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The Impact of Multisensory Stimuli on Affective Branding and Long-Term Brand Memory within the Digital Educational Experience

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ABSTRACT: *The digital transformation of higher education has shifted a significant portion of the university experience into virtual environments, where interaction between students and the institution occurs primarily through interfaces, digital content, audiovisual resources, and technology-mediated support channels. In this context of intense competition and growing homogenization of online academic offerings, building a meaningful and lasting relationship with the educational brand constitutes a fundamental strategic challenge. While consumer neuroscience and sensory marketing have extensively documented the influence of sensory stimuli on brand perception, emotion, and recall, their systematic application to e-learning requires conceptual frameworks and empirical evidence explaining how a learning experience transcends functional engagement to consolidate affective and memorable associations with institutional identity. This study aims to analyze the influence of multisensory stimuli and experiential dimensions present in e-learning experiences on the construction of affective branding and long-term brand memory among students at Universidad Virtual CNCI. Methodologically, a conceptual and systemic design is adopted, complemented by an observational empirical analysis and triangulation of four institutional data sources: a survey on visual communication and follow-up (n = 390), a record of opinion, applicability, and open-ended comments on gamified simulators (n = 21,494 evaluations across 47 simulators), an onboarding satisfaction survey for the educational experience (n = 307), and an institutional academic risk report. Findings reveal that 90.3% of students value entry visual prompts as relevant and 92.1% request ongoing reminders in gamified environments; 16.1% spontaneously use emotional-experiential language, achieving a higher mean rating (9.31 vs. 9.15) and 99.2% perceived applicability, while 9.8% verbalize specific sensory stimuli (audio, video, image, or interface). Likewise, educational experience onboarding records a Net Promoter Score (NPS) of +89.6, outperforming the +77.7 of gamified simulators, highlighting the human warmth of advisors and tutors (4.27/5) compared to the automated virtual assistant (3.98/5). At the behavioral level, standardized courses with gamified experiences show an average failure rate of 10.8% compared to the institutional rate of 12.0%, with a moderate negative correlation observed between experiential satisfaction and failure (r = -0.16). Based on this evidence, the Multisensory Educational Brand Experience Model (EMME, by its Spanish acronym) is formulated, articulated across four dimensions: Sensitize, Connect, Engage, and Endure, demonstrating that ethical and humanized multisensory design simultaneously strengthens learning and long-term institutional memory.*

KEY WORD*: consumer neuroscience, educational neuromarketing, multisensory stimuli, affective branding, long-term brand memory, e-learning, educational brand experience.*

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I. INTRODUCTION

The digital transformation of higher education has shifted a substantial proportion of university life into virtual ecosystems, where daily interaction between the student and the educational institution takes place primarily through learning management systems (LMS), graphical interfaces, multimedia content, interactive simulators, and technology-mediated communication channels. In this landscape—marked by intense inter-institutional competition and the growing functional standardization of online academic offerings—sustainable differentiation depends increasingly less on purely informational or promotional attributes and more on the affective and memorable quality of the experience lived by the student.

Contemporary literature on university brand management underscores that student experience, perceived value, and the student journey constitute intrinsic components of institutional brand equity, moving beyond the traditional view that restricted educational marketing to the stages of enrollment attraction,

prospecting, and conversion (Chen, 2022). Concurrently, research on student engagement in virtual modalities shows that academic involvement articulates behavioral, cognitive, and affective dimensions, wherein continuous support, operational clarity, and socio-emotional scaffolding operate as critical determinants of educational quality (Salas-Pilco et al., 2022; Vermeulen & Volman, 2024).

From the standpoint of consumer neuroscience and sensory marketing, it has been demonstrated that brands are consolidated in human memory not solely through rational arguments, but through the emotional charge and coherence of the sensory stimuli with which the individual repeatedly interacts: what they see, hear, manipulate on the interface, and experience affectively (Krishna, 2012; Brakus et al., 2009). However, a conceptual and empirical gap remains regarding how multisensory stimuli deliberately incorporated into e-learning environments transcend momentary involvement (situational engagement) to generate lasting affective associations and strengthen long-term institutional brand memory.

The issue takes on greater analytical complexity when recognizing that not every component of a virtual environment is strictly sensory. Indiscriminately equating primary perceptual stimuli with pedagogical or relational constructs would lead to theoretical inaccuracies and deterministic interpretations characteristic of oversimplified views of neuromarketing. Consequently, it is essential to analytically delimit sensory dimensions (visual and auditory stimuli), cognitive-experiential dimensions (interaction, narrative, and gamification), and affective-symbolic dimensions (visual identity, communicative tone, human or digital presence, and institutional symbols).

Based on this premise, the general objective of this research is to analyze the influence of multisensory stimuli and experiential dimensions present in e-learning experiences on the construction of affective branding and long-term brand memory among students at Universidad Virtual CNCI, from the perspective of consumer neuroscience and digital educational experience design. The central research question guiding the study is: how do multisensory stimuli and experiential dimensions present in e-learning influence affective branding and brand memory among students at Universidad Virtual CNCI?

II. THEORETICAL FRAMEWORK

2.1. Consumer Neuroscience, Perception, and Multisensory Encoding

Consumer neuroscience provides an interdisciplinary framework for understanding how external stimuli are captured by sensory systems, filtered by selective attention mechanisms, emotionally processed, and encoded into memory structures (Plassmann et al., 2012). In information-saturated digital environments, a stimulus stands out when it possesses perceptual salience and contextual relevance, activating attentional networks that facilitate its transfer from working memory to long-term memory stores.

According to dual-coding theory and multimedia learning models, the harmonious integration of visual and auditory information reduces extraneous cognitive load and multiplies mnemonic retrieval pathways (Mayer, 2021). Within the realm of sensory marketing, Krishna (2012) argues that multisensory congruence—the aesthetic, sonic, and narrative coherence across different perceptual channels—intensifies affective response and improves spontaneous brand recognition. Nevertheless, from an ethical and scientifically rigorous stance, any neuroscientific determinism must be avoided: mere exposure to a visual or auditory stimulus does not, by itself, guarantee a positive emotional response or an automatic improvement in retention, as meaning depends on pedagogical relevance, the technical quality of the stimulus, and the socio-affective context of the learner.

2.2. Affective Branding and Experiential Architecture in Higher Education

Affective branding is defined as the systematic construction of positive, warm, and meaningful emotional bonds between an individual and a brand, transcending a purely utilitarian or transactional evaluation of the service (Thomson et al., 2005; Brakus et al., 2009). In virtual higher education, where the absence of a physical campus reduces traditional tangible cues, the institutional brand materializes at every digital touchpoint: the graphic design of announcements, platform ergonomics, expressiveness of audiovisual resources, and empathy of educational agents.

As Chen (2022) points out, the student experience throughout the educational journey forms the core of value perception and loyalty toward the university brand. When Smart Learning Environments articulate technological adaptability with human sensitivity (García-Tudela et al., 2021), the educational experience operates simultaneously as a space for cognitive construction and as an arena for affective bonding with institutional identity.

2.3. Long-Term Brand Memory: Immediate, Delayed, and Associative Dimensions

In cognitive psychology and customer-based brand equity theory (Keller, 1993), brand memory encompasses both brand awareness (recognition and recall) and the strength, favorability, and uniqueness of

associations stored in the individual's semantic and emotional network. For the analysis of digital educational experiences, this research distinguishes three complementary manifestations of brand memory:

- Immediate memory: Refers to the ability to identify, evoke, and evaluate the sensory and symbolic elements of the experience immediately after interacting with the educational resource.
- Delayed memory: Corresponds to the persistence of recall, positive evaluation, and behavioral intention (such as spontaneous recommendation or Net Promoter Score) after a time interval following initial contact—a phenomenon strongly conditioned by the primacy effect in early institutional encounters and by the spaced reinforcement of visual stimuli.
- Associative memory and behavioral footprint: Represents the network of spontaneous links between the educational brand, specific emotions (enthusiasm, trust, support), functional attributes (practical applicability), and sustained academic performance over time.

2.4. Sensory, Cognitive-Experiential, and Affective-Symbolic Dimensions of E-Learning

To preserve conceptual rigor and avoid conflating physical stimuli with higher-order psychological processes, this theoretical framework classifies the components of the digital educational experience into three broad analytical dimensions, summarized in Table 1.

Table 1. Conceptual delimitation of the dimensions of the multisensory digital educational experience. Source: Authors' own elaboration.

Analytical Dimension	Operational Components in E-Learning	Neurocognitive and Affective Mechanism
1. Sensory Dimension	Visual stimuli (infographics, graphic notices, color palette, typography, video, animation) and auditory stimuli (voiceover, ambient music, sound effects, audio-text synchronization).	Capture of selective attention, perceptual salience amid digital overload, visual-auditory dual coding, and prevention of cognitive noise caused by technical friction.
2. Cognitive-Experiential Dimension	Interface interactivity, immersive narrative, simulation of real-world scenarios, gamification mechanics, immediate feedback, and practical applicability.	Active processing, sense of presence and situational immersion, consolidation of experiential learning (Kolb, 2015), and emotional tagging of utility.
3. Affective-Symbolic Dimension	Institutional visual identity, approachable language, human presence (virtual advisor and tutor), conversational agents (bot/AI), and symbols of university belonging.	Affective primacy effect, construction of interpersonal trust, relational warmth, and symbolic bonding with the educational brand.

2.5. Proposed Conceptual Sequence: From Multisensory Perception to Retention

Based on the theoretical foundation outlined above, a seven-link conceptual sequence is postulated in which the digital educational experience functions simultaneously as a learning environment and as a brand-building architecture: (1) Multisensory stimuli and experiential dimensions, (2) Perception and selective attention, (3) Emotional response and affective activation, (4) Consolidation of affective branding, (5) Mnemonic encoding and strengthening, (6) Long-term brand memory (immediate, delayed, and associative), and (7) Retention intention, spontaneous recommendation, and sustained academic performance. Within this chain, the affective response operates as the key mediating mechanism that transforms a technical interaction into a lasting institutional imprint.

III. METHODOLOGY

3.1. Research Approach and Design

The study adopts a mixed-methods approach with a quantitative predominance, articulated under a systemic-conceptual and empirical-observational design that integrates descriptive statistical analysis, correlational-explanatory analysis, and spontaneous language mining across large-scale institutional records. This design allows for evaluating the relationship between the sensory, cognitive-experiential, and affective-symbolic dimensions of the digital experience at Universidad Virtual CNCI and their manifestations in affective

branding and brand memory. Furthermore, it establishes the methodological architecture for a second quasi-experimental phase aimed at contrasting conventional educational experiences against experiences redesigned under comprehensive multisensory principles.

3.2. Population, Sample, and Sources of Institutional Evidence

The target population consists of active students across various academic programs (high school, undergraduate, and graduate levels) and different stages of curricular progression at Universidad Virtual CNCI. To empirically ground the analysis, four independent institutional databases covering different moments and layers of the student journey were triangulated (Table 2).

Table 2. Sources of institutional empirical evidence and operationalization of variables. Source: Authors' own elaboration based on institutional records (September 2026).

Institutional Data Source	Sample Size (n)	Constructs and Variables Measured	EMME Model Layer Evaluated
Visual Communication and Follow-Up Survey (gamified simulation)	n = 390 students	Perceived importance of notices/images, instructional clarity, and desire to receive visual reminders.	Entry visual stimulus, selective attention, and spaced memory reinforcement.
Opinion, Applicability, and Open-Ended Comments Record (gamified simulation)	n = 21,494 evaluations (47 simulators)	Affective rating (0–10 scale), perceived practical applicability (%), NPS, and lexical analysis of open-ended comments.	Core multisensory event, spontaneous sensory mentions, emotional charge, and technical friction.
Educational Experience Onboarding Satisfaction Survey	n = 307 incoming students	Satisfaction by channel (1–5 Likert scale: advisor, virtual tutor, platform, AI, bot, overall experience), perceived preparedness, and NPS.	First institutional contact (primacy effect), human warmth vs. automation, and initial brand imprint.
Institutional Report on Courses at Academic Risk	132,465 records across 303 courses	Final academic status (pass, fail, dropout) and cross-referencing by standardized code across 28 gamified courses ($n \geq 20$ evals).	Behavioral proxy for long-term memory, academic persistence, and association between affect and performance.

3.3. Analytical Procedure and Scope Delimitation

Data processing was conducted through three complementary procedures: (a) descriptive frequency analysis, means, and Net Promoter Score calculation (NPS = % Promoters [9–10] − % Detractors [0–6]); (b) lexical content analysis across the 21,494 open-ended gamified simulation evaluations to quantify the spontaneous frequency of emotional-experiential vocabulary (terms such as interactive, dynamic, fun, exciting, immersive, realistic) and specific sensory references (video, animation, image, audio, voice, music, interface, lag); and (c) bivariate correlational cross-referencing between mean gamified satisfaction ratings and official failure rates across 28 standardized courses meeting a minimum threshold of 20 evaluations. In alignment with the study's ethical considerations, associations between academic and experiential variables are interpreted as convergent observational evidence rather than direct experimental causality.

IV. RESULTS

4.1. The Visual Stimulus as a Trigger for Attention and Initial Encoding

Analysis of the Gamified Simulation Visual Communication Survey (n = 390) demonstrates that brand memory construction begins before the student enters the simulation environment, via graphic invitation and follow-up notices. Exactly 90.3% of respondents consider images and visual notices important for their academic management (compared to 7.9% who answered 'somewhat' and 1.8% who answered 'no').

Additionally, 85.6% state that these graphic resources helped them clearly understand what actions they needed to take, evidencing an effective transfer from visual attention to operational working memory.

Notably, 92.1% of students express a desire to continue receiving periodic visual reminders. From the perspective of memory neuroscience, this finding indicates that the repetition of a well-structured visual stimulus is not perceived as saturation or promotional clutter, but rather as a valuable cognitive anchor that facilitates the transition of institutional information into long-term memory through spaced reinforcement.

4.2. The Multisensory Event in Gamified Simulation: Affective Response, Spontaneous Language, and Technical Friction

In the Gamified Simulation Opinion and Applicability Record (n = 21,494 evaluations distributed across 47 simulators), the multisensory experience achieves a mean affective rating of 9.18 out of 10, a perceived professional applicability index of 98.8%, and an overall NPS of +77.7. Analysis of spontaneous discourse in open-ended comments reveals how students sensorially and emotionally process the platform:

- Salience of audiovisual and immersive channels: Exactly 9.8% of all evaluations spontaneously mention—without a prompted item—some sensory or digital design attribute. Disaggregated by perceptual channel, references to video and animation predominate (3.2%), followed by visual components, images, and graphics (2.9%), audio, voice, and music (2.7%), interface and screen design (1.6%), and situational immersion or realism (0.8%). Although explicit mentions of immersion are small in volume, they exhibit high affective density associated with the phenomenon of psychological presence:

> *"The game is dynamic, taking real forms and situations where they make you feel like you are the character and are actually in that situation; I liked the story and its characters." (Gamified Simulation Record, 2026).*

- Rating intensification through emotional charge: A total of 16.1% of all comments spontaneously incorporate adjectives of emotional and experiential valence. When contrasting this subgroup against the remaining participants (83.9%), a systematically higher mean rating is observed (9.31 vs. 9.15), and perceived applicability rises to 99.2% (compared to 98.8% overall). This confirms that positive emotional activation does not compete with perceived cognitive utility,but rather acts as an amplifier of its valuation.
- Sensory friction as encoding noise: Within the subset of comments explicitly referring to the auditory channel (434 mentions, equivalent to 2.0% of the total), 14.5% report concrete technical friction, primarily desynchronization between audio and on-screen text or loading delays ('lag'). Although these incidents do not cause the subgroup's overall mean to plummet (9.27/10), they constitute points of interference in sensory encoding that can erode the fluency of the emotional imprint:

> *"It has too much lag, it is very hard to understand the audio and the slides have a lot of lag." / "It is very accessible, I like that when you open it, it's right where you left off [...] I just don't know if it's only on my device, the audio is somewhat out of sync with the text." (Gamified Simulation Record, 2026).*

4.3. Educational Experience Onboarding and the Primacy Effect: Human Warmth vs. Automation

Results from the Educational Experience Onboarding Satisfaction Survey (n = 307) provide crucial evidence regarding the moment of first institutional contact, a stage in which the primacy effect operates in brand impression formation. The course achieves an NPS of +89.6 (comprising 90.6% promoters, 8.5% passives, and just 1.0% detractors), surpassing the NPS of gamified simulators (+77.7) by 11.9 percentage points, while 98.7% of students report feeling prepared to begin their regular coursework.

When disaggregating scores by interaction channel (1-to-5 Likert scale), a clear hierarchy emerges between human stimuli and purely technological stimuli: human-mediated channels—Advisor (4.27) and Virtual Tutor (4.27)—obtain the highest ratings, followed by Overall Experience (4.23) and Content and Platform (4.20). In contrast, the AI and Personalization dimension scores 4.09, and the automated Virtual Assistant (Bot) registers the lowest score in the ecosystem (3.98). These data demonstrate that, in building educational affective branding, empathy and timely human responsiveness constitute the most potent emotional

stimulus, whereas automated agents require warmer conversational design to avoid generating a neutral or distant affective imprint.

4.4. Behavioral Footprint of Brand Memory: Multisensory Satisfaction and Academic Risk

Cross-referencing the Gamified Simulation Record with the Institutional Report on Courses at Risk (132,465 academic records across 303 courses) makes it possible to explore whether the affective imprint generated by multisensory experiences translates into behavioral indicators of persistence and academic success. Across the overall institutional dataset, the average failure rate stands at 12.0%, whereas in the subset of 28 standardized courses integrating gamified simulators (with $n \geq 20$ evaluations), the average failure rate drops to 10.8%.

Furthermore, bivariate analysis at the course level reveals a moderate negative correlation ($r = -0.16$) between the mean affective rating given to the simulator and the course failure percentage: the greater the intensity of positive response toward the multisensory experience, the lower the incidence of academic failure. Nevertheless, granular analysis identifies highly informative outliers, such as the introductory course Administration I (Module 1), which combines a high simulator rating (8.85/10) with a 32.8% failure rate. This contrast demonstrates that while multisensory stimuli strengthen affective bonding and disposition toward learning, they do not by themselves replace the structural academic scaffolding required by incoming students facing conceptually demanding courses.

Table 3. Synthesis of empirical findings on multisensoriality, affective branding, and brand memory at Universidad Virtual CNCI. Source: Authors' own elaboration.

Dimension / Indicator Evaluated	Observed Empirical Metric	Interpretation from Affective Branding and Brand Memory
Salience of entry visual stimulus	90.3% importance; 85.6% clarity; 92.1% want reminders (n = 390)	The graphic notice acts as an initial unit of affective branding and facilitates mnemonic consolidation via spaced reinforcement.
Spontaneous sensory verbalization	9.8% total mentions (video 3.2%, visual 2.9%, audio 2.7%, interface 1.6%, immersion 0.8%)	Audiovisual channels dominate the narrative awareness of the experience and trigger states of immersive presence.
Amplifying effect of emotion	16.1% emotional language; mean 9.31 vs. 9.15; applicability 99.2% vs. 98.8%	Positive affective activation simultaneously increases overall valuation and perceived practical utility.
Sensory technical friction	14.5% of complaints within audio mentions (audio-text desync and lag)	Synchronization failures introduce cognitive noise that weakens the fluency of emotional encoding.
Affective primacy and human factor	Onboarding NPS +89.6 vs. Gamified Simulation +77.7; Advisor/Tutor 4.27/5 vs. Bot 3.98/5	First contact infused with human warmth imprints the deepest emotional trace in institutional memory.
Behavioral footprint on performance	Failure rate 10.8% (gamified) vs. 12.0% (overall); correlation r = -0.16	The multisensory experience accompanies greater academic persistence, though scaffolding is required in Module 1.

V. DISCUSSION AND PROPOSAL OF THE EMME MODEL

5.1. Three Empirical Theses on Affective Branding in E-Learning

Triangulating the theoretical and empirical findings allows for the formulation of three central theses that redefine the understanding of the digital educational experience:

First Thesis.- The digital educational experience operates, de facto, as a multisensory branding system: The fact that nearly one-tenth of students spontaneously mention audiovisual or interface attributes and 16.1%

use emotional vocabulary without being prompted demonstrates that the educational platform is never perceived as a neutral container. Every graphic design decision, narrative pacing choice, and sound synchronization configures a brand signal that shapes institutional perception.

Second Thesis.- Human warmth constitutes the highest-ranking affective stimulus over automation: During the stage of greatest emotional plasticity and impression formation (educational experience onboarding, with an NPS of +89.6), human channels consistently outperform automated interfaces. In alignment with the tenets of educational humanization (Salas-Pilco et al., 2022; Silvola et al., 2021), university affective branding cannot be delegated entirely to algorithms or conversational bots; technology must amplify human presence, not replace it.

Third Thesis.- The emotional imprint leaves a measurable behavioral trace on academic performance: The lower failure rate in courses featuring gamified experiences (10.8% vs. 12.0%) and the inverse correlation between experiential satisfaction and academic failure (r = -0.16) suggest that brand memory in higher education transcends declarative recommendation intent. Within the university ecosystem, the behavioral equivalent of consumer loyalty is expressed through educational persistence and successful completion of the curricular pathway.

5.2. Architecture of the Multisensory Educational Brand Experience Model (EMME)

As the primary conceptual and applied contribution of this research, the Multisensory Educational Brand Experience Model (EMME) is proposed to guide the strategic design of e-learning environments at Universidad Virtual CNCI and serve as a transferable framework for other online higher education institutions. The model structures the learning experience into four dynamic, interdependent phases (Table 4).

Table 4. Operational structure of the Multisensory Educational Brand Experience Model (EMME). Source: Authors' own elaboration.

EMME Model Dimension	Strategic Brand Purpose	Key Stimuli and Resources	Empirical Validation Indicators
1. SENSITIZE (Perceptual Activation)	Capture selective attention, generate institutional salience, and cognitively prepare the student before and during contact.	Structured visual notices, coherent color identity, instructional infographics, graphic quality, and flawless audiovisual synchronization.	Perceived visual relevance (90.3%), operational clarity (85.6%), and absence of technical friction (audio/lag).
2. CONNECT (Affective Bonding)	Trigger emotional resonance, interpersonal warmth, and a sense of belonging from the very first institutional contact.	Empathetic support from advisors and virtual tutors, contextualized narrative, humanized conversational tone in bots/AI, and identity symbols.	Satisfaction in human channels (4.27/5), presence of spontaneous emotional language (16.1%), and educational onboarding NPS (+89.6).
3. ENGAGE (Active Immersion)	Promote deep cognitive processing, learner agency, and a sense of situational presence.	Gamified simulators, decision-making in real-world scenarios, immediate formative feedback, and applicable challenges.	Experiential rating (9.18/10), perceived professional applicability (98.8%), and mentions of immersion.
4. ENDURE (Mnemonic Consolidation)	Transform situational emotion into long-term brand memory, voluntary recommendation, and academic persistence.	Spaced visual reminders, mentoring continuity in critical modules (Module 1), and coherent curricular articulation.	Desire for communicative continuity (92.1%), sustained NPS (+77.7), reduced failure rate (10.8% vs. 12.0%), and delayed recall.

5.3. Practical Implications for Instructional Design and Institutional Management

Implementing the EMME model entails five priority lines of action for academic and technological management: (1) auditing and eliminating audiovisual synchronization friction and loading delays identified in

14.5% of auditory mentions, ensuring rigorous standards of sensory ergonomics; (2) professionalizing the graphic design of follow-up notices as strategic assets of institutional identity; (3) redesigning the conversational training of virtual assistants (bots) to imbue them with greater empathy and seamless handoffs to human tutors; (4) targeting high-touch human and multisensory hybrid interventions toward critical first-term courses (such as Administration I in Module 1); and (5) incorporating automated analysis of spontaneous emotional language alongside traditional satisfaction and performance metrics.

5.4. Limitations and Future Research Directions

Three main methodological delimitations are acknowledged: first, the observational and cross-sectional nature of the institutional records precludes establishing strict counterfactual causality between multisensory exposure and academic performance; second, the study did not employ direct neurophysiological recordings (such as electroencephalography or eye-tracking), so consumer neuroscience operates as an interdisciplinary interpretive framework; and third, affective metrics derive from self-reports and spontaneous verbal expressions. Consequently, the future research agenda contemplates executing the second quasi-experimental phase of the project using control and experimental groups with longitudinal measurements of immediate, delayed (at 30 and 90 days), and associative brand memory.

VI. CONCLUSIONS

This research demonstrates that, in virtual higher education, building a strong and memorable institutional brand does not rely on isolated promotional campaigns, but rather on the deliberate, ethical, and humanized orchestration of the multisensory and experiential stimuli that shape the student's learning journey. By integrating contributions from consumer neuroscience, sensory marketing, and techno-pedagogical design, it is confirmed that university students act as holistic subjects who perceive, feel, interpret, and consolidate affective associations with their institution through every interface, audiovisual resource, and human interaction.

The empirical evidence gathered at Universidad Virtual CNCI supports the relevance of this perspective: entry visual stimuli effectively capture attention and sustain recall through spaced reinforcement; multisensory gamified experiences trigger positive emotional responses that elevate both overall valuation and perceived practical utility; human support during educational experience onboarding imprints the deepest affective trace of the student lifecycle; and the integration of immersive experiences is descriptively associated with lower academic failure rates.

Finally, the Multisensory Educational Brand Experience Model (EMME), structured across the dimensions Sensitize, Connect, Engage, and Endure, offers a replicable conceptual and operational roadmap for transforming digital learning environments into true ecosystems of affective bonding and long-term institutional memory, where technological innovation enhances, without ever replacing, the warmth and human essence of education.

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APPENDIX 1. MATRIX OF INSTITUTIONAL EMPIRICAL EVIDENCE USED IN THE STUDY

This matrix synthesizes the quantitative and lexical indicators extracted from the Integrated Report on Multisensory Stimuli, Affective Branding, and Brand Memory in the Digital Educational Experience (September 2026), used as empirical support for grounding the EMME Model.

Table A1. Matrix of institutional empirical evidence. Source: Authors' own elaboration.

Institutional Indicator	Observed Result	Analytical Interpretation in the Study
Importance of entry notices and images	90.3% (n = 390)	High perceptual salience of the preliminary visual stimulus amid digital overload.
Instructional clarity through images	85.6% (n = 390)	Effective encoding from visual attention into operational working memory.
Desire to continue receiving reminders	92.1% (n = 390)	Validation of spaced reinforcement to consolidate long-term memory without fatigue.
Mean affective rating in Gamified Simulation	9.18 / 10 (n = 21,494)	Highly favorable evaluation of the gamified multisensory experience.
Perceived professional applicability (gamified simulation)	98.8% overall (99.2% with emotion)	High practical transfer; emotional charge amplifies perceived utility.
Spontaneous mentions of sensory stimuli	9.8% (audio/video/image/interface)	Evidence of conscious processing of audiovisual and interface design.
Comments with spontaneous emotional language	16.1% (mean 9.31 vs. 9.15)	Verbalized affective intensity is associated with higher evaluation scores.
Technical friction in auditory mentions	14.5% (across 434 audio mentions)	Audio-text desynchronization and lag act as cognitive noise on the emotional imprint.
Net Promoter Score (NPS) in gamified simulation	+77.7	Strong disposition toward spontaneous recommendation following the immersive experience.
Net Promoter Score (NPS) in Educational Experience Onboarding	+89.6 (90.6% promoters)	Primacy effect: first contact imprints the most lasting brand trace.
Satisfaction by channel in Educational Experience Onboarding (1–5)	Advisor/Tutor 4.27 vs. Bot 3.98	Supremacy of human warmth over conversational automation.
Institutional failure rate vs. gamified simulation	12.0% overall vs. 10.8% gamified	Observational association between multisensory experience and academic persistence.
Correlation between satisfaction vs. failure rate	r = -0.16 (28 courses)	Moderate inverse relationship; associative evidence, not counterfactual causality.