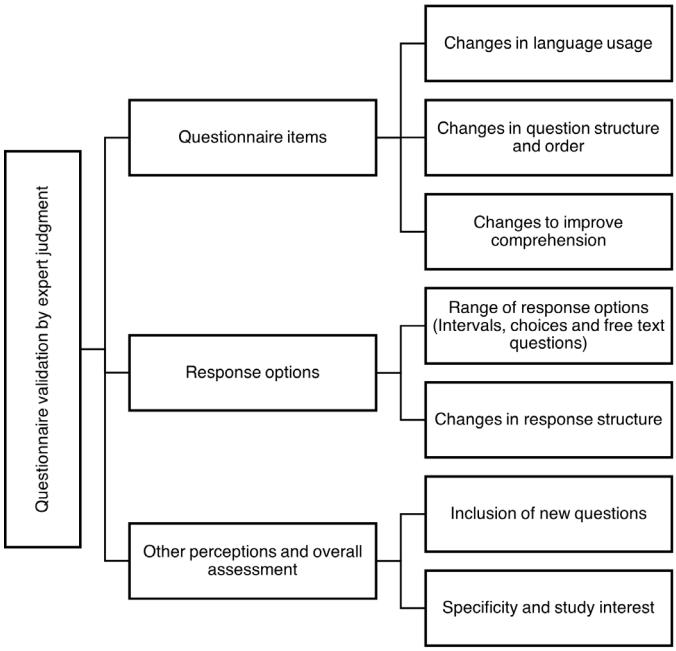
Section 4 scored well, although S4Q3 was subdivided and the response options in S4Q4 were expanded or revised to consider more elements that convey cultural content and to better define those initially envisaged.

Finally, minor adjustments were made to the wording and presentation of section 5, allowing for greater clarity of the questions posed, by changing the response options to a drop-down list or by correctly linking the options given.

5. Discussion and Conclusions

The results obtained from the validation allow the clarity and applicability of the (QUDEACV) questionnaire to be improved. The comments helped to restructure the questionnaire by restructuring questions that could be considered ambiguous, and the inclusion of answers was improved, which helped to redefine the sections in order to improve the understanding of the individuals to whom the questionnaire was applied (see Figure 2):

Figure 2: Summary of Changes Implemented after Validation.



In this way, it is possible to affirm that the validation process provides the designed tool with reliability and validity, allowing the resulting questionnaire to be much more concise and the designed tool to comply with the scientific guarantees for its application. This tool is expected to help deepen the barriers to ICT access and use noted by Cabero Almenara (2010), while expanding knowledge about video games and their classroom application. In doing so, research on video games can centre on teachers, address long-standing calls in the literature (Dorado Gómez & Gewerc Barujel, 2017; Martínez, 2019), and attend to the needs of the main educational agent. It will do so by examining teachers' practices, concerns, and perceptions of the medium and its cultural and educational implications.

The validation of this questionnaire will allow the development of a second research process, associated with the collection of data and the interpretation of the responses to the questionnaire. In line with the principles of open science, both the validation protocol and the final version of the (QUDEACV) will be published in open access, facilitating its replication, adaptation and international comparability. Thus, the instrument not only provides a rigorous means of evaluating teaching practices, but also serves as a catalyst for professional reflection and evidence-based decision making within a global and interconnected educational landscape.

5.1. Study Limitations and Prospective

Although the findings provide a first solid approximation to the validity of the (QUDEACV), they should be interpreted with caution: the sample of ten judges, mostly from Spanish and Latin American universities, limits extrapolation to different sociocultural contexts; on the other hand, the psychometric validation was limited to content validity, internal reliability and factorial exploration, with evidence such as convergent, discriminant, temporal stability and predictive validity still pending; the exploratory factor analysis was conditioned by an undefined positive correlation matrix, which made it necessary to discard items of null variance and to consider the three-factor solution as provisional; both the expert assessments and future teacher responses may be biased by the self-reported nature and by item purging, which, while improving statistical consistency, potentially reduces conceptual richness; and finally, the entirely online administration, while facilitating geographically dispersed participation, could exclude specialists with low digital competence or limited connectivity, thus restricting the diversity of perspectives collected.

In this sense. It is recognized to have defined a robust measurement tool, endorsed by an initial panel of 10 experts and an internal reliability of $\alpha = .978$, articulated in three factors, but its true pedagogical effectiveness will be verified in the next phase: a controlled pilot with a minimum sample of 200 teachers from different educational levels and cultural backgrounds. This pilot, scheduled for the next academic year, will make it possible to evaluate the clarity of the items, temporal stability (test-retest) and convergent validity against related instruments; the resulting data will be used to refine the questionnaire, reintroduce those items that enrich the conceptual dimension and adjust the response scales. Following this external validation, a staggered rollout is planned, first in collaborating institutions in Spain and Latin America, then in other European contexts, combining online applications via EU Survey with face-to-face or hybrid formats, integrated into teacher training programs. This progressive deployment

will not only reinforce the psychometric soundness of (QUDEACV), but will also facilitate the creation of a longitudinal observatory capable of monitoring, in the medium term, the evolution of teaching practices in education in cultural and digital values, thus generating empirical evidence to guide educational policies and future lines of research.

Declaration of Conflicts of Interest

The authors have declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Annex A. Questionnaire on the Use, Definition and Educational Application of Cultural Video Games (QUDEACV).

Analysis of The Incidence Of Use And Impact Of Video Games In The Classroom. A Study With A Cultural Perspective.

Introduction And Description of The Survey

The following questionnaire belongs to a Doctoral Thesis study developed at the University of Extremadura (Spain). Specifically, the research design has been carried out by Mario Cerezo Pizarro, Substitute Professor in the Department of Educational Sciences at the University of Extremadura, who is carrying out the Doctoral Programme in Innovation in Teacher Training. Assessment Analysis of Educational Practice and ICT in Education (R010). The Doctoral Thesis is supervised by Francisco Ignacio Revuelta Domínguez and Jorge Guerra Antequera, both doctors and researchers at the University of Extremadura.

Informed Consent

UNIVERSIDAD DE EXTREMADURA

UNIVERSIDAD DE EXTREMADURA

○ I agree that I have read and understood the informed consent below.

The informed consent follows the guidelines or recommendations for the area of Social Sciences of the Bioethics Committee of the University of Extremadura (Spain).

Fields marked with * are mandatory.

Informed Consent Model.pdf

Information on participants (Section 1 of 5)

* 1 Age (Numerical range, both values inclusive)

○ Less than 18 years
○ Between 18 and 25 years old
○ Between 26 and 30 years old

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- ○ Between 31 and 35 years old
- ○ Between 36 and 40 years old
- ○ Between 41 and 45 years old
- ○ Between 46 and 50 years old
- ○ Between 51 and 55 years old
- ○ Between 56 and 60 years old
- ○ Between 61 and 65 years old
- ○ Over 65 years old

* 2 Gender

- ○ Female
- ○ Male
- ○ Non-binary
- ○ Prefer not to answer
- ○ Other

* 3 If you selected the option Other, please indicate in this space. We understand that binary categorisation is not sufficient, and the field of research is still adapting. Your response will serve to improve future research.

* 4 Teaching experience

- ○ Less than 1 year
- ○ 1 to 5 years
- ○ 6 to 10 years
- ○ 11 to 15 years
- ○ 16 to 20 years
- ○ More than 20 years

5 Faculty (If you work in more than one, please indicate by ticking two boxes)

- □ Early Childhood Education
- □ Primary Education
- □ Secondary Education
- □ Vocational Education
- □ EOI teaching staff
- □ University Education
- □ Other Higher Education, Adult Education, Non-regulated Education, etc. (Please specify)

* 6 If you select the option other bodies, specify your working area

* 7 Ownership of the centre

○ Public
○ Private
○ Subsidised

* 8 ICT experience: Do you consider that your work is directly linked to/needs Information and Communication Technologies (ICT)?

○ Yes
○ No
○ Don't know / Don't answer

* 9 Do you use them or include them in your classes?

○ Yes
○ No
○ Don't know / Don't answer

* 10 What type of ICT technologies or tools do you introduce in your classroom? (Select as many options as technologies you introduce in your usual practice).

□ Video games
□ Gamification tools
□ Animated stories
□ Virtual Reality
□ Augmented Reality
□ Educational robotics
□ Programming
□ Other

* 11 If you selected the other option, please specify which one:

Previous teacher training and impact on their teaching practices (Section 2 of 5)

* 1 Have you received previous training on the use of video games in the classroom?

- ○ Yes
- ○ No

* 2 What agency or entity provided this training?

- ○ Teachers and Resources Centers (resource and training centers dependent on the autonomous administrations)
- ○ Universities
- ○ Private entities
- ○ Individuals (Online training and other self-taught alternatives)
- ○ Other

* 3 If you selected other, specify which one

* 4 Was the fact of receiving this training a determining factor in the subsequent inclusion of the video game in your classroom?

- ○ Yes
- ○ No
- ○ Don't know / Don't answer

* 5 Why was it? Describe your answer.

* 6 How did this subsequent implementation change from what you were doing previously?

Use of Video Games in the Classroom (Section 3 of 5)

The use of video games in the classroom is understood to mean not only the use of commercial video games and/or their elements or narratives. But the so-called educational video games (included within editorial proposals, serious video games, mobile video games and any other type of game or associated playful-digital element).

* 1 Do you consider yourself a player?

○ Yes
○ No

* 2 What genre and video game titles do you usually play?

* 3 Do you use or have you used video games in your teaching practice?

○ Yes
○ No

* 4 How long have you been using video games in the classroom?

○ Less than 2 years old
○ From 2 to 4 years old
○ From 4 to 6 years old
○ 6 to 8 years old
○ 8 to 10 years old
○ More than 10 years old

* 5 If you answered yes to the previous question, you consider this to be (More than one possible choice):

□ Commercial video games
□ Educational video games

□ Serious games
□ Simulator
□ Digital board games
□ Immersive experiences (Augmented Reality)
□ Own video game (Teacher creation)
□ Video game creator (Used by students)
□ Gamified activities
□ Templates from platforms such as Genially or JClic

* 6 And more specifically use (Write the title or titles of the video games):

* 7 What template and gamification platforms or tools do you use?

* 8 What for (didactic objective, content, justification, etc.)?

* 9 How did you introduce or implement video games in your classroom?

○ Complete video games
○ Video game sections (Partial use)
○ Other

* 10 If you selected other, specify which one

* 11 Regarding your use of video games in the classroom I would say that it is intended for (It is possible to select more than one option):

□ Improve motivation
□ Expand knowledge (Source of information)
□ Training (Develop practical skills)
□ Evaluation processes
□ Entertainment

* 12 Regarding the number of students participating (More than one possible choice):

□ The whole class
□ A specific group (booster groups)
□ Teacher only

* 13 How do you do grouping in activities or sessions where you use video games? (More than one possible answer choice):

□ Large group
□ Small groups
□ Pairs
□ Individual
□ Indistinctly

* 14 The use or play sessions are conducted:

○ Mainly in the school environment
○ Mostly outside the school (homework, homework, parallel practices, play sessions at home, etc.).
○ Indistinctly, both inside and outside the school and school hours.

* 15 Finally, regarding the introduction of the video game and the interaction you and your students engage in through video games, I would say it is (Multiple Choice):

□ Guided teaching
□ Guided exploration
□ Free discovery

Conceptualization and use of video games as a cultural product (Section 4 of 5)

* 1 Are you familiar with the term cultural video games?

○ Yes
○ No

* 2 What do you understand by cultural video games?

3 Could you name any video game with a strong cultural content?

○ Yes
○ No

4 If yes, please indicate the full title if known:

* 5 What elements of video games do you identify as cultural transmitters? (More than one possible answer choice):

□ Musical section (Melody, soundtrack, ambient music)
□ Sound (Sound effects, rain, footsteps, explosions, etc.)
□ Graphic elements (Image, art, color, others)
□ Narratives
□ Dialogues (Conversations between characters and/or narrator)
□ Rituals (Rites and social customs)
□ Symbology (Representation of ideas, concepts, emotions, etc.). Understood by different cultures and societies
□ Mechanics (Game-player interaction)
□ Fidelity and historical concreteness of the facts.
□ Emotional management (Construction, identity, resignification, being aware of the emotions involved, emotional capacity)
□ Access to the resource (Availability)
□ Language
□ Other

* 6 If you indicated the other option, please specify below

Post and prospective study (Section 5 of 5)

This research is part of a broader process. It includes the response to teachers' demands and research, as well as the possibility of providing teachers with specific resources for the use of video games in the classroom.

* 1 Do you have problems identifying and introducing cultural video games in the classroom?

○ Yes
○ No

* 2 Which ones?

3 Do you consider that specific training in the use of video games in the classroom is necessary?

○ Yes
○ No
○ Don't know / Don't answer

* 4 Do you consider it necessary to develop and disseminate a tool for the analysis of cultural video games?

○ Yes
○ No
○ Don't know / Don't answer

* 5 Do you consider it necessary to draw up a guide for the identification of cultural video games?

○ Yes
○ No
○ Don't know / Don't answer

* 6 Which of the following do you consider to be of interest to you? (Select as many options as you find interesting)

□ Specific training on video games in the classroom
□ List of cultural resources or video games
□ Pilot experience of introducing video games in the classroom (Supported by the University)
□ Other

* 7 If you indicated that you are interested in another aspect, please specify which one:

* 8 In which province is your workplace located? (Including Autonomous Cities)

○ Álava
○ Albacete
○ Alicante
○ Almería
○ Asturias
○ Ávila
○ Badajoz
○ Barcelona
○ Burgos
○ Cáceres
○ Cádiz
○ Cantabria
○ Castellón
○ Ciudad Autónoma de Ceuta
○ Ciudad Autónoma de Melilla
○ Ciudad Real
○ Córdoba
○ Cuenca
○ Girona
○ Granada
○ Guadalajara

- ○ Guipúzcoa
- ○ Huelva
- ○ Huesca
- ○ Islas Baleares
- ○ Jaén
- ○ A Coruña
- ○ La Rioja
- ○ Las Palmas
- ○ León
- ○ Lleida
- ○ Lugo
- ○ Madrid
- ○ Málaga
- ○ Murcia
- ○ Navarra
- ○ Ourense
- ○ Palencia
- ○ Pontevedra
- ○ Salamanca
- ○ Santa Cruz de Tenerife
- ○ Segovia
- ○ Sevilla
- ○ Soria
- ○ Tarragona
- ○ Teruel
- ○ Toledo
- ○ Valencia
- ○ Valladolid
- ○ Vizcaya
- ○ Zamora
- ○ Zaragoza
- ○ Fuera de España

* 9 If you selected the option outside Spain. Define the location and country below.

* 10 If you have chosen to be interested in one of the above aspects, please provide a contact method or email address so that we can contact you in the future.

11 Other contact email

Acknowledgement

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