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# Towards an Analysis of the Information Practices of Actors Involved in the Field of Educational Serious Games

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**Abstract.** The integration of digital technologies in education has highlighted the transformative potential of Serious Games (SGs). This research offers a comprehensive analysis of informational practices among key actors involved in the design, implementation, and utilization of SGs. Adopting a qualitative methodology, the study explores how these stakeholders navigate, interpret, and share information, and assesses the potential for enhancing existing classification models for SGs, focusing on their integration into educational strategies. Fieldwork includes workshops with teachers and institutional actors, and game experimentation at the National Library of France (BnF), providing a cross-examination of diverse perspectives. The data reveals a strong reliance on human and online resources, especially personal networks and digital platforms. Educators expressed the need for specialized research tools for Serious Games and opportunities for professional development and resource sharing. The study highlighted the need to improve the distribution of resources and suggested the potential for greater collaboration between teachers and serious games designers. Additionally, the study addresses the challenges of SG preservation, emphasizing the role of institutions like the BnF. This multifaceted exploration seeks to connect theoretical models with real-world practices, offering insights to inform future educational and archival methodologies in the digital era.

**Keywords:** Serious Games, Information Practices, Game Classification.

## 1 Introduction

Digital technologies have profoundly transformed educational landscapes, ushering in innovative teaching methods and practices. A pivotal contributor to this transformation has been the emergence and integration of Serious Games (SG) as notable educational resources. The intricate process of designing, implementing, and managing these unique educational artifacts engages a wide spectrum of stakeholders—ranging from

game designers and teachers to researchers, and even information professionals such as librarians and archivists.

All these stakeholders, within their specific realms of operation, are concerned about informational aspects related to SG. These concerns encompass the identification, tracking, utilization, and dissemination of such artefacts. While the field of Information and Library Sciences has strived to develop classification and description models that facilitate access to resources related to video games—and, by extension, SG—there remains a lack of consensus regarding a universally accepted model, which is mainly due to the wide variety of expectations, depending on user expectations, when it comes to managing information on such educational resources.

Positioned against this backdrop, our doctoral research seeks to shed light on these dimensions, pivoting on the analysis of the informational practices of the involved stakeholders. Our study will help to better understand how teachers and researchers navigate the flood of information relating to digital educational resources and, more specially, SG.

Our main objective is to address information-related issues not from a top-down or institutional point of view, but from a user-centered approach. Our review of the literature has enabled us to identify methods and models, some of which focus on the organization of video game collections, without explicitly taking into account the specifics of SGs. Other works focus on the access or distribution of SGs, without taking into account all the characteristics and constraints resulting from pedagogical contexts and the diversity of the categories of actors (makers, users, educational engineers, information managers). We try to fill this gap with this research by analyzing the intricacies of these dimensions and exploring how SGs can be more effectively classified, accessed, and utilized within educational settings. Our investigation is anchored in the hypothesis that a nuanced understanding of the informational needs and behaviors of various SG stakeholders – including designers, educators, and learners – can lead to the development of more effective educational strategies. In doing so, we not only contribute to the theoretical discourse surrounding digital educational resources but also offer practical insights for educators and designers in their quest to optimize the use of SGs. The research thus seeks to make a dual contribution: enriching the academic understanding of SGs within the Information and Library Sciences (ILS) and enhancing their practical application in educational environments.

## **2 Theoretical Framework**

### **2.1 The ambiguous definition of Serious Games**

While there exists no universal consensus on what precisely constitutes a Serious Game, the term traces its roots back to Clark Abt, an American scholar, who first considered the potential of games for military training, envisioning them as “explicitly and intentionally designed for educational purposes and not primary for entertainment.” [1] This idea is mirrored by Michael and Chen, renowned SGs designers, who describe these games as being crafted for more than just entertainment[2].

Despite these varying perspectives, for the purpose of our research, we have chosen to adopt the definition proposed by Julien Alvarez, a respected expert in Information and

Communication Technologies for Education. Alvarez defines SGs as “computer applications combining educational objectives with playful elements of video games. [3] This definition, which aligns well with the broader conceptualizations of SGs, serves as the foundation for our exploration into the informational practices of different stakeholders involved in the world of SGs. Alvarez’s perspective is particularly pertinent as it encapsulates the dual nature of SGs, blending educational intent with the engaging format of video gaming.

## **2.2 Informational Practices from an Information and Library Sciences Perspective**

Many factors can influence a person's information-seeking practices, including their knowledge and understanding of a topic, their personal and professional goals, the resources and tools at their disposal, as well as the social and cultural norms that shape their behaviours and expectations. To better understand these various factors, our study aligns with the continuum of research focused on informational practices. In doing so, we adopt the definition provided by Chaudiron and Ihadjadene. They describe informational practices as “the manner in which a set of devices, formal or informal sources, tools, cognitive skills are effectively mobilized, by an individual or a group of individuals, in various situations of production, research, organization, processing, use, sharing, communication of information.”[4] this perspective allows us to delve deeper into the nuances of how different actors engage with information in the context of SGs. The design, adaptation, and use of a serious game in an educational context require the mobilization of a number of informational competencies, regardless of the category of actor concerned.

## **3 The Imperative of Analysing Informational Practices of Serious Games Stakeholders**

Serious games, emerging as distinct branch of video games in early 2000s, represent more than mere entertainment [2]. Their rise marked a significant shift, particularly in the academic world, where the interest in utilizing these games in educational settings began to flourish[5]. This era saw teachers, especially those without a background in computer science, grappling with the complexities of finding digital SGs. The challenge for educators lies not only in identifying games that align with specific pedagogical needs but also in ensuring their technical and educational feasibility for classroom implementation.

For game designers, the questions are manifold: How to describe and share their creations effectively? What approaches can be taken to find existing resources, develop new ones, reuse gamification elements, and draw inspiration? These challenges highlight the intricacies involved in the design and dissemination of SGs.

At an institutional level, the shift towards gamification has been a significant trend for many years. The widespread adoption of digital technology presents a transformative opportunity. Institutions face the task supporting teachers in this transition and foresting the growth of a fruitful ecosystem around SGs.

Furthermore, for libraries and information institutions, the focus extends to the valorisation, preservation, and the management of collections within the unique

category of documents. As SGs continue to proliferate, generated by both teachers' innovative adaptations and designers' creative efforts, understanding the informational needs and practices of these diverse stakeholders becomes paramount. This understanding is not just about meeting their immediate requirements but also about enhancing the overall efficacy and impact of SGs in educational settings.

#### **4 Challenges of Describing Serious Games In the context of Information Services**

In the realm of Libraries and Information Sciences, myriad models aim to categorize video game resources as discrete units, facilitating their access, use, and repurposing in diverse contexts. Such efforts have been significantly buoyed by the enthusiasm of information services, spanning libraries, archives, and documentation centers. Yet, a universal standard for video game description remains elusive. Pre-existing standards tailored for conventional document resources stumble when addressing the unique contours of video games[6]. For instance, the U.S. Library of Congress catalogs video games using metadata originally crafted for films and sound recordings. Such an approach inevitably begs questions concerning the efficacy of database retrievals using this methodology[7]. These standards inadequately capture the essence of video games for the research community[8].

IFLA's FRBR model (Functional Requirements for Bibliographic Records), though commonly utilized for video game description, is riddled with constraints emanating from the intricate nature of video games and the model's inherent omissions[6]. The delineation between its core entities – Work, Expression, Manifestation, and Item – becomes muddled when applied to video games[9]. Recognizing these inherent limitations, Jacob Jett put forth the "Conceptual Model for Video Games and Interactive Media"[6]. Jett's brainchild seeks to encapsulate the perceptions of diverse stakeholders such as players, collectors, and researchers about video games and their interrelations. Building on Jett's framework, the Mediated Vocabulary For Video Game Research[10] delves into the amalgamation of diverse informational sources, such as game-centric metadata, to recreate the chronological release journey of video games. This vocabulary emerges as a conduit, bridging diverse sources to provide a consolidated information pool for researchers.

The in-depth taxonomy proposed by De Lope and Medina-Medina[11] aligns well with the challenges of describing serious games in the context of Information Services. Their taxonomy provides a comprehensive framework for understanding the multifaceted nature of serious games, addressing the need for a cohesive classification system that can cater to the diverse requirements of educators, designers, and documentary institutions.

Serious games, a niche within the video game universe, compound the complexity of description. The vast tapestry of stakeholders implies an intricate web of informational expectations.

While educators gravitate towards descriptors anchored in pedagogy, designers yearn for resources underpinned by gamification, adaptability, and reusability. Julien Alvarez's G/P/S model[12], underpinning our study, emerges as a beacon in this space.

Segmenting on *Gameplay*, *Purpose*, and *Scope*, the model resonates with the duality of serious games – the playful and the purposeful. The *Gameplay* facet unravels the structural core of the game, discerning winnable games from explorative video toys. The “*Purpose*” dimension elucidates the broader objectives that transcend entertainment, while the *Scope* facet offers insights into its application realms, target audience, and age specificity.

Incorporating the descriptive models outlined in this section, our intended exploration of stakeholder information practices will juxtapose theoretical paradigms against real-world applications in the educational domain. We delineate these perspectives in the following sections.

## 5 Method

Our study adopts a qualitative approach to explore in depth the perceptions and experiences of teachers and educational engineers regarding the use of SGs in education. The aim is to understand the practical dynamics and challenges faced by professionals in integrating these pedagogical tools.

Data collection was based on a two-stage workshop aimed at identifying the information practices and resources used by 31 teachers and educational engineers. First, they were asked to imagine a situation in which they were looking for a serious game to use in class, to place all the sources they would consult and to position them in 3 concentric circles. Secondly, 9 of the 31 participants agreed to take part in semi-structured interviews. 8 of the 9 interviews were conducted on the Zoom platform in order to facilitate participation despite geographical and time constraints. Only one interview was conducted face-to-face.

The interviews were structured around a grid of individual semi-structured interviews, facilitating open discussion while focusing on key themes based on the Information Horizon concept[13]. The concept of the information horizon suggests that in a given context and situation, there is an "information horizon" within which we can act. Important data such as decisions taken, information-seeking processes, access to resources, individual preferences and the impact of situations on information-seeking processes shape this horizon.

The questions related to their professional backgrounds, their personal experiences with SG, their information practices and their strategies for integrating SG into their teaching practices, and their perceptions of the benefits of and obstacles to SG.

## 6 Preliminary results

The data reveals a strong reliance on human and online resources, especially personal networks and digital platforms. Educators expressed the need for specialized research tools for Serious Games and opportunities for professional development and resource sharing. The study highlighted the need to improve the distribution of resources and suggested the potential for greater collaboration between teachers and serious games designers.

## 7 Research Perspectives

Our thesis seeks to enrich the understanding of informational practices among serious game actors. By adopting a qualitative research approach, we intend to delve deep into the informational landscape surrounding designers and users of serious games. Specifically, our research aspires to:

- Enrichment of Classification Models: Explore potential avenues to augment existing classification frameworks for serious games, enhancing their relevance and utility.
- Assess Pedagogical Impact: Investigate the tangible effects of integrating serious games into educational methodologies and curriculum.

Beyond the practical access, the realm of Serious Games also encounters significant challenges in preservation. The endeavor to preserve video games—efforts dedicated to ensuring the usability, conservation, and collection of materials and knowledge chronicling the history of video games[15]—began to resonate with library and information professionals in the 1990s. In France, the 1992 deposit legislation empowered the National Library of France (BnF) with the mandate to archive software that is either published, disseminated, or imported within the country, including video games. The BnF's video games collection, encompassing serious games, caters to academic researchers. This repository will not only bolster our research but will also be juxtaposed against hands-on studies in educational landscapes.

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