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Research Article

Exploring the Landscape of Role-Playing Game Research Through Bibliometric Analysis From 1986 to 2023 Using Scopus Database

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Background: Role-playing games (RPGs) have long attracted scholars because of their interactive and immersive attributes. The areas of studies on RPGs are various, from computer science to sociology and psychology. Nevertheless, there is a notable absence of comprehensive systematic literature that traces the trends, changes, and developments in RPG research.
Purpose: This paper is aimed at undertaking a systematic review of RPG research by analyzing the Scopus database, covering the period from 1986 to 2023.
Method: The analyzed dataset comprises 1152 documents, filtered through the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) screening method from an initial pool of 2908 data points. This data was subjected to analysis using descriptive statistics and bibliometric techniques to discern trends in RPG research and identify influential documents shaping studies in this domain.
Findings: This research systematically analyzes RPG research, providing insights into growth patterns, global interest, and influential contributors. By synthesizing diverse research strands, the study contributes valuable knowledge for scholars, practitioners, and policymakers as well as guiding future research in RPGs.
Contribution: This research provides valuable insights into the evolving RPG landscape, offering guidance for future research.

Keywords: bibliometric analysis; global interest; growth patterns; influential contributors; interdisciplinary studies; role-playing games (RPGs); Scopus database; systematic review; trends

1. Introduction

Role-playing games (RPGs) have been an indispensable component of the global game industry [1]. In RPGs, participants are assigned a character whose growth and evolution are influenced by the decisions made by them during the course of gameplay and interactive storytelling. RPGs establish a compelling and immersive milieu for participants through the implementation of a reward-driven system. In this system, players undertake "quests" during their gameplay experiences and are subsequently rewarded upon successful quest completion, facilitating their involvement in increasingly intricate and demanding challenges [2]. In contemporary discourse, RPGs are commonly understood as a genre of video games, as noted by Awati [3]. Kao [4] elaborates on this notion, highlighting how RPGs in digital form have introduced elements such as "juiciness, color, audio, feedback, and seductive details" to augment the traditional design of RPGs.

RPGs are categorized into two primary classifications: nondigital RPGs and digital RPGs [5].

Nondigital RPGs, often referred to as "pen and paper" and "live action role-play" (LARP), involve a group of players sitting around a table or gathering in a designated space [5]. In these games, participants engage in the

gameplay through verbal description and physical interaction, fostering an immersive and collaborative experience. This has spurred research into the use of RPGs in the area of training and education. Notably, Sanchez, Young, and Jouneau-Sion [6] and Warin et al. [7] have explored the application of RPGs in the educational context, focusing on high school and higher education. Additionally, RPGs serve as a research tool in studies related to decision-making, as exemplified by the works of Innes and Booher [8], Becu et al. [9], and Lamarque et al. [10].

On the other hand, digital RPGs often refer to the form of video games [5]. Digital RPGs also provide players with immersive and collaborative experiences by adapting nondigital RPGs in digital form. Research on video games primarily constitutes an interdisciplinary subject of study centered on human–computer interaction, with its foundations grounded in the disciplines of psychology and computer science [11]. RPGs, in particular, are the subject of research due to their distinctive design, encompassing both computer-to-human interaction and player-to-player interaction. Studies on digital RPGs involve the examination of issues like the impact of video game addiction and problematic use on physical and mental health, as highlighted by Mentzoni et al. [12], and the exploration of the design aspects of digital RPGs, as discussed by McMahan [13]. The immersive qualities of RPGs open avenues for research beyond entertainment, including their application in education [14], training [15], and management [16].

Among the diverse spectrum of digital RPGs, massively multiplayer online role-playing games (MMORPGs)—a special case of RPGs—have garnered the greatest research focus [12]. MMORPGs are a type of digital RPG that offers players an interactive environment populated by thousands of individuals, resembling a virtual world [17]. In MMORPGs, participants have the capacity to exercise control over their respective avatars, navigate the virtual realm, engage in physical and verbal interactions with both fellow players and nonplayer characters (NPCs), and partake in a variety of activities, including the completion of quests and sporting endeavors. Due to their pronounced levels of autonomy and interactivity, MMORPGs have become the focal point of numerous research endeavors within the domains of human–computer interaction and media psychology [11]. For instance, research on motivation to play [18], in-game social interaction [19], and the phenomenon of MMORPG addiction [20] has been conducted. Furthermore, MMORPGs also facilitate the undertaking of extensive research initiatives, such as investigating the connection between human behavior during real-world epidemics and the behavioral responses of players during the Corrupted Blood incident in World of Warcraft (WoW) [21].

Previously, there were several systematic reviews made on related topics of RPGs. Notably, there is Sun et al.'s [11] research on MMORPG knowledge structure and Arenas, Viduani, and Araujo's [22] on RPGs in mental health research. There are also systematic reviews on research in various majors that include role-play factors, such as communication training [23], teaching history-taking [24], and learning through stimulation [25]. However, a broader review of the whole field of RPGs has thus far remained untouched.

In this study, bibliometric analysis will be employed to enhance the current knowledge pertaining to RPGs. Bibliometrics is an analytical methodology employed to systematically interpret, map, and analyze the vast amount of unstructured data that accumulates within established domains of scientific knowledge. This method has been chosen due to its effectiveness in managing large volumes of scientific data and its ability to produce high research impact [26]. Following the guidelines established by Donthu et al. [26], this study is aimed at investigating the research trends in the field of RPGs. It will endeavor to discern the primary driving forces behind research within this domain, including the notable contributions made by authors, academic institutions, and countries. Additionally, this research will employ cocitation analysis to pinpoint highly cited authors, documents, and journals within the RPG research landscape. Overall, our research questions (RQs) include the following:

RQ1: What is the trajectory of growth and the geographical dispersion of scholarly literature in the field of RPGs?

RQ2: Which documents and authors exert the most significant impact within the domain of RPGs?

RQ3: Which publication outlets exert the most significant impact within the domain of RPG research?

RQ4: What are the fundamental research domains within the field of RPG research?

RQ5: What are the current trends of RPG research and the latest research outcomes?

2. Method

2.1. Data Collection. The data for this research was sourced from the Scopus database and subsequently analyzed using VOSviewer.

While conducting bibliometric analysis, scholars have several alternative databases to choose from, such as Scopus, Web of Science, and Dimensions [27]. This choice is influenced by the technical compatibility between these databases and the software used for analysis, such as VOSviewer. Other, more extensive databases like Google Scholar and Semantic Scholar were not selected due to their incompatibility with the analysis software. In this study, Scopus was selected because it is more suitable for social science-related topics such as RPGs and because it also has more books, book chapters, and conference papers [28, 29].

The researchers adhered to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines for conducting document searches, as outlined by Moher et al. [30].

First, the search process involves inputting the keywords "role playing game" and "role-playing game" and related keywords (such as "live action role playing game") into the advanced search section of the Scopus database on May 16, 2024. Since the keywords have a similar meaning, they were separated by the argument "OR". Furthermore, we excluded publications from the year 2024 due to their incomplete status and the ongoing nature of their updates. The search

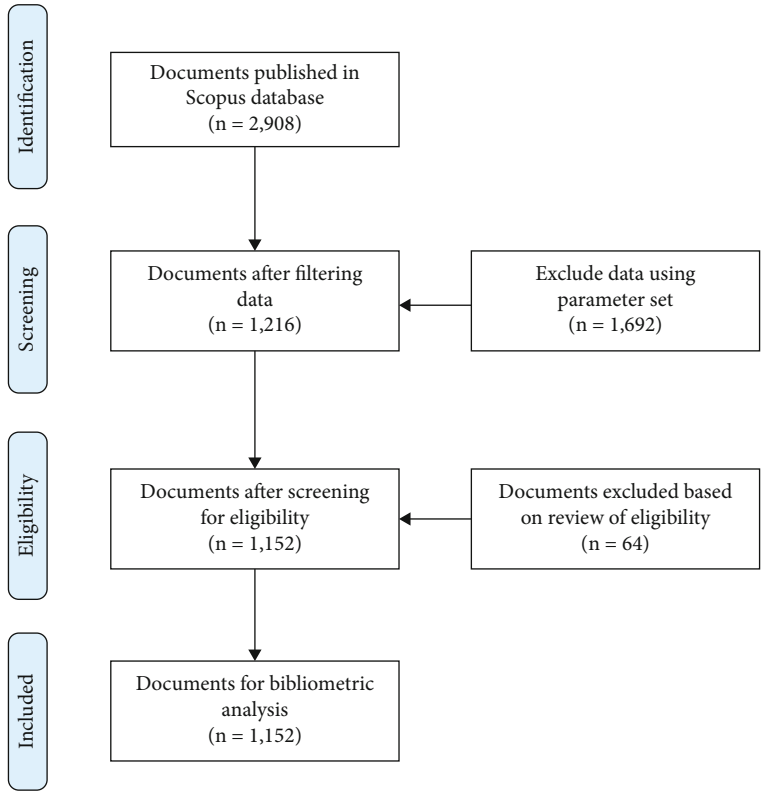

Figure 1: PRISMA screening process.

yielded an initial total of 2908 documents. The data was subsequently refined through a series of filtering criteria:

- Exclusion of documents published in the year 2024;
- Restriction to subject areas encompassing social science, arts, and humanities and psychology, business, decision sciences, economics, and multidisciplinary;
- Limitation to document types categorized as article, conference paper, book chapter, and book;
- Selection of documents at the final stage of publication;
- Exclusion of documents not in the English language.

The new keywords were then entered into the advanced search section of the Scopus database. The set of keywords was combined using the logical operator "AND"; the keyword "PUBYEAR, 2024" was linked with the operator "EXCLUDE"; and the rest of the keywords were connected using the operator "LIMIT-TO." The search phrases are as follows:

TITLE-ABS-KEY ("role playing game*" OR "role-playing game*") AND ("live action role playing game*" OR "live action role-playing game*") AND (EXCLUDE (PUBYEAR, 2024)) AND (LIMIT-TO (SUBJAREA, "SOCI") OR LIMIT-TO (SUBJAREA, "ARTS") OR LIMIT-TO (SUBJAREA, "PSYC") OR LIMIT-TO (SUBJAREA, "BUSI") OR LIMIT-TO (SUBJAREA, "DECI") OR LIMIT-TO (SUBJAREA, "MULT")) AND (LIMIT-TO (DOCTYPE, "ar") OR LIMIT-TO (DOCTYPE, "cp") OR LIMIT-TO (DOCTYPE, "ch") OR LIMIT-TO (DOCTYPE, "bk")) AND (LIMIT-TO (PUBSTAGE, "final")) AND (LIMIT-TO (LANGUAGE, "English")).

The search and screening process is illustrated in Figure 1. Out of the initial 2908 documents obtained from the Scopus search, 1692 documents were eliminated from the initial raw data due to their irrelevance to the specified search criteria. Subsequently, the new dataset underwent a further filtration process involving the examination of document titles and abstracts to identify and exclude materials that were unrelated to RPGs. This culling process resulted in a reduction of the dataset from 1216 to 1152 documents (see Figure 1). It should be noted that the database comprises 1152 RPG-related documents. This includes not only documents that primarily focus on RPG topics (such as Cole and Griffiths [19]) but also those that mention RPG at some points in their content (e.g., [31]).

2.2. Data Analysis. The screened data were exported from Scopus into a master Excel file to conduct descriptive statistical analyses for the data, including growth trajectory and geographical distribution. The Excel file was then uploaded to VOSviewer to conduct bibliometric science mapping [32].

VOSviewer, a bibliometric analysis tool, was employed to conduct a comprehensive examination encompassing coauthorship, bibliographic coupling, cocitation, and co-occurrence analyses within the domain of RPG research. Coauthorship analysis facilitated the creation of science maps illustrating collaborative networks among countries and authors, shedding light on knowledge dissemination and collaborative frameworks within the academic

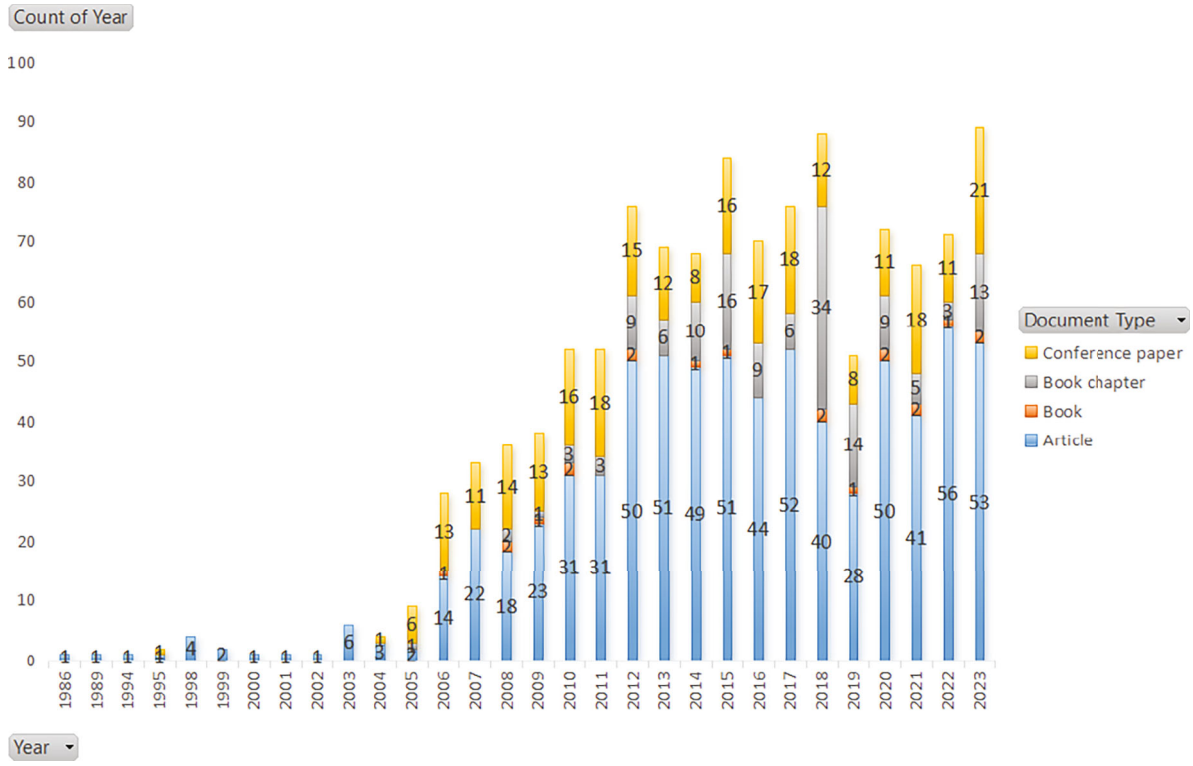

Figure 2: Number of publications on RPG over time.

community [26]. Bibliographic coupling, following the methodology elucidated by Donthu et al. [26], served as an analytical approach to generate scientific maps, revealing intellectual connections and thematic intersections by assessing the relatedness between the citations of two documents. Cocitation analysis, as per Donthu et al. [26], enabled the mapping of frequently cited documents, unveiling the primary research areas in RPG literature. Finally, co-occurrence analysis, in alignment with the methodology proposed by Van Eck and Waltman [32], was conducted to delineate a scientific network based on instances where two keywords coappeared in the titles, abstracts, or keyword lists of documents. This multifaceted approach provided a nuanced understanding of the landscape and dynamics of RPG research.

2.3. Limitations of Research Method. All research methods have their disadvantages, and bibliometric analysis is no exception. First, in bibliometric analysis, a specific academic database must be selected as the source for data collection; however, the chosen database may not cover all relevant publishing outlets (i.e., journals, books, and conferences). In this study, Scopus was selected as the data source, but it does not index some important journals related to RPGs, such as *The International Journal of Role-Playing and Analog Game Studies*. As a result, some important RPG papers may be missed, or the number of citations counted may be incomplete. Second, bibliometric analysis tends to focus on bibliometric indicator-based descriptive analysis and science mapping rather than on the in-depth content of the studied papers, which may provide a more comprehensive reflection of their quality. Third, this study focuses solely on English-language RPG documents, excluding those written in other languages such as Chinese, French, or German.

3. Findings and Discussion

3.1. The Trajectory of Growth of Scholarly Literature and Types of Publication in the Field of RPGs From 1986 to 2023. The year 1986 marked the first instance of a publication on RPGs, according to the Scopus database. Specifically, in 1986, the seminal article by Zayas and Lewis [33] explored adaptive social interaction among boys playing Dungeons and Dragons, thereby inaugurating RPG literature. This research was published 12 years after the release of the first and most famous RPG ever made, Dungeons and Dragons [34]. The game gained popularity upon its release and began to garner mass cultural recognition in the late 1970s and 1980s. However, as depicted in Figure 2, it is evident that there was a noteworthy lack of interest in RPG research from 1986 to 2002, with the annual number of RPG publications consistently ranging between zero and two papers. Subsequently, between 2003 and 2005, studies on RPGs began to garner attention from scholars; however, the number of papers published during this period remained significantly low, consistently below 10 papers per year. The period from 2006 to 2012 witnessed a substantial growth in the number of published papers. The growth was steady from 2006 to 2009, and in 2010, the momentum increased significantly, reaching 76 articles in 2012. This can be explained by the

Table 1: Top 10 countries on RPG based on number of publications.

No.	Country	Year of first publication	Documents	Citations	Citations per document
1	The United States	1986	336	7801	23.2
2	The United Kingdom	1989	117	3595	30.7
3	Canada	1998	71	1309	18.4
4	Taiwan (ROC)	2006	65	2368	36.4
5	France	2005	63	1588	25.2
6	Australia	2005	59	951	16.1
7	Germany	2005	55	822	14.9
8	Italy	2007	40	624	15.6
9	China	2006	38	459	12.1
10	Netherlands	2010	37	1150	31.1

fact that the 2000s witnessed the release of numerous RPGs that garnered significant attention at the time of their launch, with notable examples being Diablo II, Final Fantasy XI, and particularly WoW, which has emerged as one of the most renowned MMORPGs in history [35]. This prompts the inquiry into the influence of RPGs on their players and the exploration of how these impacts can be adapted and utilized in other areas, such as education.

From 2013 to 2023, there was a stable trend in the number of papers published each year. Notably, there was a temporary reduction in the number of published papers in 2019, but the growth momentum started to recover in 2020. The decline in 2019 can be attributed to a shift in player preferences, as various video game genres gained significant attention in recent years. Genres such as Multiplayer Online Battle Arena (MOBA), Battle Royale, and First-Person Shooter captured the spotlight, drawing players away from other genres. The resurgence observed from 2020 onward may be linked to the heightened attention the video game industry received during the COVID-19 period, as more people turned to gaming as a form of entertainment and social connection during lockdowns and restrictions.

Regarding types of publication, our database comprises four document types: article, book, book chapter, and conference paper. As shown in Figure 1, journal articles dominate the collection, constituting 63.2% of the total with 728 documents, followed by conference papers at 22.6% with 260 documents, book chapters at 12.5% with 144 documents, and books at 1.7% with 20 documents.

Notably, there was a significant increase in the number of book chapters, rising from six in 2017 to 34 in 2018. This shift can be attributed to the publication of a book on RPGs titled *Role-Playing Game Studies: Transmedia Foundations*, edited by Sebastian Deterding and José Zagal, which contributed 28 of the book chapters during that period.

3.2. The Geographical Dispersion and Science Mapping of Scholarly Literature in the Field of RPG From 1986 to 2023. Table 1 indicates that scholars from the United States secured the top position with 336 documents (29.2%) and 7801 citations, followed by the United Kingdom with 117 documents (10.15%) and 3595 citations. Despite Canada (third rank) having more publications (71) than Taiwan (Republic of China (ROC)) (fourth) (61) and France (fifth) (62), it amassed fewer citations (1309) compared to Taiwan (ROC) (2368) and France (1588). The sixth position is held by Australia with 59 documents and 951 citations, followed by Germany with 55 documents and 822 citations, and Italy with 40 documents and 624 citations in the seventh and eighth positions, respectively. China and the Netherlands secured the ninth and tenth spots with 38 documents and 459 citations and 37 documents and 1150 citations, respectively.

The first-place ranking of the United States is understandable, given that it is the birthplace of the first commercialized RPGs [36]. The presence of Taiwan (ROC) and China in the Top 10 can be attributed to the rapid growth of their gaming industries between 2000 and 2010 [37].

To illuminate the coauthoring pattern among countries in RPG studies, we employed science mapping analysis. As shown in Figure 3, the global distribution of RPG studies is depicted across 77 countries. The size of each node corresponds to the number of publications, and the color indicates the seniority of each country in the field. Predominantly, nodes are colored in shades of purple and green, suggesting a higher level of seniority. In contrast, there are only a few nodes colored in yellow, indicating a scarcity of new players in the field. This implies that there are relatively few newcomers in the realm of RPG research.

There exist links between different nodes that represent the coauthorship between different countries. The two biggest links are between the United States and the United Kingdom (12 link strengths or 12 coauthoring publications of scholars from the two nations) and the United Kingdom and Australia (nine link strengths). The US scholars and the UK peers coauthored a wide range of topics, including the relationship between in-game behavior and off-game behavior [38], the form of RPGs and their characteristics [39], and online RPG addiction [40]. The United Kingdom and Australia shared their research on the Proteus effect on RPG players [41], female gaming [42], virtual purchase behavior [43], and game-based learning [44].

According to Figure 3, Macao, Ecuador, Guatemala, Bhutan, Costa Rica, and Kazakhstan are the seven countries that had their first publication on RPGs in recent times (2020-2022). Macao, Ecuador, Guatemala, and Kazakhstan had their first publication on game-based learning using

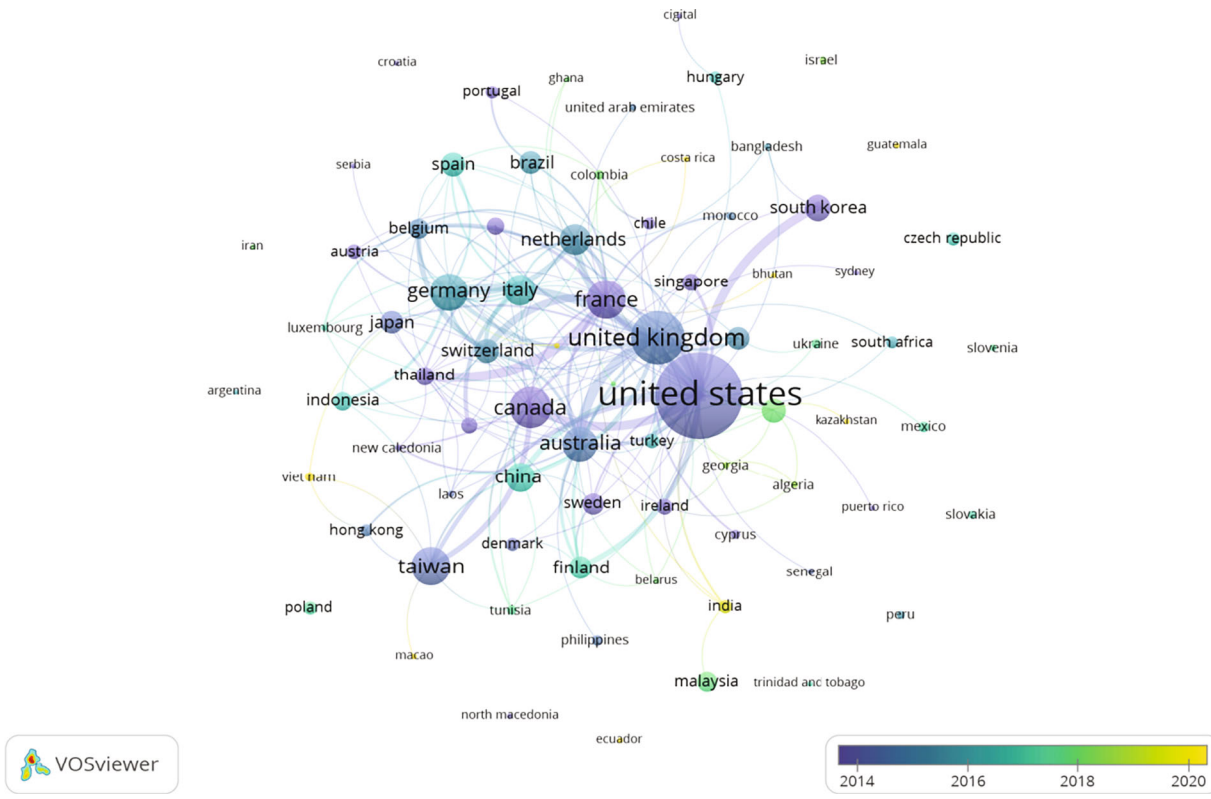

Figure 3: Science mapping of country collaboration on RPG. Note: 77 countries from 1986 to 2023.

RPGs [45–48]. Bhutan marked its inaugural collaborative publication with France, focusing on utilizing RPGs to tackle the challenge of overgrazing and subsequent high-elevation rangeland degradation in the alpine areas of eastern Bhutan [49]. Similarly, Costa Rica achieved its initial collaborative publication with France and the Netherlands, centering on the application of RPGs as a tool for scenario evaluation [50].

3.3. Authors and Research Groups Exert the Most Significant Impact Within the Domain of RPG Research From 1986 to 2023. Table 2 shows the Top 10 scholars in the realm of RPG literature. The first place belongs to Griffiths with 12 documents and an average of 123.3 citations per document, followed closely by Szafron with 10 documents and an average of 8.2 citations per document. Billieux and Cutumisu have nine documents; however, Billieux has a significantly higher number of citations per document (102.9) compared to Cutumisu (8.2). The fifth place belongs to Le Page with eight documents and 386 citations. The last five places have the same number of documents (seven), so they were ranked based on the citations per document. Barreteau ranked sixth with 60.9 citations per document, followed by D'aquino (44.3), Dray et al. (24.1), Perez (22.7), and Schaeffer (9.7).

Figure 4 unveils the collaborative landscape among 200 authors with the highest number of publications from 1986 to 2023 through coauthoring analysis. Each node represents an author, with its size corresponding to the number of publications attributed to that author, mirroring the structure of Figure 3.

As evident in Figure 4, research groups within the RPG field exhibit characteristics of being both large and cohesive, featuring various groups alongside a few single authors. Notably, there are prominent groups led by significant authors, including Griffiths and Billieux's group, Szafron's group, and Le Page's group.

Upon closer examination, it becomes apparent that while Griffiths and Billieux's group remains active, as indicated by light nodes (new authors), Szafron's group shows a lack of recent publications, marked by dark nodes. This decline in activity is linked to the decreased involvement of the group's leader, Szafron, who has been entirely inactive in the field since 2016. Similarly, Le Page's group also exhibits numerous dark nodes, suggesting a period of inactivity in RPG research in recent years.

Surprisingly, within Le Page's group, there are noticeable yellow nodes indicating new authors and publications in RPG research. These nodes are connected to Perez, suggesting his role as the new leader of the group. However, it is important to note that a search on Google Scholar yields conflicting information. According to Google Scholar, Le Page remains actively involved in recent research, evidenced by his latest work on RPG dated in 2022. This variance could be linked to a potential oversight in the Scopus database, where Le Page's recent publications, particularly those in French, may not have been included, resulting in an incomplete portrayal of his recent research endeavors.

Furthermore, the emergence of new multiauthor groups, particularly the group comprising Mota, Born, De Aguiar, and Adamatti—who collectively contributed three publications in 2023 [51–53], adds to the evolving landscape of

Table 2: Top 10 authors on RPG based on number of publications.

No.	Author	Affiliation	Documents	Citations	Citations per document
1	Griffiths	Nottingham Trent University, The United Kingdom	12	1479	123.3
2	Szafron	University of Alberta, Canada	10	82	8.2
3	Billieux et al.	Catholic University of Louvain, Belgium	9	926	102.9
4	Cutumisu	University of Alberta, Canada	9	74	8.2
5	Le Page	Centre de coopération internationale en recherche agronomique pour le développement, France	8	386	48.3
6	Barreteau	Institut national de la recherche agronomique, France	7	426	60.9
7	D'aquino	Centre de coopération internationale en recherche agronomique pour le développement, France	7	310	44.3
8	Dray et al.	Australian National University, Australia	7	169	24.1
9	Perez	Australian National University, Australia	7	159	22.7
10	Schaeffer	University of Alberta, Canada	7	68	9.7

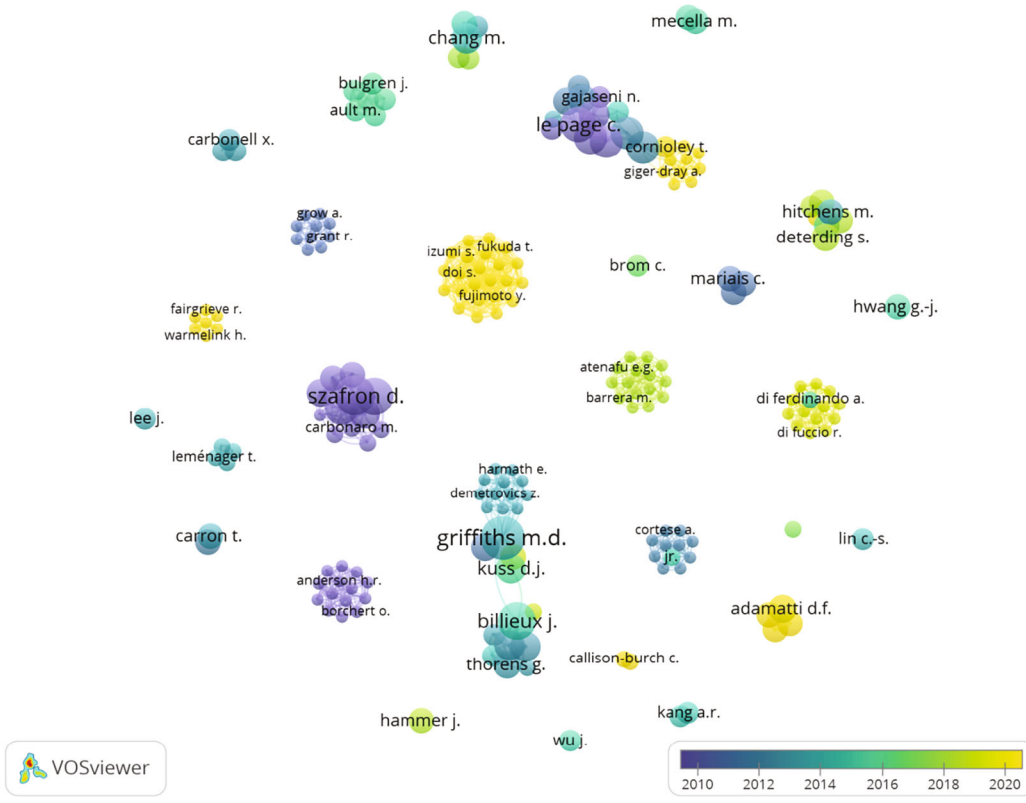

Figure 4: Science mapping of author collaboration on RPG. Note: 200 authors from 1986 to 2023.

RPG research groups, indicating collaborative efforts and potentially shifting leadership dynamics within these groups.

3.4. Documents Exert the Most Significant Impact Within the Domain of RPG Research From 1986 to 2023. Table 3 shows the Top 10 documents based on citations among the 90 documents illustrated in Figure 5. The document with the highest citation is attributed to Cole and Griffiths [19], focusing on the relationship between the social interactions of MMORPG players, both within the game and in off-game contexts, with 669 citations. Within the Top 10, while most documents specifically focus on RPGs, Mentzoni et al. [12] (ranked fourth), McMahan [13] (ranked sixth), and Shaffer [31] (ranked seventh) primarily address digital games and only refer to RPGs at certain points in their research.

It should be noted that this study covers not only documents specifically focused on RPGs but also documents that relate to RPGs at some points in their content. For example, among the Top 10 RPG-related documents, seven belong to the former category, while three belong to the latter (see Table 3). A high-profile example of the latter group is [31] work, which specifically develops the concept of epistemic frames. This

Table 3: Top 10 RPG-related documents based on citations.

No.	Author	Title	Source	Relevance to RPG		Citations
				Specifically focused	At some points	
1	Cole and Griffiths [19]	Social Interactions in Massively Multiplayer Online Role-Playing Gamers	*Cyberpsychology, Behavior, and Social Networking*	X		669
2	Yee et al. [54]	The Unbearable Likeness of Being Digital: The Persistence of Nonverbal Social Norms in Online Virtual Environments	*Cyberpsychology, Behavior, and Social Networking*	X		442
3	Hwang, Yang, and Wang [14]	A Concept Map-Embedded Educational Computer Game for Improving Students' Learning Performance in Natural Science Courses	*Computers and Education*	X		417
4	Mentzoni et al. [12]	Problematic Video Game Use: Estimated Prevalence and Associations with Mental and Physical Health	*Cyberpsychology, Behavior, and Social Networking*		X	385
5	Innes and Booher [8]	Consensus Building as Role Playing and Bricolage	*Journal of the American Planning Association*	X		355
6	McMahan [13]	Immersion, Engagement, and Presence: A Method for Analyzing 3-D Video Games	*The Video Game Theory Reader*		X	348
7	Shaffer [31]	Epistemic Frames for Epistemic Games	*Computers and Education*		X	317
8	Dickey [55]	Game Design and Learning: A Conjectural Analysis of How Massively Multiple Online Role-Playing Games (MMORPGs) Foster Intrinsic Motivation	*Educational Technology Research and Development*	X		292
9	Kuss, Louws, and Wiers [20]	Online Gaming Addiction? Motives Predict Addictive Play Behavior in Massively Multiplayer Online Role-Playing Games	*Cyberpsychology, Behavior, and Social Networking*	X		257
10	Billieux et al. [18]	Why Do You Play World of Warcraft? An In-Depth Exploration of Self-Reported Motivations to Play Online and In-Game Behaviours in the Virtual World of Azeroth	*Computers in Human Behavior*	X		253

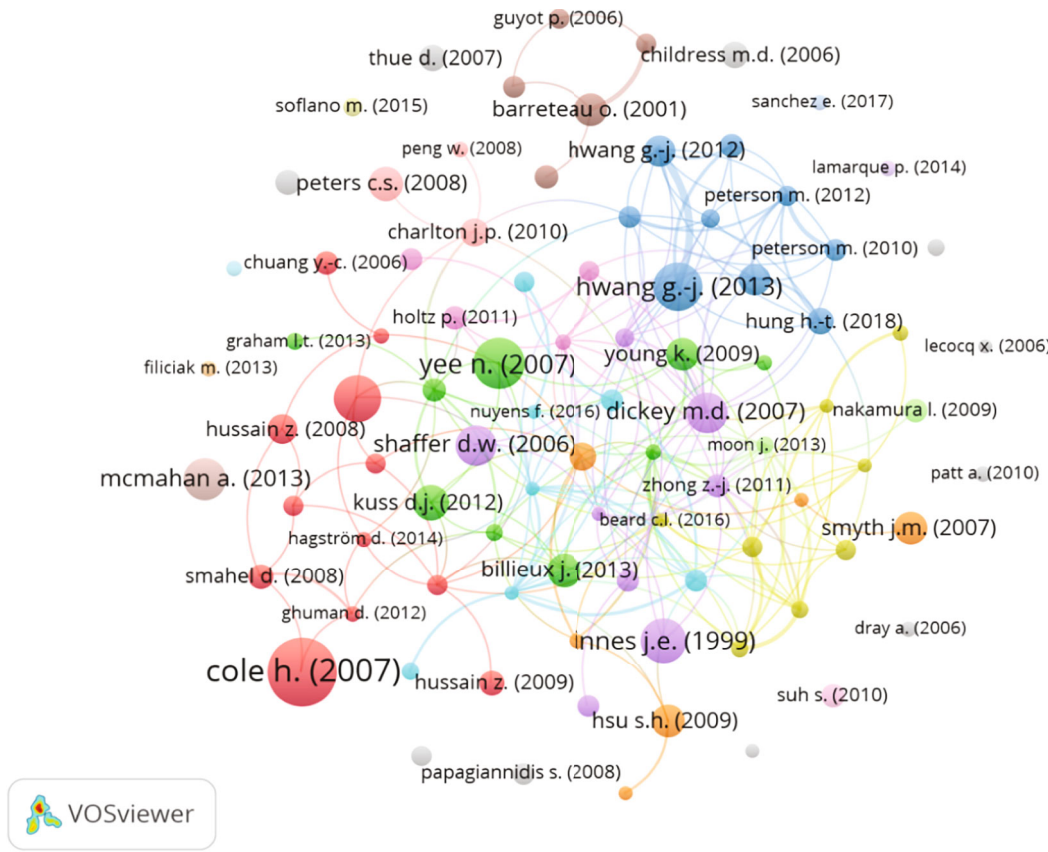

Figure 5: Science mapping of documents based on the coupling analysis. Note: 90 documents with a minimum of 60 citations.

Table 4: Top 10 publication sources ranked by number of documents.

No.	Source	Publisher	Documents	Citations
1	*Computers in Human Behavior* (Journal)	Elsevier	48	2498
2	*Cyberpsychology, Behavior, and Social Networking* (Journal)	Mary Ann Liebert	36	3924
3	Proceedings of the European Conference on Games-Based Learning (Conference)	/	36	92
4	*Games and Culture* (Journal)	Sage	28	655
5	*Role-Playing Game Studies: Transmedia Foundations* (Book)	Routledge	28	247
6	*Simulation and Gaming* (Journal)	Sage	27	516
7	*Computers and Education* (Journal)	Elsevier	13	1639
8	*Journal of Artificial Societies and Social Simulation* (Journal)	University of Surrey	12	805
9	Proceedings - Frontiers In Education Conference, FIE (Conference)	Institute of Electrical and Electronics Engineers	9	23
10	*Personality and Individual Differences* (Journal)	Elsevier	8	323

concept serves as a mechanism through which students can leverage experiences in video games, computer games, and other interactive learning environments to handle situations more effectively outside the original learning context.

Figure 5 visually represents a network of the Top 90 documents, showcasing the most connections between documents that share common references among the 1152 documents. This network was constructed using bibliographic coupling as a method for analysis. The network illustrates 28 different clusters, with 11 clusters having more than two documents.

3.5. Publication Outlets Exert the Most Significant Impact Within the Domain of RPG Research From 1986 to 2023. Table 4 represents the Top 10 publication outlets within the domain of RPGs, according to the number of documents. Among the Top 10, there are seven journals, two conferences, and one book.

Among seven journals, five are published by Elsevier and Sage. Specifically, Elsevier published *Computers in Human Behavior* (ranked first with 48 documents and 2498 citations), *Computers and Education* (ranked seventh with 13 documents and 1639 citations), and *Personality and*

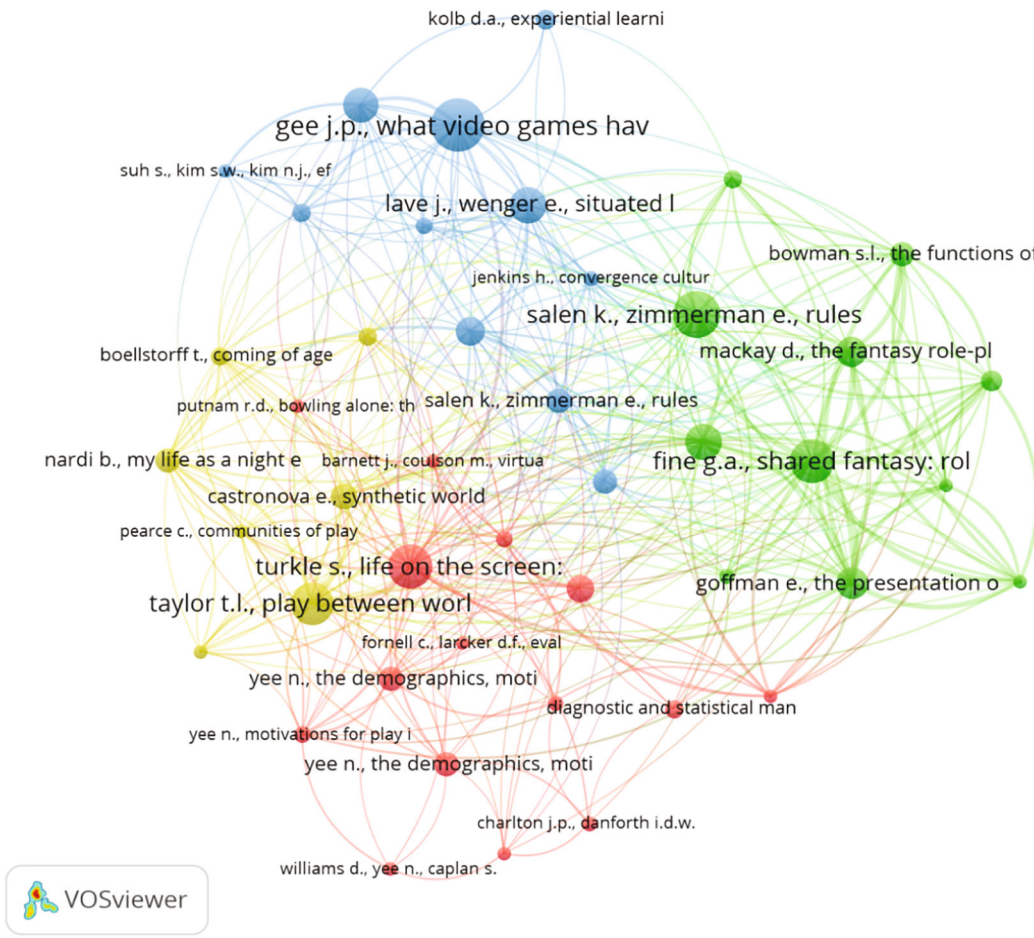

Figure 6: Science mapping of documents based on the cocitation analysis. Note: 44 documents with a minimum of 10 citations.

Individual Differences (ranked tenth with eight documents and 323 citations). Sage published *Games and Culture* (ranked fourth with 28 documents and 655 citations) and *Simulation and Gaming* (ranked sixth with 27 documents and 516 citations). The remaining two journals are *Cyberpsychology, Behavior, and Social Networking* (ranked second with 36 documents and 3924 citations), published by Mary Ann Liebert, and *JASSS* (ranked eighth with 12 documents and 805 citations), published by the University of Surrey. The Proceedings of the European Conference on Games-Based Learning and Proceedings - Frontiers in Education Conference (FIE) contributed high numbers of documents (36 and nine, respectively); however, their citation counts were significantly lower than the others in the Top 10 (92 and 23 citations, respectively). *Role-Playing Game Studies: Transmedia Foundations*, published by Routledge, was the only book in the Top 10 (ranked fifth with 28 documents and 247 citations).

Regarding the scope of the outlets, three outlets, including two journals (*Games and Culture* and *Simulation and Gaming*) and one book (*Role-Playing Game Studies: Transmedia Foundations*), are specifically games-related; meanwhile, seven others belong to more extended fields or subjects, such as *Computers in Human Behavior* and *Computers and Education.*

3.6. The Fundamental Research Domains Within the Field of RPG Research From 1986 to 2023. To delineate the core research domains within the realm of RPG research, we undertook a cocitation analysis, as depicted in Figure 6. The resulting science map revealed a cocitation network comprising 44 documents, each having a minimum of 10 citations. Each cluster, distinguished by a distinct color, represents a distinct domain of study. Three themes are identified: the education-related theme (blue cluster), the RPG design–related theme (green cluster), the human behavior in virtual environment–related themes (red cluster), and the virtual culture–related themes (yellow cluster). Additionally, a comprehensive list of the Top 10 documents was compiled, providing a succinct overview of the most influential and frequently cited works in the field, as presented in Table 5.

It is evident that many of the frequently cited sources in the field, such as Lave and Wenger [61], Csikszentmihalyi [62], and Goffman [64], do not originate from game studies. While these sources do not provide a precise representation of the field itself, they underscore the theories, for example, situated learning theory [61] or flow state theory [62], that frequently inform and influence it.

3.6.1. Blue Cluster: Education. According to Table 5, Gee [56] emerges as the most cocited document with 38

Table 5: Top 10 documents cited by RPG-related research.

No.	Document	Article/book title	Publisher/journal	Relevance to RPG		Number of citations
				Specifically focused	At some points	
1	Gee [56]	*What Video Games Have to Teach Us about Learning and Literacy* (Book)	Palgrave Macmillan (Publisher)		X	38
2	Salen and Zimmerman [57]	*Rules of Play: Game Design Fundamentals* (Book)	MIT Press (Publisher)		X	34
3	Fine [58]	*Shared Fantasy: Role Playing Games as Social Worlds* (Book)	University of Chicago Press (Publisher)	X		32
4	Taylor [59]	*Play Between Worlds: Exploring Online Game Culture* (Book)	MIT Press (Publisher)	X		32
5	Turkle [60]	*Life on the Screen* (Book)	Simon and Schuster (Publisher)		X	31
6	Lave and Wenger [61]	*Situated Learning: Legitimate Peripheral Participation* (Book)	Cambridge University Press (Publisher)		X	27
7	Csikszentmihalyi [62]	*Flow: The Psychology of Optimal Experience* (Book)	Harper and Row (Publisher)		X	26
8	Prensky [63]	Digital Game-Based Learning (Article)	*Computers in Entertainment* (Journal)		X	26
9	Goffman [64]	Presentation of Self in Everyday Life (Article)	*American Journal of Sociology* (Journal)		X	22
10	Mackay [65]	*The Fantasy Role-Playing Game: A New Performing Art* (Book)	McFarland (Publisher)	X		21

citations. The book underlines the argument that high-quality digital games possess the potential to act as valuable learning resources, applicable in diverse settings such as schools, workplaces, families, and academic research. Building on this perspective, the notion is put forth that digital games can function as effective tools for situated learning, aligning with Gee's [56] suggestion. This research domain appears to be framed within the concept of situated learning, as evidenced by the cocitation of Lave and Wenger's [61] work on situated learning, which garnered 27 citations, securing the sixth position among the Top 10. Furthermore, it is noted that digital game–based learning has the capacity to enhance learners' motivation, as emphasized by Prensky [63] (ranked eighth with 26 citations).

3.6.2. Green Cluster: RPG Design. Salen and Zimmerman [57] secured the second position with 34 citations, offering an in-depth exploration into the realm of RPG design. Following closely is Fine [58], ranking third with 32 citations, delving into the nature of RPGs and players' interaction patterns. These influential works contribute to a comprehensive understanding of the various facets and complexities inherent in RPGs. Notably, the research domain places a significant emphasis on the aspects of entertainment, self-identification, and art performance, evident in the cocitations of Csikszentmihalyi [62] in the seventh position with 26 citations, Goffman [64] in the ninth position with 22 citations, and Mackay [65] in the tenth position with 21 citations.

3.6.3. Yellow Cluster and Red Cluster: Virtual Culture and Human Behavior in Virtual Environment. Both Turkle [60], securing the fifth position on the list with 31 citations (red cluster), and Taylor [59], ranking fourth with 32 citations (yellow cluster), contribute valuable insights into virtual worlds. However, while Taylor [59] and the documents in the yellow cluster delve into the cultural aspects of the virtual world, Turkle [60] and the documents in the red cluster offer an in-depth understanding of human behavior in virtual environments. This includes the impact of computers on our psychological lives and evolving ideas about minds, bodies, and machines [60]; the motivation to play as explored by Yee [66]; online social interaction scrutinized by Cole and Griffiths [19]; and gaming addiction studied by Kuss and Griffiths [67].

3.7. The Trend of RPG Literature From 1986 to 2023. To analyze the trend of RPG literature, authors used VOSviewer software to visualize a keyword co-occurrence overlay from 1986 to 2023 (Figure 7). The size of each circle in the visualization corresponds proportionally to the number of publications, while the color signifies the average publishing year. Lighter colors indicate topics that are more recent in the literature, whereas dark colors represent traditional topics of RPGs.

Popular keywords according to Figure 7 are *RPG* (189 occurrences), *MMORPG* (*Massively Multiplayer Online Role-playing Game*) (138), *digital games* (83), *game based learning* (73), *role play* (59), and *World of Warcraft* (32). These keywords all have a certain connection with each other. Despite the diverse range of RPGs available, digital games, in general, and MMORPGs specifically, stand out as the most extensively studied subjects. Studies in digital games indicate that avatar customization within these games can trigger the Proteus effect, potentially offering

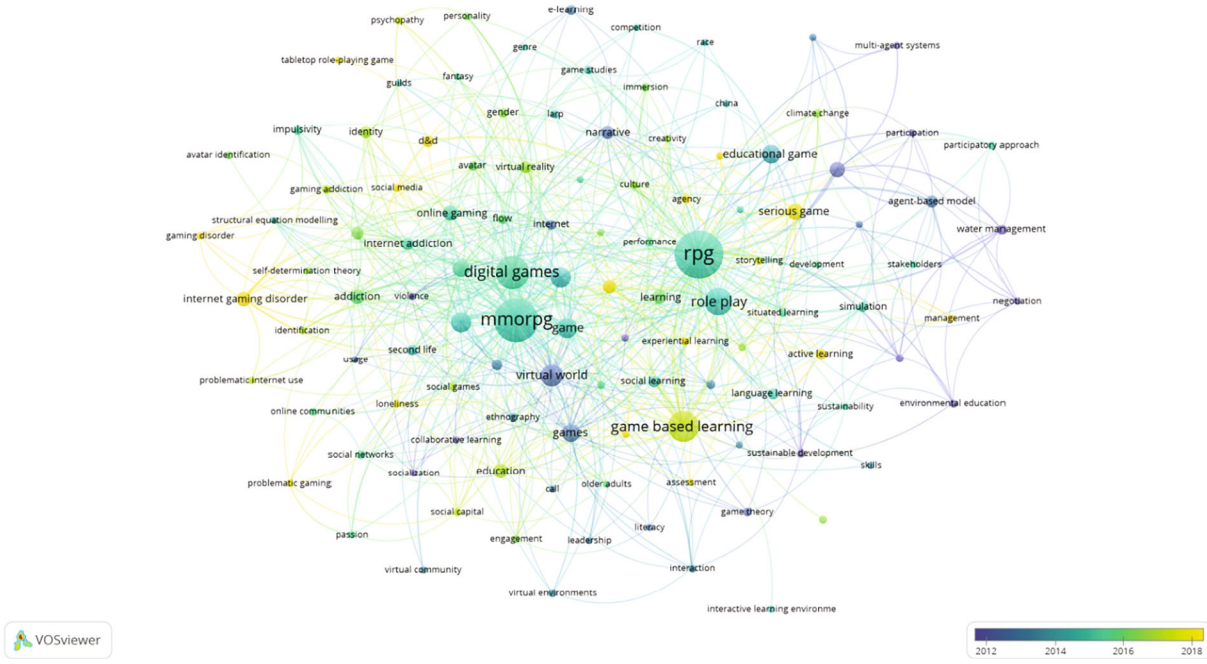

FIGURE 7: Science mapping of documents based on the keyword co-occurrence analysis. Note: 116 keywords appear at least four times.

educational benefits when integrated into learning environments [68]. MMORPGs offer an intricately connected virtual environment, amplifying the efficacy of education and transforming participants' perspectives on knowledge and performance [69].

Most recent keywords were illustrated with light color nodes, including *problematic gaming*, *gaming disorder*, *internet gaming disorder*, *loneliness*, *D&D* (which stands for Dungeons and Dragons), *tabletop role-playing game*, *social media*, *higher education*, *augmented reality*, *experiential learning*, and *serious game*. The dominant keywords are *serious game*, *Internet gaming disorder*, and *higher education*. *Serious game*refers to games designed for purposes other than pure entertainment, such as education [70], social learning [71], and design strategies of change [72]. Internet gaming disorder is linked to game addiction [73] and body dissociation [74]. Higher education can leverage RPGs as a teaching tool to enhance students' innovation and problem-solving skills [75] and sustainable knowledge acquisition [76].

4. Conclusions and Implications

This study utilizes the Scopus database to comprehensively document the growth and development of research on RPGs from 1986 to 2023. The analysis encompasses an in-depth examination of the developmental trajectory and global distribution of academic literature, identification of influential papers, authors, coauthor networks, and publishing venues, as well as the delineation of foundational research domains and keyword trends.

The investigation of the developmental trajectory of RPG research seeks to identify consistent patterns, critical milestones, and transformative turning points. Empirical findings delineate four distinct periods in the evolution of RPG research. The initial phase (1986–2002) is characterized by a marked lack of scholarly interest. Between 2003 and 2005, RPGs began to attract significant academic attention. The period from 2006 to 2012 witnessed a substantial surge in research activity, while 2013 to 2023 was marked by steady growth in RPG-related publications.

The analysis of the international distribution of academic literature provides insights into the production, dissemination, and accessibility of research across different nations. Empirical evidence indicates that the United States and the United Kingdom have emerged as leading contributors to this field, based on publication volume, and exhibit the strongest coauthorship networks.

To identify the most influential contributions, this study ranks papers based on citation metrics. The paper Social Interactions in Massively Multiplayer Online Role-Playing Gamers by Cole and Griffiths [19] emerges as the most frequently cited work. Griffiths is further recognized as the most influential author, with the highest number of publications and citations. Additionally, active coauthor groups, including those led by Griffiths and Billieux and by Le Page, are identified as prominent contributors to the field.

A cocitation analysis reveals three core research domains within RPG scholarship: (1) education, (2) RPG design, and (3) virtual culture and human behavior in virtual environments. Finally, keyword analysis highlights emerging trends in RPG research, with terms such as serious games, Internet gaming disorder, and higher education reflecting current focal areas in the discipline.

This study has several implications for various stakeholders. First, future researchers interested in conducting research on RPGs may benefit from this bibliometric work. They can obtain lists of key authors, sources of publications, sources of references, and keywords identified in this study to use in their future RPG-related research.

As shown in the Findings and Discussion section, research on RPGs can be approached from different perspectives other than game studies, especially education studies, behavioral sciences, or recent research trends, such as augmented reality (AR) and serious games. AR integrates digital elements into the real world, providing immersive experiences that can enhance RPG mechanics and storytelling, making them valuable tools in both educational and training contexts. Similarly, serious games are designed with purposes beyond entertainment, such as teaching, therapy, or social awareness, and often incorporate RPG elements to engage users effectively. In other words, RPG has become a multidisciplinary research topic, and future researchers should be aware of this reality. Therefore, while conducting studies on RPGs, researchers should extend their references beyond game-specific outlets to include other relevant fields where researchers on RPGs may adopt and employ theories, models, frameworks, concepts, instruments, and methods from other fields in their RPG-related studies. In the same vein, RPG-related studies may be submitted to outlets in various fields, not just those specific to game studies.

Second, future conference organizers, book editors, and journal editors may also benefit from this bibliometric study while considering RPG as a potential topic of their future collections, themes, or special issues, especially from other perspectives rather than game studies itself.

Third, the findings of this study, such as best practices, notable examples, and empirical insights, can serve as valuable inputs for education developers and instructors in designing curricula and syllabi at various levels (undergraduate, graduate, or continued education) and across different fields (game studies or related disciplines). Policymakers, more broadly, should consider using these insights to inform decisions across multiple sectors, including education, technology, and workforce development. By promoting interdisciplinary approaches and supporting the integration of innovative technologies like AR and serious games, policymakers can foster a more dynamic, future-ready society. Additionally, game designers can leverage these findings to predict emerging trends and better understand user behavior, allowing them to create more engaging and effective game experiences that cater to user preferences and learning needs.

Fourth, while Scopus is robust, its exclusion of non-English documents and other databases (e.g., Web of Science) limits the comprehensiveness of analyses conducted using VOSviewer. This limitation arises because VOSviewer relies heavily on the dataset provided by the selected database, potentially overlooking valuable research published in other languages or indexed in different databases. Therefore, future research is recommended to adopt a more comprehensive approach by utilizing advanced software tools, such as Biblioshiny, which allow for more flexible integration of diverse data sources and enhanced visualization capabilities.

Data Availability Statement

The data used in this study were obtained from the Scopus database, a proprietary and subscription-based resource provided by Elsevier. Access to the data is subject to Scopus licensing agreements and institutional access rights. Interested parties can obtain access to Scopus data by subscribing through Elsevier or through institutional access where available. The specific queries, search terms, and inclusion criteria used for data extraction in this study are available upon request. Please contact the corresponding author for further information.

Conflicts of Interest

The authors declare no conflicts of interest.

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