

EDUCATIONAL EXPERIENCE IN CONTEMPORARY MUSEUM DISPLAY DESIGN: A CONCEPTUAL FRAMEWORK BASED ON THE FOUR-QUADRANT THEORY

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ABSTRACT

Following the ICOM 2022 definition establishing Varied Experiences for Education as museums' core mission, the concept of educational experience remains ambiguous - particularly the boundary between education and entertainment. This paper constructs a conceptual framework to define educational experience in museum display design. Drawing on Pine and Gilmore's Four-Quadrant Theory, Dale's Cone of Experience Theory, and synthesizing insights from museology, pedagogy, and cognitive psychology, the study distinguishes educational experience from entertainment, aesthetic, and escapist experiences. Through theoretical deduction, the paper proposes that an ideal museum educational experience is characterized by active participation and cognitive absorption. A comprehensive definitional framework is presented, covering definitional boundaries, core characteristics, the immersion-to-absorption transformation process, and design principles. This framework provides a theoretical foundation for evaluating and designing educational displays, particularly for small and medium-sized museums.

Keywords: Educational Experience, Museum Display Design, Four-Quadrant Theory, Cone of Experience

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INTRODUCTION

As global museums transition from material collections to human-centered educational experiences, the International Council of Museums (ICOM) formally established delivering "varied experiences for education" as the core mission of museums in 2022 (Robinson, 2021). Displays serve as the primary means for museums to fulfill their public education mission (Trofanenko, 2010), and technological advancements have expanded the possibilities for interactive display projects (Kamariotou et al., 2021). However, many museums, especially small- and medium-sized institutions, prioritize technical novelty and entertainment appeal over educational substance in digital display design due to insufficient resources and a lack of specialized personnel (Qi, 2024). The museum faces a fundamental question: What exactly does EDUCATIONAL EXPERIENCE mean in a museum context, and how does it differ from entertainment experience?

The central problem is that the conceptual essence of educational experience has not been clearly defined. Without a rigorous definition, designers lack theoretical guidance, evaluation becomes impossible, and museums risk deviating from their core educational mission. A phenomenon some scholars have criticized as the Disneylandization of museums (Cuno, 2009). The lack of interdisciplinary integration has resulted in a disconnect between display design and educational objectives (Han, 2026).

This paper aims to answer the following research question: How can the educational experience of contemporary museum display design be conceptually defined and framed?

Specifically, this study seeks to synthesize theoretical frameworks from museology, pedagogy, and experience economics. Apply the Four-Quadrant Theory to differentiate educational experience from other experience types, propose a comprehensive conceptual framework with clear characteristics and design principles, provide a theoretical foundation for subsequent empirical research.

Theoretically, this study pioneers an interdisciplinary conceptual framework by synthesizing museology, cognitive psychology, and educational theories. Practically, it provides museums with a clear conceptual tool to guide display design decisions and maintain educational focus amid technological proliferation. Socially, it empowers museums to uphold their educational mission during digital transformation, enhancing public cultural service quality.

Research Objectives

To define the conceptual essence of educational experience in contemporary museum display design: Through interdisciplinary synthesis of museology, pedagogy, and experience economics, this study aims to establish a rigorous, operational definition that distinguishes educational experience from entertainment, aesthetic, and escapist experiences.

To differentiate educational experience from other experience types: By applying Pine and Gilmore's Four-Quadrant Theory, this study aims to systematically distinguish educational experience from entertainment, aesthetic, and escapist experiences along the dimensions of participation (passive–active) and connection (absorption–immersion).

To establish an integrated operational framework for museum display design: This objective involves fusing the Four-Quadrant Theory with Dale's Cone of Experience to create a practical design tool, including a four-phase transformation model (Capture → Engage → Teach → Reinforce) that guides visitors through a progressive learning journey.

To derive actionable design principles and a priority framework for practice: Based on the integrated operational framework, this study aims to extract five core design principles and develop a cost-effective priority framework for museums with limited resources.

LITERATURE REVIEWS

Cross-Cultural Integration and Democratic Ideals Have Driven the Evolution of Museum Education

Museum education has evolved from serving the few to serving the many. The Alexandrian Museum (4th century BC) functioned as an academic center serving imperial rule (Di Pasquale, 2005). Renaissance cabinets of curiosities (14th-17th centuries) reflected elite curiosity and thirst for knowledge (Vlasity, 2016). The Enlightenment (18th century) marked the emergence of public museums the British Museum (1759) and Louvre (1793) embodying ideals of democratizing knowledge (Bennett, 1995). The 19th-20th centuries saw thematic museums emerging, expanding display forms and emphasizing audience experience, with the Smithsonian Institution (1846) establishing museums as public service institutions. The 2022 ICOM definition introduced "experience" as a new keyword, with educational experience ranked first among museum functions (ICOM, 2022). This historical trajectory reveals a consistent pattern: museums have progressively expanded access and diversified their educational roles, culminating in today's experience-centered paradigm.

On August 24, 2022, ICOM adopted a new museum definition, marking a significant shift in which Experience appears as a core keyword for the first time. The conceptual framework of the new definition is drawn as shown in Figure 1. Education is listed first among the purposes of experience, explicitly distinguished from enjoyment (entertainment) and reflection (aesthetic contemplation). This shift reflects a global consensus on diverse museum experiences, yet raises a crucial question: How do we distinguish educational experience from other types of experience?

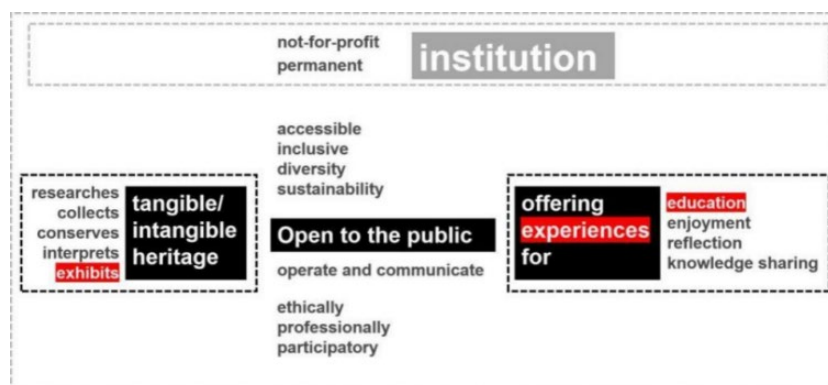


Figure 1 Conceptual Framework of the new definition of museum

The Shift from Collection-Centered to Visitor-Centered Museology and Its Design Imperative

Traditional museology (pre-1970s) focused on collections, research, and preservation as core functions, with education and display subordinate to collections. The new museology emerging in the 1970s shifted focus to social responsibility and public service (Vergo, 1989), with the 1984 Declaration of Quebec symbolizing its birth, emphasizing that museums should serve community development, ecology, and adult education. By the 1990s, scholars called for museums to transform from elite to inclusive institutions (Ross, 2004), though new museology has been criticized for excessive focus on politics at the expense of ontological questions what museums are and what they do (Thomas, 2016). Contemporary museology recognizes that the essence of museum experience is about visitor-based knowledge construction (Teather, 1998), centered on the visitor's construction of meaning rather than curator-centered information delivery. Parallel to this shift, research on museum audience behavior revealed that visitors often suffer from Museum Fatigue and engage in Active Dozing purposeless (Gilman, 1916). This finding has crucial implications: most museum audiences do not automatically gain

educational value from their visits; educational value must be designed into the experience. Furthermore, Treinen (1993) found striking similarities between museum audiences and mass media viewers in terms of passive consumption behavior, museums must compete with theme parks and mass media for audience attention (MacDonald, 1996), if museums cannot provide meaningful educational experiences, audiences will treat them as mere entertainment venues. Digital technology has intensified the tension between education and entertainment (Cuno, 2009). yet entertainment without educational substance violates the museum's core mission. Is the museum an ivory tower for research or a Disneyland for entertainment? (Cuno, 2004). The challenge lies in integrating both without sacrificing educational integrity, a challenge this paper tries to address through the Four-Quadrant Theory. The most directly applicable theoretical framework for defining educational experience comes from Pine and Gilmore's (2011) Four Realms of an Experience (during widespread application, gradually became known as the Four-Quadrant Theory), introduced in The Experience Economy.

Three Pedagogical Pillars for Museum Educational Experience

Three foundational educational theories support the conceptualization of museum educational experience.

Dewey's experience-centered education holds that the best education is experiential, advocating Learning by Doing over textbook-centered instruction. Dewey argued that experience-centered implementation of the principle of learning by doing makes the school's influence on its members more vivid, more lasting, and contains more cultural significance. (Ansbacher, 1998)

Dale's Cone of Experience

The Cone of Experience is a visual model proposed by educator Edgar Dale in 1946 and revised in 1969. It is used to illustrate the varying degrees of abstraction in the ways people gain experience through different modes of learning.

The Learning Pyramid is a later model based on Cone of Experience and be revised and widely disseminated that builds upon earlier concepts (e.g., by the National Training Laboratories in the United States). It emphasizes the retention rates associated with different methods of learning. This model demonstrates that active participatory learning produces the strongest educational outcomes. While recent studies have questioned the precise percentages as not derived from specific research findings (Masters, 2013), the fundamental insight remains valid: passive reception yields lower retention than active engagement, and the most effective learning involves doing, discussing, and teaching.

The validity of the hierarchical framework within the Learning Pyramid has been repeatedly demonstrated in global teaching practices. This study does not adopt the percentage data of retention rates; only retains the hierarchical framework content as a reference.

This hierarchical structure from abstract verbal symbols at the top to direct purposeful experience at the base provides a powerful framework for understanding how different museum display tools contribute to educational experience.

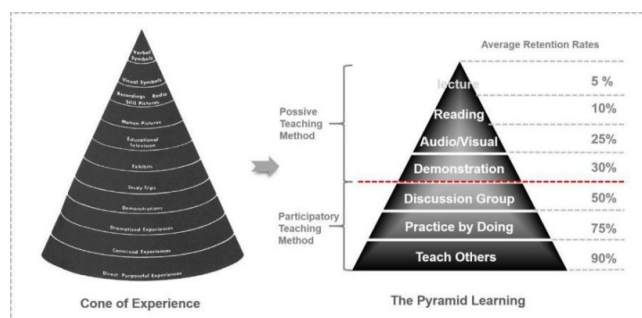


Figure 2 From the Cone of Experience to the most widely cited Learning Pyramid, the average retention rate of learning content. (The data are compiled according to different versions)

Constructionism (*Learning by Making/Design-Based Learning*) holds that learners build knowledge most effectively when creating meaningful works (Dougherty, 2012; Halverson & Sheridan, 2014). The Learning by Making theory argues that good education is not about how to make teachers teach better, but how to provide sufficient space and opportunities for learners to build their own knowledge system. Design-based learning emphasizes that when students try to design things, they learn the knowledge and skills they need in time, developing problem-solving skills and innovative thinking.

These theories collectively establish that active participation and concrete experience are essential to effective learning - principles directly applicable to museum display design.

The Digital Transformation Challenge for Small and Medium-Sized Museums

Since the turn of the 21st century, China's museum sector has experienced vigorous development. However, small and medium-sized museums, which constitute a significant proportion of the country's total museum count, are generally constrained by limited resources and face persistent difficulties in sustaining their developmental momentum (Wang, 2025). The proliferation and application of digital technology in museum displays have become an inevitable trend in the industry and represents a critical pathway for these museums to enhance the effectiveness of knowledge dissemination (Song et al., 2011). Nevertheless, due to financial constraints, shortages of professional personnel, insufficient operational experience, and the inherent limitations of online exhibitions, the virtual exhibitions of small and medium-sized museums in China commonly suffer from thin content, a lack of core functions, and suboptimal visitor experiences (Zhang & Yu, 2022), which have severely undermined the educational value of these online offerings.

RESEARCH METHODOLOGY

Research Approach

This study adopts a qualitative, theory-building research approach. As a conceptual paper, it does not employ primary data collection but systematically synthesizes existing theoretical and empirical literature to construct a new conceptual framework. This approach is appropriate for addressing the research question, which concerns conceptual definition and theoretical framing rather than empirical measurement.

Method of Analysis

The analysis follows a four-step procedure, each drawing on established academic methods:

Table 1 Four-step Procedure of Research Approach

Step	Actual Operation	Academic Method	Description
Step 1	Systematic literature review across museology, pedagogy, and experience economics	Documentary Research Method	Systematic identification, evaluation, and synthesis of existing scholarship to establish the theoretical foundation
Step 2	Application of Pine and Gilmore's (2012) Four-Quadrant Theory as the primary analytical lens Differentiation of four experience types (educational, entertainment, aesthetic, escapist) and extraction of core characteristics	Theoretical Analysis Method	Adoption of a mature theoretical framework from experience economics as the core analytical tool Logical reasoning from general theory (Four-Quadrant Theory) to specific application (museum educational experience)
Step 3	Integration of insights from museology, pedagogy (Dewey, Dale, Constructionism), and experience economics into a unified definition and framework	Conceptual Synthesis Method	Interdisciplinary integration of concepts and theories to construct a new conceptual framework
Step 4	Derivation of design principles, priority framework, and evaluation indicators from the conceptual framework	Logical Reasoning Method	Logical extension from conceptual framework to practical design guidelines

Theoretical Framework

The study is anchored in Pine and Gilmore's (2012) the Four Realms of an Experience (latterly been widely known as Four-Quadrant Theory), introduced in The Experience Economy. This framework organizes experiences along two dimensions: participation (passive-active) and connection (absorption-immersion). It was selected because: (1) it directly addresses the distinction between educational and other experience types; (2) it has been widely applied in experience design across disciplines; and (3) it aligns with pedagogical theories emphasizing active learning. The study also incorporates Dale's Cone of Experience as a complementary framework to understand the hierarchy of learning methods from abstract to concrete, and how different museum display tools correspond to different levels of learning effectiveness.

Conceptual Framework Development

Conceptual Framework of Museum Educational Experience

Based on the systematic literature review (Step 1) and interdisciplinary theoretical synthesis (Step 3), this study defines Educational Experience in Contemporary Museum Display Design as:

“A learning process in which the audience actively participates, interacts, and explores within a museum display, acquiring knowledge, skills, and emotional understanding through multi-sensory engagement and cognitive absorption, transforming abstract concepts into concrete, perceptible learning activities that stimulate curiosity and motivation to learn.”

The Four-Quadrant Theory Theory and Educational Experience Differentiation

This framework provides a systematic way to distinguish different types of experiences based on two underlying dimensions like figure 3.

Based on the intersection of the participation dimension (passive-active) and the connection dimension (absorption-immersion), the four-quadrant framework delineates four ideal types of experience.

Educational experience occupies the quadrant of active participation and cognitive absorption, is oriented toward knowledge gain, skill development, and deep understanding, manifested in classes, training, workshops, and interactive exhibits.

Entertainment occupies the quadrant of passive participation and cognitive absorption, with pleasure, relaxation, and stimulation as its core purposes, as exemplified by movies, concerts, sports events, and comedy shows.

Esthetic experience, by contrast, occupies the quadrant of passive participation and emotional immersion, focusing on beauty appreciation, contemplation, and reflection, typically embodied in art galleries, scenic viewpoints, and cathedrals.

Escapist experience is situated in active participation and emotional immersion, aiming at reality avoidance and fantasy participation, commonly found in theme parks, VR games, immersive theater, and travel.

These four types of experience differ in the intensity of participation and the depth of connection, collectively constituting a referential framework for museum experience design.

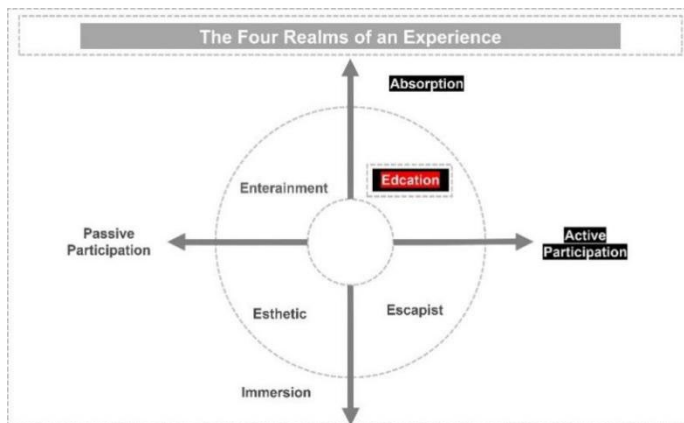


Figure 3 the Four Realms of an Experience

Table 2 The Two Dimensions of The Four-Quadrant Theory

Dimension	Continuum	Definition
Participation	Passive → Active	The degree of audience involvement in shaping the experience
Connection	Absorption → Immersion	The depth of psychological engagement with the experience

Active participation refers to the visitor directly influencing or shaping the experience through their actions, choices, or operations. Passive participation refers to the visitor receiving or experiencing without directly influencing the content or flow of the experience.

Absorption refers to focused attention and understanding of information, typically involving cognitive and sensory participation. During absorption, people focus on an activity but can still perceive the outside world. Examples include reading a book or watching a movie with focused attention.

Immersion refers to complete integration into an experience, as if merged with it. In immersion, individuals may temporarily forget the existence of the outside world, experiencing deep emotional and cognitive participation. Examples include virtual reality environments or being completely absorbed in a compelling game.

Museum experience is organized along two core dimensions: Participation, ranging from passive to active and measuring the audience's behavioral involvement in shaping the experience; and Connection, ranging from absorption to immersion and gauging the depth of psychological engagement. Together, they constitute a two-dimensional framework for classifying experience types.

Table 3 Educational vs. Entertainment

Criteria	Educational	Entertainment
Participation	Active	Passive
Connection	Absorption	Absorption
Primary goal	Knowledge/skill acquisition	Pleasure/relaxation
Outcome measure	Learning gain	Satisfaction/enjoyment
Cognitive demand	High (understanding, application)	Low to moderate (stimulation, amusement)
Duration of impact	Long-term (retention, transfer)	Short-term (immediate pleasure)

The two can coexist, but education must remain primary. Such as a museum game that teaches fire safety principles is educational; the same game with no learning content is merely entertainment.

Table 4 Educational vs. Esthetic

Criteria	Educational	Aesthetic
Participation	Active	Passive
Connection	Absorption	Immersion
Primary goal	Understanding	Appreciation
Audience role	Learner/investigator	Contemplator/appreciator
Typical action	Operating, selecting, problem-solving	Viewing, reflecting, feeling

Traditional art museum viewing may be primarily aesthetic. An interactive art interpretation that guides viewers to analyze compositional elements engages both aesthetic appreciation and educational understanding. Neither is superior but they are different.

Table 5 Educational vs. Escapist

Criteria	Educational	Escapist
Participation	Active	Active
Connection	Absorption	Immersion
Primary goal	Knowledge gain	Reality avoidance
Relation to real world	Applies to real problems	Escapes from real problems
Typical design	Problem-solving with real-world relevance	Fantasy, fictional worlds, thrill-seeking

Although educational and escapist experiences both fall under the category of active participation, they differ fundamentally in their modes of connection, ultimate purposes, and orientations toward reality. In terms of the connection dimension, educational experience is characterized by cognitive absorption, requiring learners to focus on processing and comprehending information; escapist experience, by contrast, is characterized by emotional immersion, seeking deep engagement with virtual or fantastical scenarios. In terms of ultimate purpose, educational experience is committed to knowledge acquisition, whereas escapist experience aims at withdrawal from reality. This distinction is further manifested in their

relationship with the real world: educational experience consistently addresses and applies to real-world problems, with its design revolving around problem-solving that bears practical relevance; escapist experience, on the other hand, detaches from real-world issues, with its design tending toward fantasy, fictional worlds, or thrill-seeking. In short, educational experience guides audiences back to reality and enhances their capacity to cope with it, while escapist experience offers audiences a temporary respite from reality though they are similar in the intensity of participation, they diverge sharply in cognitive processing modes and orientations toward reality.

Integrated Operational Framework for Museum Display Design

This study presents the integrated operational framework as figure 4 that fuses the Four Realms of an Experience (Four-Quadrant Theory) with Dale's Cone of Experience (Learning Pyramid) to create a practical design tool for museum educational experiences. The integration is justified by their complementary strengths: The Four-Quadrant Theory defines what type of experience is being created, while the Cone of Experience defines how effectively the learning content is being delivered.

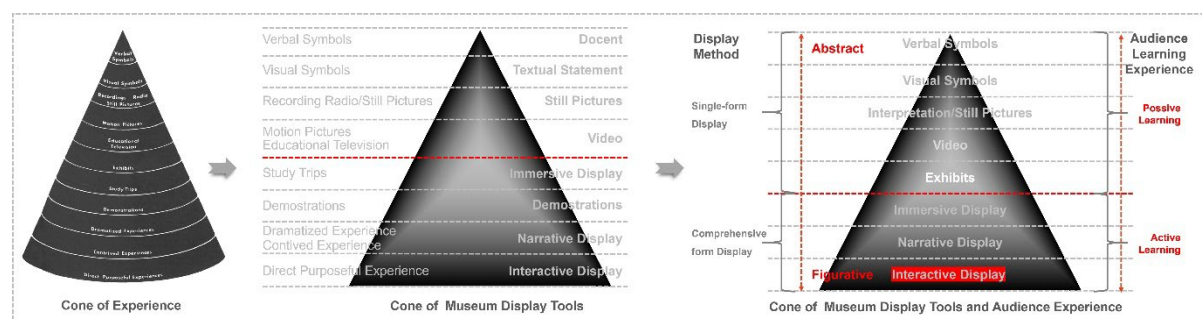


Figure 4 Cone of Museum Display Tools and Audience Experience based on Edgar Dale's Cone of Experience

This study integrates two core theories based on their inherent consistency across two fundamental dimensions. First, the central insight of Dell's The Cone of Experience Theory is that learning outcomes (measured by knowledge retention rates) positively correlate with the specificity and immediacy of learning approaches: cognitive engagement progressively deepens from abstract verbal symbols at the top to concrete experiential learning at the bottom. This Progressive Cognitive Continuum is fundamentally isomorphic to the Absorption-Immersion dimension in the Four Quadrants Theory, which describes learners' progression from surface-level information acquisition to deep meaning construction.

Second, Dell's Experience Cone inherently contains an axis spanning passive reception to active participation: the upper-level "verbal symbols" and "visual symbols" correspond to passive teaching methods (e.g., listening, reading), while the lower-level "direct experience" and "simulated participation" align with active teaching approaches (e.g., practice, discussion, sharing). This axis establishes a precise correspondence with the Passive-Active Participation dimension" in the Four-Quadrants Theory, as illustrated in Figure 5.

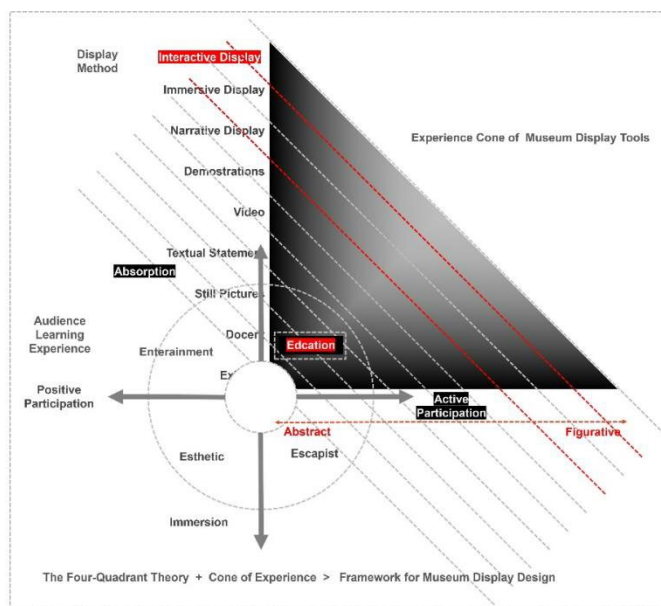


Figure 5 Framework for Museum Display Design

Based on this logic, when mapping the teaching methods within The Cone of Experience to museum exhibition tools, we adhere to the following principle: methods situated at the base of the cone those requiring active learner engagement and hands-on practice (e.g., practical activities, role-playing, peer teaching) clearly correspond to the Active + Absorption dimensions in the Four-Quadrant framework, as their core focus is guiding learners to engage in deep cognitive processing, which defines the essence of the ABSORPTION state. Conversely, methods primarily involving observation and listening (e.g., video viewing, audio lectures) located in the upper-middle section aligned with the Passive + Absorption quadrant. Although certain active experiences (such as peer teaching) may involve emotional or social interactions, their dominant psychological processes remain cognitive integration and knowledge externalization, thus fundamentally belonging to the ABSORPTION state. Consequently, the relationship between these two dimensions can be summarized in Table 6.

Table 6 The Integration Logic

Cone Level	Four-Quadrant Placement	Museum Display Tool
Verbal Symbols	Not placed (below threshold)	Textual statements
Visual Symbols	Not placed (below threshold)	Still pictures
Audio-Visual	Immersion-Absorption	Video, audio guides
Demonstration	Absorption (Active)	Demonstration, docent
Discussion	Absorption (Active)	Narrative display, discussion
Practice by Doing	Active + Absorption (Educational Quadrant)	Interactive display
Teaching Others	Active + Absorption (Educational Quadrant)	Teach-back, peer learning

This study have no plan to elaborate on the interplay between the two distinct psychological states of "Immersion" and Absorption within museum educational experiences or their impact on learning outcomes; these aspects will be thoroughly examined in subsequent research. This alignment demonstrates that the Educational Quadrant (Active + Absorption) directly corresponds to the highest retention levels of the Cone of Experience. This is not coincidental both frameworks emphasize active engagement as the key to effective learning.

Based on the integration of Four-Quadrant Theory and Cone of Experience, this paper proposes a four-phase design model that guides visitors through a progressive learning journey as Figure 5:

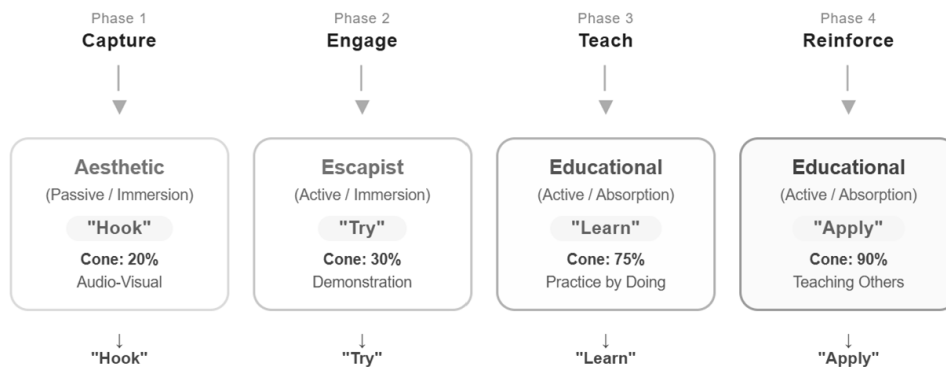


Figure 5 illustrates Four-Phase Transformation Model

This transformation pathway is critical: visitors rarely enter a museum in a state of cognitive absorption. They must first be captured emotionally (Phase 1: Aesthetic), then engaged through active exploration (Phase 2: Escapist), then guided to learn through focused, active participation (Phase 3: Educational), and finally reinforced through application or teaching (Phase 4: Educational deepened). Each phase corresponds to progressively higher levels on the Cone of Experience, maximizing retention and educational impact.

Based on the integration of Four-Quadrant Theory and Cone of Experience, this paper proposes a four-phase design model that guides visitors through a progressive learning journey. The following table operationalizes each phase into concrete design guidance:

Table 7 The Design Model

Phase	Quadrant Transition	Cone Level	Design Focus	Display Example
Phase 1: Capture	Aesthetic (Passive/Immersion)	Audio-Visual	Attention-grabbing, emotional hook	Dramatic fire scene visual, tense soundscape
Phase 2: Engage	Escapist (Active/Immersion)	Demonstration	Invite exploration, lower barriers to action	Touchscreen activation, gesture recognition
Phase 3: Teach	Educational (Active/Absorption)	Practice by Doing	Information delivery, feedback, knowledge check	Interactive selection with immediate feedback
Phase 4: Reinforce	Educational deepened	Teaching Others	Application, repetition, confidence building	Test scenario, challenge mode, teach-back

From the integrated operational framework, five design principles emerge: Based on the integrated framework, this study distills five core design principles. First, enabling active operation, derived from the principle of active participation, requires the design of touchscreens, gesture control, physical manipulation, and selection tasks to transform audiences from passive recipients into active agents. Second, provide immediate feedback,

grounded in cognitive absorption and practice-based learning, employs correct/incorrect indicators, guiding text, and progression cues to reinforce correct understanding and correct errors in a timely manner. Third, sequence from immersion to absorption, following the four-phase transformation model, begins with dramatic or environmental emotional hooks and culminates in knowledge application and internalization. Fourth, transform abstract concepts into concrete experiences, informed by the principle of concrete transformation and the Cone of Experience, utilizes simulations, scenarios, role-play, and step-by-step demonstrations to render abstract knowledge into perceptible experiences. Fifth, include knowledge application, based on the goal of knowledge acquisition of teaching others, designs test scenarios, problem-solving tasks, and teach-back opportunities to ensure learning outcomes are consolidated and transferred. These five principles, working in concert, provide a systematic operational guide for museum educational experience design.

For digital interactive displays (the focus of the dissertation's case study), the integrated framework provides specific guidance as table 8:

Table 8 Application to Digital Interactive Displays

Design Element	Educational Function	Quadrant Phase	Cone Level
Dramatic opening visual (fire scene)	Capture attention, set context	Phase 1 (Aesthetic)	Audio-Visual
Touch-activated interaction	Lower barrier to participation	Phase 2 (Escapist → Active)	Demonstration
Information pages (text + images)	Provide foundational knowledge	Phase 3 (Educational input)	Reading
Selection task (choose fire type)	Test understanding, require active processing	Phase 3 (Educational active)	Practice
Immediate feedback (correct/incorrect)	Reinforce correct knowledge, correct errors	Phase 3 (Feedback loop)	Practice
Challenge scenario (apply learning)	Knowledge application, confidence building	Phase 4 (Reinforcement)	Teaching Others

Implications for Small and Medium-Sized Museums

For museums with limited resources, the integrated framework provides a cost-effective priority framework like table 9:

Table 9 Key insight for small museums

Priority	Investment	Rationale	Estimated Cost	Cone Level
1st	Ensure active participation	Low-cost interactives (flip panels, physical sorting, discussion prompts, decision points)	Low	Practice
2nd	Provide immediate feedback	Simple mechanisms (answer keys, comparison charts, guide prompts)	Low-Medium	Practice
3rd	Transform abstract concepts	Narrative, metaphor, analogy, scenario design	Low	Demonstration
4th	Sequence from immersion to absorption	Storyboarding, flow design, spatial planning	Low	N/A
5th	Add digital interactivity	Only after educational goals are clear; technology serves content	Medium-High	Practice

The most expensive part (digital technology) is the lowest priority. Educational quality depends primarily on design thinking and pedagogical strategy, not budget. Museums can achieve high levels on the Cone of Experience (Practice by Doing, Teaching Others) through low-cost, low-tech interventions that prioritize active participation and knowledge application.

CONCLUSION AND DISCUSSION

The theoretical analysis yielded four major findings. First, a clear definition of museum educational experience emerges from the interdisciplinary synthesis, emphasizing active participation, cognitive absorption, knowledge acquisition, and concrete transformation. This operational definition distinguishes educational experience from entertainment, aesthetic, and escapist experiences through the Four-Quadrant Theory's dimensional framework. Second, the integration of Four-Quadrant Theory with Dale's Cone of Experience creates a powerful operational framework: the former defines the type of experience (Educational = Active + Absorption), while the latter defines the effectiveness of learning methods. Together, they provide a comprehensive tool for both design and evaluation. Third, the four-phase transformation model (Capture → Engage → Teach → Reinforce) provides a practical design pathway, recognizing that visitors enter museums in states of passive absorption or emotional immersion and must be guided progressively toward active, cognitive engagement. The model maps directly onto the Cone of Experience, ensuring each phase corresponds to increasingly effective learning methods. Fourth, the priority framework for small and medium-sized museums demonstrates that educational quality is not primarily a function of budget active participation, immediate feedback, and concrete transformation can be achieved through low-cost, low-tech interventions, with digital technology as the last priority after the educational strategy is clear.

This study's framework differs from existing museum education models in several ways. Traditional models such as Interactive Experience Model (Dierking & Falk, 1992) and Communication model (Hooper, 1994) focus on describing the museum experience but do not provide clear criteria for distinguishing educational from non-educational experiences. The Four-Quadrant Theory's dimensional approach offers a systematic way to make this distinction: educational experiences require both active participation and cognitive absorption. The Cone of Experience integration adds a retention-effectiveness dimension directly applicable to display tool selection. The transformation model addresses a gap in existing literature: how

visitors move from passive observers to active learners. For practitioners, the framework provides clear design principles derived from theoretical integration, warning signs to identify when technology or entertainment has displaced education, evaluation tools with observable indicators, and a priority framework for resource allocation. For museum theory, this study contributes conceptual clarity through a rigorous definition aligned with ICOM 2022, interdisciplinary synthesis of museology, pedagogy, and experience economics, a theoretical foundation for future empirical research, and a framework testable through design practice.

This paper addressed the research question: How can the educational experience of contemporary museum display design be conceptually defined and framed? The main contributions are sixfold: a clear, operationally defined concept grounded in theoretical synthesis; a comprehensive definitional framework organized in four layers (Core Definition, Four Core Characteristics, Boundary Definition, Theoretical Foundations); an integrated operational framework combining Four-Quadrant Theory with Dale's Cone of Experience; four core characteristics (active participation, cognitive absorption, knowledge acquisition, concrete transformation) that provide measurable indicators; a four-phase transformation model (Capture → Engage → Teach → Reinforce) mapped to Cone of Experience retention levels; and practical design principles with a cost-effective priority framework for small and medium-sized museums demonstrating that educational quality depends primarily on design thinking, not budget.

This paper is theoretical; the proposed conceptual framework requires empirical validation. Specific limitations include the lack of empirical testing with actual museum visitors, the potential incompleteness of the Four-Quadrant Theory as a single theoretical lens, cultural specificity derived from Western theoretical traditions requiring investigation in non-Western contexts, an age group focus on primary and secondary school learners that may not fully apply to adults. Future research should operationalize the framework into measurable questionnaire items for empirical validation, test its predictive validity, cross-validate with expert interviews, apply the framework to diverse museum types, investigate the transformation model empirically, examine long-term retention, and compare low-tech versus high-tech implementations.

As museums worldwide embrace digital transformation, the risk of losing educational focus in pursuit of technological novelty is real. A clear, rigorous conceptual framework for educational experience is not an academic luxury, it is a practical necessity for museums to maintain their public service mission. This paper has proposed such a framework, grounded in interdisciplinary theory and designed for practical application. The Four-Quadrant Theory provides a systematic way to distinguish educational experience from other types of museum experiences. The Cone of Experience provides a complementary hierarchy for understanding learning effectiveness. The four-phase transformation model provides a design roadmap. The priority framework provides guidance for resource-constrained institutions. It is now the task of empirical research to validate and refine this framework, ensuring that museums remain true to their educational mission in the experience economy. As Dewey (1902) recognized over a century ago, the best education is experiential, but not all experiences are educational. The framework presented here helps distinguish between the two, providing both theoretical clarity and practical guidance for museum display design.

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