

The Impact of VR Technology on Enhancing Emotional Experiences in Otome Games

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Abstract. This paper focuses on the shift of otome games from screens to VR, exploring whether VR enhances their emotional experience, its mechanisms and potential risks. Findings suggest that VR has no direct enhance emotional experience of otome games; it increases immersion, presence and interactive realism through increased visual and interaction fidelity, improving visual and interactive quality in otome games and encouraging intimacy, companionship and emotional support. Meanwhile, where latency and tracking errors cause sensory inconsistencies, induce motion sickness and physical discomfort, where intimate interactions have no distance adjustment, avoidance and exit mechanisms, VR may increase intrusiveness and discomfort, thereby negating the emotional experience. Based on this background this paper claims that VR can improving the emotional aspect of otome games, but the effect is conditional upon the stable activation of mechanisms and the adequate regulation of the risks of intimate interactions by the designing otome games in a controllable way.

Keywords: VR, Otome Games, Emotional Experience

1 Introduction

With the ever-growing market of the otome games, the presentation of the product is starting to shift to the 3D instead of 2D to seek more immersion. This level of presentation improvement is turning out to be one of the determinants of the level of engagement and competitiveness of the product. The studies suggest that in otome games, it is not necessarily the narrative texts that trigger the emotional experiences; rather, it is the visualization of the characters and interactive responses mechanisms that are used as the co-determinants [1]. Besides, the studies of VR show that the increased display fidelity and interaction fidelity tend to improve the positive gaming experience [2-4]. Thus, how VR can cause an emotional experience game the otome to be improved further and what mechanisms and risk limits such an improvement can be maintained has become one of the major issues in the current otome game market as the otome games in VR medium.

The growth of technological power has provided an opportunity to improve the emotional experience of otome games with the help of VR technology. For example, how VR improves

display fidelity to create a better Visual presentation effect in otome games, and thus, their formation of intimacy and emotional support; and how VR improves interaction fidelity to create a better companionship and intimate perception during otome game interactions. Meanwhile, the rapid development of the market is accompanied by the lack of relevant research and explanatory frameworks. The existing researches on VR game experience are mostly based on general game scenes, which makes it difficult to directly explain the triggering mechanisms of emotional experiences in otome games such as intimacy, companionship, and emotional support in VR; In addition, while existing studies on otome games have highlighted the significance of visual and interactive elements, yet lacks a seamless transition from screen-based interfaces to VR, For example, the working mechanism explanation and boundary discussion after the introduction of VR technology [1,5]. Based on this, this paper adopts the methods of literature analysis and cross disciplinary research, systematically combs, compares and integrates the researches on VR game experience, emotional experience of otome games and VR potential risks, Propose the possibility of introducing VR into otome games, and explains the mechanism of emotional experience enhancement and potential risks of otome game after VR technology is added. The paper focuses on two aspects: First, the visual dimension, exploring how stereoscopic display and wide field of view coverage induce emotional resonance through visual enhancement; Second, the interactive dimension, exploring the beneficial effects of fidelity factors such as 6DoF interaction, real time feedback, and natural input on emotional experiences. Meanwhile, this paper will incorporate the discussion of VR's mechanism and potential risks, such as latency, tracking error, discomfort and experience loss caused by intimate interaction, to define the situation in which the gain may fail or produce negative effects. The ultimate objective of this study is to address a pivotal yet inadequately explained question in the context of otome games' transition to VR: Whether VR can further enhance the emotional experience of otome games, the mechanisms through which such enhancement occurs, and the conditions under which this effect diminishes or transforms into negative outcomes.

2 Literature review

2.1 Otome games and the emotional experience

Otome games are romantic video games aimed at heterosexual female audiences. With the development of the times, the otome game market continues to expand. In January 2024, Papergames 'mobile otome game "*Love and Deep Space*" garnered significant attention; Meanwhile, research confirms that female oriented games have tremendous potential. Market performance and related research show that the otome games has gradually developed into an important industry with significant commercial value and growth potential.

Emotional experience is a important part of otome gaming, Its prominent feature is to create a romantic situation and love narrative with surreal color. Players can interact with and develop romantic relationships with male characters who possess more attractive appearances [6,7]. For example, In "*Love and Deep Space*", the claw machine interaction offers a dating scenario with the male lead, During gameplay, players can not only touch the male lead to offer encouragement but also randomly trigger conversations, enhancing the realism of the date. In conclusion, the emotional experience of otome games provides emotional support and enhancing happiness to players.

2.2 The definition of VR technology and its impact on gaming experiences

VR technology is an immersive technique that generates computer generated environments, enabling users to interact in real time and efficiently with 3D computerized databases using their natural senses and skills. VR is currently transforming the gaming experience as a powerful immersive technology medium. A qualitative interview on how VR mini-games influence romantic interactions on Tinder revealed that the VR environment created a virtual image that fully embodied virtual avatars that enhancing the visual experience; Interactive elements such as motion control and spatial movement enhance the flexibility of this performance [8]. Research also indicates that in VR games, both display fidelity and interaction fidelity significantly influence the gaming experience. Display fidelity and interaction fidelity as critical variables in VR technology, Its positive change pathway can enhance users' positive subjective responses to virtual reality systems. High levels of display and interaction fidelity create a significant positive influence on immersion and engagement and other factors affecting the gaming experience [2]. This demonstrates that VR technology is transforming the gaming experience as a powerful immersive medium, especially in the visual and interactive aspects of the game experience has a positive impact.

2.3 VR technology in otome game

In recent years, the evolution of gaming presentation has become a trend, leading to the initial adoption of VR technology in otome games. In October 2024, Papergames unveiled a VR demo version of *"Love and Deep Space"* during its Technology Open Week [9]. The event received widespread acclaim, Las Estrslla, a participant in the *"Love and Deep Space"* VR project, remarked, "Even though it's only visual, playing it truly brought me happiness [10]." In 2017, Capcom hosted a VR meet-and-greet event for *"Toraware no Palm,"* Players can interact with the male character through a VR head-mounted display, a participant in the VR project *"Toraware no Palm"*, Honma Ura, remarked, "When I looked back, I could sense a sense of space on the visitor's side—a feeling I'd never experienced in any other game [11]." Based on the above case studies, this paper proposes that the integration of VR head-mounted display with otome games offers distinct advantages over traditional presentation methods in terms of visual immersion and interactivity, players can engage in more immersive interactions with characters within virtual spaces, an experience often difficult to achieve on conventional 2D platforms. In conclusion, VR can enhance the emotional experience of otome games by increasing display fidelity and interaction fidelity, making it one of the key directions for improving emotional experience in future otome games.

Although VR technology's integration into mainstream gaming has been widely discussed, there are few studies explaining the working mechanisms of its impact on the emotional experience of otome games and addressing its potential risks. Research on otome games indicates that the emotional pleasure provided by otome games includes two dimensions: visual and interactive [1]. Research on commercial immersive games provides evidence: when players experience horror games, VR delivers heightened fear by enhancing presence compared to less immersive media [12]. This suggests that if VR technology is integrated into otome games, the improvement of VR's emotional experience of otome games may depend on the intermediary mechanism such as presence. Meanwhile, as an immersive technology, VR needs to pay attention to the potential risks for otome games. The research combed the potential risk factors

of VR intervention: VR may cause discomfort to users at the system level [13,14]. In conclusion, VR does not directly enhance the emotional experience of otome games, it strengthens such experiences through intermediary mechanisms like heightened immersion, however, the enhancement of emotional experience is not guaranteed, and attention should be paid to potential risks, for instance, VR may cause discomfort at the system level. Future research and development should address this issue to reduce the adverse effects of technology integration.

3 Research methods

3.1 Conceptual foundations and related research

This paper argues that VR's impact on the emotional experience of otome games does not directly influence emotions themselves, is mediated by the VR display fidelity and interaction fidelity, which induces the improvement of the game experience and thus the emotional experience of otome games.

Current VR research consensus indicates that the gain of VR to the game experience does not come from a single factor, and display fidelity and interactive fidelity are also one of its important driving methods. Research indicates that the fidelity level of display and interaction may be key factors influencing performance, immersion, presence, and usability [2]. In visually dominant displays, VR typically offers higher display fidelity, such as Stereoscopic display and a field of view coverage approaching 360 degrees, These hints add to user immersion and presence and make gaming experience much more positive [2]. In the meantime, the degree of interactivity has an impact on subjective experience of the user. As an example, with 6DoF controller tracking, the coordinated motion of the handheld controllers and head mounted display brings the objective hand movements into correspondence with the actual actions to bring actions like object delivery, proximity and touch once triggered by buttons and to provide a greater interaction realism and immersive experience [4]. Drawing on the evidence presented above, one can conclude that VR improves immersion, presence and interaction realism of users due to its visual enhancement solutions such as the influence of stereoscopic display and a closer field of view that approaches 360 degrees, as well as interaction improvement solutions such as controller tracking, demonstrating the possibility to promote the gaming experience on the mechanistic level.

The emotional experience in otome games is not solely driven by narrative text, but closely related to the overall quality of the game experience, especially the immersion and engagement brought by the visual presentation and interactive mechanisms. Relevant literature indicates that players' emotional engagement and the construction of intimacy depend on both visually appealing character designs and continuous interaction mechanisms; notably, visual design and character modeling are more effective at triggering emotional resonance and interaction during the early stages of relationship formation [15]. In terms of visual presentation, a study using "*Love and Deep Space*" as a case study further illustrates that, 3D visual representation, nuanced facial expressions and material details, enhances the immersive experience in daily interactions. Compared to traditional 2D illustrations, these more realistic and close-up visual cues foster a stronger sense of intimacy and provide emotional support [5]. One of the male protagonists in the game, Li Shen, showed traces of private hair removal in his character card, this sparked heated discussions among players, A *Rednote* user named "Chun Tian De Chun" posted that

"Many people were screaming when this card appeared", and players expressed excitement and thrill over this discovery [16]. This indicates that when in otome games, the visual improvement can be proved by more nuanced portrayals of characters 'physical details and subtle emotional cues can increase the authentic perception of the characters and emotional involvement of players to support the creation of intimacy and provide emotional support even further. In the meantime, the experience boost at the participatory level is also vital in promoting the emotional involvement in the otome games. By using the high frequency daily interaction; taking photos, playing cards, catching dolls and random events that can happen without prior storylines to creates a more immersive daily experience; continuing interaction and immediate feedback *Love and Deep Space* allows players to keep not only maintain engagement more easily, but also gradually familiarize oneself with the succeeding companionship and intimate perception [5]. In conclusion, when otome games enhance their visual and interactive presentation to boost the experience overall, such as through enhance visual representation, nuanced facial expressions, material details and high frequency daily interactions, there are more chances that the players will convert this experience into fundamental emotional deliverables, such as intimacy, companionship and emotional support.

Based on the above analysis, the main argument of this paper is that the introduction of VR in otome games has obvious mechanistic rationality. On the one hand, the interaction and high fidelity of VR have also been found to result in improved user immersion, presence, and interactive realism which leads to an enhanced gaming experience [2,4]. On the other hand, the visual and interactive enhance in the otome games can lead to the emotional effects like intimacy, companionship and emotional support. being attained by the players [5,15]. Thus, it is deductible that the promotion of the display fidelity and the interaction fidelity of VR can increase the gaming experience quality, thereby increasing the emotional experience of otome games, which makes otome games not a screen based medium, but a more space permeating and embodied interaction. It follows that, the VR can be incorporated in the otome games, in order to add to the intimate, companionship and emotional support.

3.2 The working mechanisms and boundaries of VR in enhancing the emotional experience of otome games

VR does not directly increase the emotional experience of the otome games, rather, it reinforces that experience by the mediating mechanisms. First, VR technology with display fidelity cues, including a field of view which is the tighter to 360 degrees, and a stereoscopic display benefits players by bringing a feeling of immersion, presence and interactive realism as well as an overall experience in the game [2]. The game "*Love and Deep Space*" by way of 3D visual representation, nuanced facial expressions and material details to ensure a more immersive experience of being thereby enabling players to form a feeling of emotional support, companionship and intimacy [5]. As such, it can be deduced that additions of this pathway in otome games will improve feelings of emotional support, companionship and intimacy in the players through mediating factors which include increased immersion, presence and interactive realism during gaming. Secondly, the augmentation of the interaction of VR can be seen primarily in the more regular feedback loops and the more natural input of the motions. Using 6DoF controller tracking as an example, the collaborative tracking of the head mounted display and handheld controller aligns the virtual hand with real time movements, transforming interactive operations from button triggered events into physically engaged processes, making

the interactive processes more real and more immersive [4]. *"Love and Deep Space"* offers a more immersive daily interaction experience through frequent daily interactions and random event triggers that help the players to build a feeling of companionship, intimacy and emotional support with ease. In conclusion, VR is worth using because it can provide better display fidelity and better interaction fidelity makes users feel more immersed, present, and interactive realism, which further enhances the visual display in the otome games, in addition, continuous interaction further shapes the daily co-experience, ultimately translating VR gaming experience into emotional outcomes such as intimacy, companionship and emotional support in otome games.

The VR emotional boost of otome games isn't unconditional, it comes with potential risks. To begin with, the sensory incongruity can easily be caused under systems level in VR by display latency and tracking error, which induces both motion sickness and physical discomfort [13]. Thus, it becomes difficult to enhance the emotional experience of otome games. Secondly, in otome game narratives, highly intrusive plot elements such as aggressive proximity or sudden face to face encounters may trigger discomfort when users lack effective distance adjustment, avoidance and exit mechanisms, moreover, under the immersive VR environment, such intrusiveness and discomfort may be exacerbated [17-19]. Therefore, the enhancement of emotional experience in otome games brought by VR is not unconditional; its effectiveness depends on whether the extremes of experiences such as immersion, presence, and interactive realism can be stably triggered at the technical level, as well as whether the boundaries of intimate interaction can be properly managed through controlled design.

4 Research results

This study aims to address the core question of whether VR can further enhance the emotional experience of otome games when migrated to the VR medium, as well as the mechanisms and potential risks. Based on a literature analysis and cross disciplinary research, this study finds that VR's enhancement of emotional experience in otome games is not direct, but mediated by identifiable mechanisms. Specifically, VR's advantages in display fidelity and interactive fidelity, such as stereoscopic display, wide field of view coverage, 6DoF tracking, and more natural motion input can enhance immersion, presence, and interactive realism in the gaming experience[2-4]; the emotional experience in otome games is closely related to the quality of visual presentation, interaction frequency, and responsiveness[5,15,20]. Thus, the VR experience may be additionally converted into the emotional results like intimacy, companionship and emotional support in otome games. Meanwhile, this study determines the potential risks with this mechanism. Firstly, when factors such as display latency and tracking errors at the system level cause sensory inconsistencies, which may further lead to motion sickness or physiological discomfort, the positive enhancement of VR on gaming experience will be diminished, which in turn will decrease the beneficial impact of VR on emotional engagement in otome games [13]. Secondly, when the intimate interaction in the otome games lacks distance adjustment, avoidance and exit mechanisms that can control the intimate interaction, and the high sense of presence of VR is likely to strengthen the presence of intrusion and discomfort that transforms the initially positive emotional interaction into a negative one [17-19].

To summarize, the studies show that VR can be used as a possible platform to enhance emotional engagement in otome games. However, its effectiveness is not unconditional, it depends on whether the technical mechanisms can reliably trigger responses and whether the risks of intimate interactions are properly mitigated.

5 Conclusion

The paper undertake an literature survey and interdisciplinary research on the issue of whether and how VR can be used to increase the emotional experience of otome games and the threats that might arise. The evidence is that VR could be used to improve the emotional experience of otome games, this is not direct, but a mediating chain: The display fidelity of VR and its interaction fidelity can contribute to improving immersion, presence and interactive realism to the gaming experience, which in turn leads to an increased level of visual and interactive presentation in otome games; as the gaming experience increases, there is an increase in the probability of the player showing emotional results such as intimacy, companionship and emotional support. In the meantime, this paper also highlights the potential risks of this mechanism: In those cases when the latency of the system level and the tracking errors would cause sensory inconsistencies, which would trigger motion sickness and the physical discomfort, or the intimate interaction scripts of otome games are not moderated with adjusting the distance, avoiding and exit mechanisms, the high immersion nature of VR would increase the level of intrusiveness and discomfort and result in a decrease in the level of emotional experience. Thus, the addition of the emotional experience of the otome games with VR may be interpreted as an indirect benefit, the effectiveness of which depends on the stable activation of VR mechanisms, as well as the possibilities of eliminating possible threats to the emotional experience of otome games.

Concerning research impact, the key contribution of the paper is an explanation and assessment logic regarding the introduction of VR integration to the emotional experience of otome games that can be applicable in both the academic research and industry. In the case of academic research, the present work derives through the literature of VR game experience, the game experience improvement factors in the aspects of display and interaction fidelity, relates them with the discussions on the role of visual presentation and mechanisms of interactive enhancement of emotional experience in the context of the otome game research, and implements them into a consistent analytical system. This approach transforms the macro level judgment of whether VR can elevate the emotional experience in otome games into a detailed process mechanism for discussion, while analyzing its potential limitations. This gives latter research a better method of defining variables and research directions that can be tested without too much overgeneralization of discussions. For industry practitioners, the recommendations that the paper gives to the developers include: integration of VR is not just a presentation upgrade and its effect on emotional experience should not be disregarded and developers should not only work on improving display and interaction fidelity of VR and should also aim at management of potential risks to minimize degradation of experience and maximize emotional benefits.

Future studies can be refined in two areas: first, comparative user studies and experimental confirmations should be carried out, elements including VR display and interaction fidelity,

immersion, presence and interactive realism in gaming experience and intimacy, companionship and emotional support in the experience of the otome game should be operationalized and measured in terms of the validity of this mediating path and the power of its influence. Secondly, a systematic investigation should be conducted to examine VR's moderating effects on the emotional reinforcement risks in otome games, including delay thresholds, tracking stability, interaction consistency, as well as comfort zones and exit requirements under varying intimacy script intensities, so as to form transferable design parameters and evaluation criteria. In conclusion, this paper provides a mechanistic explanation and an analysis of potential risks for the view that VR technology can enhance the emotional experience of otome games, and provides an operational theoretical starting point for subsequent user research and design development.

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