ภาวะลื่นไหลระหว่างการใช้วิทยาการความจริงแบบผสมผสาน ในการสร้างสื่อประสบการณ์ดิจิทัลแบบเป็นตอน ๆ

Flow State while Using Mixed Reality to Create Episodic Digital Experiences

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บทคัดย่อ

การศึกษานี้สำรวจจุดบรรจบระหว่างสภาวะลื่นไหล (Flow States) และเทคโนโลยี Mixed Reality (MR) ในกระบวนการสร้างสรรค์งานศิลปะและการเล่าเรื่องแบบดื่มด่ำ โดยเน้นถึงศักยภาพของเครื่องมือ MR ในการเสริมสร้างความคิดสร้างสรรค์ ความร่วมมือ และการมีส่วนร่วม การผสาน MR เข้ากับกระบวนการสร้างงานศิลปะช่วยเน้นย้ำถึงความสามารถในการปรับตัวและความเพียรพยายามในการนำเทคโนโลยีล้ำสมัยมาใช้เพื่อขับเคลื่อนนวัตกรรม พร้อมมอบแนวคิดอันทรงคุณค่าแก่ศิลปิน นักออกแบบ และนักเทคโนโลยี วัตถุประสงค์หลักของการวิจัยนี้คือการสำรวจว่าเครื่องมือสร้างงานศิลปะด้วย MR สามารถส่งเสริมการเกิดสภาวะลื่นไหลในกระบวนการสร้างสรรค์ และช่วยสร้างประสบการณ์ XR แบบตอนต่อเนื่องที่ผสานโลกดิจิทัลและโลกจริงเข้าด้วยกันอย่างไร การวิจัยนี้ใช้ระเบียบวิธีวิจัยเชิงคุณภาพ โดยมุ่งเน้นที่การทดลองร่วมกันระหว่างการพำนักศิลปิน ณ คณะมัณฑนศิลป์ มหาวิทยาลัยศิลปากร กลุ่มผู้เข้าร่วมประกอบด้วยศิลปิน XR ที่มีประสบการณ์ นักศึกษาระดับปริญญาโทและเอก และคณาจารย์ การวิจัยนี้รวมถึงการจัดเวิร์กชอป การสัมมนา และการใช้เครื่องมือ MR ในสถานการณ์จริง เช่น Gravity Sketch, Open Brush, Nomad Sculpt และ Adobe Aero เพื่อศึกษาพลวัตของสภาวะลื่นไหลในสภาพแวดล้อม MR ผลการศึกษาพบว่า เครื่องมือ MR มีประสิทธิภาพในการกระตุ้นสภาวะลื่นไหล ซึ่งมีลักษณะเด่นคือ การบิดเบือนเวลา ความรู้สึกเติมเต็ม และพฤติกรรมที่มีจุดมุ่งหมายในตัวเอง การเล่าเรื่อง XR แบบตอนต่อเนื่องได้กลายเป็นสื่อที่ทรงพลังในการแสดงออกทางศิลปะอย่างดื่มด่ำ โดยตัวละครอย่าง Jaffa ผู้ทำขนมปังกรอบ และ Juju หมูน้อย แสดงให้เห็นถึงความเป็นไปได้ทางจินตนาการที่เทคโนโลยี MR มอบให้ ผู้เข้าร่วมแสดงให้เห็นถึงการมีส่วนร่วม ความร่วมมือ และความสามารถในการปรับตัวที่เพิ่มขึ้น โดยสามารถเอาชนะความท้าทายด้านเทคโนโลยีพร้อมกับจินตนาการใหม่ของพื้นที่ทางกายภาพผ่านประสบการณ์ AR ที่ยึดตามตำแหน่งทางภูมิศาสตร์ การศึกษานี้เน้นย้ำถึงความสำคัญของการมีกรอบความคิดที่ยืดหยุ่นและพร้อมทดลองเพื่อรับมือกับความซับซ้อนของเทคโนโลยีใหม่ ๆ รวมทั้งแสดงให้เห็นความสัมพันธ์อันเกื้อหนุนระหว่างจิตวิทยาสภาวะลื่นไหลและเครื่องมือ MR โดยเน้นถึงบทบาทสำคัญของการเล่นในการปลดล็อกความคิดสร้างสรรค์และการแสดงออกอย่างแท้จริง กระบวนการทำงานร่วมกันและการทำซ้ำที่สังเกตได้ยืนยันถึงศักยภาพของ MR ในการสร้างแรงบันดาลใจให้เกิดเรื่องราวแบบไดนามิก ปรับเปลี่ยนกระบวนการทำงานศิลปะ และเพิ่มพูนความเข้าใจที่พัฒนาต่อเนื่องเกี่ยวกับสภาวะลื่นไหลและความคิดสร้างสรรค์ดิจิทัลในศิลปะร่วมสมัย

คำสำคัญ : วิทยาการความจริงแบบผสมผสาน, ภาวะลื่นไหล, กระบวนการสร้างสรรค์ดิจิทัล, สื่อประสบการณ์ดิจิทัลแบบเป็นตอน ๆ

Abstract

This study investigates the intersection of flow states and Mixed Reality (MR) technology within artistic creation and immersive storytelling, emphasizing the transformative potential of MR tools in enhancing creativity, collaboration, and engagement. By integrating MR into artistic workflows, the research highlights how adaptability and perseverance in navigating advanced technologies can drive innovative practices, offering valuable insights for artists, designers, and technologists. The primary objective of this research is to explore how MR art authoring tools can facilitate flow states in creative processes and enable the creation of episodic extended reality (XR) experiences that seamlessly merge digital and physical realities. A qualitative methodology was employed, centered on collaborative artistic experiments conducted during an artist residency at Silpakorn University's Faculty of Decorative Arts. Participants included an experienced XR artist, Master's and Ph.D. student, and faculty members. Workshops, seminars, and real-world applications of MR tools—such as Gravity Sketch, Open Brush, Nomad Sculpt, and Adobe Aero—provided a platform to analyze the dynamics of flow states in MR environments. The findings reveal that MR tools effectively induce flow states, characterized by time distortion, fulfillment, and autotelic behavior. Episodic XR storytelling emerged as a compelling medium for immersive artistic expression, with characters like Jaffa the biscuit maker and Juju the little pig exemplifying the imaginative possibilities of MR technology. Participants demonstrated heightened engagement, collaboration, and adaptability, overcoming technological challenges while reimagining physical spaces through geospatially anchored augmented reality (AR) experiences. The study underscores the importance of maintaining a flexible and experimental mindset to navigate the complexities of emerging technologies. It highlights the synergistic relationship between flow psychology and MR

tools, emphasizing the critical role of play in unlocking creativity and fostering genuine self-expression. The collaborative and iterative processes observed affirm MR's potential to inspire dynamic narratives, transform artistic workflows, and contribute to the evolving understanding of flow states and digital creativity in contemporary art practice of storytelling that emphasizes the impact that technology has on the production of immersive media.

Keyword : mixed reality, flow state, digital creation workflows, episodic digital experiences

Introduction

The definition of flow is summed up aptly by professor and author Mihaly Csikszentmihalyi, who has spent more than 25 years researching the concept (Gierland, 1996): "Being completely involved in an activity for its own sake. The ego falls away. Time flies. Every action, movement, and thought follows inevitably from the previous one, like playing jazz. Your whole being is involved, and you're using your skills to the utmost."

Flow state, an elusive yet sought-after mental state characterized by deep immersion, heightened focus, and an intrinsic sense of joy during an activity, has been a part of human experience throughout history. However, the manifestation of flow has evolved over millennia, adapting to the channels available in each era. The contemporary landscape witnesses a revolutionary shift with the advent of mixed reality, introducing an entirely new medium for entering this heightened state of consciousness. This study started looking into how advanced hardware and tools make it possible for people to coexist in both the physical and digital worlds.

The study delves into the time-distorting, fulfilling, and focus-driven aspects of creative activities within mixed reality, seeking to understand the transformative impact on participants.

Flow state has always existed in one form or another. What has changed through millennia are the channels through which it manifests. Virtual reality, augmented reality, and mixed reality are advanced digital technologies that serve as conduits for experiencing the Flow state.

1.1 The Flow State

Three aspects of being in the "flow zone" are "time distortion", "sense of fulfilment", and "autotelic behavior" were studied.

Time Distortion

The article "A meta-analysis of flow effects and the perception of time" presents a comprehensive analysis of 63 articles that investigate the relationship between the flow state and the perception of time. The perception of time is a crucial determinant in achieving a state of "flow" (Hancock et. al, 2019). Time distortion is a captivating phenomenon that frequently accompanies intense and immersive experiences. Individuals often experience a subjective distortion of time perception in various contexts, ranging from extreme sports to creative endeavors. The perception of time can be altered, resulting in a distorted perception of its duration. During intense focus, such as when engaging in artistic pursuits or high-pressure tasks, the mind can enter a state where time perception is altered. Hours may seem to pass quickly, or a short moment can feel like an extended period. Neuroscientists propose that the distortion of time perception is not a mere illusion, but rather a result of intensified concentration and adrenaline, which can influence the brain's internal timing mechanism. Gaining insight into time distortion enhances our understanding of human experiences, emphasizing the intricate relationship between consciousness, perception, and the specific circumstances that cause these temporal changes (Craig, 2022).

Sense of Fulfillment

The profound and rewarding aspect of human experience lies in the sense of fulfillment that accompanies the state of "flow". When individuals engage in an activity that matches their

abilities and requires intense focus, they experience a profound feeling of fulfillment (Isham & Jackson, 2022). During the flow state, the act of pursuing a task or goal becomes inherently satisfying, while external rewards or recognition become less important. The gratification obtained from being in the zone arises from the seamless integration of expertise and difficulty, resulting in an ideal equilibrium that drives individuals to perform at their utmost capacity. While dealing with the intricacies of the current task, the perception of time fades away, and the concentration becomes the primary objective. The inherent satisfaction derived from this experience not only demonstrates the individual's abilities but also mirrors the pleasure derived from active participation. The flow state, characterized by its immersive and all-encompassing quality, provides a distinctive route to attaining a profound and significant sense of achievement, leaving individuals with an enduring and impactful feeling of fulfillment.

Autotelic Behavior

Within the flow state, autotelic behavior refers to a self-contained and intrinsically motivated engagement in activities for the sake of enjoying the process itself. The term "autotelic" means "(of an activity or work of art) having a purpose or meaning simply by the fact of actually existing, being done, or having been created" (Oxford Advanced Learner's Dictionary, 2023). It is derived from the Greek words "auto," meaning self, and "telos," which means end or goal.

Individuals in the flow state engage in autotelic behavior by becoming completely absorbed in an activity, with the pursuit of the activity serving as its own reward. This self-sufficient motivation implies that the individual is not motivated primarily by external rewards or outcomes, but rather by an internal desire to participate in the activity for the intrinsic satisfaction it provides.

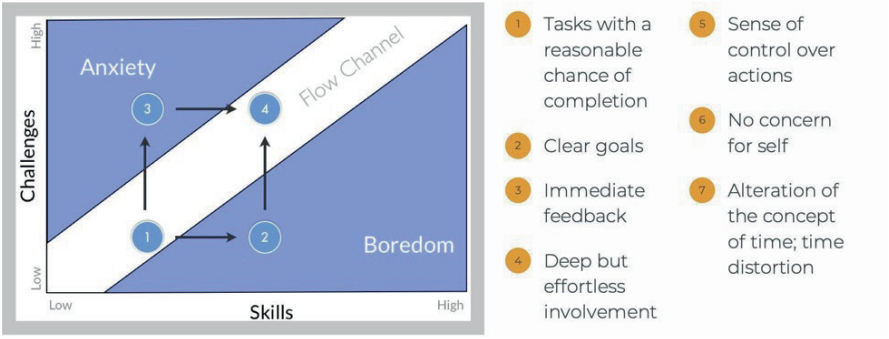
Autotelic behavior in the flow state is distinguished by a seamless integration of action and awareness, in which the individual is entirely focused on the present moment and the activity becomes a source of intrinsic joy and fulfillment. Achieving autotelic behavior

in the flow state frequently requires a balance between the perceived challenges of the task and the individual's perceived abilities, resulting in an optimal and harmonious environment for sustained, immersive engagement. The concept of autotelic behavior in the flow state emphasizes the profound satisfaction gained from the process itself, highlighting the activity's intrinsic value as a source of profound personal fulfillment.

We theorize that flow is not limited by time, but rather by a continuum of tasks that can last as little as a few minutes or years. However, this phenomenon does not occur without the appropriate balance of challenge and mastery, as shown in Figure 1 below.

Figure 1

How to Know You're in the Zone



Note. Diagram by Fajans (2023)

1.2 Mixed Reality

Mixed reality is a medium consisting of immersive computer-generated environments in which elements of a physical and virtual environment are combined (Papadopoulos et. al, 2023). In this section, we will give an overview of what the current ecosystem looks like, including light-field displays, holographic projection, mobile phones and tablets, and VR headsets. With

mixed reality being a major feature of the new headset by Meta Quest 3 and other competing headsets on the horizon, it's becoming more possible than ever to explore and experiment in this space through networked environments, haptics, and spatial audio.

The potential for a paradigm shift lies in the ability to utilize immersive technology to reignite childlike curiosity, resulting in the creation of more innovative and significant art through movement, collaboration, and play. In this context, the concept of the "flow zone" or experiencing a state of flow becomes particularly relevant.

2. Research Objective

To explore the concept of flow with mixed reality art authoring tools to create free-flowing episodic extended reality experience.

3. Research Methodology

This study adopted a qualitative research approach to explore the concept of flow within mixed reality (MR) art authoring tools and its impact on creating episodic extended reality experiences. The study was carried out as part of the Reinventing University System, which invited artists and experts from around the world to share their knowledge. A seasoned XR artist was invited to work in Thailand as an artist in residence from October 30, 2023, to December 15, 2023, collaborating with a lecturer in the Ph.D. program in Design at Silpakorn University's Faculty of Decorative Arts. Through a series of digital art experiments, workshops, and seminars, the two were able to achieve the state of flow in creating four episodes of geo-mixed reality storytelling. The equipment and software that were used during the study are listed below.

3.1 Equipment

Meta Quest 3: Meta Quest 3 is a virtual reality (VR) headset developed by Reality Labs, a division of Meta Platforms. It was unveiled on June 1, 2023, and released on October 10, 2023 as a successor to the Quest 2. Its biggest feature is a mixed reality color passthrough via two monochrome cameras and a sensor on the front (Nast, 2023).

Oculus / Meta Quest 2: Reality Labs, a division of Meta Platforms, developed the Quest 2 virtual reality (VR) headset. The Oculus Quest 2 was unveiled on September 16, 2020 and released on October 13, 2020. In 2022, it was rebranded as the Meta Quest 2, as part of a company-wide phase-out of the Oculus brand following Facebook, Inc.'s rebranding as Meta (Oculus VR, 2020).

3.2 Software

Gravity Sketch: Gravity Sketch is a design and collaboration tool that lets you create 3D models of cars, sneakers, furniture, and characters. It is an excellent tool for quickly expressing ideas and overcoming complex design challenges while working directly in 3D at any scale (Gravity Sketch, 2023). In this study, the researcher demonstrated how to sketch out ideas in a matter of minutes in Gravity Sketch using Meta Quest 3.

Open Brush: On January 26, 2021, Google announced that it would discontinue development of Tilt Brush and release the source code on GitHub under the Apache 2.0 license. Open Brush is a free derivative based on Tilt Brush's open-source code. Open Brush allows you to paint in 3D space using virtual reality. Users can use three-dimensional brush strokes like stars, light, and even fire to paint in three dimensions. (Open Brush, 2024).

Nomad Sculpt: Nomad Sculpt is an iOS and Android-based mobile sculpting app that allows users to sculpt anywhere, at any time (Nomad Sculpt, 2024). For this study, the Nomad Sculpt was used on iPad by the researcher to demonstrate that the flow state can extend beyond a single device. The models were eventually exported and used as ingredients in augmented reality storytelling.

Adobe Aero: Adobe Aero is an augmented reality authoring and publishing tool available via Creative Cloud from Adobe Inc. Aero is available for iOS and Android, with versions for macOS and Windows currently in public beta. Adobe Aero was originally announced as a private beta for iOS users at Adobe MAX 2018,

with its official launch at Adobe MAX 2019. Aero is part of Adobe's 3D and augmented reality series, which also includes Dimension, Mixamo, and Substance by Adobe. Its collaboration with Google to develop a Geospatial Creator tool is in beta, allowing creators to permanently anchor their filters in global locations (Adobe, 2024). The program was used by the researcher to author augmented reality filters which were originally created in Nomad Sculpt.

4. Results and Discussions

The researchers conducted workshops and a seminar on the concept of flow and mixed reality and served as an expert advisor to Master's and Ph.D. students who wanted to integrate mixed reality into their final projects. The researcher mentored a Master's student and a Ph.D. student who were eager to learn about mixed reality and how it could enhance their final projects' immersive experience. Students were driven by their curiosity and academic/career objectives to explore new and uncharted territories in their research. Figure 2 showcases the capabilities of FigminXR in overlaying digital elements on physical reality.

Figure 2

Mixed Reality Passthrough View Through FigminXR Showing a Classroom full of Ph.D. and MFA Students

Figure 3

Researchers Co-creating in FigminXR at the Workshop

The researcher spent time both in and out of the classroom to introduce them to the various tools, platforms, and ecosystems while they were refining their conceptual frameworks. An intuitive allowance for multiplayer and asset creation was essential to their research and output. During the workshop, the researchers both demonstrated the concept of shared extended reality space in FigminXR (Figure 3).

One of the students was tutored for half a day in FigminXR to gain essential skills in accessing the paint tools and importing 3D objects and YouTube videos. The following day, the student was able to instruct the Ph.D. candidate on how to apply it in multiplayer mode, demonstrating how intuitive it was in action. They demonstrated the same learning muscle memory in the final artist-in-residence seminar on campus, displaying what a multiplayer experience looks like to the student body watching. One of the essential points of the workshops was instilling an attitude of pivoting in the face of creative blocks. As cutting-edge technology was being covered, there were bound to be developmental gaps between tools and pre/post-production. One common challenge was that the theses and projects often had to traverse a chasm between technological and human limitations. Frustration sets in very fast, and it takes an immense amount of grit not only to problem-solve but also to come up with alternative pathways to reach that goal. In this section, we will take a closer look at the residency objectives as examples of this challenge and walk through how the flow state has aided in finding solutions.

4.1 The Flow with AR/VR Tools and Episodic Storytelling

AR Augmented Reality (AR) filters and apps are commonly used to educate, entertain, and tell stories via a digital overlay on mobile devices or lightweight glasses. We decided to test the capabilities of Adobe Aero's geospatial creator by placing digital elements at specific landmarks throughout the city to recontextualize the neighborhood in creative ways. One of the most significant advantages of AR is its ability to provide an audience with an immersive experience that can only be experienced at a specific location. In this case, a curated Google Maps-powered art exhibit. AR also has the power

to transform mundane things into something new and exciting through history, imagination, and animation.

The state of internal flow took a grand pivot by deciding to create an episodic story featuring characters who were all born in Thailand. This was not the original plan, however. The idea began to form when the researcher noticed the Thai people's love for cats. Whether it was a farmer turning a rice field into cat art, bookshop kitties making friends with customers over coffee, or seeing food left out for stray cats every day, the concept of feline characters with unique personalities and traits started to take shape and become a part of the story.

During a visit to a bookstore called "A Book with No Name," the researcher met a cat named Si-mok (Figure 4) who was very friendly with the customers. The cat even made herself comfortable on the researcher's backpack. Fortunately, the researcher had brought his Meta Quest 3 headset, which allowed him to use Open Brush in mixed reality to paint a portrait of the cat. With the high-quality passthrough feature of the headset, the researcher was able to observe the cat and paint a spatial art piece based on her likeness (Figure 5).

Figure 4

Si-mok Being the Perfect Figure Model at "A Book with No Name" Coffee Shop

Figure 5

Mixed Reality Creation of Si-mok Using OpenBrush

At the heart of many art practices that involve the use of physical tools, there is a desire to be fully present and engaged with the moment or opportunities that present themselves. To achieve this state of mind, some researchers have used relaxing music to help them focus their attention. The key is that through this process, they are able to connect with their inner child and tap into a sense of authenticity that is free from the stresses and anxieties of everyday life. This approach is seen as a way to unlock the subconscious mind and promote genuine self-expression.

Maintaining an inner and outer equilibrium can help individuals enter a state where all 7 attributes in the flow channel are possible. However, the researchers suggest that there is one missing attribute - play. Mixed reality art naturally encourages this "play" attribute as you actively create digital paint or shapes from your hands into spatial reality, enabling you to make the world your canvas in real-time, with or without a specified outcome.

4.2 Episode 1: Jaffa's Biscuits Open for Business

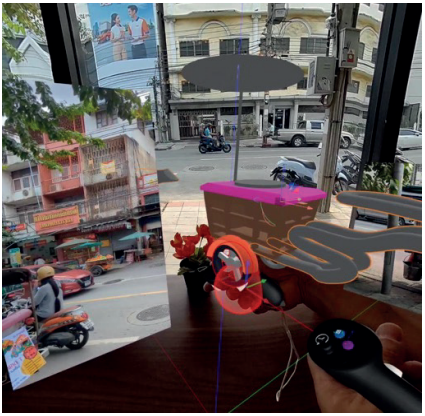
The researcher's second extended reality feline creation was Jaffa, the master biscuit maker (Figure 6). At this point, the researcher had been living in the Dusit district of Bangkok, a local neighborhood with few tourists, for several weeks. During his first week, he spent most of his time wandering the streets and alleys to get a feel of the area and how his work could complement it. One thing that stood out to him was the prevalence of street vendors in Bangkok, who catered to a diverse range of appetites and social interactions. As the researcher observed more of the daily life in Bangkok, it became clear that a street vendor would be the perfect subject for his first animated AR diorama.

Figure 6

Jaffa the Master Biscuit Maker Selling cookies in Front of a Shrine

Figure 7

Mixed Reality Creation of the Cart in Gravity Sketch



One notable feature of many districts in Bangkok is the presence of spiritual temples. During a recent visit, the researcher came across a tiny Chinese shrine located just a few blocks away from the hotel. Despite being situated among neighboring businesses, the shrine stood out for its cheerful and unfazed appearance. The researcher thought that it would be an excellent location for Jaffa's biscuit-making stand, as these sites are often used for offering prayers and paying respects. Why not also enjoy a delicious snack for good luck? Figure 4 shows Jaffa bidding farewell to one of his biscuit customers.

The researcher had started sculpting Jaffa before the residency and knew that the character was perfect for the project. The goal was to create a character that was lovable, dependable, and durable. To achieve this, the researcher used Nomad Sculpt, which is a mobile app that allows for character creation anywhere. It was important to maintain a balance between the inner and outer flow state to ensure that Jaffa was a genuine expression of the researcher's self. Jaffa was brought to life in various locations such as a park, cafe, and hospital lobby. The researcher used Gravity

Sketch, a collaborative VR design tool, to create the hawker stand that Jaffa operates. This tool was ideal for hard surface modeling (Figure 7).

To narrate the scene, a short looping animation was created depicting Jaffa greeting passersby with one cookie left for the taking.

4.3 Episode 2: This Little Piggy Went to the Market

A week had passed, and a new character in the form of a little pig emerged from a Nomad Sculpt workshop. She was named Juju, which means "Little Piggy" in Cantonese, and was intended to be the perfect cheeky companion to Jaffa, a gentle giant. The character was envisioned as a sassy entrepreneur who could help Jaffa become a food truck sensation with all her resources. She even takes it upon herself to jump on the hawker stand seat to be at the same level as Jaffa. The creative flow took the form of a narrative, showcasing the whimsical nature of our imagination when bringing characters or ideas to life. Since Adobe Aero could accommodate multiple AR filters at the exact location with different links or QR codes, we only needed to leverage the same assets and change out animations and dialogues to present an evolving story to viewers. The XR filter was treated like an episodic weekly cartoon strip, played out on the canvas of real-life streets (Figure 8).

Figure 8

Jaffa and Juju Meet for the First Time While a New Friend IRL Looks on Selling Snacks from Her Own Stand

4.4 Episode 3: Cats and Dogs Can Get Along

Staying open to what the world wants to show you is also a form of flow. During the following week, the researcher was inspired by an adorable pup while walking to the university and snapped an impromptu photo of it (Figure 9).

Figure 9

The Muse Caught in a Candid Shot

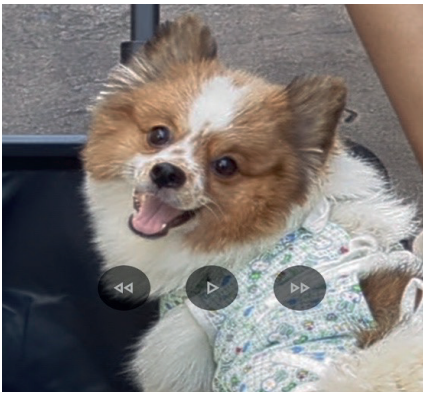


Figure 10

Mr.Waddington, the Renowned Food Critic, Coming to Life in Nomad Sculpt

The photo led to the creation of Mr. Waddington (Figure 10), a rather dapper dog, who was given a cameo in the further adventures of Jaffa and Juju.

In this episode, Mr. Waddington is a visiting food critic who happens to be a good business associate of Juju's. Since then, Juju has convinced Jaffa to move to a more visible venue that is frequented by both locals and tourists alike. She invites Mr. Waddington to try Jaffa's biscuits, and he raves in public about how good they are. The Silpakorn University's campus gate, located right across the street from the Royal Palace, would be the perfect debut for Mr. Waddington and the Jaffa's biscuits stand (Figure 11).

One technical issue that arose repeatedly in these AR pieces was whether the scene appeared in a different location or not. The researcher later discovered on forums that geospatial anchors

Figure 11

Mr.Waddington and Juju at Jaffa's Biscuits Stand

only work where the orange Google Pegman goes. It took several frustrating attempts throughout the city before the researcher figured it out. This is where the previously mentioned dynamic of challenge and mastery takes hold. Many XR developers and creatives share the ability to persevere in the face of a technical challenge. The willingness to troubleshoot repeatedly is balanced by the satisfaction of creating something magical for themselves and their users.

4.5 Episode 4: Police Kitty Enters the Scene!

People can be the most beautiful manifestation of creative flow. The art residency has ended as of the time of writing, and the researcher has returned to the United States. Before leaving, one of the Ph.D. students sculpted her feline character into the shape of a police officer as part of the Nomad sculpting workshop during the art residency (Figure 12).

Figure 12

The Police Officer Character Created by a Student

An opportunity to collaborate arose when she shared the character. The police character will be a perfect addition to the existing group for another episode (Figure 13). When she showed him to the researcher, it was evident he would fit right in with the cast of characters. Community can also be key to how flow gets nurtured. Had the tools not been made accessible to the class, this collaboration would not have been possible.

Figure 13

Adobe Aero Screenshot of the Episode 4 Scene

The chance to make the scene even more interactive became not only a possibility but necessary. Adobe Aero has made it user friendly to create interactive behaviors for any asset you import. Still taking place at the campus entrance, the researcher wanted Juju and Police Kitty to have a heated back and forth. The word balloons were set to scale up based on the viewer's proximity. This naturally invites the viewer to get in closer and feel like they are a part of the story.

5. Discussion

In this study, the researchers emphasized the importance of maintaining a flexible attitude in the face of challenges, which is a key characteristic of the flow state mentality. Adopting cutting-edge MR technology required bridging the gap between technological capabilities and human limitations, which demanded perseverance and adaptability, qualities that are emblematic of individuals in a state of flow.

The study also explored the application of AR tools, specifically Adobe Aero's geospatial creator, to reimagine physical spaces and engage audiences in immersive storytelling experiences. The

researchers' decision to create an episodic story featuring characters rooted in Thai culture illustrates a pivot in the creative process driven by the flow state's intrinsic flexibility and adaptability. The creation of characters like Jaffa, the biscuit maker, and Juju, the little pig, reflects a playful exploration of imagination facilitated by MR technology, an attribute of the flow state.

Furthermore, the iterative process of character creation and narrative development, facilitated by tools such as Nomad Sculpt and Gravity Sketch, exemplifies the fluidity and immersion inherent in the flow state. The researcher's ability to seamlessly transition between physical observation, digital creation, and real-time collaboration underscores the synergistic relationship between flow-state psychology and MR-enhanced artistic expression. Additionally, it highlights the potential of MR-enhanced storytelling to capture people's attention and evoke emotions through immersive narratives.

The flow state in mixed reality (MR) offers a unique blend of physical and digital immersion, providing a dynamic and engaging environment for creative activities. Unlike traditional activities that may rely solely on physical tools or purely digital platforms, MR enables seamless interaction between the two realms, enhancing sensory engagement and fostering a heightened sense of presence. This dual engagement can amplify the time distortion, intrinsic motivation, and sense of fulfillment associated with flow states, making MR particularly effective for storytelling and artistic creation. However, limitations exist, including the steep learning curve associated with mastering MR tools, the potential for technical issues to disrupt immersion, and the reliance on costly, specialized equipment that may not be universally accessible. Additionally, the necessity for constant adaptability to technological advancements can occasionally pull creators out of the flow, highlighting the balance required to sustain this optimal state in MR environments.

6. Conclusion

This study provides insights into the integration of Mixed Reality (MR) technology and flow in artistic creation and storytelling. Master's and Ph.D. students from Silpakorn University's Decorative

Arts Faculty participated in workshops and seminars guided by researchers, which helped them to leverage MR technology and enhance their immersive experiences in their final projects. The study emphasizes the importance of adaptability in overcoming challenges inherent in working with cutting-edge technology, highlighting perseverance and alternative problem-solving approaches. By exploring the internal flow experienced during the creative process, the research underscores the transformative potential of MR technology in providing immersive experiences tailored to specific locations, particularly in episodic storytelling using augmented reality (AR) tools.

This research also showcases the collaborative potential of AR filters, allowing for the presentation of evolving narratives within real-life environments. The study concludes by providing insights into ongoing collaborations and future directions in MR-enhanced storytelling, demonstrating the profound impact of immersive technologies on artistic practice and expression. This research contributes to the growing body of literature on flow states and digital creation workflows, offering valuable implications for artists, designers, and technologists to navigate the ever-evolving landscape of immersive technologies. By keeping up with these developments, researchers, practitioners, and educators can continue pushing the boundaries of creativity and storytelling within the MR landscape. Jaffa, the biscuit maker, and Juju, the little pig, are examples of characters created through MR technology, showcasing the whimsical exploration of imagination enabled by MR technology and emphasizing the role of play in fostering genuine self-expression and engagement.

Mixed reality (MR) holds transformative potential across various fields beyond the arts. In medicine, MR can revolutionize surgical training and patient care through immersive simulations, anatomy visualization, and augmented procedural guidance, enhancing precision and outcomes. In education, MR offers interactive, experiential learning environments, enabling students to explore complex concepts such as molecular biology or historical reconstructions in an engaging, hands-on manner. Manufacturing and engineering can benefit from MR-assisted design, prototyping, and maintenance

workflows, reducing errors and improving efficiency. Similarly, retail can leverage MR for immersive shopping experiences and product visualization, while real estate can offer virtual tours of properties. By integrating MR into these industries, organizations can foster innovation, enhance user engagement, and improve decision-making processes.

By embracing the flow state mentality, individuals can navigate the complexities of technological innovation and leverage MR technology to unlock new dimensions of artistic expression and storytelling.

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