How do different methods of displaying knowledge keep visitors of Botanical Gardens engaged with the knowledge displayed?

By Juanito Espericueta and Troy Shaffer

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2. Introduction to topic

The Missouri Botanical Gardens is one of the most iconic botanical gardens in the United States. It is a gorgeous place to walk around and enjoy nature and pretty plants, but also a place for environmental education and scientific and plant research. The Missouri Botanical Gardens are quite large and have many different displays of plants and more. However, effectively displaying the complex and scientific knowledge about plant species, ecosystems, and more to a diverse audience can be quite difficult. Our research investigates how different methods of displaying knowledge at the Missouri Botanical Gardens, which can range from traditional signage, exhibits, digital displays, and guided or non-guided tours, impact visitor engagement and learning. By looking and analyzing the effectiveness of various methods of displaying knowledge and educational strategies, our research is trying to determine which methods are the most successful to grab visitors' attention, keep them engaged, and enhance their understanding of whatever they may be reading about. Ultimately, our research is aiming to create insight about the best ways to keep visitors engaged and overall enhance the educational experience at the Missouri Botanical Garden, hoping that visitors can leave with a greater appreciation and understanding of plants and other knowledge.

Why is it important?

Missouri Botanical Gardens or any botanical garden for that matter, are important not just for being a nice place to walk around with pretty plants, but also for teaching visitors about nature, conservation, the environment, and more. The earth we live on is currently facing issues like climate change and extinction of many species, so it is definitely important that visitors of botanical gardens understand the importance of plants and ecosystems. How this knowledge is displayed and shared with visitors, whether it be through signs, digital displays, or exhibits, can affect how much the visitors engage, learn, and care about these issues. Our research will help us understand the best ways to keep visitors engaged and make learning more effective, so hopefully they will walk away with more knowledge than they walked in with.

What is unknown?

We are not sure what display methods of sharing knowledge are the most effective at Missouri Botanical Gardens. We are trying to determine what types of exhibits, whether it be signage, videos, or activities, that make visitors the most engaged. We are also not sure of how different groups of people, like children or adults, react or like different methods. Our research will try to figure out what methods work best to keep all visitors engaged.

3. Research Question

Our research question is how do different methods of displaying knowledge keep visitors of Botanical Gardens engaged with the knowledge displayed? We are interested in this because of our projects in Dr. Hildebrandt's and Dr. Jack's classes. We want to make things that will actually grab people's attention and make a positive impact at the garden.

4. Evidence:

Article 1 – Review - Troy

Sanders, Dawn L., et al. "Navigating Nature, Culture and Education in Contemporary Botanic Gardens."
    Environmental Education Research, vol. 24, no. 8, 29 May 2018, pp. 1077–1084,
    https://doi.org/10.1080/13504622.2018.1477122.

"*Navigating Nature, Culture, and Education in Contemporary Botanic Gardens"* By Dawn L. Sanders is a review paper that discusses and explores the impact and roles of Botanical Gardens in our modern-day society that is becoming "plant blind". Which is due to the growing plant deficit in modern areas and cities. Some of the main points of the article are urbanization and its effects, the role of botanical gardens and how it can be expanded, plant blindness. There are quite a few purposes of this article which I will discuss below.

One of the main topics discussed in Sanders' review is the effect of urbanization. As humans and areas become more urbanized, "plant blindness" tends to follow. "Plant blindness" is the growing inability to not notice or understand plants and their importance. This is a direct consequence of living in areas where nature is controlled or completely absent whatsoever. Growing cities tend to have less and less nature with parks, zoos, and gardens being the only "nature" around. Sanders also mentions ecophobia, which is basically the fear of nature or the natural world, and biophilia, which is the natural human tendency to want to connect and experience nature. The article says that children that grow up in big "megalopolitan" cities with little to no nature are more likely to have ecophobia. Botanical gardens can help combat "plant blindness" and ecophobia and help promote/create biophilia by simply just being a safe space that educates about plants and their importance.

Reframing the role of Botanical Gardens is another big topic explored by Sanders in this article. Botanical gardens are typically just seen as places for plant research, plant conservation, or just a pretty place to walk around. Sanders wants Botanical Gardens to broaden their role in two different ways, be a place to educate the public about environmental issues, conservation, and sustainable practices as well as to educate visitors on the cultural and ecological significance of plants. Sanders believes if the visitors of the garden engage in conversation about these topics that it can help create change and preserve plants and cultures better.

"*Navigating Nature, Culture, and Education in Contemporary Botanic Gardens"* by Dawn L. Sanders explores the roles of botanical gardens as an educational space in a world that is becoming more and more urbanized and a disconnection from nature is only becoming more common. Sanders wants botanical gardens to grow from their more traditional function and start educating more on environmental issues, conservation and sustainability practices, as well as going more in depth with details of plants including the cultural and ecological significance. So the future direction sort of goes hand in hand with this, as she wants botanical gardens to expand into a more educational place.

Ultimately this article helps us understand the current view and overall role of botanical gardens. Botanical Gardens are typically just seen as places of plant conservation and research, but if we expand the roles of Botanical Gardens, it is possible that they would be able to have more engagement.

Article 2 – Research - Troy

Chang, Li-Shin, et al. "Improving Educational Functions in Botanic Gardens by Employing Landscape Narratives." *Landscape and Urban Planning*, vol. 86, no. 3-4, June 2008, pp. 233–247, https://doi.org/10.1016/j.landurbplan.2008.03.003. Accessed 17 Oct. 2021.

The research article *"Improving Educational Functions in Botanic Gardens by Employing Landscape Narratives"* by Li-Shin Chang, Richard J. Bisgrove, and Ming-Yi Liao does exactly what the title says, and looks at the potential use of landscape narratives in botanical gardens to improve the educational role as well as engagement overall. The authors provide insight and recommendations for botanical gardens on how to use landscape narrative techniques to make the gardens more appealing to diverse audiences.

Plant taxonomy and scientific information are typically what's displayed and focused on at botanical gardens, but the authors believe that it is not very engaging for visitors. Which is why the authors think incorporating narrative elements into the gardens design will create a better and more engaging experience for any visitors. The whole idea of "landscape narratives" involves storytelling elements in the garden that are able to communicate the cultural and ecological significance of plants and landscapes. Doing this helps create less of a gap between "boring" scientific knowledge and the visitor's interest.

Chang, Bisgrove, and Liao used qualitative research methods to look at the effectiveness of landscape narratives in botanical gardens to improve engagement. To conduct their experiment, the first thing the authors did was an extensive review of already existing research that is similar to theirs. The next step in their process was examining several botanical gardens where narrative elements were already in use. The authors of the article then designed an experiment where they would have a control group and experimental group, the control group would just have traditional botanical garden signage, and the experimental group would have a narrative-based interpretation. The experimental group was exposed to stories that incorporated the cultural and ecological uses of plants, unlike the control group which were exposed to the general scientific information and taxonomy. After the experiment, they would collect feedback from the two groups and conduct surveys.

The results of the experiment were very clear that the experimental group or the narrative-based group were much more engaged and interested. Which shows that the narrative-based approaches do significantly enhance the educational impact of botanical gardens. The use of storytelling made the experience much more memorable and easier to retain the information. The results of the surveys also just proved that the visitors had a stronger preference for the narrative based approach. The future directions for the ideas explored in the article would to focus on expanding the integration of landscape narratives in botanical gardens to further enhance educational experiences and deepen their impact on different audiences.

Ultimately, the article "*Improving Educational Functions in Botanic Gardens by Employing Landscape Narratives*" by Li-Shin Chang, Richard J. Bisgrove, and Ming-Yi Liao uses an experiment to provide recommendations for botanical garden managers/designers on how to use narrative techniques to make visitors more interested and engaged at botanical gardens. The goal of the authors is to create better understanding of plant conservation and biodiversity, while also making botanical gardens more appealing and engaging to any visitors.

This article directly relates to our research question because it conducts an experiment based on methods of displaying knowledge in botanical gardens. Showing that when a narrative is included, engagement and retention is increased.

Article 3 – Research - Troy

Pérez-Sanagustín, Mar, et al. "Using QR Codes to Increase User Engagement in Museum-like
    Spaces." *Computers in Human Behavior*, vol. 60, July 2016, pp. 73–85,
    www.sciencedirect.com/science/article/pii/S0747563216300644,
    https://doi.org/10.1016/j.chb.2016.02.012. Accessed 9 Nov. 2019.

The article "*Using QR Codes to Increase User Engagement in Museum-like Spaces*" by Mar Pérez-Sanagustín, Denis Parra, Renato Verdugo, Gonzalo García-Galleguillos, and Miguel Nussbaum looks at the impact and effectiveness of using QR codes in museums. The authors describe QR codes as a digital bridge to enhance engagement of visitors by providing access to multimedia content, like videos or an interactive website that can provide even more information about exhibits. The study explores the potential of using QR code technology to make museums more interactive learning experiences rather than just looking at boring displays.

The purpose for the experiment conducted by the authors was to look at the effectiveness of using QR codes to create more engagement in museums. They wanted to see if QR codes could improve the visitor experience by providing easy access to digital content. They looked at if the QR codes would increase visitor interest, create a better and deeper understanding of exhibits, and just overall improve the museum experience.

In the article, the authors conducted an experiment at the Royal botanical gardens in Kew, London. They created a system where they created two panels, a screen and paper panel and a QR code panel. There are two groups and there would be a person who would lead them to one of the panels. They were instructed to interact with the panel as they normally would, like they did not have to read or interact completely if they did not want to. For the people who would do the QR panel, each QR code would give whoever scanned it access to more content, like videos and interactive platforms with information. When the participants would scan the QR codes, it gave the authors many different types of data. They could see the number of scans, how long people interacted with the content, and they also received feedback from surveys.

The results of the experiment showed that there was an increase in engagement when the QR codes were integrated in the museum experience. The participants reported that they like the QR codes because it makes the museum experience more interactive and immersive. It was also reported by the participants that they appreciated the ability to have a more personalized experience since they were able to go at their own pace and engage with their specific interests. Although the QR codes were well received, QR code interaction did not affect the visitors' experience. This is due to the fact that the perceived quality of the experience was not influenced by the way the information is received. The data shows that the ratings given by the visitors about the content in the exhibits were similar, so the way it was received did not affect the information received. But also, the ratings said that the QR code panels, which are obviously different from the more traditional screen and paper panel, did not have a negative effect on the visitors' experience.

Overall, "*Using QR Codes to Increase User Engagement in Museum-like Spaces*" shows that QR codes have great potential to enhance museum or botanical garden experiences. Even though the way the information was received did not really change the way the quality of the exhibit was received, the QR codes did increase engagement. This directly relates to our research since the experiment the authors did, was at a botanical garden. Missouri botanical gardens have some QR codes on display and we can look to see if they help create engagement.

Article 4 – Research - Troy

Boy, Jeremy, et al. "Storytelling in Information Visualizations." *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, 18 Apr. 2015, https://doi.org/10.1145/2702123.2702452.

The article *"Storytelling in Information Visualizations: Does it Engage Users to Explore Data?"* by Jeremy Boy, Francoise Detienne, and Jean-Daniel Fekete looks at the role of storytelling in data and information visualizations and how it affects user engagement. The authors look at if incorporating a narrative element into these visualizations improve engagement, instead of the traditional presentation of data in a more neutral and factual manner. Their research aims to find if storytelling in visualizations makes data more interesting and engaged and creates deeper interaction.

The research in their study is based on a series of experiments that compares more traditional, "non-narrative" visualizations to visualizations that had narratives and storytelling techniques. The results of their research suggest that the storytelling can increase engagement, but how the story is structured and context can affect the engagement. The authors found that a well-designed and thoughtful narrative can help the readers/users understand the data more easily and possibly motivate further exploration. Even though the narratives do improve engagement, the authors say that not all users prefer and react positively to the narrative/storytelling approach. The authors state that some prefer the flexibility of exploring the data on their own, without the narrative guiding them.

Overall, the article concludes that narratives and storytelling in information visualizations can be used as a powerful tool for increasing engagement. However, the success depends on the user themselves and whether they want the narrative to help guide or if they would want flexibility in interacting with the data. The authors believe you should carefully consider the audience and the type of data before deciding if you want to use a narrative approach. If it is done correctly, storytelling and narratives can make data visualizations more understandable and enjoyable for users.

This article is helpful in our research because Missouri Botanical Gardens has visualizations that include narratives and some that do not. So, we can look at these two different types of visualizations within the gardens and compare our results to the ones in the article.

Article 5 – Science Communication – Troy

Moser, Stephanie. "THE DEVIL IS in the DETAIL: Museum Displays and the Creation of Knowledge." *Museum Anthropology*, vol. 33, no. 1, Mar. 2010, pp. 22–32.

In "The Devil is in the Detail" by Stephanie Moser, Moser explores museum displays and how different arrangements can help improve understanding and just the overall amount of learning done at the museum. She talks about how the combination of design, visual elements, spatial arrangement, and text play a role in creating narratives. By examining these details, you can enhance the power of museum exhibits and create a deeper understanding of what the exhibit is.

The Purpose of the article is to show how museum displays can do more than just display old objects and artifacts, they can also create new knowledge and can shape how the museum's visitors understand history, culture, and more. The article explores how the design, layout, and text are all working together to create a narrative to educate visitors in different ways. The article is intended for a professional or academic audience. It could also just be for Museum designers.

But it is clear that the information inside the article is clearly for someone who has interest in museum design. Which makes sense considering the author, Stephanie Moser is a professor of Archaeology at Southampton University.

Overall, the article shows explains and explores how the different ways a museum display is set up can affect the way it is perceived and the knowledge taken from it. One of the main points from the article is that displays are supposed to create knowledge, not just showcase it. The design and layout of an exhibit is very important, you have to take elements like architecture, lighting, color, and arrangement into account. An example the article gives is that big open galleries tend to convey authority while smaller and more intimate spaces encourage reflection. Text in exhibits is an important tool to shape understanding, like the example from the last sentence, more scholarly and formal text make the exhibit more intimidating. But if you use informal and creative texts for an exhibit, it seems more accessible and engaging. You can also use a variety of ways to create engagement with an exhibit, dioramas, models, videos, and interactive activities can help create connections with whatever is being displayed.

In "The Devil is in the Detail", Stephanie Moser emphasizes and explores the role of museum displays as creators of knowledge. By looking at the interplay of design, arrangement, text, and audience interaction, the article shows the complexity and intentionality that can be behind exhibitions. Moser's work shows the importance of analyzing details to fully appreciate how museums can influence ideas about history, culture, and more. The article broadens the understanding of museum exhibits and calls for reflection on their power to create knowledge.

This article is helpful to us in our project because it discusses how a display in a museum is set up can make a difference. We can take this knowledge and apply it to Missouri Botanical Gardens. We can look at the different displays and look at arrangement and compare engagement between different displays.

Article 6 – Review – Juan

Mahmod, Waad A. "The Role of Digital TECHNOLOGY in Visual Display Methods in Natural History Museums Around the World." International journal of health sciences, vol. 6, no. S2, 2022, pp. 14916-14926, doi:10.53730/ijhs.v6nS2.8953.

In this review paper titled "The role of digital technology in visual display methods in natural history museums around the world," written by Waad Addnan Mahmod, the author investigates the ways in which technology is impacting and improving the style in which natural history museums show exhibits. Throughout the entirety of the article, it explores the aesthetic, educational, and technological aspects of museum displays, as well as the significance of employing digital tools to assist in improving the quality of these displays in order to significantly transform the experiences that visitors have.

Through the first chapter of this article, they emphasized how digital technology has revolutionized the way museums present their collections. This technology has made it possible to create three-dimensional environments that provide an interactive atmosphere. Additionally, it has made it simpler to communicate complex information and enhance visitor experiences to their global audience from computers, mobile devices, or any other digital platforms. Not only that, but this chapter also addresses how digital technologies complement traditional museum exhibits. This is due to the fact that while real items continue to play a key part, digital technologies allow for experiences that are more immersive and engaging.

Over the next chapter, they focus on how digital technology has changed the visual presentation techniques and natural history museums all around, especially in Europe and America. Natural History museums have changed their virtual presentation strategies to fit changes in computers and smart devices, which are required to keep pace with the digital age and to interact with guests more successfully. Some examples move these presentations would be the holograph which creates a more vivid experience for visitors. This section also goes into how digital technologies is not only redefining museums but also impacting areas such marketing and education threw using virtual classrooms and online learning.

This article ends with highlighting once more how digital technology has changed Natural History museums by allowing virtual and augmented reality exhibits that increase audience engagement through the use of 3D models, virtual spaces, and smart devices to create interactive and immersive experiences to connect visitors with museum content, as well as establishing cultural exchange and providing new ways the museum may interact with global audiences. Regarding our question, it provides us with various instances of digital technology being a practical approach to keep guests engaged.

Article 7 – Research – Juan

Steinhauer, Melissa, M.A. Brennan, Dennis McConnell, Carrie Reinhardt-Adams, and David Sandrock. "Visitor Responses to an Ethnic Garden Display in a Botanical Garden". HortTechnology hortte 17.4 (2007): 537-543. < https://doi.org/10.21273/HORTTECH.17.4.537>. Web. 16 Sep. 2024.

Researchers Melissa Steinhauer, M.A. Brennan, Dennis McConnell, Carrie Reinhardt-Adams, and David Sandrock collaborated to write a paper titled "Visitor Responses to an Ethnic Garden Display in a Botanical Garden." The purpose of this research is to investigate the financial and demographic aspects that have an impact on the experience that visitors have at

botanic gardens, as well as the ways in which different audiences influence the amount of funding and attendance that gardens get.

This study used a cross-sectional design to analyze adult visitors' reactions to a newly installed African American horticulture display at the Leu Gardens in Orlando, FL. The unit of analysis was the individual, and the sample included visitors to the gardens during its business hours. Data was collected through self-completed questionnaires distributed to visitors during the display after three months. The questionnaire included 27 items that assessed attitudes about the garden and exhibit, as well as preferences for ethnic displays. Due to an inability to construct a full sample frame, participants were selected depending on their availability during the survey. The regression models used dummy variables for ethnicity, with African-American tourists acting as the reference group. This method allowed for an in-depth study of how different demographic parameters impacted visitors' impressions and choices.

Reviewing the results revealed that 38% of visitors had previously visited the Leu Gardens, while a significantly higher 84% had visited other Botanic Gardens during the demographic split. Of the sampled audience, 61.6% were female, 77.8% were of European American descent, and the majority of visitors were middle-aged or younger—60.3% were 40 years of age or younger. Almost evenly distributed were the season and days of visits, with 54% occurring in the summer and 46% in the fall, and a significant portion (70.8%) occurring on weekends.

Although attitudes toward the Leu Gardens did not differ significantly across demographic groups, certain visitation patterns did affect attitudes. For example, summer visitors had significantly more negative attitudes than fall visitors, and weekend visitors tended to have more positive attitudes about the garden than weekday visitors. Individuals who had previously visited the gardens or who visited more frequently also tended to have more positive attitudes toward the garden, as did those who visited other botanic gardens. Visitors with higher incomes had more negative opinions about the African American horticultural display than visitors from other demographics. It also found that garden visitors and vegetable gardeners were more positive about the display.

The overarching goal of this study was to determine whether the new African American horticulture show improved visitors' perceptions of the garden and the display, as well as whether it improved attendance and attitudes in general. But in terms of how this relates to our question, research shows that various exhibits can significantly affect visitors' attitudes, which ultimately helps them remain interested in the information on display.

ARTICLE 8 – Research Article

Borgman, Christine L. *Digital data archives as knowledge infrastructures: Mediating data sharing and reuse*. 2019. *Asis&t,*
https://asistdl.onlinelibrary.wiley.com/doi/abs/10.1002/asi.24172

In the research article "Digital Data Archives as Knowledge Infrastructures: Mediating Data Sharing and Reuse" written by Christine L. Borgman, Andrea Scharnhorst, and Milena S. Golshan they focused on understanding the rules of different communities involvement and data

sharing including contributors, consumers, and archivists. This research article aims to answer 3 main questions: Who contributes data to digital archives and why? Who consumes data and what are their needs and motivation? And the final question being what roles do archivists play in managing and disseminating data?

When I was reading this article, I managed to pick up three different methods in which they used to gather their data. The first being qualitative interviews, which in the article they conducted 27 one-on-one interviews with contributors, consumers, and archivists. The next method is transaction log analysis, which analyzes system usage logs from DANS, focusing on the behavior of contributors and consumers. And the final method is ethnographic fieldwork, which in the article they conducted in-person visits to DANS over three years, engaging with contributors, consumers, and archivists.

This looks at the practices, policies, motivations, and concerns of people involved with DANS. It explores how data sharing and reuse are supported by the infrastructure that uses the archive and what it means to manage data. DANS serves a wide range of users with data from many different fields. DANS aims for open access; it also lets contributors control who can use their data through access requests. So while the contributors and the consumers are mostly separate groups, they still show how important it is for a wide range of users. By serving as a middleman, DANS helps to bridge the gap between data contributors and consumers, even in situations where they are not in direct communication. In addition to handling the intricacies of restricted data files and finding a balance between contributors and consumers, the archive oversees data submission, processing, and access.

Article 10 – Science Communication – Juan

Association of Independent Museums. "Types of interpretation and museum displays - AIM." *Association of Independent Museums*, https://aim-museums.co.uk/museum-displays-interpretation/types-interpretation-museum-displays/. Accessed 6 October 2024.

The Association of Independent Museums' article, "Types of Interpretation and Museum Displays," describes the best practices and factors to take into account when creating effective interpretations in museums and cultural institutions. They stress that interpretation should be adaptable, always changing, and responsive to the needs of the audience. They also go over different ways to deliver and interpret content, ranging from traditional displays and labels to digital tools like QR codes, apps, and interactive exhibits to make sure that the information is interesting, educational, and accessible in a variety of formats.

This page is primarily intended for museum and heritage professionals, such as exhibit designers, museum managers, and educators, as they are the ones in charge of developing and providing visitors with an appropriate interpretation. Guidelines and best practices for delivering

information in various media are provided in this article; these could include AV presentations, object labeling, and in-person tours.

This article covers several practices that are most useful for effectively sharing knowledge. Their most effective methods include digital labels, QR codes, applications, and visuals to offer site-wide information and activities, as well as further flexibility to update content and deliver deeper information. Additionally, they advise employing AV presentations, which are short clear audio files that should be accessible with features like hearing loops and subtitles. But these aren't the only ways to improve the experience of visitors; they also recommend interactive displays that allow visitors to interact with models of replica objects or even transform them into games in order to help them relate to stories more deeply. They also recommend graphic panels for people who learn visually. The text on the panels should be brief and have an appropriate font, size, and placement to avoid overwhelming viewers with a wall of words. Alternatively, they might prefer to use in-person interpretation, where someone tells a story or perhaps a staff member dressed in costume to provide a customized experience so they can interact with visitors through demonstrations and stories, but this would require volunteers or skilled staff.

Generally speaking, what I've learned from this article is that there are a variety of ways that museums can display information. It provides a number of examples, including QR codes, apps, graphic panels, and even in-person interpretations, which helps answer our question to what extent do different methods of displaying knowledge keep garden goers engaged with the knowledge displayed?

5. Proposed Experiment

Independent variable: Different methods of displaying knowledge.

Dependent variables: Engagement of garden visitors

Controlled variables: Type of knowledge displayed
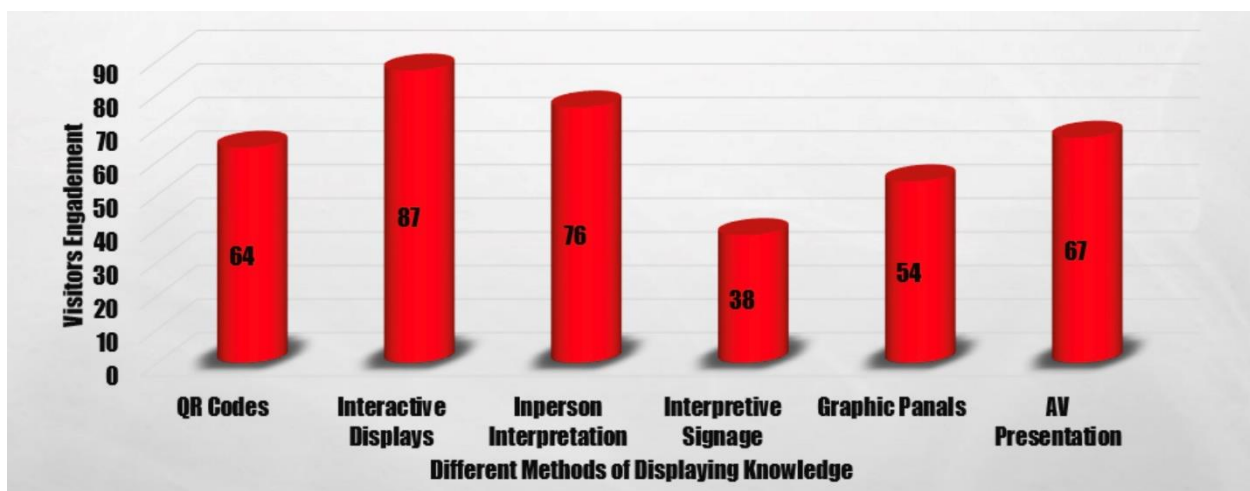
This graph shows the visitors engagement to different methods of displaying knowledge on average at museums and other educational facilities.

6. Summary and Reflections

Summary

Botanical Gardens and museum like places have important roles in education, but their potential to actually inform and educate visitors is based on presentation. We looked through different research and review articles to look into methods on how to enhance engagement, as well as looking at other issues like urbanization and "plant blindness". Our summary will look at several articles that explore these ideas, and present strategies for making botanical gardens and museums better places for education and overall increase engagement

In "*Navigating Nature, Culture, and Education in Contemporary Botanic Gardens*" by Dawn L. Sanders, she looks at the role of botanical gardens and addresses "plant blindness," ecophobia, and urbanization. In the article she advocates for expanding the gardens' roles to include education on environmental issues, conservation, and the cultural significance of plants.

The research article *"Improving Educational Functions in Botanic Gardens by Employing Landscape Narratives"* by Li-Shin Chang, Richard J. Bisgrove, and Ming-Yi Liao" explores the use of storytelling and narrative elements in botanical gardens to make them more engaging and educational. The authors conducted many experiments that ultimately showed that narrative-based approaches significantly improve visitor engagement and information retention.

"*Using QR Codes to Increase User Engagement in Museum-like Spaces*" by Pérez-Sanagustín, Denis Parra, Renato Verdugo, Gonzalo García-Galleguillos, and Miguel Nussbaum looks at how QR codes enhance and create more visitor engagement in museums and botanical gardens. The results from the experiments that the authors conducted in the article suggest that QR codes make the experiences more interactive, but it doesn't necessarily change the perceived quality of exhibits. I found this article to be very helpful as it applies to both of our projects within our research teams.

In the research article/videos "Storytelling in Information Visualizations" by Jeremy Boy, Francoise Detienne, and Jean-Daniel Fekete examine the use of narratives in data visualizations. Their research shows that storytelling can increase engagement but must be tailored to the audience to avoid alienating people who like to explore data independently. So basically, it depends on the person, on whether or not they like to explore data or need a narrative to help them engage in it better.

Overall, these articles and the other articles we explored collectively conclude that enhancing engagement and education in botanical gardens or museum-like spaces requires the integration of storytelling, interactivity, and design that is tailored to the audience.

Reflection

Overall, this project was a lot of work and we looked into many different methods of displaying knowledge. Personally, we thought that QR codes would not be as popular as they were, since typically I find that QR codes are boring and overused. But after reviewing all of the articles, QR codes seem to be a good way to engage people in less engaging content. Which I was not expecting, since I usually see a QR code and just ignore it and keep walking.

Not much changed about our research, other than the wording of our research question. Our question started as "To what extent do different methods of displaying knowledge keep Garden Goers engaged with the knowledge displayed?" but we ultimately reworded it to sound better, and it is now just "How do different methods of displaying knowledge keep visitors of Botanical Gardens engaged with the knowledge displayed?".

Even though we did not necessarily enjoy these scientific processes, we agree that they are important and helpful. This was my first research paper (Troy) and it was very helpful to learn and understand the process. I have never dug this deep into different papers to help write my own. So, I do believe it is helpful for the public to understand the different scientific processes because it can help your understanding of how things work. I am excited to see how our research can help both of our upcoming projects for our research teams.

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