

## INTERACTIVE LEARNING AND VISITOR ENGAGEMENT: ANALYZING THE ROLE OF EDUTAINMENT IN MUSEUMS OF DELHI

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**Abstract:** This study explores the integration of edutainment—educational entertainment—in museums of Delhi, aiming to evaluate its effectiveness in enhancing visitor engagement and learning outcomes.

**Background:** Amidst the evolution of museums from traditional exhibit halls to interactive learning environments, this research addresses the significant gap in empirical studies concerning edutainment's impact within the cultural and educational context of India's capital.

**Objective:** To evaluate the impact of edutainment activities on visitor satisfaction and learning outcomes and to determine the relationship between the frequency of museum visits and the preference for interactive exhibits.

**Methodology:** Quantitative approach has been selected for the study. A self-structured questionnaire has been taken for the collection of primary data from 120 respondents. For the sample size calculation, R-Studio has been used, and for the Statistical tests (Regression Analysis and Correlation analysis), SPSS V27 has been used.

**Findings:** Findings indicate a positive correlation (0.726) between the frequency of museum visits and the preference for interactive exhibits. Additionally, the perceived impact (0.985) of these activities strongly aligns with visitor's satisfaction and experiences.

**Conclusion:** These results underscore the potential of interactive technologies to transform educational delivery in museums. The study concludes with recommendations for museum administrators to optimize edutainment implementations, aiming to maximize educational impact and visitor satisfaction.

**Keywords:** Edutainment, visitor engagement, learning outcomes, museums, interactive learning, Delhi

### Introduction

Museums have long served as vital cultural and educational pillars in societies worldwide, curating knowledge and heritage to enlighten the public. Historically, museums were viewed primarily as custodians of arti-facts and historical relics, presenting these items in static displays that required visitors to passively observe and absorb information. However, the role of museums has dramatically evolved over the past few decades. They have transitioned from traditional exhibition

halls to dynamic learning environments where interactivity and engagement are prioritized. This shift is reflective of a broader educational paradigm known as "edutainment," which combines learning with entertainment to enhance educational experiences through enjoyable and interactive methods.

The introduction of edutainment into museum settings aims to captivate audiences by making learning more appealing and accessible. Interactive exhibits, digital installations, and engaging multimedia presentations are now commonplace in museums, aiming to enhance visitor engagement and deepen the educational impact. Such features not only attract a more diverse audience but also cater to different learning styles, potentially increasing the retention of information and satisfaction levels among visitors.

Despite the growing integration of edutainment features in museums globally, there remains a significant gap in empirical research, particularly concerning their effectiveness in the context of Delhi's museums. Delhi, as the capital of India, hosts a variety of museums that cover a broad range of subjects from history and art to science and technology. These institutions are pivotal in educational outreach and cultural preservation but face the challenge of maintaining relevance and visitor interest in an age dominated by digital media.

The primary objective of this study is to evaluate the impact of edutainment activities on visitor's satisfaction and learning outcomes within these museums. This involves assessing how such activities contribute to a visitor's overall satisfaction and learning achievements during their museum visit. Additionally, the study aims to analyse the correlation between the frequency of museum visits and the preference for interactive exhibits.

This research will fill the critical void in the existing literature by providing data-driven insights on the utilization and effectiveness of edutainment strategies in the museums of Delhi. By doing so, it aims to contribute to the broader discourse on museum education and visitor studies, providing valuable recommendations for museum administrators and educators striving to enhance the educational impact of their institutions through innovative and interactive methods.

### **Objectives of the Study:**

1. To evaluate the impact of edutainment activities on visitor satisfaction and learning outcomes
2. To determine the relationship between the frequency of museum visits and the preference for interactive exhibits.
- 3.

### **Review of literature**

The study "Investigating Visitor Engagement in Interactive Science Museum Exhibits using Multimodal Bayesian Hierarchical Models" (Emerson et al., 2020) considered the key to learning at museums is involvement. Computational models of visitor engagement have the potential to provide analytical tools for museum educators and adaptive help to enhance visitors' learning experiences. People of many ages, interests, levels of education, and cultural backgrounds attend science museums, which could influence their interaction with the exhibits. This study introduces

a Bayesian hierarchical modelling strategy for forecasting student participation in the environmental sustainability science tabletop exhibit Future Worlds. We calculate the average amount of time that visitors spend at science museums by analysing data collected from fully-instrumented Future Worlds displays, which include a variety of channels such as eye tracking, facial expression, posture, and interaction logs. We demonstrate that baseline approaches are outperformed by the Bayesian hierarchical modelling strategy. These findings suggest that multimodal learning analytics have the potential to enhance our understanding of how science museum visitors interact.

"Democratizing the Museum Reflections on Participatory Technologies" (Pruulmann-vengerfeldt, 2014) was examined. In "Democratizing the Museum," we look at how participation—whether digital or otherwise—could open up the museum to more people. The open museum is negotiating its role in modern society and professionalism with the help of its visitors. How digital technology aids interactive museums is one of the topics covered in this book, along with the challenges faced by audiences/visitors and experts. An lengthy participatory action research project at the Estonian National Museum provides the theoretical backbone of the book, while there are empirical examples in various chapters as well. Art historians and museum professionals are the intended readers of this book.

"Aesthetic Attributes of Museum Environmental Experience: A Pilot Study with Children as Visitors" (Annechini et al., 2020) investigated this very question. This study is a pilot study on the effects of museum visits on children's relaxation and interest. Museum and visitor studies did not arrive at environmental consciousness until much later, although it is now much valued. Today, museum architecture is just as fascinating as the "things" housed inside. According to some research, there are four distinct ways in which people get satisfaction while visiting museums: objective, cognitive, introspective, and social. Museum experience was defined and expanded upon in our survey with the addition of "environmental experience" as the fifth component. This term characterises the effect that the actual space of a museum has on its audience. In order to identify the aesthetic components of the "environmental preference," we want to assess the feelings and perspectives of museumgoers throughout their stay at the MART (Museum of Modern and Contemporary Art of Trento and Rovereto).

"From the standpoint of visitors' visual assessment," examined "A research on the learning experience of visitors of digital museums in STEAM education" (Zhang & Hu, 2022). Evaluation of the STEAM education learning experience for digital museum visitors using visual means Xin Zhang and Jieming Hu\* are faculty members of Shanghai, China's Donghua University's College of Fashion & Design. As with STEAM education, museum public education draws from a variety of disciplines. In order to facilitate mobile learning for the general audience, digital museums may make use of mobile terminals. Several offline museums have shuttered or placed restrictions after the global outbreak of COVID-19. Improving the educational experience for museum visitors via the use of digital resources is an important priority. Online museum classes could benefit from better visual information delivery. Digital museum visitors' learning experiences were examined in this research using a visual evaluation technique.

"Voices from the Museum: Qualitative Research Conducted in Europe's National Museums" was the subject of research by Dodd et al. (2012). Museum The public has long maintained that national museums serve as "identity frames" through which tourists may make connections between their own experiences and the nation's history and present. The concept of "country" and "citizenship" that tourists bring to museums is, however, something they construct and build on their own. The findings from the qualitative research corroborated this hypothesis, demonstrating that when people visit the national museum, their preconceived notions about the country and Europe are challenged by the museum's discipline, content, displays, layout, narrative, size, environment, and building, which all contribute to the museum's "frames" of national history and identity.

Research on the "Educational Role of Museum in India" (Nasrin, 2021) Heritage, both natural and cultural, is preserved at museums. Centers for informal education. Things used to be the museum's strong suit, but now it's all about the collection and the attention to detail. Without knowledge, museum value is meaningless. People of all ages may participate in the museum's educational activities. In this piece, the author delves into the educational functions of museums.

A study on "The function of educational museums in the growth of education" was conducted by Warath in 2022. In order to study, educate, and understand a subject, educational museums are essential. Learning museums play an important part in the expansion of education, as this abstract explains. Interactive and hands-on learning is offered by educational museums in a unique way. To make learning more engaging and long-lasting, they provide physical resources like exhibits and displays.

Learn Through Play: The Role of Edutainment in Museums (MOUSTAFA, 2020) The fact that playing may foster cognitive development is well recognised. Learning via entertainment is a trend. Both "edutainment" and "learn via play" are terms that the general public is familiar with. Edutainment essentially consists of learning via play. Still, you can tell them apart. In this research, we look at both theories and see how they stack up in terms of definition, applicability, effectiveness, and exemplary school learning foundations.

The term "play and exhibitions: expanding definitions inside museums" was examined in a study by Sizemore (2018). Museums' use of play to captivate visitors is the focus of this thesis. Play as a method of engagement and learning is a topic of controversy among museum professionals and academics. The difficulty museums have in striking a balance between entertaining and instructing visitors, as well as the inherent ambiguity of play, contribute to this problem. An important concept upheld by the Denver Museum of Nature and Science is the usage of names. Through the use of anthropological ideas and methodologies. These findings motivate me to propose a musicological definition of play tailored to the needs of the Denver Museum of Nature and Science, and to stress the importance of doing so.

### **Methodology:**

Quantitative method of analysis was adopted for achieving the said objectives of the study. First, a self-administered questionnaire was constructed and its responses was collected through E-mail from a total of 120 respondents based in the Delhi-NCR. The collected data was analyzed using

IBM SPSS V27. Further, to know the impact of edutainment activities on visitor satisfaction and learning outcomes Regression Analysis has been conducted and to determine the relationship between the frequency of museum visits and the preference for interactive exhibits Pearson Correlation has been calculated.

### **Sample Size Calculation:**

For the calculation of sample size, power analysis has been used, using R-Studio V23. Testing the equation at an effect size of 0.5, significance level of 95% confidence and a power estimate of around 97%.

“pwr.t.test (n=NULL, d=0.5, sig. level = 0.05, power = .97)”

n = 118.9808 or 119

For the collection of data, rounding off the total number of respondents to be 120.

### **Reliability Analysis:**

<b>Case Processing Summary</b>		
		N
Cases	Valid	120
	Excluded <sup>a</sup>	0
	Total	120
<b>Reliability Statistics</b>		
Cronbach's Alpha		N of Items
0.863		11

The statistical output consists of two main parts: Case Processing Summary and Reliability Statistics. In the Case Processing Summary, it shows that there are 120 valid cases, with no cases excluded, totaling to 120 cases considered in the analysis. Moving to the Reliability Statistics, the Cronbach's Alpha value is 0.863, calculated over 11 items. This alpha value suggests a great level of internal consistency among the items in your dataset. Typically, a Cronbach's Alpha above 0.7 is considered acceptable, indicating that items measure a single construct reliably. A value of 0.863, which is above this threshold, will be considered good and can be acceptable for further study.

### **Demographic:**

Variables		Frequency	Percent	Valid Percent	Cumulative Percent
Age	Under 18 years old	7	5.8	5.8	5.8
	18-24 years old	16	13.3	13.3	19.2
	25-34 years old	15	12.5	12.5	31.7
	35-44 years old	28	23.3	23.3	55.0

	45-54 years old	15	12.5	12.5	67.5
	55-64 years old	39	32.5	32.5	100.0
Gender	Male	62	51.7	51.7	51.7
	Female	58	48.3	48.3	100.0
Residence	Delhi	52	43.3	43.3	43.3
	Outside Delhi	68	56.7	56.7	100.0

The dataset comprises information on age, gender, and residence of 120 respondents. The age distribution shows a broad range, starting from those under 18 years old, which constitutes 5.8% of the sample. The age group 18-24 years old represents 13.3%, and 25-34 years old accounts for 12.5%. The 35-44 years old group is the largest, making up 23.3% of the respondents. Both the 45-54 years old and 55-64 years old groups hold smaller proportions, 12.5% and 32.5% respectively, with the latter being the second-largest group.

In terms of gender distribution, “the dataset is nearly balanced with males comprising 51.7% and females 48.3%. As for the residence of the participants, 43.3% live in Delhi, while 56.7% reside outside of Delhi.

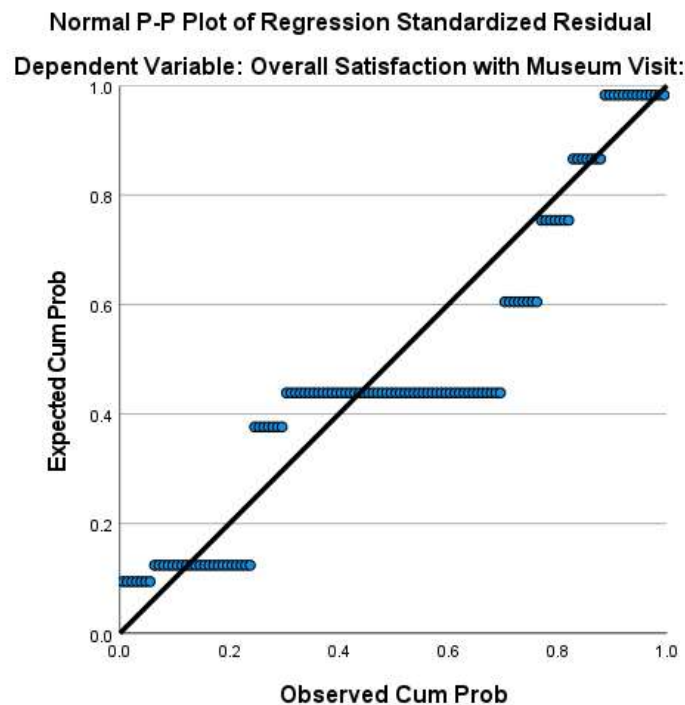
### Statistical Tests:

#### *Regression Analysis:*

Model Summary <sup>b</sup>						
Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	
Regression Analysis		.985 <sup>a</sup>	0.971	0.971	0.21343	
ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
Regression Model	Regression	178.592	1	178.592	3920.599	.000 <sup>b</sup>
	Residual	5.375	118	0.046		
	Total	183.967	119			

A very significant model fit was found in the regression analysis that was performed to evaluate the effect of edutainment activities on the pleasure of visitors and the learning outcomes. With an R-value of 0.985, the degree of linear correlation between the two sets of data is quite high. There seems to be a rather significant relationship. An impressive R-squared value of 0.971 indicates that the model provides a great fit, explaining almost all of the variation in the dependent variable (visitor satisfaction and learning outcomes). Even after accounting for the number of predictors in the model, the Adjusted R-square, which is similarly 0.971, supports this conclusion.

Additional evidence that the regression model is robust may be seen in the ANOVA table. While 178.592 is the regression sum of squares, which shows how much of the variation is explained by the model, 5.375 is the residual sum of squares, which shows how much of the variance is not explained by the model. Since the model successfully accounts for the majority of the variation, we can see that the regression has a mean square value of 178.592 and the residuals only amount to 0.046. The regression model is strongly supported by the extremely significant F-statistic of 3920.599 ( $p < 0.001$ ), which indicates statistical significance.



***Pearson's Correlation:***

<b>Correlations</b>		
Variables		Preference for Interactive Exhibits
Frequency of Museum Visits	Pearson Correlation	0.726
	Sig. (2-tailed)	0.045
	N	120

A correlation study was carried out to investigate the connection between the 120 participants' preference for interactive displays and the frequency with which they visited the museum. A linear link between the two variables is shown by a Pearson correlation value of 0.726, which indicates both the strength and direction of the association. This points to a robust positive link, which can

mean that people like interactive displays more often when they visit museums more often. The observed correlation is statistically significant, as shown by the significance level (p-value) of 0.045, which is lower than the generally used threshold of 0.05.

**Conclusion:**

This study provides compelling evidence of the positive impact of edutainment activities on visitor satisfaction and learning outcomes in Delhi's museums. Through quantitative analysis, we demonstrated that engaging, interactive exhibits significantly enhance visitors' educational experiences and overall satisfaction. Our findings reveal a robust correlation between the frequency of museum visits and the preference for interactive exhibits, suggesting that more frequent visitors develop a stronger inclination towards engaging with interactive educational content. Moreover, the study's results underscore the crucial role that edutainment plays in transforming museums from traditional repositories of arti-facts into vibrant, dynamic educational landscapes that cater to diverse learning styles and preferences. By integrating interactive technologies and edutainment strategies, museums can significantly boost visitor engagement, making learning more accessible and enjoyable.

As museums continue to adapt to the digital age, our research highlights the importance of continual investment in interactive technologies and educational programming that align with contemporary visitor expectations. Museum administrators and educators are encouraged to leverage the insights provided by this study to further refine and enhance the efficacy of edutainment implementations.

**Ethical Statement:**

This research adheres to the highest ethical standards in data collection, analysis, and reporting. Participants were informed about the purpose of the study and their involvement was voluntary, with consent obtained prior to data collection. The study was designed to ensure confidentiality and anonymity of all respondents, safeguarding their personal information.

**Conflict of Interest:**

This research was conducted independently, with no conflict of interest from any of the involved parties, ensuring that the findings and recommendations are solely intended to contribute to the academic community and the operational enhancements of museums in Delhi.

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