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Skinned Worlds: Virtual Reality and the Postbiological

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Abstract

This paper explores the concept of "skinning" in educational virtual reality (VR) environments, reframing it as a dramaturgical and pedagogical act rather than a mere visual overlay. Through comparative analysis of *The World of Hugo Simberg* and *Ciao: Piazza Navona Experience*, the study investigates how design decisions shape user identity, agency, and the performance of learning. Drawing on performance theory, it examines how avatars – or their absence – guide learners through curated paths, subtly influencing perception and interaction. While both applications strip away overt self-representation, they open space for subversion, reflection, and imaginative engagement. The paper argues that skinning encodes the boundaries of presence and the architecture of knowledge, inviting critical analysis of who learners are allowed to be and what ways of knowing they are offered. Ultimately, it positions skinning as a vital design principle for crafting immersive educational futures where learners not only consume content but perform new ways of understanding

Keywords: skinning, educational applications, virtual reality, identity in virtual spaces

1. The Potential of Virtual Spaces

Choosing an avatar in a video game or virtual reality application is a commonplace activity. A user casually scrolls through the options available, perhaps choosing to perform in an alien body or an animal rather than a human. You do not have to be confined to just one body; many applications allow a user to switch to a different form with a simple click of a mouse. But what are the implications of this action? What does it mean to take on a skin in the potential worlds of the virtual?

When we enter virtual environments, the skin we know as a biological constant suddenly shifts into a programmable surface. Where we can feel the sun on our skin in the biological world, for example, a user can only feel a virtual sun on a virtual skin if the developer programmed a sun into the world, manipulated the variables of that interaction between pixel points, and translated that data through a haptic device to the biological skin of the user. Even without haptic devices, the sense of presence in virtual reality is a state which users widely report, and users experience a seamless connection between the virtual and the biological skin after spending time in the virtual space (Berki, 2019; North & North, 2016).

The skin acts as a way of projecting our inner self into the virtual space, and the world, in turn, presses against that skin to mold behavior and our sense of self. One way to view this programmable surface is as an interface between user and world that functions as both a

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projection site and a container for identity. We recognize that function because we use skin in the biological world in the same way: our skin is a way we project our sense of self while also receiving information from the world around us about how we are perceived, something Didier Anzieu calls the "skin ego" (Anzieu, 2018). Our skin is a container for who we are, so when we move into virtual performance spaces – video games, virtual reality applications, or even social media – we take on a new, virtual skin, and, while these containers may seem limitless, they are developed and shaped by systems that often obscure the creators. The concept of skin, so often taken for granted in biological contexts, assumes new significance when applied to the constructed bodies and landscapes of virtual reality (VR). These digital skins do not simply cover a form; they define the conditions of agency, perception, and relational presence within immersive environments.

Skinning, in the context of VR, functions on multiple levels. It is a technical process of binding images to 3D models so that they move believably within a coded environment. But it is also an act of world-making, an aesthetic and ideological choice that encodes the assumptions and the biases of its creator into the visual and haptic experience of the user. Users often feel that they are choosing their virtual identities freely when they enter into these worlds, but the range of possible performances is limited by the interface design and narrative architecture behind the world. These constraints remain largely invisible, giving users the sense that they have control and freedom in the virtual space while masking the boundaries developers put in place. Coding makes decisions for the user, but the alternatives to that coding lie just below the surface. If your avatar's hair is red, for example, all potential colors, including ones not visible to the human eye, are possible underneath the prescribed coding.

This disjuncture between perceived freedom and pre-coded limitation recalls the tension between what we know in the biological world contrasted with the postbiological. In virtual worlds, where bodies are conjured through pixels and data points rather than cells and tissue, the avatar becomes a site of negotiation between self and system, presence and programming. Skin functions as a symbolic surface imbued with power, allowing the wearer to appropriate, transform, or conceal identity, so to do digital skins confer symbolic significance upon users, enabling access to alternative identity performances while occluding others. Digital skinning occurs in a fully constructed potential world, one that can only be navigated through the boundaries it sets.

This paper argues that skinning in VR is not merely a superficial aesthetic layer; it is a performative structure that governs embodiment within the potential worlds of the virtual. The focus of this exploration are two virtual reality applications that suggest how a user can enter into a virtual space through a different skin: *The World of Hugo Simberg* and *Ciao*: *Piazza Navona Experience*. These two worlds have similar aims: to bring the user into an alternative reality as an educational experience. The difference in the way the user is skinned in each world alters how they interact with new knowledge, and examining these experiences can show us insight into how VR developers can consider the body as a vital performance element.

By placing *The World of Hugo Simberg* and *Ciao*: *Piazza Navona Experience* in conversation with the theories of skin, postbiological embodiment, and digital subjectivity, this study explores how virtual skin mediates the user's engagement with both world and self. It investigates

how skinning establishes a framework of potentiality, a limited field of action where realities are reimagined. Far from being a neutral technical process, skinning functions as a gatekeeper to agency, revealing not only what is possible within a digital world but, more importantly, what has been excluded.

2. Skin, Cyborgs, and the Posthuman

Early virtual scholars framed the virtual as a landscape of limitless play (Bruckman, 1996; Turkle, 1995), but its horizons are bound by the same cultural theories that govern embodiment and identity in the physical world. To ground the argument that follows, this section synthesizes cultural studies of skin, cyborg and posthuman theory, psychoanalytic accounts of the skin ego, game-studies work on the game-ego, and cognitive–linguistic models of metaphor and then re-reads them through the lens of "skinning" as both technical procedure and ideological act.

Claudia Benthien's seminal work positions skin as the visible, performative border where self meets the world, echoing Anzieu's conception of the skin ego (Benthien, 2002; Anzieu, 2018). Because it is simultaneously surface and signal, skin can never be "purely biological;" it is always already encoded with social meaning. In Benthien's terms, skin is the medium through which identity is broadcast and read. When that medium migrates into VR, its semiotic function does not disappear; instead it is re-implemented as graphics layers, texture maps, and shader code. Digital skin thus inherits the same burden of representation as its fleshly counterpart, but with an additional layer of opacity: the user rarely sees the labour or value-judgements embedded in the code that renders it. We adopt the Anzieu's skin ego in these spaces, but developers mask their presence in the regulations deciding how that ego will develop.

When we enter the virtual, we take on the characteristics of the cyborg, a bricolage, a hybrid assemblage of organic tissue and technological surface, which extend Benthien's insight into the posthuman domain (Gaggi, 2003). In VR the avatar is precisely such a bricolage: a body whose biological skin has been replaced by a programmable membrane that may or may not resemble the user's biological body. A user could, for example, choose to craft an avatar body within the limits of the virtual space that reflects how they feel internally, but goes beyond the biological: my own avatar can reach the upper shelves of a cabinet, for example, something that my biological body cannot do in the virtual space. When we are given these options in building the cyborg body of an avatar, the result is a postbiological interface that promises fluidity, such as being as tall as you wish, while simultaneously delimiting agency to what the designers have foreseen, such as only allowing a range of heights for an avatar. Users often celebrate the plasticity of this condition, but the freedom is highly conditional: every menu slider and texture pack mark the outer edge of someone else's imagination.

As mentioned earlier, Didier Anzieu's psychoanalytic notion of the skin ego explains how a coherent sense of self is generated by interactions at the skin/world threshold; the ego contains, protects, and filters psychic material through that envelope (Anzieu, 2018). In virtual environments a complementary mechanism is required, because biological skin is no longer the operative boundary. Ulf Wilhelmsson's game-ego fills that role: it is the functional link that fuses the player's intention with the affordances of a digital body (Wilhelmsson, 2008). As a user interacts with the avatar body and learns to control it, the feedback which loops from those interactions graft the avatar onto the existing biological skin-ego, creating a new psychic envelope specific to the virtual space. This new virtual skin goes indeed beyond the biological and affords the user new ways of expressing their inner sense of self. Skinning provides the scaffold for this graft by attaching visual and kinaesthetic cues to avatar skeletons. The game ego builds our understanding of who we are inside the virtual space and allows us to influence the virtual world in return.

We understand these potential worlds, therefore, as we negotiate our virtual skins. Skin here is a helpful metaphor for us to navigate between the virtual and the biological. Lakoff & Johnson (2008)_ argue that the self is conceptualised through pervasive "container" metaphors: being "in" or "out" of one's body, letting others "in," and so on. Digital skinning literalizes those metaphors. When a user selects an avatar, they are not merely picking hair color or body shape; they are choosing the container that will delimit projection and perception in that world. They are choosing a body that can project beyond what their biological skin can do, but it is a negotiation between what the user wants and what a developer will allow. None of those containers is neutral: every choice list and random-spawn default encode what the developer regards as legible or desirable. If a starter avatar is a white, young, handsome, straight male, for example, we would see a reification of a patriarchal hierarchy. To move away from that power structure, a user makes choices for their avatar body that go beyond the developer's idea of the starter avatar. The process of skinning therefore stages an implicit negotiation between user intention and designer constraint, a negotiation that continues well after the first login as updates, patches, and mods rewrite what the container can do.

Together these frameworks show that skinning is far more than a minor technical step in the asset production; it is the hinge on which questions of identity, ethics, and power turn. In what follows, the study leverages these lenses to analyze *The World of Hugo Simberg* and *Ciao: Piazza Navona Experience* as practical instantiations of skinning's promises and traps: worlds that invite users to believe in boundless presence, while quietly scripting the limits of what that presence can be.

3. Skinning as Design

While the user's perspective often dominates discussions of virtual reality, the skinning process begins long before a player enters the world. Every digital surface, movement, and constraint is authored, intentionally crafted by the developers who act as world-makers, dramaturgs, and costume designers all at once. In this sense, the developers are not simply technicians; they are choreographers of experience, shaping how our digital bodies will interact with the world. To understand skinning fully, we must shift our gaze toward the systems and creators behind the rendered world. Not every developer decision results in a negative impact to the user. Indeed, without the developer's decisions, the virtual world would not be visible to us at all. What is interesting is to consider what the developers chose to keep and what potentials they have ignored. In traditional theatre, designers carefully choose fabrics, colors, and cuts to signify status, character, or tone. In virtual environments, these choices are executed in pixels and code, but the dramaturgical implications remain.

In educational virtual spaces, a developer is determining a path for a user to follow with an explicit goal of providing access to knowledge in a way that would be impossible in the biological world. We cannot, for example, whisk a class of students off to Italy and Finland within a sixty-minute class period, but we can achieve such a task with a VR headset. Virtual reality offers pedagogical potential not simply by transferring content into immersive formats but by transforming the conditions under which learners experience that content. The process of skinning plays a critical role in determining how learners enter, inhabit, and make out the meaning within virtual spaces.

The two VR applications in this paper purposefully build a skin for the user, both in the way the user perceives themselves within the world (their skin) and in the way the world acts upon the user. Both applications are designed to introduce the user to new information through a student's interaction with a potential world. Neither application is a perfect copy of the biological equivalent of the performance world: each application uses the potential

of the virtual to transform what exists into what is possible. *The World of Hugo Simberg* simulates a museum experience while *C!ao: Piazza Navona Experience* guides users on a virtual walking tour of a Roman piazza. What we need to look for in these experiences is not just the developer's choices but the intention for the learner's path. What opportunities do these potential worlds afford the user and what potentials do they hide?

Theatre scholars look at biological productions with a dramaturgical lens, unpacking the semiotic load of the set, costume, lighting, and other design choices. For virtual applications, the same kind of analysis unpacks the design framework that determines the user's role, capacity for action, and the relationship to the knowledge which present within the application. The developers encode the boundaries of presence for specific pedagogical reasons, shaping how learners perceive themselves within a world and how that world responds in return. Without such an analysis, however, we cannot determine if those coding choices result in the appropriate educational outcome. When applied to VR education, skinning reveals its architectural logic: not just who the learner appears to be, but what kind of learning they are permitted to perform. Skinning, therefore, is the means to determine effectiveness of the virtual experience.

We must start, therefore, with an understanding of the basic design structure of each of these applications. *C!ao: Piazza Navona Experience* draws from a dramaturgical impulse to skin the user as a cultural tourist, navigating a richly reconstructed Roman square through wayfinding cues and embedded media. The user does not have a full body, only hands that allow the user to interact with the various locations within the piazza. A warm voice tells the stories of each landmark, with visual lighting cues guiding the user from point to point. The user can decide whether to do the tour on day or night mode, unlocking different story cues in each environment. The world closely resembles the biological version of the piazza, with some elements mimicking that space, such as the babbling of the fountains. There is also an absence of biological-world cues, such as other people, the smells within the piazza, and the feeling of the weather on any given day.

The World of Hugo Simberg, by contrast, builds a very different kind of skin that functions through aesthetic affect and narrative distance. The user is not embodied in the conventional sense; no avatar appears, no shadow suggests corporeality. Instead, users drift through atmospheric recreations of Simberg's paintings and imagined spaces, guided by sound cues and environmental transitions. This absence of visual self gives users a ghostly quality, positioning them as silent witnesses to a poetic, memory-laden world. The skin they wear is ambient, simply the palette of the artist, the soft gloom of his landscapes, the symbolic weight of reapers and angels. The experience is contemplative rather than kinetic. By eliminating a performative body, the developers direct focus toward immersion in tone for the world.

These two design strategies reflect fundamentally different educational philosophies encoded through skinning. *The World of Hugo Simberg* values symbolic engagement and reflective pacing; *C!ao: Piazza Navona Experience* prizes clarity, realism, and guided learning outcomes. Both build paths for the user, but their architecture reveals different assumptions about how knowledge is accessed and what role the learner plays. In *The World of Hugo Simberg*, the user's learning is secondary to the experience of being in the world of the painter's imagination. In C!ao: Piazza Navona Experience, the learner is a curious navigator expected to absorb modular, scaffolded information efficiently.

In both cases, the skin is not passive. It is directive. It tells the user how to move, what to notice, and how to relate to the world around them. The *The World of Hugo Simberg* developers chose movement that is fluid and slow, inviting users to linger, observe, and absorb. For the Piazza Navone Experience, movement is deliberate and goal-oriented, with visual prompts and interface mechanics that suggest progress and completion. These choreographies are not neutral; they encode pedagogical and cultural values. One

prioritizes introspection; the other, information access. One scripts the user as an art-lover lost in imagination; the other as an informed tourist with a map in hand. This distinction becomes especially apparent when we consider what is not possible within these worlds. With *The World of Hugo Simberg*'s paintings, users cannot question the logic of the narrative or step outside the affective tone. While strolling through C!ao: Piazza Navona Experience, users cannot engage with the local population, enter shops, or deviate from the curated route. These limits are not failures, but dramaturgical decisions. Understanding their impact is essential to evaluate the success of the experience. The skins may be seamless, but they are always selective.

Skinning as design is, thus, a diagnostic tool. It lets us see not just how a virtual world looks, but also how it thinks. It reveals what kinds of learners are being imagined and what kinds of learning are being privileged. In *The World of Hugo Simberg*, the learner is skinned as a poetic wanderer, guided by visual and emotional metaphor. While walking through the Piazza Navone, the learner is skinned as a cultural spectator, empowered through interactivity but bounded by informational structure. Both are valid educational roles, but both are constructed through invisible choices in code, tone, and interface. Understanding skinning from this vantage point returns us to the theatrical roots of virtual experience. Just as a costume designer shapes character through silhouette, fabric, and color, the VR developer shapes the learner through space, interaction, and constraint. And just as theatre is always a collaboration between performance and perception, so too is VR education a collaboration between design and interpretation.

What we learn, in the end, depends on what we are allowed to be. And what we are allowed to be depends on the skin we are given or denied.

4. Pedagogical Analysis through Performance

Virtual reality offers pedagogical potential not simply by transferring content into immersive formats, but by transforming the conditions under which learners experience, interpret, and embody that content. The process of skinning plays a critical role in determining how learners engage with and construct knowledge within the virtual spaces, and without a thorough analysis of not only what the developers include, but also what they exclude we cannot fully see whether an educational VR application has the capacity to be successful.

The World of Hugo Simberg, developed by the Finnish National Gallery, invites users into the fantastical landscapes of the Finnish Symbolist painter's imagination. One of the pedagogical purposes behind this app is to introduce users to this artist's work, and it uses the potential of the virtual in a specific way. Simberg worked with paper-based gouache, a technique that can easily degrade in light, making traditional exhibitions of his work difficult. No such limitation exists in the virtual. His work can be arranged in any way imaginable without the need to worry about the destruction of the paintings themselves.

In this VR space, learners traverse an interpretive environment that merges biography, symbolic imagery, and art historical narrative. The user enters a world with four potential paths, represented by four of Simberg's paintings. At this point in the experience, the user is in what resembles a museum: a darkened room with the paintings hanging under specific light. Once the user decides which painting to follow, they are suddenly immersed in the worlds of Simberg's making: a field of haystacks, a lake nestled in hills, a garden, and a forest. Paintings hang from various elements, and the user can decide to click on any of the images to see a larger version with an interpretive piece of dialogue explaining the painting.

The application has a very specific pedagogical purpose: take delicate works not commonly seen in public and place them in a space where they can be experienced in more depth and immersion. As the page for the application states, the Finnish National Gallery wanted to explore innovative ways of sharing Simberg's work safely and widely:

> The virtual environment allows the details of small-scale original works to be viewed at a much larger size and presented in an environment that does not follow the laws of the physical world. In other words, it is possible to provide an experiential space for the exhibition that draws on Simberg's imaginative world. *The World of Hugo Simberg* is an enchanting journey that sweeps you away (Finnish National Gallery, 2023).

There are several objectives in this paragraph: firstly, to allow a user to view the paintings in ways that go beyond the biological space, a necessity for these sensitive works; secondly, to give the user an experience of Simberg's imagination; and, finally, to take the user on an enchanting journey. These are excellent pedagogical objectives, especially when introducing students to new work. Skinning shows us how developers made choices to engage the user with these objectives, and in that analysis, we can also see where other potentials could also be useful paths to success.

In this application, the user's perspective is loosely embodied. They are not granted a visible avatar or interactive gestures, but instead become a floating presence within Simberg's paintings and memories. The skinning here is environmental rather than personal. A user does not possess a body, but simply feels the impact of the various elements. The world itself is skinned in Simberg's aesthetic: dark gardens, skeletal figures, muted palettes, and symbolic animals surround the user, generating a mood that is both immersive and reflective. Simberg's work is enchanting in itself, but the lack of a body means that the user is only a spectator rather than an active participant in the experience. We can choose which paintings to view, but we cannot sit beneath a tree or touch the water of the lake. The developers made the choice to keep the user distanced from the work, similar to the experience in a museum. Could a choice to give the user a body like the skeletal figures in Simberg's work offer a different experience? Potentially, leading to the question of whether these choices were the correct ones.

By contrast, *Ciao: Piazza Navona Experience*, developed by the Italian Ministry of Culture and Vection Technologies, uses VR to situate users in a historically reconstructed Roman piazza, layered with augmented information about architectural features, cultural history, and civic life. Users are cast as tourists in this experience, but more specifically as data consumers. With a simple set of hands, the user starts the experience in an alleyway next to the piazza, where they are guided through the basic controls and introduced to the way that they will navigate through the experience. The body is only a set of hands, which are skinned as large, masculine, and white. The hands are the guiding force of the experience, leading the user through the square. As various areas light up, the user is expected to travel to that area of the square, and when they do, an audio recording describes what the user is looking at in the square and the history behind it. The user is free to move about the world as these recordings occur, in contrast to the stillness of the Simberg application.

Although a full-body is again absent, the environment is richly populated with interactive objects. The skinning in *Ciao* is driven by a logic of clarity and comprehensibility: bright visuals, realistic scale, and smooth transitions encourage a sense of frictionless navigation through a historic square. It is like a guided tour: while the tour guide is talking, there is no sense that the user needs to look in a specific place but can visually and kinesthetically explore the space at one's leisure. The developers call this app "travel entertainment," with a goal of bringing the sensation of exploration and cultural immersion to users who may not be able to physically visit the location. In this way, the skinning in this application emphasizes comfort over complexity, framing virtual tourism not as challenge or simulation but as a relaxed, intuitive encounter with history.

These two approaches exemplify the spectrum of skinned pedagogy in VR. In *The World of Hugo Simberg*, the learner is enveloped in affect and metaphor, moving through an environment that demands interpretive labor and emotional engagement. The absence of a body heightens the sense of ghostly witnessing. Users are not meant to be Simberg, but to feel the atmosphere of his world. *C!ao: Piazza Navona Experience*'s developers position the user as a more active learner, engaging with clickable nodes, choosing when to access certain information, and receiving feedback through clear visual and auditory cues. Knowledge here is scaffolded rather than evoked.

Yet both applications share a crucial feature: the absence of a fully embodied avatar. Users are not given the tools to customize appearance, gesture, or interpersonal presence. Instead, the skin is worn through perspective. The user's identity is constructed by where they are placed in space, what they are allowed to do, and how the environment responds to them. In *The World of Hugo Simberg*, the environment is largely non-reactive, emphasizing contemplation and haunting detachment, while in *C!ao: Piazza Navona Experience*, the user's movement and gaze trigger interactions, fostering a sense of agency, even if that agency is confined to predefined educational routes. This contrast speaks directly to the idea that skinning is not only about avatar design, but also about the dramaturgy of knowledge itself. The Finnish National Gallery developers chose to teach through mood and immersion; the *C!ao: Piazza Navona Experience*'s developers chose education through structure and interactivity. One is poetic, the other didactic. Yet both rely on carefully designed skins to structure the learner's experience: what they see, what they can touch, how they feel, and what they remember.

In both cases, the lack of a personalized avatar can be seen as a double-edged sword. On the one hand, it removes distracting self-consciousness, allowing the users to engage more fully with the content. As one user of *The World of Hugo Simberg* notes in the review, the lack of distractions makes the art more alive because of the focus of the experience (Finnish National Gallery, 2023). On the other hand, it limits opportunities for expressive or participatory learning. The user becomes a node in a system, a camera with agency, rather than a character within a narrative. *The World of Hugo Simberg*'s design choice reinforces the dreamlike distance of the artwork; *C!ao: Piazza Navona Experience*'s world helps maintain the clarity of an educational tour. But in both, it restricts relational identity formation. There is no person to gesture to, no dialogue to inhabit, no social presence beyond the self.

However, even within these constraints, users may still experience moments of affective learning. With Simberg's work, these moments may emerge through symbolic recognition: a user familiar with death iconography may find unexpected poignancy in a garden of skeletons. While navigating the Italian piazza, they may be sparked by the contrast between present-day Rome and the reconstructed, idealized past. These moments do not come from interactivity per se, but from spatial narrative: how the world is skinned to provoke affect and understanding simultaneously.

The design philosophy behind each application also reveals different assumptions about what constitutes learning. *The World of Hugo Simberg* offers ambiguity and interpretive space, inviting the user to draw personal or emotional conclusions. *C!ao: Piazza Navona Experience* assumes a goal-oriented learner and organizes content accordingly, guiding the user along a curated path toward specific knowledge outcomes. In this sense, *The World of Hugo Simberg* is more aligned with experiential, constructivist learning models, while *C!ao: Piazza Navona Experience* mirrors more traditional instructional design, even as both use immersive technology. Yet what unites both experiences is the insistence that the skin, however abstract, is not merely a wrapper, but a pedagogy. It determines how learning is framed, what kinds of knowledge are possible, and how the users understand their own presence in relation to content. Whether one floats through the haunted brushstrokes of a symbolist

painter or walks the clean stones of a Baroque Plaza, one is always wearing the space. That skin defines how one learns to see.

As virtual education continues to evolve, the role of skinning and the choices developers make about who the user is allowed to be and how the world reveals itself will become ever more central. If VR is to fulfill its promise of transformative learning, it must attend not only to content, but also to embodiment: not just what is taught, but also how learners feel themselves taught to be.

5. Identity and Performance in Skinned Realities

In skinned virtual environments, identity is not merely chosen or expressed. It is performed within a set of constraints that define the limits of recognition, participation, and transformation. These constraints are not simply aesthetic; they are structural and deeply performative. The skin, both as avatar and interface, becomes the site where identity is negotiated, shaped, and often contested.

Performance theorists have long emphasized the body as the locus of meaning in theatrical experience. In live performance, the body's gestures, voice, and presence signal emotion and intent. But in virtual performance, the body is no longer biological: it is simulated, skinned, and often abstracted. This abstraction creates both opportunity and tension. On the one hand, it enables a kind of fluidity. Users can step outside of normative bodily expectations, experiment with form, and enter spaces untethered from physical identity. On the other hand, the limits imposed by the digital skin – such as the gestures allowed, the level of interactivity, or any encoded expressivity – circumscribe what forms of identity can be meaningfully performed.

In the two educational applications we have been considering, identity is largely stripped of distinguishing markers. There is no body in *The World of Hugo Simberg*, and there is only a pair of floating hands in *C!ao: Piazza Navona Experience*. There are no names, no user tags, and no ability to customize appearance. Yet within this imposed anonymity, a rich field of identity performance still emerges.

The absence of an avatar in *The World of Hugo Simberg* is not neutral. It reframes the user's role from participant to observer, even as it immerses them in the visual and affective texture of the artist's world. Without a body, users cannot gesture, emote, or even occupy space in a way that might be interpreted by others. Instead, they exist as a mobile pointof-view, a ghost among memories. This condition of non-being becomes a kind of performance in itself. It demands a mode of presence rooted not in action, but in reception – how long one lingers before a symbolic image, how slowly one moves through the dim corridors of Simberg's imagination. Identity here is enacted through rhythm, gaze, and stillness. It is a performance of sensitivity rather than assertiveness.

By contrast, *C!ao: Piazza Navona Experience* offers users partial embodiment through disembodied hands – a gesture toward physical presence without the complexity of fullbodied animation. These hands serve as cursors and triggers, signaling that the user is a tactile being capable of interacting with the world. However, without a head, face, or voice, the performance of identity is functional, not expressive. The user is defined by what they can activate, not how they are seen. This reduction simplifies navigation but also flattens individuality. The user's performance becomes one of progress through pointing and clicking rather than one of emotional or intellectual expression.

Yet even these minimal systems construct frameworks for identity. In *The World of Hugo Simberg*, the user becomes a poetic voyeur, immersed in the psyche of an artist who, notably, also operated on the edge of physical visibility in his own lifetime. Simberg's own body was marked by illness, silence, and retreat. The user's formless presence mirrors this quiet

erasure, creating a resonance between avatar and subject. The learner is not invited to become Simberg, but to experience the world as though thinking alongside him: without intrusion, without weight.

C!ao: Piazza Navona Experience positions the learner as a kind of digital flâneur, walking a prescribed path through architectural history. Flâneur implies a male body, which we see in the size and shape of the hands. We are skinned as the intended audience for the square itself historically. The disembodied hands suggest interaction, but the limitations of movement and the absence of dialogue reinforce the user's role as an informed spectator temporarily inhabiting this skin. This is not a space for invention or self-reflection; it is a guided tour, and the learner's identity is shaped by their willingness to follow. Still, the performance is not without agency. Users choose where to linger, which artifacts to examine more closely, and how quickly they move. These choices produce a rhythm of attention that can differentiate one user's performance from another, even in the absence of personalization.

Both applications therefore raise key questions about identity in educational VR. Who is the user meant to be? What actions can they take, and what performances are recognized or ignored by the system? The answers, as with any performance, are encoded in the environment's design. *The World of Hugo Simberg* invites a slow, reverent tempo, *C!ao: Piazza Navona Experience* a paced, goal-directed progression. Both constrain speech and gesture, rendering identity legible only through pacing, proximity, and curiosity.

This is where the concept of skinned performance becomes particularly useful. In theatrical terms, a skin is both costume and constraint. It dresses the performer but also defines their mobility and silhouette. In VR, the skin is both visual and procedural. It is the interface through which performance occurs, and the boundary that limits what kinds of performance are possible. The user is always performing, even when silent. The choice not to touch, not to move, not to follow is itself a performance of resistance or disengagement. Educational designers often focus on cognitive outcomes: did the student learn the historical facts, identify the correct symbolism, retain the material presented? But in skinned realities, learning also occurs through performative engagement: how the student experiences themselves in relation to the knowledge. Do they feel like a tourist, a witness, a collaborator? These identities are shaped not by the content alone, but by how the system scripts their role, which is wholly dependent on the developers' choices in the potential world.

Moreover, the minimalist avatar strategies in both *The World of Hugo Simberg* and *C!ao: Piazza Navona Experience* also point to broader ethical questions about visibility, agency, and the pedagogy of presence. What does it mean to strip users of visible identity? In some cases, it may protect against bias, creating an egalitarian space where learners are not judged by race, gender, or appearance. In others, it may erase opportunities for meaningful selfexpression, limiting users to anonymous consumption. These tensions echo debates in theatre and performance studies around invisible labor, audience agency, and the politics of representation.

Virtual identity, then, is never neutral. It is always coded – by gesture, by limitation, by what the world allows the user to do and to be. In *The World of Hugo Simberg*, identity is shaped through spectral immersion; in *C!ao: Piazza Navona Experience*, it is shaped through guided action. Both demand a kind of choreography: not just of movement, but of self. And this choreography is not fixed. Users bring their own subjectivities to these roles. A student exploring *The World of Hugo Simberg* may feel an unexpected affinity with the melancholy symbols and find resonance in their silence. A learner in *C!ao: Piazza Navona Experience* may resist the guided path, choosing to remain in one plaza and contemplate a fountain's sculpture rather than "progress" toward the next data point. These acts of divergence are

performative, and they remind us that even within constrained environments, users create identity through friction, rhythm, and resistance.

Ultimately, skinned realities do not erase the self but, rather, stage it. They script possibilities, and mark boundaries. They offer affordances through which identity can be temporarily worn and reimagined. Educational VR is not just a tool for delivering content. It is a stage upon which students try on new ways of being learners. And that stage, like any theatrical environment, demands critical attention to the roles we are asked to play.

6. Potentials Beneath the Code: Subversion and Imagination

At first glance, educational VR applications such as *The World of Hugo Simberg* and *Ciao: Piazza Navona Experience* may seem rigidly structured, bound by the clarity of their objectives and the apparent linearity of their user pathways. But beneath their polished surfaces lie deep reservoirs of potential, sites where the virtual skin does not simply direct behavior, but opens opportunities for imaginative subversion. These are neither chaotic, sandbox-style worlds, nor do they offer branching narrative choices. Yet, even within their scripted architectures, users may engage creatively, far beyond the bounds of what the developers imagined. The true pedagogical value of these environments emerges not only in what they present, but also in how users choose to inhabit them. For developers, considering these alternative performances can more carefully illuminate the potentials of these worlds.

Virtual experiences, like theatrical ones, do not require overt rebellion to be subversive. In fact, the very act of lingering, skipping, or reframing a learning experience within VR may constitute a kind of quiet challenge to the designed path. In *The World of Hugo Simberg*, where interaction is minimal and embodiment is absent, users are invited into a symbolic world rich with metaphor and melancholy. While the environment provides no obvious agency – no levers to pull or quests to complete –, the open-ended pacing and spatial ambiguity grant the user permission to resist narrative closure. A user can sit with a painting, for example, for as long as they wish, although the audio cues for each painting indicate a moment when the user has completed the experience. There is no explicit "lesson" to be mastered; instead, the experience leaves room for personal interpretation, including how long a user wishes to be involved in the experience. Subversion here takes the form of imaginative inhabitation: a student may begin by simply listening to the audio explanation of the symbolism in Simberg's work, but end up immersed in a meditation on grief. This divergence from curricular intent is not a failure. It is the mark of a deeply affective and flexible pedagogical skin in a virtual space. Even without a body, the users in this experience feel the pressure of the virtual space on their sense of self, giving them the space to reflect on Simberg's work without the societal pressures which their biological skin would experience in a physical-world museum. One might be looked at askance if crying loudly while meditating on death in a still museum, for example.

Ciao: Piazza Navona Experience, while more directive in its structure, similarly invites subtle acts of reinterpretation. Its precise reconstructions and informative nodes suggest a clear learning goal: to introduce users to the architecture, history, and cultural importance of Piazza Navona. But the user need not follow this path obediently. They might choose to ignore the audio prompts and instead focus on textures of the stone, the spatial relationships between fountains, or the imagined sounds of contemporary street life bleeding in from the edges of the scene. There are even small cafes where a user could sit and simply look at the square for a period of time. Even in a setting built for efficient delivery of historical content, the user can wander and daydream, filling in silences the program does not account for. The tension between the curated experience and the user's

wandering attention becomes a powerful space for learning, one not easily measured, but richly generative.

These moments of imaginative subversion, though subtle, speak to the affordances of VR as a learning medium. Unlike a video or a textbook, VR places the user in spatial and temporal control. Even in tightly skinned worlds, the user determines their rhythm in the experience. The very constraints of *The World of Hugo Simberg* and *Ciao: Piazza Navona Experience*, such as their minimal avatar presence and limited interactivity, paradoxically amplify this internal agency. There are fewer buttons to press, but more space to feel, interpret, and resist. It is here that performance theory becomes particularly resonant. If we consider each user a performer and each session a performance, then we must also consider the possibility of improvisation or quiet rebellion. In both applications, the user can refuse to follow the script. A visitor to the *The World of Hugo Simberg* world may dwell on unexpected details or even turn their backs completely on the paintings to experience only the opening scene in a quiet, dark museum. A visitor to the Piazza Navone in *Ciao: Piazza Navona Experience* may focus on the emotional implications of public space or imagine the lives of invisible people behind closed windows instead of absorbing only the historical narrative on offer.

Such acts of imagination are not distractions from learning; they are its expansion. They move the user beyond the presented content into reflective territory where connections are forged and more complicated ideas are awakened. These acts may never be assessed on a test, but they mark the difference between passive reception and critical engagement. They also reveal the flexibility hidden in even the most structured skinned environments. The skin may shape the path, but the performer always retains the interpretive power. Moreover, these imaginative acts invite a reconsideration of what educational success looks like in VR. Should we measure learning in terms of completed checkpoints, time spent inapp, or information retained? Or should we also account for the user's emotional journey, their spontaneous questions, and the invisible mental theatre that unfolds beneath the code? This question is particularly urgent for humanities-based educational VR, where meaning is often shaped less by recall than by resonance.

Both *The World of Hugo Simberg* and *Ciao: Piazza Navona Experience* implicitly encourage this kind of resonance by denying users the tools of overt performance. There are no conversations with other users, and without a body, facial and bodily expression remain minimal. And yet, this lack can become a gift. In the absence of expressive tools, users must turn inward. They become observers and authors of their own interpretations, layering meaning onto their silent, floating perspectives. The skin, in this context, does not prevent identity. It stages it as a contemplative act. These potentials are fragile. Without intentional design practices that leave room for interpretive wandering, even the most beautiful VR applications can become rigid delivery mechanisms. The key for developers lies in recognizing that they cannot predict all outcomes. Educational VR does not need to control every response; it can allow space for surprise. When developers understand that the skin is not just a container, but a performance partner, they may begin to craft experiences that welcome rather than suppress improvisation.

7. Conclusion: The Reality beneath the Surface

Virtual environments may promise escape, immersion, or freedom, but as this study has argued, what they most reliably offer is structure. The skin, whether worn as an avatar or encountered as a world, is the central organizing metaphor of virtual performance. It is what the users see, what they inhabit, and ultimately, what they become. But unlike theatrical costuming, where identity may be chosen or discarded at will, digital skinning embeds identity within the rules of the system. It is not merely surface, but structure.

The educational applications considered here exemplify this relationship between skin and system. They show that freedom in virtual space is not the absence of constraint, but the ability to perform meaningfully within it. The experience strips users of verbal language, personalized features, and clear narrative goals, yet out of this emptiness, rich performances emerge. Users wave, kneel, follow, abandon. They form attachments to live performers. They repeat the rituals. They build ephemeral communities. None of these behaviors are demanded by the code, and yet they arise from it: proof that within the skin lies not just control, but invitation.

In this sense, the skin is not a barrier to meaning but a dramaturgical device. It frames the user's range of movement and action, shaping not just what can be done, but how it feels to do it. It is a politics of presence. As such, it demands critical attention, not only for how it encodes systems of power, but also for how it can be reimagined through performance. Skinning equally offers a valuable lens to understand how users craft identity in postbiological contexts. Here, identity is not selected from a menu or expressed through customization. It is enacted through the experience of moving through a skinned world where even the smallest decisions result in an interaction with the world. It is seen in things like how long one lingers in the experience or whether to engage with the interactive elements. By applying a dramaturgical lens to the design of educational VR, we move beyond questions of technological novelty and enter the realm of critical performance. In this frame, learning becomes an act of performed identity; presence is something sculpted by code and interface; and the virtual world, like the theatre, becomes a stage for becoming. The learner is not merely a consumer of content but a character cast within a tightly written script – albeit one that always leaves space for improvisation.

This paper does not suggest that all constraints are limitations. Quite the opposite: it is within the boundaries of skinning that meaning emerges. What matters is not the presence or absence of user agency, but how that agency is framed, supported, and interpreted. In *The World of Hugo Simberg*, agency is contemplative and affective. In *Ciao: Piazza Navona Experience*, it is spatial and procedural. Each world constructs a specific mode of learning, and each leaves open particular avenues for imaginative resistance and subversion. What is at stake, then, is the ethics of skinning: the question of what kinds of learners we are designing for, and what roles we are asking them to perform. Educational VR carries the power to replicate the worst habits of traditional instruction, but it also holds the promise of staging radically different futures. These futures are not utopian, nor are they free of constraint. Rather, they are thick with possibility, inviting users not just to absorb knowledge but also to move through it. The practice of skinning reminds us that even digital education has a dramaturgical core. Behind every interface is a set of choices about bodies, presence, and potential. To understand those choices and to imagine new ones is the critical task of both educators and world-builders. As we look to the future of immersive learning, the question is not just how we will use VR, but how we will perform within it, and who we will be allowed to become.

If the world is a stage, as Shakespeare reminds us, then VR education is a new kind of theatre, one where the scenery is code, the audience is immersed, and the costume is the skin we are given. To engage with that skin is to ask: What kind of performance is this? Who wrote the script? And most importantly, how might we revise it?

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