

How musicians get inspired to write music in VR immersive music spaces?

Introduction

Nowadays, the rapid development of virtual reality (VR) technology has brought more new challenges and creativity to people, which is also true in music. It provides musicians with creative tools to explore creativity and inspire creative inspiration. VR immersive music space provides musicians and audiences an unprecedented new experience, combining spatial audio, immersive environment and multi-sensory interaction to create a fully immersive music space. This stimulates the imagination of musicians, allowing audiences to release pressure more deeply in this environment and find their true selves in the space.

1) Purpose and scope

This study explores how the VR environment inspires musicians to create. The survey scope includes the interaction between VR music space's spatiality, relationality, generativeness, and human creativity. This study takes music inspiration creation as the research object. To fully understand this phenomenon, it combines it with an in-depth exploration of its philosophical foundation, including ontology, epistemology, and values.

2) Core phenomenon

The core phenomenon of this article is how musicians get inspiration in an immersive

music space. VR technology transcends traditional time and space limitations and realizes a multi-sensory and interactive experience. Musicians and users interact in real-time through VR technology to generate music, which makes musicians more creative.

Philosophical Background

1) Ontology

Phenomenological ontology lays the foundation for this study, analysed in terms of Heidegger's and Merleau-Ponty's phenomenology. Heidegger's concept of being in the world emphasises the relational and dynamic nature of existence in VR (Heidegger, 1962). In music composition, musicians dynamically interact with the user in the VR music space, extending their presence and revealing new composition dimensions. Merleau-Ponty's theory of embodied perception further confirms the importance of the body as an essential medium for perception and interaction with virtual space, making bodily rhythms an integral part of composition (Heidegger, 1962).

2) Epistemology

Phenomenological epistemology provides a new perspective for understanding how musicians construct knowledge in virtual reality spaces, where inspiration is gained. Husserl's intentionality theory (1970) holds that the user's consciousness and behaviour are the subjects in the VR music space, and musicians can achieve dynamic interaction between perception and creative action. This epistemology reveals how a

VR immersive experience can help musicians gain inspiration and musical experience.

Specific significance

This study has theoretical and practical significance:

Theoretical significance: The research content, combined with ontological and epistemological perspectives, expands the relationship between creativity and existence in the VR music space, breaking the single static way of creating traditional music and viewing it as a dynamic and interactive process.

Practical implications: Future developments based on this research could be used to develop VR tools and platforms to optimize creative workflows, inspire the creation of new music, and increase multi-sensory engagement.

Research questions and objectives

1) Research question

How do musicians interact with VR music spaces for creative inspiration?

What is the role of multisensory stimulation and embodied interaction in shaping musical creativity in VR?

How can VR redefine ontological and epistemological understandings of musical creativity?

2) Objective

To analyse the spatial, relational and generative aspects of VR musical spaces in terms of inspiration.

Explore the phenomenological underpinnings of musicians' interactions with VR music spaces.

Propose strategies for designing VR tools that support innovative music-making.

Roadmap

- 1) *Introduction*: Purpose, scope, philosophical basis and significance of the study.
- 2) *Philosophical Framework*: Understanding VR music-inspired compositions from an ontological and epistemological perspective.
- 3) *Case Studies*: Exploration of substantiation with the help of real-life applied cases, such as Laurie Anderson and Huang Xinjian's Chalk Room, and how they contribute to the understanding of VR music.
- 4) *Values and Ethics*: The values embodied in this research and ethical issues include data privacy and emotional well-being, highlighting the balance between technological innovation and artistic authenticity.
- 5) *Future Developments*: the potential of VR music creation is explored, including cross-sensory integration and practice in education.

Conclusion

Through the philosophical theory and practical application sections, this study illuminates new perspectives on how VR technology can redefine musical

composition, enrich artistic expression, and expand human creativity. It also lays the foundation for understanding how VR immersive music spaces can inspire musicians.

Ontological stance in VR immersive music creation

Ontology

Ontology is the study of being and its nature, and as a branch of philosophical foundations, it explores 'what is being' and how is being. From Plato and Aristotle in ancient Greece to Husserl and Heidegger in modern phenomenology, the development of ontology has shifted from abstract ideas to concrete experience.

Phenomenological ontology was laid down by Edmund Husserl and subsequently developed by Martin Heidegger as a philosophical approach that provides a valuable philosophical theory for exploring the nature of existence and the reality of human experience. For musicians to gain creative inspiration in virtual reality (VR) immersive music spaces, combined with a phenomenological ontological perspective to understand the nature of being in virtual environments, the authenticity of emotional responses, and how to redefine the being in VR music creation environments' concept opens the way.

Husserl suggested suspending all a priori assumptions through the phenomenological reduction method, which focuses on how consciousness points to intentionality (Husserl, 2002). This method also emphasises revealing the universal structure of phenomena through essential intuition, and it is also an experiential method.

Heidegger further refined Husserl's theory, turning the study of phenomenological consciousness analysis to the study of existence, and introduced the core concept of "being there". Heidegger believed that phenomenological theory could reveal the essence of existence by analyzing how phenomena are manifested. Existence is fundamentally relational, exploring how humans exist and how the environment interacts under specific circumstances. However, this view is closely related to VR immersive music space, where musicians interact with VR music and inner emotional landscapes and immersive virtual environments (Madary and Metzinger, 2016). How immersive experience in VR music space integrates into actual existence. He also revealed the dynamic structure of existence through temporality, emphasizing that interweaving the past, present, and future is crucial to the meaning of existence (Heidegger, 1962). He believed that technology is not only a tool but can also reveal new ways of existence while warning that it may lead to "the blurring of existence" (Heidegger, 1977).

Finally, Merleau-Ponty extended phenomenological ontology by proposing embodiment and perception, emphasising the centrality of the body in experience and everyday life as a field of meaning construction (Merleau-Ponty et al., 2013).

Phenomenological ontology provides theoretical support for virtual reality research by analysing how users experience immersion, embodied interactions and emotional engagement in virtual reality, revealing their authentic ways of being. This approach

helps to understand how virtual environments shape human creativity and existential meaning.

Critical analyses by proponents of phenomenological ontology

Although both Husserl and Heidegger proposed phenomenological approaches, their methodologies and emphases are different, and depending on the content of the study, one would be more appropriate than the other to prove existence. Husserl's phenomenology emphasises a descriptive, a priori approach that aims to reveal the universal structure of consciousness—his theoretical perspective combined with research analyses how musicians perceive and participate in virtual reality environments. In contrast, Heidegger's existential ontology explores existence more profoundly and combined with research, emphasises the existence of individuals in virtual reality music spaces. Furthermore, Merleau-Ponty's concept of embodied perception extends this dialogue by emphasising the role of the body in shaping experience and interacting with the world. In the context of VR immersive music spaces, therefore, Merleau-Ponty's perspective helps to shed light on how users' bodily rhythms with virtual instruments and spatial audio can shape their creativity, bringing new creative inspirations and emotional responses to musicians. In light of the research content, I believe that Heidegger's focus on Dasein (existence) combined with Merleau-Ponty's embodied perception can provide a comprehensive framework for the research project, which can be used to analyse how musicians gain creative inspiration and lay a solid foundation for users' presence and embodied emotions in

VR music spaces.

Phenomenology-Ontology Combination Research Analysis

1) The essence of existence: the generation of dynamics and inspiration

Phenomenological ontology regards existence as a dynamic generation process rather than a fixed entity, so existence in VR is achieved through perception and interaction. Merleau-Ponty believes that the body is the core medium of perception, and existence manifests through environmental interaction (Carman, 2019). In VR music creation, the existence of musicians and users is not only reflected as a physical subject but also in the interaction with the VR music environment, as the body's rhythmic music is constantly changing. Hansen (2012) proposed that technology-mediated perception makes the subject's state of existence dynamic, manifested in the creation process of real-time adjustment of melody and soundscape in VR music. VR technology has become a realistic extension of perception and expression, making the VR music environment a part of the creation.

Heidegger's (1962) "Being-in-the-world" further emphasizes the relational and situational nature of existence. In VR music creation, musicians are not isolated subjects, but are embedded in the virtual environment and become an extension of their existence based on the user's interaction with the immersive environment and soundscape. From Heidegger's theoretical perspective, virtual instruments in VR music space conform to his concept of "ready to use", and the utility of the tools becomes invisible and seamlessly integrated into the musician's creative process. For

example, users need to see or manipulate virtual instruments. They interact with them in a way that goes beyond the virtual nature, incorporating musical changes into their experience, and bringing more inspiration extensions to the musician's creation (Heidegger, 1962).

By comparing Merleau-Ponty's embodied perception with Heidegger's ontology of existence, it becomes clear that existence in VR music creation is a dynamic interaction of body, perception, and relational existence. The production of rhythms, melodies, and soundscapes is not Heidegger's, but a process constantly mediated by the user's embodied interaction with the VR music and environment. The VR Merleau-Ponty comes from an ontological arena. Heidegger's sense is manifested through interaction, perception, and creative transformation.

user's

2) Authenticity and temporality of emotional response

Phenomenological ontology believes that emotional response is naturally manifested through the subject's perception and experience and has nothing to do with the physical properties of the environment, so the emotional response in VR music space can be regarded as accurate. Merleau-Ponty pointed out in the article that the body is a bridge to perceive the world. Through the embodiment of the body, the subject can directly interact with the virtual environment and generate a natural emotional response (Toadvine, 2016). In the VR music space, users interact with VR space music

based on multi-sensory stimulation (such as touch, spatial sound effects, and dynamic vision), and this interaction stimulates immediate emotional response.

The authenticity of virtual emotions is also reflected in the consistency of perception.

Lombard and Ditton (1997) pointed out that emotional response is confirmed when the perception experienced by users in the virtual environment is consistent with their cognitive expectations. Therefore, users perceive the melody changes in the virtual soundscape, and the tactile feedback synchronized with the body movement enhances the sense of emotional substitution. This perceptual consistency strengthens the authenticity of emotions.

In addition, temporality in phenomenological ontology (Heidegger, 1962) further supports the authenticity of virtual emotions. Users generate emotional responses in VR through the temporality of instant perception, past and future, making the emotional experience in the virtual environment not only a natural manifestation but also a real process that continues to unfold. In summary, users' emotional response in the VR music space is accurate because it is rooted in the subject's perceptual structure rather than the environment's physical properties.

3) *How VR Redefines Existence*

VR technology redefines existence in music creation through expanded senses and dynamic interactions. Hayles (1999) proposed that technology and the subject form a "symbiotic relationship", and the subject's existence is expanded through technology.

Virtual and physical reality blend in an immersive environment to construct a new

multidimensional existence (Biocca, 1997). Therefore, in VR music creation, the user's body rhythm and virtual melody generation merge, and the music the musician feels in the VR music space forms a dynamic mixed existence state.

Case Study

Laurie Anderson and Huang Xinjian's *The Chalk Room* is an immersive VR art space that reinvents the nature of music by merging sound, text and virtual reality. The work demonstrates three key characteristics of music in virtual environments: spatiality, relevance and generativity.

Spatiality transforms music from a linear flow of time into a multidimensional spatial experience. Participants travel freely through the virtual 'room' accompanied by a dynamic soundscape, and the music becomes part of the spatial experience (Anderson and Huang, 2017).

Relationality emphasises interaction, where the audience's movements and behaviours directly affect the soundscape. This coincides with Oliver Grau's view that virtual art facilitates interaction between the audience and the work (Grau, 2004).

Generativity reveals the dynamic and evolving nature of music, where each experience is unique and shaped by real-time participation. This echoes Manovich's notion of generative art (Manovich, 2002).

Chalkroom redefines music as an interactive, aural and generative art form in virtual space, breaking down traditional boundaries and inspiring new possibilities for VR music-making.

Conclusion

This study combines a phenomenological ontological perspective to provide a philosophical foundation for exploring musicians' experiential presence in VR immersive music spaces. The critical analysis of Husserl, Heidegger, and Merleau-Ponty's contributions combined with this study shows that an integrated approach is essential to understanding the multifaceted nature of VR immersive experiences. Husserl's focus on consciousness reveals the intentional structure behind VR experiences, Heidegger's existential ontology reveals the relational and situated nature of existence, and Merleau-Ponty's embodied perception ensures that sensory and physical dimensions are central to the analysis. These perspectives deepen the understanding of VR presence, creativity, and emotional engagement and lay the foundation for broadening artistic creation and user experience.

Epistemological position

Epistemology, as one of the important branches of philosophy, is concerned with how we know what we know, exploring the nature, sources, composition and acquisition of knowledge, how we believe what we believe, and what kind of evidence we have to prove it when we seek these truths (Audi, 2010). In addition, epistemology, which has had different historical contexts at different times, has explored different aspects of the development of knowledge in terms of the complexity of knowledge, the constant searching and dynamic process of knowledge generation, and the impact of

knowledge on human beings. Following the chronological development of epistemology, Plato's epistemology focuses on the nature of 'knowledge' and how it benefits the perceiver; Locke explores the mechanisms by which human knowledge operates; Kant examines the conditions under which it is possible for human beings to know; and Russell attempts to explain how modern science is justified through sensory experience (Steup and Neta, 2005). Summarising the long-term evolution of epistemology, it can be argued that contemporary epistemology involves technology and cognitive science that is more in line with my understanding of what my research is about, namely exploring immersive experiences and the production of practical knowledge, which informs this study's exploration of how immersive experiences are gained and how they are inspired.

Phenomenological epistemology is concerned with how knowledge is produced and constructed as a system of knowledge, and in particular how subjective experience shapes meaning. Edmund Husserl founded phenomenological epistemology, whose theoretical core lies in analysing subjective experience and exploring the process of knowledge construction. His concepts seek to reveal how human beings construct an understanding of the world through perception and experience, starting from the suspension of external biases and a return to phenomena, thus exploring the nature and generation of knowledge (Husserl, 2002). In conjunction with the phenomenological ontology explored above, this theory is used as the basis for a phenomenological epistemology, which leads to a deeper revelation of the

relationship between knowledge and existence in this study. Introducing this theory into the VR immersive music space provides new insights into how musicians are inspired to create and provides a new framework for delving deeper into how they are inspired to create, how knowledge is constructed in the VR music space, and how immersion is formed, all from a phenomenological epistemological perspective - the formation of immersion.

1) How do musicians get inspiration for music creation in VR music space?

These inspirations can be reflected in the user's perception of the VR music environment, dynamic generation, and interaction in the VR music space. This article explores this in depth from the perspective of phenomenological epistemology.

Music creation does not come out of thin air but is produced by musicians collecting several relevant raw materials from different sources in formal or informal ways. This study is based on artistic creation and music creation. It regards inspiration as an irreplaceable stage in the creative process, equivalent to the raw materials that can inspire creative inspiration in the VR music space. Therefore, the source of inspiration in the VR music environment mainly refers to any external or internal stimulus from the user's dynamics that inspires creative inspiration rather than inspiration and creative drive.

The fusion of multi-sensory stimulation provides a new dimension for inspiration. In the VR music space, virtual technology is used to create a VR music experience space that integrates multiple senses, such as visual dynamics, stereo sound effects, and

touches, stimulating the user's emotions and unconscious behaviours. This unconscious reaction, such as emotional expression or intuitive gestures, is collectively called physiological effects. In fast-paced and high-pressure situations, heart rate changes, facial micro-expressions, etc., will occur unconsciously (Bradley and Lang, 2006). Combined with Husserl's theory of intentionality, consciousness is always directed to an object. When users make unconscious behaviours in the VR music space (such as body rhythm, turning the head, or triggering interaction), the behaviour will become the object of musicians' perception (Husserl, 1970). The rhythm or emotional changes of these behaviours can inspire musicians to create. As the user's movements in the music space slow down, musicians can design softer and lighter melodies to match the user's accurate emotional feedback, thereby recognizing their true self. This perceptual fusion goes beyond the single sensory input of the traditional composition environment, where the flow of the melody can be stimulated by dynamic light and shadow, and the spatiality of the 3D soundscape may affect the design of harmony and rhythm (Varela et al., 2017). These virtual reality technologies enable users and musicians to transcend the boundaries of multi-sensory experience and transform stimulation into creative inspiration and emotional expression. In addition, the dynamic behaviour of users in the VR music space has a strong symbolic meaning, and musicians can draw inspiration from the note changes and visual changes provided by the VR music environment. This symbolic interpretation provides a basis for musicians to create music while broadening virtual VR technology and bringing more expressiveness to music.

2) *How VR Music Builds Knowledge?*

Knowledge construction is an important outcome of VR music creation. Within the framework of phenomenological epistemology, knowledge, as an integral part of a musician's music-making process, is generated in the VR music space not through traditional theoretical learning, but through interaction with virtual objects in a virtual environment. This interaction relies on several key mechanisms and practices that have evolved over time.

First, intentionality and cognitive interaction are key to knowledge generation. Phenomenological epistemology suggests that subject consciousness is always directed towards the object, and that this intentionality drives the cognitive activity of the musician (Husserl, 1970). By tuning virtual instruments and sound effects in a virtual music space, musicians can deepen their understanding and practice of sound design and musical structure more intuitively in experiential learning, whereas traditional music learning is more about memorising and analysing theories than constructing knowledge by deepening understanding through constant feedback from perception and practice. When musicians create with virtual dynamic sound generation tools, they can learn about their virtual technical features and experimentally build up practical knowledge about timbral variations and the diversity of timbre generation in a way that is not possible with traditional music.

Secondly, VR music creation brings a lot of practicality and diversity to the contextualized knowledge learning experience. By creating in a highly contextualized VR music space, musicians can accumulate knowledge of similar sounds, spaces, and spatial performances in specific scenes, which often provide contextualized creation environments, such as virtual scenes with nature as the theme or abstract soundscape design. Musicians can be inspired to create different music scenes and understand the changes in different musical styles. In the virtual reality music scene with nature as the theme, musicians can see and hear the sounds of birdsong and flowing water in the music space and incorporate these sounds into their works, thereby enhancing the narrative of the works. In addition, the continuous creation of symbol systems brings additional knowledge to musicians. By experimenting and innovating with virtual tools, musicians can create unique and further expand the boundaries of knowledge. According to semiotician Wendy Leeds-Hurwitz (1993), communication is a human-centered activity in which symbols or signals play an important role. In VR music space, symbols and communication are always inseparable. Users dynamically feedback the symbols they generate to musicians, and the latter becomes the link between musicians and users. Therefore, musicians and users are passive recipients of symbols and producers of symbol systems in their interaction with virtual tools.

3) *How is immersion manifested?*

Immersion is a state in which the subject is wholly immersed in the virtual environment and deeply interacts with the virtual scene, dynamics, emotions, and

meaning. Analyzing it with phenomenological epistemology can reveal the formation mechanism of immersion in VR music research.

The concept of immersion in VR music space can be traced back to Mihaly Csikszentmihalyi's "flow theory", which describes a state of deep involvement and satisfaction that can be achieved when challenges and personal abilities are balanced, attention is highly focused, and feedback is timely (Csikszentmihalyi, 1990). In the VR music space, both musicians and users are entirely immersed in a pleasant musical atmosphere: the flow state. Immersion is also a deep sense of involvement when people "enter the virtual world" (Coomans and Timmermans, 1997), making users feel like they are in the game experience, just like experiencing the game in reality. Immersion is "the degree of participation in the game" (Brown and Cairns, 2004). Therefore, immersion in the VR music space is the musician's and users' investment and enjoyment of the music environment to achieve whole-body and mind relaxation.

Embodied perception provides the basis for immersion at both the physical and perceptual levels. Merleau-Ponty's embodied perception theory believes that the body is the central medium of perception and action, and immersion is enhanced through the interactive behaviour between the subject and the environment (Merleau-Ponty, 1962). Through the body's actual behaviour, the virtual environment's dynamic changes can form real-time interactive feedback with the user's actions, and the subject establishes a deep connection with the virtual environment through the

multi-sensory integration of vision, hearing and touch. In the VR music space, visual dynamic light and shadow are perceived as the gradual change of melody, stereo sound effects present a sense of spatial flow through body positioning, and touch will be enhanced to the immediacy of operation as the body interacts with virtual instruments. This instant feedback makes the body movement highly synchronized with the dynamics of the virtual environment, enhancing the sense of immersion (Merleau-Ponty, 1962).

Analysis of similar works

‘Beyond the Senses VR Concert’ is a virtual concert organised by Canadian electronic music artist Rezz in collaboration with The Wave VR platform in 2019. The concert is a solid foundation for a virtual reality music performance through VR technology that integrates music, visual dynamics, and interactive experiences to give audiences and artists an unprecedented immersive experience.

The virtual concert combines Rezz's electronic music with dynamic lighting, particle effects and abstract geometric scene construction to achieve an immersive virtual concert effect. From a phenomenological epistemological point of view, the visual elements of the scene (e.g. the diffusion of light and shadow and the vibration of particles) are fully synchronised with the tempo and mood of the music, creating a unique multi-sensory experience in which the audience interacts with the environment through virtual characters. The audience triggers specific lighting changes or sound

effects through gestures or movements, making the concert a dynamic process co-created by the artist and the audience. This is further explained by Merleau-Ponty's (1962) theory of embodied perception, whereby the audience strengthens their connection to the music through physical interactions (e.g. character movements) with the virtual environment.

Rezz will adjust the music and visuals in real time during the virtual concert performance and draw inspiration from the audience's behaviour. The audience will interactively experience the dynamic process of music creation and feel the emotional resonance of the music and visuals, thus broadening the possibilities of musical expression. This virtual concert breaks through the physical limitations of actual performances and explores a new form of combining technology and art, providing a new path for future immersive music performances.

Conclusion

In summary, the above description is combined with phenomenological epistemology to reveal the key mechanisms of inspiration generation, knowledge construction and immersion formation that VR music creation should study how to obtain. The user's unconscious behaviour reacts to the important triggers for musicians to create inspiration. In contrast, the symbolic meaning and emotional connection behind this behaviour provides a new path for knowledge generation. The combination of immersive design of virtual technology and VR music space realises the deep

integration of technology and art, which also provides theoretical support and practical guidance for future music creation research and tool design.

Values, Ethics and Future Prospects

1) Value embodiment

The popularity of virtual reality technology has opened up a whole new realm of music creation, especially in the immersive music space. In this space, musicians can break through the limitations of traditional music creation and inspire more creativity through the multi-sensory stimulation and interactive characteristics of the virtual environment. Studying how musicians get creative inspiration in VR immersive music space is of great technical and artistic value.

2) Technology Value

2.1) Driving optimisation of VR music systems:

Studying how musicians get inspired in VR spaces can help develop more intuitive and inspiring virtual music creation tools. For example, virtual technology can convert music rhythms and frequencies into dynamic visual waveform displays through audio visualisation systems, which can be more intuitive and help musicians quickly adjust melodies. At the same time, the virtual instrument interface can be combined with gesture control to perform in a way that simulates the way real instruments are played, and there are different kinds of instruments to choose from in the interface so that musicians can feel the convenience and thus improve the

efficiency of creation.

2.2) New technological applications for audio-visual interaction:

VR technology can combine music creation with dynamic visual and haptic feedback. For example, in a virtual reality concert, the famous electronic musician Jean-Michel Jarre used VR technology to achieve a dynamic interaction between vision and sound. The musical melodies in his work utilised a combination of virtual particles and 3D light effects, creating a strong sense of immersion for the audience and providing a new way of creating music (Jean Michel Jarre, 2021). This technology allows musicians to find new directions of sound expression from visual and tactile perception and to adjust the musical and visual impact to the state of the live audience in order to achieve total immersion in the enjoyment of the music and inspiration triggers.

3) The value of artistic creativity

3.1) Inspire creative expression:

Immersive virtual environments can provide unlimited space for creativity. Imagine that in a VR virtual space, when a musician walks into a virtual forest full of natural light, the space simulates the sound of actual birdsong, streams flowing, and walking on rustling leaves and combines it with the scene to create a nature-themed musical work. The immersive VR technology experience breaks the creative limitations of traditional studios and brings rich inspiration and practice to music creation.

Incorporating design elements such as natural landscapes into the space, this environmental simulation evokes people's sense of happiness and the tranquillity of coexisting with the natural world (Gupta, 2024). This gives musicians more unlimited imagination and creativity to create more great music.

3.2) *Multi-sensory artistic expression:*

The VR virtual technology performance experience combines music with vision and touch, injecting new inspiration into music creation. For example, "The Wave VR" is an immersive music platform that creates visual and auditory virtual music experiences for users through real-time 3D animation, dynamic particle effects, and multi-sensory interactions. The project has been widely used in virtual concerts and creative performances, showing how musicians can create through physical interaction with the environment. Musicians use tools on VR platforms to adjust musical and visual colours in real-time during performances, further promoting the integration of music with other sensory colour arts. When the presence of colour affects our emotions and behaviour, it can evoke specific sensations that create different musical atmospheres. For example, warm colours such as red and yellow can stimulate energy and excitement, allowing musicians and users to dance to the music in the music space and make the music cheerful; however, cool colours such as blue and grey tend to have a calming and soothing effect, which is more suitable for users to heal themselves and relax (Gupta, 2024).

4) *Values*

4.1) *Balance between technology and art:*

Virtual reality technology provides excellent freedom and possibilities for music creation, but it also brings about thinking about the essence of artistic creation. In the VR music space, musicians can quickly generate complex musical effects through multi-sensory interaction and VR virtual technology. However, over-reliance on technology may cause music creation to lose its unique artistic emotions and personal style. Heidegger's criticism of technology also provides important arguments. He believes that while VR music creation reveals new possibilities of existence and expression, it also introduces different technical creation risks through technical framing tendencies; the immersion and inspiration inspired by VR music space will ensure that VR technology always enhances rather than weakens the authenticity of its presence and expression (Heidegger, 1977). Research needs to explore further how to maintain the authenticity and humanistic spirit of artistic creation while improving technical efficiency, emphasizing the dominance of musicians in using technology rather than letting technology completely replace the creative process.

4.2) *Inclusiveness and diversity:*

VR Music Space is a music platform that uses technology and diversity. It can provide musicians with a virtual medium to showcase their music, cultural background and performances combined with VR technology. However, in terms of content and presentation, this technology may not be as intuitive as traditional music. It may be

based on big data push combined with current mainstream trends, resulting in a lack of personal style and cultural colour. On the contrary, some music forms or styles of niche cultures may be submerged and replaced due to the high cost of VR technology or the influence of the overall environment. Therefore, VR music platforms should be inclusive and promote different elements and non-mainstream cultures to ensure that diverse cultures are equally expressed in global technology.

5) *Ethical level*

In VR music creation, ethical issues mainly focus on data privacy, creators' rights and interests, and mental health. First, VR technology data collection is inseparable from user behaviour, preferences, voices, etc. These data are crucial to the continuous improvement of the system, but there are also problems of privacy leakage and data abuse. For example, unauthorized personal data analysis may infringe on user privacy. At the same time, the original content of music creators may also face infringement risks on the platform, and many of them cannot verify the authenticity of their identities, so a clear legal framework protection is needed (Lin and Latoschik, 2022). Secondly, users' long-term immersion in the VR environment may cause some irreversible effects on their body and mind. The strong sense of immersion may weaken users' connection with the real world and generate dependence, especially for some young users. Social skills and emotional regulation bring challenges. Therefore, when using VR technology, we need to formulate a reasonable user manual, such as limiting the duration of use, pausing for rest, etc., to reduce adverse psychological

effects.

By paying attention to these ethical issues, combined with this study, VR technology in the field of music creation is respected for the legitimate rights and interests of users, protecting their physical and mental health. Thus, the long-term sustainable development of VR music creation and maximizing cultural value are achieved.

6) Future Studies

6.1) Cross-Sensory Experiences:

Future research in virtual reality technology will focus on combining visual art, haptic feedback and other senses to enrich musical experience and expression. Through 3D holographic projections, haptic devices or dynamic light effects, listening experiences will be combined with other sensory interactions to create more immersive and expressive music. In the future of music creation, this direction will provide musicians with unlimited inspiration and creativity to attract more listeners.

6.2) New Mode of Music Education

VR virtual technology will play a leading role in music education. Through virtual teaching platforms, students can experience virtual orchestras, concert halls or interactive composing environments, and intuitively learn complex musical skills. VR technology replaces traditional verbal teaching methods, bringing students more vivid teaching experiences and atmospheres, and providing more opportunities for musical enlightenment, especially in areas with limited educational resources.

Through these future directions, VR music creation will not only be a technological innovation but will also become a new engine to promote cultural integration, education popularisation and artistic expression, bringing far-reaching impact to the music field.

Conclusion

The continued refinement of VR technology in music has also changed how musicians create music. Through different music scenes in the VR music space, musicians can experience the multi-sensory and other sound effects of sight, sound and touch, inspiring more creativity from now on. By combining multi-sensory, interactive music and the fusion of technology and art, musicians can discover more ways to create by breaking down traditional creative boundaries.

From a philosophical point of view, phenomenological ontology provides a fundamental explanation of existence in the VR music space. Drawing on the theories of philosophers such as Heidegger and Merleau-Ponty, it emphasises existence's dynamic, relational and embodied nature. In a VR music space, the musician is not a lone creator but an active co-creator alongside the user, who interacts with the virtual environment through the dynamic rhythms of the music, the ever-changing soundscape, and the embodied gestures. The interaction between the user and the environment will confirm its presence and the user's behaviour (e.g. body dynamics, melodic changes and emotional expression). These behaviours act as a stimulus in the

VR music space, which allows the musician to draw creative inspiration from the changes in the musical environment.

From an epistemological perspective, virtual reality technology has redefined how knowledge is constructed in musical composition. Phenomenological epistemology, particularly Husserl's theory of intentionality, reveals how the musician's consciousness interacts with the virtual environment to produce practical knowledge. This also goes far beyond the traditional way of learning music, which emphasises memorising knowledge, but the VR music space prefers learning by doing. Musicians interact with virtual tools, spatial soundscapes, and dynamic elements in VR environments, immersing themselves in sound design, music theory knowledge, and more. For example, the immersive nature of VR allows musicians to perceive and adapt their compositions in real-time, thus creating a deeper emotional connection with their work and their audience.

Multiple senses enhance the emotional response to being in a VR music space, thus creating a cohesive and immersive musical experience. As real-time feedback mechanisms (e.g., visual dynamics and spatial audio effects) continue to amplify the user's interaction with the music space, it stimulates musicians and users to empathise and create works more in tune with the user's heart. Redefining the creative process, music evolves into a multidimensional and spatially interactive art form through dynamic visual effects, virtual instruments, and user interaction.

Existing examples such as The Chalk Room and Beyond the Senses VR Concerts demonstrate how the VR music space's spatiality, relevance, and generativity can be utilised to inspire new creative possibilities. Combined with these cases, incorporating virtual reality technology and art can allow musicians to generate unique inspiration and innovation.

Therefore, the emergence of VR music brings more possibilities for experience and inspiration in the field of music and shows the feasibility of integrating technology and art. Future directions in this field, such as cross-sensory experience and VR immersive music classrooms, will further expand its influence and promote cultural integration, popularisation of education, and artistic innovation.

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