**Museums as Interactive Spaces**

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### Abstract

Museums are the storehouses for humanity. Modern museum designs aim to be more interactive to attract visitors. This study considers preferences in museum amenities and exhibit designs to inform a science museum design plan.

**The goals were:** to determine if there is a connection between different types of technology and users; to determine how interaction affects the popularity of exhibits; and to determine how users interact with different amenities. Findings from this investigation confirm that visitors prefer museum exhibits that are hands-on and interactive. Preferences were also found for children's play areas, retail areas, and external design features to create a more experiential and inclusive environment. Results from this study will inform design strategies for a science museum with interactive elements and accommodating amenities.

### Methodology

**Measures**

Data for this study was collected through an online survey of 20 questions, including demographics and both qualitative and quantitative questions.

**Subjects**

Participants of this survey had to be 18 years of age or older and were obtained through purposive sampling. A total of 643 participants completed the survey. 53.58% percent were college students.

**Procedure**

This survey was distributed through the North Dakota State University (NDSU) faculty, staff, and student email listserv systems and through social media.

**Research Questions**

- To determine if there is a connection between different types of technology and users (Zaharias, Machael, & Chrysanthou, 2013).
- To determine how interaction affects the popularity of exhibits (Jung, Perez-Edgar, & Zimmerman, 2018).
- To determine how users interact with different amenities (Bartneck, Masuoka, Takahashi, & Fukaya, 2006; Zaharias, Machael, & Chrysanthou, 2013).

### Discussion

- **Hands-on features are quite popular and museum visitors like amenities such as gift shops and outdoor features such as pocket gardens.**
- **Most participants do not participate in museum programs, but in written responses, many said they enjoy expert lecture series and specialty events put on by museums.**
- **The ratio of participants who visit museums based on gender was Female (71.72%) to Male (28.28%).**
- **There is interest in a science museum in the Fargo-Moorhead area.**
- **Due to sampling strategies, the participants were mostly college age, and many do not have children.**
  - **What is the participant's age?**
    - 55-64 years old: 7.93%
    - 40-54 years old: 14.31%
    - 25-39 years old: 23.33%
    - 18-24 years old: 54.12%
- **Selecting participants who do have children under age 18, many agreed they would use indoor or outdoor children's play areas.**
  - **Are the participants a parent, grandparent, or guardian of a child/children under 18? If yes what is their age?**
    - High school (ages 15-18): 12.24%
    - Middle school (ages 12-14): 11.43%
    - Elementary (ages 5-11): 35.93%
    - Infants (ages 0-2): 19.59%
    - Pre-school (ages 3-4): 20.82%
- **Play areas should have some interactive elements as this was also a popular design choice selected by participants in this study.**
- **Participants who do visit museums tend to visit once or twice a year and many indicated they spend two hours or more in these spaces.**
- **Science museums are also popular destinations, followed by museums that focus on history, the arts, or nature.**
- **In museum exhibits, participants prefer touch and feel exhibits, outdoor exhibits, and digital interactive designs.**
- **Participants also enjoy reading materials associated with exhibits and based on written responses are looking for a more immersive experience that heightens other senses as well.**
- **It was discovered that a proportion of participants use mobile phone app translators (5.09%).**

### References


### Results

- **As for types of museums visited, the results show Science Museum is a popular choice (17.52%) followed by Historical Museums (16.1%), Art Museums (15.73%), Aquariums (15.22%), Nature Centers (12.78%), Children's Museums (11.91%), and Planetariums (9.72%). Less than 1% of respondents gave additional written responses such as air, nature, cultural, and topic specific museums.**
- **When asked how often they visit a museum, roughly 1/3 never (6.53%) or rarely (32.5%) visit a museum, and most indicated they visit once (23.02%) or twice (30.95%) a year.**
- **Participants were asked specifically if they would like to visit a museum in Fargo-Moorhead and most said they would (34.55% likely, 32.72% somewhat likely) when asked how often they visit a museum, roughly 1/3 never (6.53%) or rarely (32.5%) visit a museum, and most indicated they visit once (23.02%) or twice (30.95%) a year.**

### Interactive Elements and Spaces

- **How likely is a participant to use hands on interactive elements in museum exhibits?**

### Conclusion

Science museums are popular destinations. People in our sample would like to see a science museum in the Fargo-Moorhead area. Respondents from all backgrounds enjoy immersive, interactive museum experiences.

Findings from this study will influence a design plan for a science museum which includes the following features:

- **Hands on elements,**
- **Gift shop,**
- **Outdoor features such as pocket gardens,**
- **Interactive children's play area,**
- **Community classroom space to host expert lecture series and specialty events and,**
- **Elements that reference the Fargo-Moorhead area.**