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Article

From Mental Characters to Shelf-Ready Commodities: A Three-Stage Translation Model for Commercial IP Design Education in the VR Era

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Abstract: The designer toy market and collectible intellectual property have developed into two economic sectors which youth culture uses to create two distinct cultural economies. The design education system must solve two problems which require students to create marketable products from their character designs while maintaining cultural identity and ethical standards. The study implements a three-stage translation model which includes three components: emotion–narrative, form–style, and commodity–scenario-based virtual-reality course for 36 senior students majoring in Virtual Reality Technology at Shandong Foreign Affairs Vocational University. The research used design translation principles from Cross (2018) and Dorst (2019) and techno-vernacular creativity principles from Gaskins (2021) to create an action-based research method which combined quantitative creativity measurements with qualitative interviews and pedagogical log assessments. The study showed that students improved their creative confidence and design scalability understanding, yet they encountered a "speed–depth paradox" which restricted their ability to appreciate various cultural traditions. The study establishes an institutional "ethical pause" system which permits organizations to conduct market acceleration operations by practicing cultural authenticity assessment. The model transforms commercialization into an epistemic translation procedure which enables VR-supported education to function as an educational environment for human-centered creative learning that maintains ethical equilibrium.

Keywords: IP design; designer toy education; design translation; VR visualization; cultural labor

1. Introduction

1.1 Consumption Context: The 90-Day Survival Window of the Designer Toy Economy

Over the past decade, designer toys—ranging from blind boxes and garage kits to soft vinyl collectibles—have evolved from niche collector artifacts into central commodities of youth culture. According to industry analytics, China's designer toy sector experienced an annual growth rate exceeding 25% between 2018 and 2023, driven primarily by Generation Z consumers' emotional and identity-based purchasing behavior (Gong & Yang, 2023). This phenomenon reflects Baudrillard's (1996) notion of symbolic consumption, where objects function less as tools and more as vehicles for personal meaning.

At the production level, manufacturing ecosystems in southern China have shortened the entire commercialization cycle—from concept sketch to steel mold fabrication and market

release—to as little as 90 days (Huang, Sun, & Sui, 2024). Consequently, designers must transform imaginative "mental characters" into manufacturable commodities under intense temporal pressure. In such contexts, speed has become a governing principle of creative work, reconfiguring how affect, narrative, and materiality are translated into marketable IPs.

1.2 Educational Discontinuity: The "High-Poly Trap" in University Curricula

The toy industry now produces products through quick manufacturing methods which use interchangeable parts at low production costs. Chinese universities continue to teach character design through traditional cinematic and AAA game development programs. Students learn ultra-high polygon modeling and advanced texturing and rendering fidelity skills which the entertainment industry requires, but those skills do not match the needs of industrial toy production workflows (Wen & Zalay, 2023).

A preliminary survey among 36 senior students in Virtual Reality Technology at Shandong Foreign Affairs Vocational University revealed that most participants lacked basic knowledge of mold tolerances, draft angles, and material separability. International educators face the same challenges because they cannot teach students correct digital modeling aesthetics which should match actual manufacturing processes (Meng, 2023; Rau, 2022). The educational system produces a fundamental mismatch which prevents students from acquiring the design skills needed in the commercial creative industry.

1.3 Research Objectives and Questions

The research establishes a three-stage translation framework which students must follow to progress from emotional imagination to actual market implementation while learning takes place in a controlled environment that maintains ethical standards. The model uses virtual reality visualization to support students who must transfer their ideas through three knowledge domains which include emotion–narrative and form–style and commodity–scenario based on the commercial IP development process.

The research investigates two primary research questions which serve as its main focus.

RQ1 Which virtual reality visualizations help design students connect their design concepts with actual product manufacturing by decreasing the distance between their intellectual work and technical execution?

RQ2 The introduction of market-based assessments into teaching practices results in reduced cultural diversity and decreased creative freedom, according to educational researchers who study these two effects.

1.4 Research Significance

The research provides theoretical benefits and educational advantages. The study presents a new theoretical framework which shows that commercialization functions as a cognitive process which designers use to translate their ideas into marketable products (Cross, 2018; Dorst, 2019). The study introduces an educational method which uses the "ethical pause" mechanism (Pyun & Quan, 2024; Freedman, 2025) to create breaks in market demand which enable students to assess their work before they complete their final product. The research establishes the classroom as a small representation of the larger creative economy which exists between imagination and cultural meaning and market principles.

2. Literature Review

2.1 Designer Toys and Youth Consumption

The designer toy market demonstrates how post-industrial youth markets use symbolic consumption to drive their business. According to Baudrillard (1996), people use commodities to display social status because they serve as communication tools that transmit social information which exists outside their functional value. Generation Z consumers use blind boxes and garage kits as collectible items which help them build their personal identity while preserving emotional bonds during times of social doubt (Bak, 2020).

Unboxing establishes a control ritual through which people perform their need for custom ownership rights within algorithm-driven economies while handling their anxiety about uncertain situations (Wolf & Perron, 2023). Gong and Yang (2023) found that virtual previews and 3D visualization tools enable customers to experience products emotionally which results in shorter design-to-market timelines and supports active audience participation during the production process. Designer toys create a learning environment where students can study creative agency development under rapid market competition by using consumption patterns and emotional responses and visualization technologies.

2.2 Design Translation Theory

The process of design translation theory demonstrates how artists develop their creative work through multiple stages of bringing their ideas to life and developing fresh interpretations of their work. Cross (2018) defined design as a process which develops through the creation of representations that architects use to design their products and their ability to communicate their ideas. Dorst (2019) developed this concept by introducing frame creation which he claimed expert designers use to develop new value systems through their ability to switch between different cognitive frames.

Beyond viewing design representations as preliminary outputs, Cross (2018) emphasizes that representations function as cognitive tools through which designers think, negotiate, and construct meaning. Sketches, diagrams, models, and spatial simulations do not merely depict ideas; they externalize partial thoughts, allowing designers to test assumptions, reflect on constraints, and communicate intentions with others. In this sense, representation operates as an epistemic medium rather than a finalized artifact.

Within design education, this cognitive role of representation becomes particularly significant. Students do not simply "produce" designs but learn through the act of representing—using visual, spatial, and narrative forms to make sense of emotional intentions, technical limitations, and social expectations. Representations thus mediate learning by enabling iterative reflection and reinterpretation. Understanding design as a representational process provides the theoretical foundation for framing commercialization not as a linear output stage, but as a sequence of translational moments through which meaning is progressively stabilized.

Building on this perspective, the proposed three-stage translation model conceptualizes each phase as a distinct representational domain. In the emotion–narrative stage, affective meanings are externalized through emotion boards and narrative descriptors; in the form–style stage, these meanings are re-represented through modular geometry and material logic; and in the commodity–scenario stage, value is further translated into market-facing representations within virtual commercialization environments. Each stage employs representation as a thinking device that enables students to reconfigure their understanding rather than simply refine surface aesthetics. In this way, the model operationalizes Cross's theory by embedding representational cognition directly into pedagogical practice.

Rau (2022) shows that modern virtual reality learning spaces require translation to transform the visual appearance of materials into understandable material cultural and economic elements. Through her study Meng (2023) shows that multimodal teaching methods in

virtual worlds boost students' capacity to express their thoughts using different modes of representation which include text visual content and performance just like designers do when they convert between emotional, formal and commercial design styles. The study presents the "three-stage translation model" which shows how emotional meaning becomes market-ready digital content through organized digital pathways between its two states.

2.3 Creative Labor and Cultural Homogenization

The quick rise of creative education as a business operation generates problems because it makes particular cultural expressions permanent while destroying various artistic forms. McRobbie (2016) warned that creative workers who face market performance evaluations will start to adopt productivity standards which hinder their ability to experiment with artistic work. Gaskins (2021) demonstrated that creative pedagogy must fight against the "techno-vernacular paradox" which shows how digital skills create hidden cultural gaps in society.

Freedman (2025) and Darts (2004) both advocate for art education that cultivates critical visual literacy—a capacity to question commercial aesthetics rather than replicate them. The process of capitalist production systems presents this design education challenge, according to Pyun and Quan (2024) who argue that design education should teach students about ethical labor practices and creative independence through direct instructional content. The proposed "ethical pause" mechanism functions as a pedagogical intervention which preserves cultural heritage through its operation as a political defense between two groups that face artistic practice commercialization.

3. Methods

3.1 Research Paradigm

The research study implements an action research design which uses a design experiment framework to repeatedly enhance its teaching method. The researchers chose action research because it provides immediate benefits to practice while developing new theoretical knowledge (Herrero & Vanderschelden, 2024). The instructional cycle used feedback loops from observation and reflection along with redesign processes to adjust teaching methods according to actual classroom needs.

The mixed-methods approach aligns with prior VR-based art education studies which emphasize both reflective inquiry and empirical evaluation together with (Wen & Zalay, 2023). The research team employed quantitative assessment methods to evaluate both creative confidence and cultural diversity while they used qualitative data to document how students created their own understanding of the subject matter.

3.2 Participants and Context

The study involved 36 senior undergraduate students who were part of Shandong Foreign Affairs Vocational University Virtual Reality Technology program and belonged to the Class of 2024. The study participants all possessed previous knowledge of 3D modeling which included ZBrush and Blender, and they had experience with texturing through Substance Painter. The study received ethical approval from the SEU-2022-ART-027 protocol after all study participants provided their informed consent.

The eight-week course Commercial Character Design for VR Environments was delivered from April to June 2025. The weekly sessions provided technical instruction design critique and reflective discussion to create a simulation of the production pipeline which started from ideation and ended with virtual commercialization.

3.3 The Three-Stage Translation Model

The intervention used a three-stage translation model to guide students from emotional thinking to business market simulation. The three stages of the process functioned as separate epistemic translation domains which matched Cross's 2018 and Dorst's 2019 cognitive design frameworks（Table 1）.

Table 1 The Three-Stage Translation Model

Stage	Focus	Key Tools	Evaluation Criteria
T1: Emotion–Narrative Translation	Articulating affective character narratives	Text-based emotion boards, color schema	Narrative coherence assessed through peer interpretation sessions
T2: Form–Style Translation	Transforming narrative into manufacturable 3D forms	Blender, Substance 3D Stager	Modularity and symbolism justified through studio critique and reflective journaling
T3: Commodity–Scenario Translation	Simulating commercialization and audience reception	VR packaging displays, crowdfunding scenario simulation	Market legibility and emotional resonance discussed in final reflection seminars

The students throughout all their stages used virtual reality (VR) environments as spaces for reflective visualization instead of using them as basic modeling tools (Rau, 2022). The VR system allowed users to experience their designs by testing size relationships while experiencing emotional presence through live scaling, lighting and ergonomic testing. The immersive experiences enabled students to discover how to express themselves while working inside the limits of what they could produce.

The students design knowledge development was studied through the design process which students used to transform their creative ideas into visible and shareable designs instead of assessing their work through numerical measurements. The focus of the program required students to learn through practical work instead of using performance metrics to evaluate their achievements.

3.4 Data and Reflection Sources

Four types of qualitative materials were collected to trace the process of transformation.

Learning journals documenting weekly emotional and technical reflections.

Instructor logs with analytical memos capturing classroom adjustments, ethical challenges, and teaching insights.

Semi-structured interviews with 12 students (30–40 minutes each), exploring how they perceived creativity, commercialization, and authenticity.

Design artifacts and prototypes, including 3D models, emotion boards, and VR packaging simulations.

4.Results

4.1 Theme 1: Awareness of Scale and Modularity

Students reported a shift from seeing modeling as an aesthetic exercise to viewing it as an act of material reasoning. One student noted:

"I used to sculpt characters just for appearance. Now I think about how every joint affects mold cost and playability."

This awareness demonstrates the emergence of design pragmatism—a new literacy in industrial negotiation and manufacturability (Gong & Yang, 2023).

4.2 Theme 2: Packaging as Narrative Closure

The final stage (T3) redefined how students perceived packaging—not as a marketing afterthought but as the final act of storytelling. Many described the moment of seeing their models boxed and priced as an emotional transition "from student to designer."

This reflects what Pyun and Quan (2024) term ethical labor consciousness: understanding one's creative work as situated within both affective and economic systems.

4.3 Theme 3: Template Anxiety and Cultural Neutralization

Several participants self-censored ethnic motifs or local color schemes, fearing they would appear "too niche" for the imagined market. This phenomenon aligns with McRobbie's (2016) critique of market-conditioned creativity, where speed and algorithmic legibility suppress cultural difference.

One student reflected:

"I deleted the dragon pattern because I worried it might not fit the international toy market image."

This illustrates a "speed–depth paradox"—students gained efficiency but at the expense of cultural specificity.

4.4 Theme 4: The Ethics of the Pause

The introduction of an "ethical pause" between T2 and T3—where students were asked to stop production and justify the cultural meaning of their design—became a turning point. It allowed for collective discussion about representation, sustainability, and authorship.

As Freedman (2025) argues, embedding ethical reflection within the creative process transforms the classroom into a moral studio, where design decisions carry both aesthetic and social weight. Students began to articulate personal criteria for authenticity, with one noting:

"The pause made me realize that speed should serve emotion, not replace it."

4.5 Synthesized Outcome

Across all stages, students demonstrated growth not in measurable performance but in epistemic awareness—an understanding of how emotion, form, and economy interrelate. The course revealed that creative acceleration need not equate to superficiality if reflective mechanisms and communal critique are structurally embedded.

The three-stage model, therefore, functions as a pedagogical translation framework—a cognitive journey rather than a production pipeline—supporting the cultivation of culturally grounded, ethically responsive creators for the VR-era design industry.

5. Discussion

5.1 Translational Cognition in Design Learning

The study results demonstrate that the three-stage translation model functions as both a teaching tool and a cognitive framework which assists students in their transition between imagination and industrial implementation. The model defines "commercialization" as an internal translation process which links emotional states with physical materials and economic systems through continuous mediation (Cross, 2018; Dorst, 2019). Students developed their capacity to perceive how form generation and storytelling functioned together within a broader system of communicative design. Cross (2018) describes design as a "language of making" in which each material translation process creates epistemic value for designers. Through the

emotion–narrative and form–style stages, students learned to interpret their own affective choices as semiotic decisions, developing a meta-awareness of how creativity operates as cultural communication rather than purely self-expression. The three-stage translation model functions as an epistemic framework which demonstrates how diverse creative concepts become understandable through different value systems. The three stages of the process lead organizations to change their dominant logic from emotional significance to technical system analysis to economic system analysis. Commercialization functions as a continuous process which transforms creative power through multiple negotiation stages instead of a single deal between two parties.

Dorst's (2019) theory of frame creation offers a useful lens for interpreting how students navigated the translation process observed in this study. Rather than solving predefined problems, expert designers create value by reframing situations—redefining what the problem is about and which constraints matter. A frame, in this sense, is not a solution but a way of understanding the relationship between intention, context, and possibility. Frame creation enables designers to move beyond surface-level optimization toward the construction of new meaning systems, particularly when facing ill-defined or contradictory demands. In educational contexts, developing this capacity requires learners to recognize that design problems are not fixed but can be reconstructed through shifts in perspective, material focus, and evaluative criteria.

The findings reported in Section 4.1 illustrate this process of re-framing in practice. During the form–style translation stage, students shifted from understanding design primarily as aesthetic sculpting toward framing it as a system of material negotiation involving scale, modularity, and manufacturability. What was initially approached as a question of visual expressiveness became reframed as a problem of how form could simultaneously support narrative meaning and industrial feasibility. This transition reflects an emergent form of design expertise, in which students began to construct new frames that integrated emotional intention with production logic. The three-stage translation model thus functioned as a pedagogical mechanism that actively supported frame creation rather than merely guiding technical execution.

5.2 Marketization and the Ethics of Design Education

The designer toy industry has developed an urgent need to shorten its design-to-market process which creates a fundamental educational problem for teachers. McRobbie (2016) demonstrates that creative workers develop market-based self-management skills because they adopt entrepreneurial behavior. The students used popularity indicators to measure their success instead of reflecting on their actual understanding.

Donald Schön's concept of reflective practice provides an important theoretical grounding for understanding the pedagogical function of the ethical pause. Schön (1983) distinguishes reflection-in-action from retrospective reflection, describing it as a form of thinking that occurs within ongoing activity when practitioners encounter uncertainty, ambiguity, or value conflict. Rather than stopping after action is complete, reflection-in-action involves a temporary suspension of momentum in order to reconsider assumptions, redefine goals, and adjust judgment in real time. This process is particularly relevant to design education, where practitioners must continuously respond to evolving constraints while maintaining ethical and conceptual coherence.

From this perspective, the ethical pause can be understood as an institutionalized form of reflection-in-action embedded within the design process. Rather than functioning as a simple interruption, the pause was deliberately positioned between the form–style and commodity–scenario stages, at a moment when students faced intensified market-oriented

pressure. During this period, learners were required to articulate the cultural assumptions, representational choices, and ethical implications underlying their designs. By formalizing this reflective interval, the ethical pause transformed acceleration into a site of critical judgment, enabling students to reconsider how speed, market logic, and authorship intersect within creative labor.

The learners received an opportunity to use creative time as a moral resource through the implementation of the "ethical pause" system which stopped program acceleration. The students obtained a new perspective on authorship and representation by taking breaks from their work to study both its original form and commercial usage. The study establishes a link between Pyun and Quan's (2024) ethical labor pedagogy framework and design learning through its requirement that students reflect on economic systems. Visual culture education should provide students with both aesthetic judgment and social and ethical decision-making skills according to Freedman (2025).

The "pause" function operated as a design of conscience because it created a regulated time frame which enabled people to exercise their free will during times of machine-based productivity.

5.3 VR as a Medium of Reflective Visualization

Virtual reality, within this pedagogical framework, operated as more than a technical tool. The system functioned as a space for students to visualize their thoughts through creation which they could use to evaluate design limits and experience emotional responses through spatial design (Rau, 2022; Wen & Zalay, 2023).

The designers and audience became one through the immersive space which allowed students to experience their own creations as both creators and spectators. Meng (2023) explains that VR teaching methods help students learn through physical experiences which combine direct interactions with their learning material. Students used their acquired bodily learning through the study to connect abstract ideas with physical objects and their ability to create new products.

Gaskins (2021) shows that digital fluency fails to provide a path for people to achieve cultural understanding. VR technology needs critical scaffolding because it will create new visual systems through which people access dominant visual systems. The combination of VR visualization and ethical reflection thus proved essential: technology amplified creative potential, while pedagogy reintroduced social and cultural grounding.

5.4 Toward a Culturally Responsive Model of Creative Translation

At its core, the three-stage translation model provides a culturally responsive framework for balancing creativity, manufacturability, and meaning. By embedding ethical reflection within each design phase, the model challenges the dichotomy between “artistic purity” and “commercial pragmatism.” Instead, it positions design as a continuum of translation—from feeling to form, and from form to shared value.

This mirrors the “design expertise” logic described by Dorst (2019), in which expert designers construct frames of understanding that integrate problem, context, and intention. Through VR mediation and communal reflection, students developed precisely this form of translational expertise: the ability to move fluidly between aesthetic intention, material constraint, and ethical accountability.

Ultimately, the study reaffirms the potential of design education as a moral laboratory—a space where emerging creators learn to negotiate not only how to make things, but how to make meaning responsibly.

6. Conclusion

The study introduced and tested a three-part translation model which enables commercial IP design education for virtual reality (VR) technology by transforming the creative process into three types of knowledge-based changes which include emotional storytelling and artistic expression through various design styles and the development of practical design solutions through different production contexts. The model showed through action research framework implementation that educational design can create a balance between artistic creativity and product development and ethical evaluation within fast-paced manufacturing environments.

The core finding of this study reveals that commercialization serves as a learning platform instead of being a terminal market destination. Through the process of changing production into a method for discovering meaning, students acquired the ability to understand their artistic work as forms of communication which create cultural value. The design discipline functions as a making language according to Cross (2018) while Dorst (2019) describes its cognitive process through his theory of frame creation which sees design thinking as material-based value construction.

The creation of an "ethical pause" mechanism established an organized period which enabled people to think about their work processes while work time interruptions became essential for performing critical evaluations. Students developed awareness of authorship, representation, and cultural responsibility, echoing Pyun and Quan’s (2024) call for ethical labor pedagogy and Freedman’s (2025) vision of moral learning through visual culture education. The findings indicate that ethical design education should not reduce innovation speed but instead bring purpose back into fast-paced design work.

The VR system brought about a new educational environment which permitted students to experience thorough educational experiences through their entire body. The authors of Rau (2022) and Wen and Zalay (2023) explain that virtual environments create a connection between sensory experiences and cognitive processes which enable students to experience their concepts through physical space before they proceed to create final products. Gaskins (2021) warns against implementing technology without critical analysis because this practice leads to maintaining existing cultural biases which technology aims to eliminate.

The study adds to the existing research through its examination of creative translation and ethical acceleration and embodied learning in design education. The three-stage model shows that educational programs which connect artistic teaching with student evaluation and technological use and cultural understanding will develop designers who can work in commercial fields and function as cultural translators in the upcoming VR-era creative economy.

Several limitations of this study should be acknowledged. First, the research was conducted with a relatively small sample drawn from a single vocational institution, which may limit the generalization of the findings. Second, participants shared a similar disciplinary background in virtual reality technology, and the model’s applicability to other design fields requires further investigation. Third, the commercialization process was simulated within a virtual environment rather than tested against real market conditions, meaning that actual consumer behavior and industrial constraints may introduce additional variables not captured here.

Future research could address these limitations by applying the three-stage translation model across multiple institutions and cultural contexts, enabling comparative analysis of how ethical reflection and commercialization interact under different educational and industrial conditions. Longitudinal studies may further examine how students’ translational competencies and ethical awareness develop over time. Additionally, as AI-assisted design tools become increasingly integrated into creative workflows, future studies should investigate how automated translation systems affect reflective judgment and ethical decision-making within VR-supported design education.

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