

ROLE-PLAYING GAMES AND NARRATIVE ARCHITECTURE IN DESIGN METHODS: A SYSTEMATIC REVIEW

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Abstract. This paper reviews existing research on the teaching of narrative architectural design and the creation of role-playing games (RPGs), with an interdisciplinary connection between them. The paper conducts a systematic review and analysis of 27 academic papers. These articles are selected from the academic database "Connected Papers" using the keywords "narrative architecture, architectural design teaching, narrative story, RPG creation." This database employs natural language processing technology to analyze the links and influencing factors among articles in different disciplines. We then performed a key review of a selection of 5 papers addressing the interdisciplinary application between architectural design teaching and RPG creation. The key papers content includes a discussion of the problems and solutions in the creation methods of narrative architecture and RPGs, aiming to crystalize the defects and advantages of both approaches. Our findings summarize the process of materializing narrative content in two different creative industries, discussing the challenges they face and the existing solutions. Drawing from the narrative architectural design

teaching effects and RPG creation results presented in the literature, this paper summarizes the advantages of both practices. This allows us to provide a summary of the current industry progress and identify possible research gaps based on the present status of interdisciplinary applications between the two.

Keywords: *Narrative architecture, Role-playing-game, Narrative story, Architectural design teaching.*

ملخص. تستعرض هذه الورقة الأبحاث الموجودة حول تدريس التصميم المعماري السردى مع وجود علاقة متعددة التخصصات بينهما. تجري (RPGs) وإنشاء ألعاب تمثيل الأدوار الورقة مراجعة وتحليل منهجي لـ 27 ورقة أكاديمية. تم اختيار هذه المقالات من قاعدة باستخدام الكلمات الرئيسية "الهندسة المعمارية" "Connected Papers" البيانات الأكاديمية السردية، تدريس التصميم المعماري، القصة السردية، إنشاء آر بي جي. "تستخدم قاعدة البيانات هذه تكنولوجيا معالجة اللغة الطبيعية لتحليل الروابط والعوامل المؤثرة بين المقالات في مختلف التخصصات. قمنا بعد ذلك بإجراء مراجعة أساسية لمجموعة مختارة من 5 أوراق تتناول التطبيق متعدد التخصصات بين تدريس التصميم المعماري وإنشاء ألعاب تقمص الأدوار. يتضمن محتوى الأوراق الرئيسية مناقشة المشاكل والحلول في أساليب إنشاء العمارة السردية وألعاب تقمص الأدوار، بهدف بلورة عيوب ومزايا كلا النهجين. تلخص النتائج التي توصلنا إليها عملية تجسيد المحتوى السردى في صناعتين إبداعيتين مختلفتين، ومناقشة التحديات التي تواجهها والحلول الحالية. بالاعتماد على تأثيرات تدريس التصميم المعماري السردى ونتائج إنشاء آر بي جي المقدمة في الأدبيات، تلخص هذه الورقة مزايا كلتا الممارستين. يتيح لنا ذلك تقديم ملخص للتقدم الحالي في الصناعة وتحديد الفجوات البحثية المحتملة بناءً على الوضع الحالي للتطبيقات متعددة التخصصات بين الاثنين.

الكلمات المفتاحية: العارة السردية، لعبة تمثيل الأدوار، القصة السردية، تدريس التصميم المعماري.

1. Introduction

Narrative architecture entails architects conveying design concepts through storytelling, formulating architectural scenarios and spatial layouts rooted in these narratives (Bleeckere and Gerards, 2017). In architectural design education, the fundamental steps of narrative architectural design encompass eight components: Narrative Concept, Spatial Design, Interactive Design, Contextual Integration, and Iteration and Feedback (Coates, 2012). Architects

address architectural elements, spatial arrangement, sensory experiences, and interactions within spaces throughout the spatial design and interactive design phases. During the contextual integration phase, architects meticulously assess the coherence between their preceding narrative designs and the site's context (Childs, 2008). However, architects' established design logic during the spatial and interaction design stages might face challenges in the Contextual Integration phase, leading to confusion and influencing overall design control, particularly for novice practitioners (Soliman, 2017). Certain architectural designers mitigate substantial divergences between phases by concurrently conducting coherence checks of the context integration phase during the formulation of the initial two phases (Psarra, 2009). Yet, this approach demands for logical thinking, introducing fresh obstacles for architects and architecture students lacking design experience (Nazidizaji *et al.*, 2015).

The objective of RPG creation is to establish an immersive sense for conveying narrative content by materializing it (Skolnick, 2014). In the early stages, RPG creation relied on the artistic abilities of planners. Insufficient personnel experience and skill resulted in many RPGs encountering issues with the lack of internal coherence between background stories and scene content (Brown and Cairns, 2004). To address these challenges, the gaming industry has developed an RPG creation approach that initially constructs the game's background world view and subsequently refines the storyline and constructs scenes in alignment with the overarching world view (Bethke, 2003). This creation method encompasses eight stages: Conceptualization, Pre-production, Art and Asset Creation, Programming and Game Implementation, Level Design and Content Creation, Playtesting and Iteration, Certification and Release, and Post-release Support (Petrillo *et al.*, 2009). Designers define the requisite game elements in the early phase, proceed to generate assets in subsequent stages, and employ these prepared assets for storytelling and scene design in the final phase (Aleem, Capretz and Ahmed, 2016b). This method empowers designers to identify their own requirements and consistently reinforce the game's background settings throughout the creative process, ensuring a strong correlation between physical content and narrative content, particularly for inexperienced novice designers (Reardon and Wright, 2021). The current RPG creation approach embodies a form of

"experience design," seeking to engage multiple senses of the human body and comprehensively evoke player emotions through diverse sensory stimuli, with the aim of more effectively conveying narrative content (Reardon and Wright, 2021).

Both narrative architectural design teaching and RPG creation share the goal of crafting deeply immersive scene experiences that align with narrative content. Some scholars have initiated cross-disciplinary exploration, drawing insights from both fields. In RPG creation, architectural research outcomes, primarily rooted in interior decoration and building block composition, have been extensively referenced for designing interior scenes and architectural assemblies (Jenkins, 2004). However, within the realm of narrative architectural design education, there is notably less incorporation of RPG creation as a reference. A handful of universities have experimented with integrating elements of narrative story creation from RPGs into architectural design to enhance immersive design (Lim, 2013). Nevertheless, the considerable potential of RPGs, particularly in influencing player emotions through adept scene design to more effectively convey narrative content, remains relatively unexplored in terms of its applicability to narrative architecture. Exploring the "interplay between scene design and emotional expression" within well-crafted RPGs could yield insights into the correlation between architectural scenes and emotional evocation, proving invaluable for architecture students as they delve into narrative architectural design.

2. Review questions and aim

Through a review of existing research on narrative architecture and RPG creation methods, this paper explores the challenges and remedies within their creation processes, elucidating their respective shortcomings and advantages. Specifically, the paper addresses the following research questions:

What aspects of RPG content creations methods, are most valuable for reference and research, to teach narrative architectural design?

3. Review methodology

Our systematic review method comprises four phases (Figure 1.). 1) Retrieving articles via the Connected Papers database, 2) Screening selected papers, 3) Classifying and analyzing each paper's content, and 4) Summarizing existing research content and identifying potential research gaps.

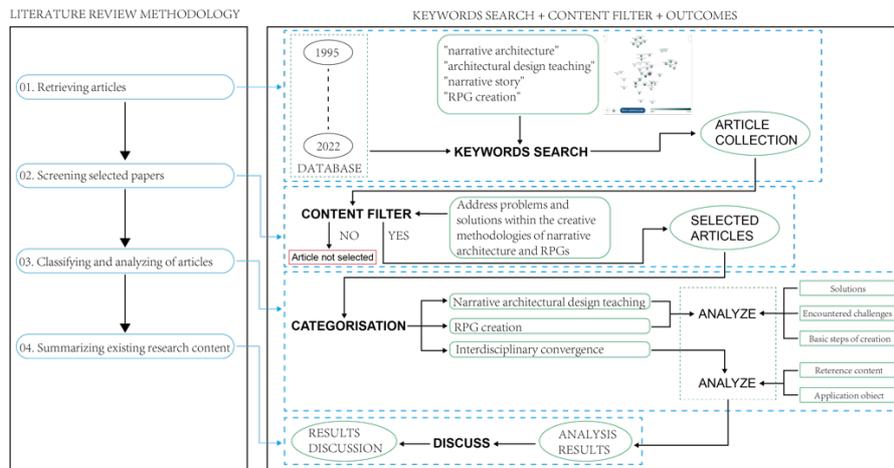


Figure 1. Literature Review Methodology

In the initial stages of our research, we utilized Connected Papers—an academic database recognized by numerous universities and academic institutions. This database uses an NLP technology, which uses language models decompose article and analyze keywords to perform article content analysis. We chose this database due to its emphasis on scrutinizing connections and influencing factors among articles across distinct disciplines, facilitating our exploration of interdisciplinary correlations between the two fields. The search keywords encompassed "narrative architecture, architectural design teaching, narrative story, RPG creation." Following the screening process, we identified 47 academic publications. In the subsequent phase, we refined the selection to 27 articles by excluding those that did not address problems and solutions within the creative methodologies of narrative architecture and RPGs. In the third phase of our literature review, we classified the 27 articles into categories: 1) Introduction to narrative architectural design teaching, 2) Introduction to RPG creation, and analyzed them based on: 1)

Basic steps of creation, 2) Encountered challenges, and 3) Solutions. From this pool of 27 articles, this paper highlights 5 pieces of literature pertaining to the interdisciplinary convergence of architectural design teaching and RPG creation, elucidating the present industry progress. The analysis results revealed frequent occurrences of narrative architecture content within RPG creation articles, whereas discussions on RPG creation were notably less prevalent in articles concerning narrative architecture design. Lastly, in the fourth phase, we synthesize and discuss the literature on interdisciplinary applications to address our research inquiries.

4. Creative methods for teaching narrative architectural design and creating role-playing game

4.1. THE BASIC STEPS, PROBLEMS AND SOLUTIONS OF NARRATIVE ARCHITECTURAL DESIGN TEACHING

Narrative architecture constitutes a form of architecture where spatial development revolves around narrative progression. Bleeckere and Gerards (2017) assert that architects employ storytelling to convey design concepts within narrative architecture, shaping architectural scenes and spatial layouts based on these narratives. In architectural design education, as summarized by Coates (2012), narrative architectural design encompasses 8 components: Narrative Concept, Spatial Design, Interactive Design, Contextual Integration, and Iteration and Feedback. Within the Narrative Concept phase, architects engage in three stages: site analysis, case study, and narrative content development, facilitating the gradual clarification of direction and vision, the acquisition of insights and inspiration, and the formation of final narrative content (Ryan, Foote and Azaryahu, 2016). According to Psarra (2009), the aim of the Narrative Concept stage is to yield narrative content anchored in the context and aligned with envisioned objectives, serving as a reference and foundation for subsequent architectural design.

In the Spatial Design phase, architects translate narrative content into spatial qualities and architectural forms. Spatial layout, symbols and metaphors, architectural technology, and sensory design are primary components, respectively addressing spatial circulation patterns (Smith, 2001),

conveying specific meanings (Eilouti, 2018), enhancing user experience (Bleekere and Gerards, 2017), and utilizing sensory stimuli to connect users with buildings (Goldblatt, 2020). Concerning the Interactive Design stage, Goldblatt (2020) emphasizes that the objective is to ensure that architectural space serves as a platform for users to interact, explore, and collaboratively craft their narrative experiences through user engagement in design, aiming to deepen their connection to spatial concepts and overarching narratives.

In the preceding two stages, the architect establishes their foundational design logic for the project and completes the initial architectural design. Subsequently, within the Contextual Integration phase, architects evaluate the harmony between the narrative design and the site's context, entailing a critical assessment of their prior design choices (Childs, 2008). However, the validation and critique aspects inherent to the Contextual Integration phase can impose significant pressure on architects, particularly those lacking experience. According to Soliman (2017), the design logic crafted by architects during the Spatial Design and Interactive Design stages might encounter challenges during the contextual integration phase, leading to confusion and impacting overall design control. For architecture students in the learning stage and lacking experience, Torres (2015) highlights that the aforementioned issues can hinder students from establishing the connection between narrative concepts and architectural design, resulting in a disconnect between architectural design endeavors and narrative content.

To address these challenges, certain architects elect to consider all three phases within the design process. Psarra (2009) introduced a design approach that amalgamates and synchronizes the Spatial Design, Interactive Design, and Contextual Integration stages, positing that this could assist architects in averting major discrepancies between phases (Figure 2.). Moreover, Psarra (2009) noted that this method empowers architects to promptly identify contradictions and architectural flaws, thereby reducing the psychological stress and self-doubt associated with troubleshooting and error correction.

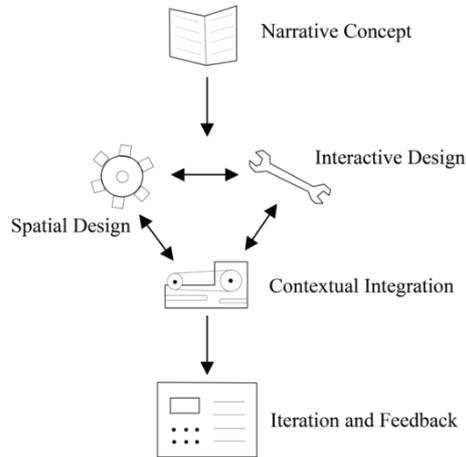


Figure 2. Basic Steps in Narrative Architecture Design (drawn by first author)

However, Nazidizaji (2015) and his research team raised concerns, contending that the logical thinking demanded by this approach erects fresh hurdles for architects and architecture students lacking design experience. They underscore that concurrently managing numerous elements like architectural components, spatial layout, sensory experiences, interaction methods, and narrative coherence necessitates advanced logical thinking skills, work experience, memory, and imagination. Hettithanthri and Hansen (2022) also expressed apprehension that students with limited architectural exposure may grapple with cognitive inconsistencies or paradoxes while adopting this approach, finding it arduous to establish a unified working logic amid the vast reservoir of existing knowledge. Insufficient working logic can impede the establishment of a nexus between narrative concepts and architectural design, ultimately yielding architectural design endeavors that remain detached from narrative content (Torres *et al.*, 2015).

4.2. THE BASIC STEPS, PROBLEMS AND SOLUTIONS OF RPG CREATION

As per Skolnick (2014), the objective of RPG creation is to establish a compelling sense of immersion to articulate narrative content by materializing it, ultimately meeting players' expectations. Research by Brown and Cairns (2004) indicated that early RPG creation relied on planners' artistic prowess. They highlighted that inadequate personnel experience and proficiency could lead RPGs to confront the issue of lacking internal coherence between the

background story and scene content. To address these challenges, Bethke (2003) posited that the RPG creation method involves first establishing the game's background worldview and subsequently refining the narrative while shaping scenes. Media scholar Petrillo (2009) delineated this process, encompassing eight components: Conceptualization, Pre-production, Art and Asset Creation, Programming and game implementation, Level design and content creation, Playtesting and iteration, Certification and release, and post-release support.

Based on Reardon and Wright's theory (2021), contemporary RPG creation embodies a form of "experience design" that seeks to engage various senses of the human body, comprehensively influencing players' emotions through diverse sensory stimuli to enhance the communication of narrative content. Within the Art and Asset Creation stage, visual assets establish a visually cohesive and immersive environment through landscapes, structures, props, and other in-game elements, contributing to the overall RPG atmosphere and sense of place (Cairns, Cox and Nordin, 2014). During the Level Design and Content Creation phase, environmental storytelling employs visual and interactive components to craft environments fostering immersion and exploration, facilitating narrative transmission and enriching experiences (Ramadan and Widyani, 2013). By utilizing sensory stimulation to steer players toward specific emotions, RPGs effectively immerse players in the narrative content, thus achieving a fusion of narrative and environmental elements. Bormann and Greitemeyer's study (2015) on In-Game Storytelling underscores that adept RPG works elicit distinct emotional impacts with each story scene, significantly aiding narrative presentation.

Today's RPG creation process can be viewed as a design approach involving planning, division, and integration (Figure 3.). The planning component encompasses the Conceptualization and Pre-production stages. Ramadan and Widyani (2013) depict the Conceptualization stage as the time when designers amalgamate market needs and team concepts to formulate a comprehensive background framework for the game. Aleem, Capretz, and Ahmed (2016a) posit that in the Pre-production stage, designers are tasked with gathering reference materials concerning art style, music, and narrative elements, employed to explore the requisite game elements for this genre.

The division segment encompasses the Art and Asset Creation and Programming and game implementation phases. Cairns, Cox, and Nordin (2014) characterize the task of designers in the Art and Asset Creation stage as breaking down the game world into components and generating art assets based on background settings. Bethke (2003) delineates the Programming and game implementation stage as involving developers writing code to transform art assets into game components usable within the game engine and constructing fundamental game operational mechanisms.

Lastly, the integration phase occurs within the Level design and content creation stage. In line with Skolnick's assertion (2014), the level designer utilizes previously generated game scene materials to craft the level scenes in accordance with each level's narrative content, thereby achieving the construction of the game scenes.

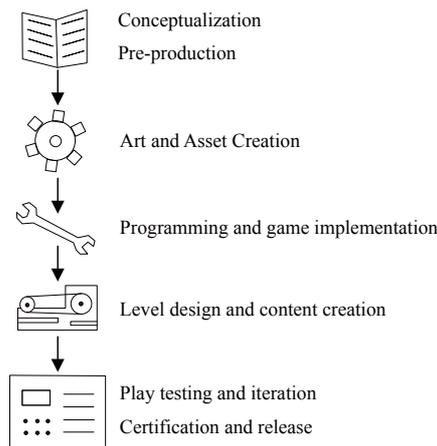


Figure 3. Basic steps of RPG creation (drawn by first author)

Bethke (2003) contends that the novel RPG authoring method empowers game designers to disintegrate design tasks into sequential phases. In this process, designers outline requisite game components during the initial stage, continually produce assets during subsequent phases, and ultimately employ these prepared assets for storytelling and scene design in the final phase (Aleem, Capretz and Ahmed, 2016b). Reardon and Wright (2021) affirm that this approach enables designers to articulate their requisites and progressively

fortify the game's background settings, ensuring a robust correlation between physical content and the narrative storyline.

4.3. INTERDISCIPLINARY APPLICATION

The objective of narrative architecture is to communicate the architect's design philosophy by amalgamating architectural and narrative elements (Bleeckere and Gerards, 2017). RPG creation's purpose is to establish a compelling sense of immersion for expressing narrative content by materializing it (Skolnick, 2014). Both pursuits strive to engender highly immersive scenes that align with narrative content. This has led some experts and scholars to contemplate the potential for reciprocal referencing between the two disciplines and prompted the exploration of interdisciplinary applications between narrative architecture and RPG in the creative process.

The initiative of interdisciplinary application within RPG creation began with the work of RPG creators. In the paper "Narrative Environments," Pearce (2007) delved into the evolution of video games and observed that as 3D technology and real-time 3D emerged, video games increasingly embraced themes and design principles akin to those found in theme parks. Drawing from Disneyland's design concepts, the author examined the visual aspects of various video games, including the "Monkey Island" series (1990-2000), uncovering the widespread integration of urban design theory to craft coherent narrative spaces. Bridges and Charitos (1997) explored the potential amalgamation of architectural design and film theory knowledge within virtual environment (VE) design in their paper "On architectural design in virtual environments". They posited that these domains offer valuable frameworks for ideation and VE design guidance, underscoring the importance of embedding theoretical and practical architectural insights into the VE creation process. Jenkins (2004) conducted an in-depth exploration of the interplay between narrative and interactivity in games, along with the potential influence of architectural design theory on game development through the paper "Game design as narrative architecture". The author accentuated the role of storytelling in games, pivotal for fostering player immersion and emotional engagement. Confronting these challenges, Jenkins advocated for an approach to game design that draws from architectural design

techniques. This strategy aims to incorporate interior decoration and building block amalgamation concepts from architectural design to construct rational and visually impactful game environments, ultimately yielding a more organic and captivating gaming experience.

Nevertheless, in the realm of teaching narrative architectural design, the incorporation of references from RPG creation has been notably diminished. In their paper "Building a World-View: Visual Communication in Classic Maya Architecture," William and Barbara (1996) referenced background design concepts from RPGs in their study on Mayan architecture, drawing parallels between the broader Mayan worldview and the stylistic and visual language of Mayan architecture. By integrating the background design principles from RPG creation, they posited that Mayan architecture initially established a cultural worldview as the foundational framework for shaping architectural forms. Their research underscores that leveraging a predetermined background worldview can foster greater coherence and seamlessness in architectural scene design. Lim (2013), a UCL scholar, transposed elements from the "Conceptualization" phase of RPG creation into his urban design study of London. Article "London Short Stories: Drawing Narratives" lauds the role of narrative and symbolism in architecture and outlines Lim's project, London Short Stories, which employs "real and imagined locations as springboards for the imagination." Through crafting settings and generating visual content rooted in these settings, along with crafting a narrative storyline, the author generates captivating narrative material. The final architectural output was lauded as "aesthetically dazzling, captivating, and visually pleasing."

5. Summary and Discussion of Screened Papers

Both narrative architectural design teaching and RPG creation share the objective of crafting deeply immersive scenes that align with narrative content. Some experts and scholars have initiated cross-disciplinary insights from both domains. Taking Jenkins (2004) as an illustrative example, researchers in game creation have enhanced the visual effects of interior scenes and architectural components in RPGs through extensive utilization of architectural research findings, particularly those concerning architectural

interior decoration and building block combinations. However, despite the potential for interdisciplinary integration of RPG creation into narrative architectural design instruction, such applications remain limited. In pioneering initiatives within certain educational institutions, a handful of scholars have also explored incorporating elements from the "Conceptualization" phase of RPG creation into architectural design and urban planning research (Lim, 2013).



Figure 4. Concept prototype: the habitable spaces within extend and unfold each morning to provide a stage set for grooming, relaxation and dining. (Lim, 2013, p. 103)

However, the reference significance of how RPGs, which excel in impacting player emotions through apt scene design to enhance narrative delivery, remains unexplored for narrative architecture.

When reviewing the creative methods of both disciplines, it becomes evident that in the teaching of narrative architectural design, while certain solutions have been proposed, the current design approaches still fail to address the issue of detachment between architectural design endeavors and narrative content arising from students' limited design experience (Torres et al., 2015). In contrast, within the realm of RPG design, an observable trend is the development of methods aimed at rectifying the lack of coherence between background stories and scene content due to the inexperience of production personnel (Brown and Cairns, 2004). The extant RPG creation methodologies

employ an "experience design" approach, leveraging scene design to influence players' emotions and immerse them in the narrative content, thereby fostering the integration of narrative and environmental elements (Reardon and Wright, 2021). Within successful RPG titles, individual story scenes wield specific emotional impacts to bolster the narrative's presentation (Bormann and Greitemeyer, 2015). Analyzing the "interplay between scene design and emotional expression" in accomplished RPGs can potentially illuminate the correlation between architectural settings and emotional resonance, facilitating the establishment of a connection between "narrative content - required emotion - architectural scene." This understanding is highly advantageous for architecture students in their pursuit of narrative architectural design proficiency.

6. Conclusion

The objective of narrative architecture is to convey the architect's design philosophy by amalgamating architectural and narrative elements (Bleeckere and Gerards, 2017). However, for architecture students, grasping the 8 fundamental steps of narrative architectural design during their architectural education proves challenging. This often results in their struggle to establish the correlation between their narrative concepts and architectural design, ultimately causing a disjunction between their architectural creations and narrative content (Torres et al., 2015). To address this predicament, the proposal of conducting coherence checks within the Contextual Integration stage, concurrently with the initial two design stages, emerged (Psarra, 2009). Yet, the prerequisite of possessing logical thinking skills in executing this approach presents fresh hurdles for students (Nazidizaji et al., 2015). Ultimately, this still leads to a detachment between students' architectural designs and narrative content (Torres et al., 2015).

The aim of RPG creation is to establish a compelling sense of immersion to convey narrative content by manifesting it (Skolnick, 2014). Many early RPGs encountered the issue of a lacking inherent connection between background stories and scene content (Brown and Cairns, 2004). The introduction of the RPG creation method, which involves crafting the game's background world view before refining the story and constructing scenes in

alignment with the overarching world view, addresses this concern (Bethke, 2003). This approach guarantees a robust correlation between physical and narrative content, particularly benefiting inexperienced designers (Reardon and Wright, 2021). Presently, the RPG creation process emphasizes an all-encompassing influence on players' emotions through diverse sensory stimuli in scene design, facilitating their immersion into the narrative content and achieving enhanced expression of the narrative (Reardon and Wright, 2021).

Recognizing the partial alignment of their creative objectives, certain experts and scholars have commenced cross-disciplinary investigations between narrative architecture and RPG creation. Game researchers like Jenkins (2004) optimize visual experiences within RPG creation by drawing from architectural theory. Some architectural scholars attempt to apply narrative storytelling techniques from RPGs to architectural research (Lim, 2013), focusing on the use of effective scene design to impact player emotions and enhance narrative delivery. However, scant attention has been directed towards exploring the instructional value of this aspect for narrative architectural education. Investigating the "relationship between scene design and emotional expression" in exemplary RPGs could help establish the connection between "narrative content-emotion-architectural scene," serving as a valuable resource for architecture students learning about narrative architectural design.

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