

Analysis of the effects of QR code interactions within Black communities surrounding the

Missouri Botanical Gardens

Britney Lewis & Kadynce Sanders

8 December 2024

## 2. Introduction to topic

The Missouri Botanical Gardens has been lacking diversity of its patrons that interact with the Garden. The Missouri Botanical Gardens sits within an area with a rich and diverse population residing within surrounding areas. With this being said, the data shown of the people who attend the Garden does not represent the diversity within the walls of this place. It is important to the Missouri Botanical Garden that they work towards a more diverse and welcoming community that correctly represents the area in which it resides, which is my group's task at hand.

Important information on our topic that is currently lacking includes data representing how many black patrons currently go to the Garden. Another unknown is how the QR codes that are currently in the Garden are being interacted with. Currently, the Missouri Botanical Garden has a system for patrons to access QR codes. "MyGuide to the Garden" is a platform currently used for QR code interaction. On September 5, all CODES students went to the Gardens to give the Interpretation team feedback on this current platform, as well as other ways they have patrons engage at the Garden. The notes made on the strengths of MyGuide were the following; "easy access, different languages available, and longevity".

QR codes are defined as, "two-dimensional codes that you can scan with a smartphone. The code contains information, usually a site address, and once you scan it, the code connects you with a resource on the web" ("Introduction to QR Codes"). These digital codes have been placed on individual tags of the plants within the perimeters of the Garden so the plants can be identified for Garden staff. In multiple groups within our research teams, the hope is to include QR codes around the Garden to increase digital engagement. As of right now, the Gardens does offer tours that are offered through their QR code database. With this being said, it was a job that appears to not be inclusive enough to catch the eye of your every day visitor as the "MyGuide" platform was highlighted by Sean for something their team had been working on improving because staff were aware that this platform needed help.

The task at hand leads to questions and unknowns that still need to be asked. The pounding question that should first be addressed is to the Garden partners asking about why the Garden doesn't appear to currently reach out to the Black communities. This is something the Garden has been struggling with considering that Tower Grove is a diverse neighborhood to be in. The CODES program is striving to help the Garden, not only to increase inclusivity, but also to help with adding the lost voices of the enslaved individuals that were owned by Henry Shaw and the Indigenous voices that have been withdrawn from the seven million plus herbarium specimens within MOBOT.

Currently, all groups are in a space where all we need to move forward is the implementation. Moving forward with our unique position in helping conquer this wall of wicked problems will hopefully be laid to rest next semester with our final CODES class, which is our implementation semester. These tasks at hand, moving forward will allow all of the CODES students to come together and work on bringing our ideas to life. That being said, the hypothesis for this experiment is the first step to tackling one of these wicked problems.

### **3. Hypothesis**

Our hypothesis is: the implementation of QR codes within the Missouri Botanical Gardens will increase the community engagement from the Black Patrons that surround the Gardens. We care about the inclusion of QR codes within the Gardens because visually speaking, Black patrons are the smallest group that have been present in the Garden which is sad considering that the Missouri Botanical Gardens is located in one of the most diverse areas.

## Review 1

Dissanayake, D. M. R., et al. "Social Media Marketing and Customer Engagement: A Review on Concepts and Empirical Contributions." *Kelaniya Journal of Management*, vol. 8, no. 1, July 2019, pp. 71–85. *DOI.org (Crossref)*, <https://doi.org/10.4038/kjm.v8i1.7592>. -**Britney**

In the digital age, social media has become a pivotal platform for businesses to engage with customers. They use social media platforms like Facebook, and Twitter; these platforms have not only expanded their outreach of marketing strategies, but they have also helped reshape how businesses and customers interact. Social media is a super effective way to promote and market, especially in today's world. It is good to understand that when times start changing we should change with it.

The main purpose of this article is to provide insights into what social media strategies work best to keep customers interested, as well as, help all businesses succeed. This article explores how different social media marketing strategies can influence customer engagement. The article also points out the successful and unsuccessful strategies and what area more research is needed to understand social media marketing better. The article explores real-world studies that have investigated the impact of social media marketing. The studies in this article reveal the effectiveness of social media and how it can significantly enhance customer engagement. It enhances engagement by giving them a sense of community and also encouraging interaction. This review also discusses different ways and types of social media platforms, such as user interaction, and content creation like YouTube videos, blogs, and much more. By trying out these different forms of social media we can determine which platform keeps customers engaged best. The challenges and limitations they faced were also addressed in this article. While social media does offer immeasurable opportunities for customer engagement, it can also require careful planning and execution to avoid things like negative feedback or things that may be ineffective.

In conclusion, the article provides an all-inclusive overview of the current state of research that is done through social media. The article also uncovers the importance of leveraging social media platforms to create meaningful interactions with customers. This review gave me a better understanding about community engagement and gave me ideas on what route to take for QR coding regarding my research question along with the Botanical Gardens. By understanding how social media marketing works we can figure out what works best for us.

The current state of MOBOT's social media has failed at reaching the community surrounding it. Our task is to help combat this disconnect between the two by assisting with the placement of where Garden information sits in these communities. Whether the disconnect is a simple miscommunication of what is needed from the community, or if the interest of wanting to visit the Garden is just not there.

## Review #2

Yu, Yinan, and Jui Ramaprasad. "Engagement on Digital Platforms: A Theoretical Perspective ." AIS Electronic Library, 2019, <https://core.ac.uk/download/pdf/301384837.pdf>.

### -Britney

In the era we live in today these digital platforms play a major role in people's social and personal lives. These different platforms allow people to communicate with one another instantly. Something else these platforms allow us to do that can sometimes be dangerous, is sharing too much information. For us to understand how people interact on these platforms we would need to look at different theories, like social presence. Social media interactions are an example of the "social presence theory". When you or another person comments on a post on Facebook or Instagram, they could respond, and that response creates a sense of social presence and the interaction feels more personal.

Clarifying the concept of engagement is one of the main purposes of this article. Another purpose of this article is to find how different theories engage on digital platforms by reviewing theories like social presence theory, gratifications theory, and network theory. We could talk about how Facebook is an app that's known for forming a community. It allows people to make groups based on their interests and their pages focus on businesses and organizations. All of this is a form of social interaction which is what the digital platforms want. This article also examines the way people use or even interact with digital platforms and being open to discussing SPT and just being connected to others can easily boost user engagement. The article states that engagement has been widely studied in different fields like sociology, social science, and others. There are many types of engagements. Platform engagement focuses on a user's degree of voluntary allocation of personal, emotional, and behavioral resources to a platform-related interaction which can involve the content, other users, or the platform itself. There is also emotional engagement which is a feeling or connection with something or someone. I feel like this one plays a big role because if a person is emotionally engaged with something, it could be meaningless and you would be promoting something that would be a waste of time.

Lastly, this review goes over the different theories and also helps develop a more effective strategy for enhancing user engagement on digital platforms by combining different insights for social presence. The Botanical garden can relate to this article because they use digital engagement for hosting of their events. For instance, if you would like to know where you're going while you are at the gardens, they have an app that will allow you to use a digital map which is a form of digital engagement. Our research question is more on the digital engagement side so this article gave me a little more insight on how to go about it.

## Research Paper #1

Durak, Dr. Gurhan, et al. "QR CODES IN EDUCATION AND COMMUNICATION." *Turkish Online Journal of Distance Education*, vol. 17, Apr. 2016, pp. 42–58, <https://files.eric.ed.gov/fulltext/EJ1097236.pdf>. -Kadynce

In this paper, the goal was to implement QR codes into learning environments to watch the effects on fifteen students attending Balikesir University. Technology has evolved fast enough to put society in a new digital age. Some thirty years ago, "phones were primarily used for making calls and sending texts" (Digital). Current day, smartphones allow for: "internet banking, paying for goods and services, browsing the internet, navigating to locations, sharing pictures and stories via social media" (Kavvadia). This vast difference in just thirty years shows just how quickly smartphones are moving, and only allows for the questioning of the unknown of where cellphones are headed in the next thirty years. The author is aspiring to engage university students into a new world of digital age. The QR codes are meant to change the way students learn. This being said, the author was seeking out the possibility of using these QR codes to help make hard topics easier for students to gather. The study was performed on the basis of a multi-step process.

The method for this topic was a case study, which is a "qualitative approach in which the investigator explores a bounded system"(Durak et al., 2016). The upside for this form of method collecting is that in a case study form, there is detailed information collected which allows for more transparency. The only criteria to be a chosen student for this study was that you must have a smartphone and internet access. The students were then placed in three subgroups, reasoning for this being that it allowed for each department to be looked at separately. Students were given the class materials with QR codes inside that led to: "web sites, applications and social networks related to the subject to be taught"(Durak et al., 2016). At the end of the study, a short interview consisting of six questions were asked to the participants. These answers prompted the researchers to believe that the hypothesis was accepted and that the students found the addition of QR codes in their learning material was helpful and enhanced the learning experience.

In conclusion, the use of QR codes is bound to make a huge impact on education. However, "it is not possible to use them without technological necessities" (Durak et al., 2016). Moving forward, QR codes can "act as a bridge linking the physical environment to the virtual environment" (Durak et al., 2016). The world of QR codes is quickly moving. Engagement in education is one of those key aspects that can add to a students learning experience. The physical engagement of a student could lead to the next revolutionary idea. This helps connect with our research question because both the Garden partners and the community members need to be educated with the impacts of QR codes so both parties know how to interact moving to the future. Once both parties are educated based on our research, bridges can be formed to make relationships.

## Research Paper #2

Shin, Dong-Hee, et al. "The Psychology behind QR Codes: User Experience Perspective." *Computers in Human Behavior*, vol. 28, no. 4, July 2012, pp. 1417–26. ScienceDirect, <https://doi.org/10.1016/j.chb.2012.03.004>. -Kadynce

The purpose of this article is to unveil the relationship between behaviors associated with QR codes. The reason this study was done was because "QR codes are rapidly gaining high levels of acceptance thanks to the wide diffusion of smartphones" (Shin, Dong-Hee, et al). This article was written in 2012 and based on the data that was collected, about 6% of smartphone users had scanned a QR code previously. As there are many upsides to QR codes, the one downside that this article highlights is "the limited interaction" (Shin, Dong-Hee, et al). The interactiveness is limited because, for a QR code to be used, the person must have a cell phone with a back camera to initiate because the QR code can't just jump out and interact with the person. When compared to other forms of interaction, for example, when there is a human standing in front of you asking questions, there is typically more pressure to answer those questions rather than just walking past.

In an attempt to understand how to increase the usability of QR codes, the team "propos[ed] a research model that incorporates various factors that influence and determine these behaviors" (Shin, Dong-Hee, et al). The factors being analyzed were the balancing aspects between QR codes and the core other factors. These unknown factors that also influence are still being studied. In the world of technology, users typically form a bias and attitude towards the product before ever interacting with it. If the behaviors surrounding the feelings of QR codes can be effectively analyzed, then the plans for how to improve QR codes can begin.

This study had four phases. First, was an in-depth interview. Those who were selected were current QR code users. The interviews gave the researchers an "overall picture of code use" (Shin, Dong-Hee, et al). Next, there were focus groups formed consisting of current QR code users, as well as, someone who will use the QR codes in the future to discuss how the QR codes are currently being used. A separate focus group was then formed with another questionnaire. This questionnaire was tested before being given out to the participants. Finally, the survey was delivered, and over 7 months, a little less than four hundred responses were received. The choice of a four step methodology led to the acceptance of the hypothesis.

The results showed that overall, QR codes are easy to use but when some extra parts or steps have to be taken, people don't want to use them because it takes too much time. Time is something that should be an upside to QR codes, not a downfall because there are apps or extra steps needed. One of the highlights of the results is, "While users might cognitively perceive the good features of QR codes, they may not intend to use those codes unless something is confirmed" (Shin, Dong-Hee, et al). The figures do not effectively show "the link between intention and behavior" (Shin, Dong-Hee, et al).

When there is trust built between consumers and the technology being used, it forms a bond and feeling of safety with information that is not shared can be conveyed to others who also struggle to trust the ever-so-evolving internet. When looking to the future, all is positive, however, this is one obstacle that needs to be tackled. That barrier is the usability of the QR codes; the author states, "Before these codes can achieve that level of popularity, developers will need to understand individual perceptions and experiences relating to social services" (Shin, Dong-Hee, et al).

This paper connects to our research question because this paper explicitly talks about how people truly feel about QR codes, whether that is the social clues given or the biases formed before interacting. All of these things play a role in how many people are interacting with the digital phenomenon of QR codes. With our question, we need to know how to flip negative feelings associated with QR codes and change that environment into one that is not scary and is instead inviting.



### Research Paper #3

Vigliaa, Giampaolo, et al. "The Determinants of Stakeholder Engagement in Digital Platforms." *Journal of Business Research*, vol. 89, 2018, pp. 404–10, <https://www.sciencedirect.com/science/article/pii/S0148296317305234>. -Kadynce

The main focus of this paper is to analyze the engagement of stakeholders. It also seeks to "investigate how the focal organization, i.e., the offline or online platform that connects stakeholders, can help maximize stakeholder engagement" (Vigliaa et al.). It has been shown that since the dramatic increase in the digital age, stakeholders have been more likely to engage with digital resources.

Research done on this analysis stands out because the "research explores an ecosystem that, indeed, embraces a much wider socio-cultural system than pure traditional stakeholder relationships such as employee/organization or supplier/organization" (Vigliaa et al.). The deep dive into stakeholder engagement was analyzed from a private Facebook group from Expo2015. The interactions of stakeholders have been compared to a game of pinball, based on the multitude of interactions that are possible. The presence of social media allows for a new form of sharing information based on comfortability. From the standpoint of a stakeholder, if there is a group full of other stakeholders or business owners, there is this sense of acceptance from the others because all members are going through the same thing. Another upside to belonging to a group such as this one, is that "social media can reflect real-world actions and practices that were started offline or they can actively represent a first initial pump priming for future real-world actions" (Vigliaa et al.). There is also a massive presence for the opportunity to network with people from across the globe.

The methodology was aimed to "portray a framework to understand the main characteristics of multi-stakeholder digital engagement" (Vigliaa et al.). This Expo2015 event was one of the best options to perform this experiment because there are millions of visitors each year. The interactions happened through "self-adjusting and service-exchange relationships with over two hundred stakeholders" (Vigliaa et al.). Results showed that the average post had seven likes and that the most common thing posted was photos. Women posted on this page about 70% compared to men. It is also given that the average post was viewed "by 87% of the stakeholders involved in the Facebook page" (Vigliaa et al.).

After analyzing the data, the researchers found that "the presence of transformation, in terms of creative resource integration in posts, is a strong predictor of compliant and interactive engagement" (Vigliaa et al.). It was found when there are areas like social media that allow stakeholders to be engaged, there is an intrigue leaving a space where the engagement is placed. It was analyzed that posts that have links had a positive impact on the engagement of those posts. Based on the data, the hypothesis was confirmed that social media does change the way people interact in marketing situations. "Stakeholder interactive engagement requires functional and rational shared content and it is enhanced when there is complementarity across stakeholders" (Vigliaa et al.). The author hoped that future research could examine the impact of the content in the Facebook posts. For the broader view, this means that the analysis would be on how the information naturally flowed through different parts of the groups of multi-stakeholders.

This article connects to our research question since one of the goals is to engage members of the community. To get more engagement from outside of the walls and bringing those people in, the drive must start with those in charge of the Missouri Botanical Garden. The stakeholders

in the Gardens have a pull that would result in a snowball effect flooding to other people and/or locations. Allowing for the stakeholders of the Missouri Botanical Gardens to openly communicate our ideas with stakeholders of their other sister locations would allow for that welcoming environment and would also help the engagement move forward.

## Research Paper #4

Miller, Gabe H., et al. "Discrimination and Black Social Media Use: Sites of Oppression and Expression." *Sociology of Race and Ethnicity*, vol. 7, no. 2, Apr. 2021, pp. 247–63. DOI.org (Crossref), <https://doi.org/10.1177/2332649220948179>. -Kadynce

The purpose of this article was to analyze the relationship between reports of discrimination and social media use among Black American adults (Miller, Gabe H., et al). Social media has become an outlet for people who have experienced the unspeakable. A sense of community is felt by the comments and likes made on vulnerable posts. The experiences of racism and discrimination in the Black community were documented and analyzed to see if social media played a positive or negative effect on the harsh times in these people's lives. Black Americans over the age of thirty are more likely to contribute financially or even volunteer for events supporting Black communities because there is a strong sense of belonging in the Black community. The reason being, that in America, Black Americans all have similar stories of their ancestors and are still dealing with the repercussions of the racism present to this day. People of color feel more comfortable speaking about racism with their loved ones (Miller, Gabe H., et al). The hypothesis had three parts, the first part was that "among Black Americans, those who report higher levels of discrimination will be more likely to 1) "report higher frequencies of social media use", 2) will be more likely to have a Facebook account, [and] will be more likely to have a Twitter account" (Miller, Gabe H., et al).

Data was collected by using telephone surveys. Participants were chosen based on a series of phone calls made five times a day. "Of 9,405 numbers contacted, the completion rate of the survey was 14%. [33%] of all numbers contacted requested follow-up calls, but did not complete the survey" (Miller, Gabe H., et al). Data showed that there is a turn to social media when discrimination occurs, but only the more severe interactions.

Results showed that there was a direct correlation between increased self-reported discrimination and the use of social media. "For every unit increase in self-reported discrimination, the odds of using social media very often increase by about [5%] percent, and the odds of never using social media decrease by [about 6%] percent" (Miller, Gabe H., et al). There was also a correlation in self-reported discrimination and the person having Facebook and Twitter. That being said, in the eyes of the authors, social media can be used effectively as an outlet for injustice and stories of racism and discrimination. When the truth about someone's interaction with discrimination is shared, it is easier for others to feel comfortable about sharing their story, creating a domino effect. A great example of this would be the Black Lives Matter movement. This movement took social media and the world by storm. Story after story was being shared on social media causing a snowball effect of more people coming forward with evidence. This movement caused pressure to be put on those who were sentencing the police officers who caused the heinous crimes.

In conclusion, the effects of social media within the Black community give way to a welcoming and belonging space where the stories are encouraged to fight for justice. Twitter and Facebook have become platforms allowing people to bravely tell the stories of the injustices against them. Moving forward, the author is pushing for research to be placed on what those certain triggers are that centralize the "negative emotional responses in the online environment" (Miller, Gabe H., et al). If these triggers could be identified, then it could lead to a more positive atmosphere on apps like Facebook and Twitter. This paper relates to our research question

because one of the main struggles right now is to figure out what that disconnect is between the people in the community surrounding the Garden and what is being offered by the Gardens.

## Research #5

Goodman, Melody S., et al. "EVALUATING COMMUNITY ENGAGEMENT IN RESEARCH: QUANTITATIVE MEASURE DEVELOPMENT." *Journal of Community Psychology*, vol. 45, no. 1, Jan. 2017, pp. 17–32. DOI.org (Crossref), <https://doi.org/10.1002/jcop.21828>. -Britney

Community engagement plays a big role in research, particularly within public health, social sciences, as well as policy studies. Engaging with the community not only improves research with diverse perspectives. This article is about creating ways to track how involved communities are in the research projects that are brought to them. They talked about having clear methods. The article also outlines the steps to develop the measures such as gathering data, identifying key elements, and more. This article also describes the development process of a quantitative measure, as well as, highlighting the importance of community involvement. Community engagement is important because it helps make sure the research is relevant and useful to the people that are involved. When evaluating the community we can measure things like what might need improvement.

The hypothesis of this article is to create different tools that can measure how well researchers are working with the community. This means many different things, but one of them, is finding a way to measure how much the community is involved, what decisions have they made, how well they understand the form of research that is being done, and if they are happy with the whole process. By testing out different tools the researchers are capable of seeing which one works best for them and which tool is more reliable. Once they have found a tool that works for them and that is proven to work, other researchers may use them to compare and to also see how good their community engagement is and if they need to find ways to make it better.

Methods that were used in the article were the "program evaluation" which was a survey that they sent out in the year 2011 (April-May). This survey was meant to evaluate PECaD's implementation of community. There were a total of 50 community members who were selected to participate in the first cohort. This research training program lasted 15 weeks. They made sure everybody who was in this program was a community activist which I found was nice and smart because you can do anything regarding the community if the community itself isn't involved.

Lastly, the author concludes that the new and well-developed tools are both reliable and accurate in the research on community engagement. This helped researchers understand and improve on how they work by involving the community, so it can lead to more effective collaborations. This article can relate to the Missouri Botanical Gardens, as well as, our research question because, with our research question, we are aiming to have more engagement with the community. Some things that The Missouri Botanical Garden does to engage with the community are having different kinds of educational programs, as well as, special events for the community to bring them out.

## Research Paper #6

Hui, Julie, et al. "Community Tech Workers: Scaffolding Digital Engagement Among Underserved Minority Businesses." *Proceedings of the ACM on Human-Computer Interaction*, vol. 7, no. CSCW2, Sept. 2023, pp. 1–25. *DOI.org (Crossref)*, <https://doi.org/10.1145/3610180>. -Britney

The article I read was about helping minority businesses because many face barriers to digital engagement. This article covers multiple important areas and discusses the role of community tech workers, in helping minority-owned businesses overcome the digital barriers they may face. Not having enough access to fast internet or affordable tech, people feel as if companies, and the government should work together to try and help the minority-owned business. This isn't a bad idea because I feel like it starts with the youth, if anything, the older generation should be all hands in when it comes to minorities. The article also tells us how even community tech workers (CTW), which is a community member provide digital support to one another with one-on-one training.

The type of data they gathered was a survey. They surveyed 128 business owners and performed 240 hours of observations over 7 months, and they also interviewed about 8 representatives of the business support organization. Some success stories come from the data collection. There was a story about a local restaurant that was struggling to attract customers, so with the help of a tech worker, they were able to create a user-friendly website as well as implement online ordering. Despite the success, they also wanted to acknowledge the challenges that the minority business also faced like the problem I stated before. By helping the minority business, not only does it help them succeed, but it can also help boost the economy and promote community development.

When becoming an owner of a small business, the article states there needs to be technology support services. But often the small business is not aware of the resources that are available to them. There is also a small chance they are aware of the resources, but just don't have enough trust in them.

With that being said, this article tells us by investing in these different programs, we are helping minority-owned businesses succeed in this digital era, as well as, making a more inclusive economy. Some ways we can do so is by setting up websites, managing social media, and utilizing digital marketing tools. Providing hands-on help and training would help in the digital world because it would reach more customers. If the garden improved its visibility and engagement, it would have a wider audience. This digital engagement would be good for the sustainability as well as the growth.

## Science Com #1

“What Is Digital Engagement? What Drives Digital Customer Engagement?” Zendesk, 15 Apr. 2020, <https://www.zendesk.com/blog/digital-customer-engagement/>. -**Kadynce**

Digital engagement, in rough terms, is defined as the way consumers interact with other people or a product through the use of technology. The purpose of this science communication article is to show how consumers interact with digital engagement. The quickness of how fast information spreads affects all aspects of daily life, even the service community and the need to serve the people in the best way possible. This article consists of definitions, and hyperlinks to other articles. There are also customer experience guides embedded into the article multiple times to make the information different, which is a way of digital engagement.

The audience intended for this paper is those who work in the service industry. There is always a move for more digital banking, food service, etc. This being said, they want to appeal to the consumer, which is very important to this industry. In particular, the example for an audience specifically mentioned is the business owner’s goal which is to “keep their customers happy and loyal” (“What Is Digital Engagement?”).

Digital channels such as email, texting, and social media are effective ways to increase digital engagement between consumers and marketers. An important thing to keep in mind is that “Customers want to be treated as individuals, meaning they expect companies to know their preferences and purchase history” (“What Is Digital Engagement?”).

There are three different approaches provided on how to consider increasing digital engagement. One of those is to stick to the business goals that have already been set. The second approach is to dive into digital channels. Now digital channels vary from “social media marketing, live chat and messaging, paid search, and webinars” (“What Is Digital Engagement?”). The last is a “customer engagement platform” (“What Is Digital Engagement?”). This is basically where all the data is gathered on the consumers beforehand so you know what to expect. This choice allows for a customized experience for each person.

There does not appear to be bias present in this article. That is only being said because the simple digital showcasing of this topic does not appear to be a topic where bias can be present. This article helped me grasp the entirety of what exactly the project is aiming toward. This is to grasp the concept of what digital engagement is, and how to increase that to have the trust, of not only the Missouri Botanical Gardens, but also those who live in the surrounding neighborhoods. The hope is to increase engagement in the Gardens by the inclusion of QR codes within and also outside of the Gardens.

## Science Com #2

How to Close the Digital Divide in Black America | McKinsey.

<https://www.mckinsey.com/industries/public-sector/our-insights/closing-the-digital-divide-in-black-america>. Accessed 15 Sept. 2024. -**Britney**

In the world we live in today, access to technology and the internet is important for education, employment, social connections, and relationships you have with others in a sense of feeling like you belong. However, an unusual digital divide exists in Black America. Many individuals and communities lack the resources and opportunities to participate in the digital world.

The purpose of this article is to raise awareness of the disparities in access to technology and the internet within black communities. In this article, they show a graph of how “The digital divide disproportionately affects Black Americans across adoption, computer ownership, and digital skills”. 62% are black and 77% have broadband Internet access. 69% of blacks and 80% of whites own a computer, and 50% of blacks and 77% of whites have the necessary digital skills. This graph not only shows us that African Americans lack digital tools, it also shows us the lack of representation of racial income and wealth gaps.

This article uncovers lots of different information for example statistics and data they showed us the graph of digital access in black communities showing how far the digital divide goes. Case studies as well as this article did a good job of showing/giving examples of the communities that are affected by the digital divide.

I feel like the targeted audience is African Americans, Educators, the leaders of the community, technology companies, and the general public. This article is about creating ways to track how involved communities are in the research projects that are brought to them. They talked about having clear methods. The article also outlines the steps to develop the measures like gathering data, identifying key elements, and more. This helps us understand what kind of approach we would need to take when it comes to the black community and the digital divide.



## 5. Proposed Experiment -Kadynce

Our experiment is looking at the analysis of how the presence of QR codes affects engagement of the patrons. The presence of the QR codes differs based on the location of where they are, whether that is inside the walls of the Garden, or in the community. Based on our experiment, it was analyzed that within the Garden, there is overall less interactions with the QR codes compared to when placed in the community. A reason for this is that when the QR codes are placed inside the familiar place of those members of the community, there would most likely be a curiosity for what the QR code would be for. The independent variable is the location of where the QR codes are placed. The dependent variable is the number of interactions with and without the presence of QR codes.

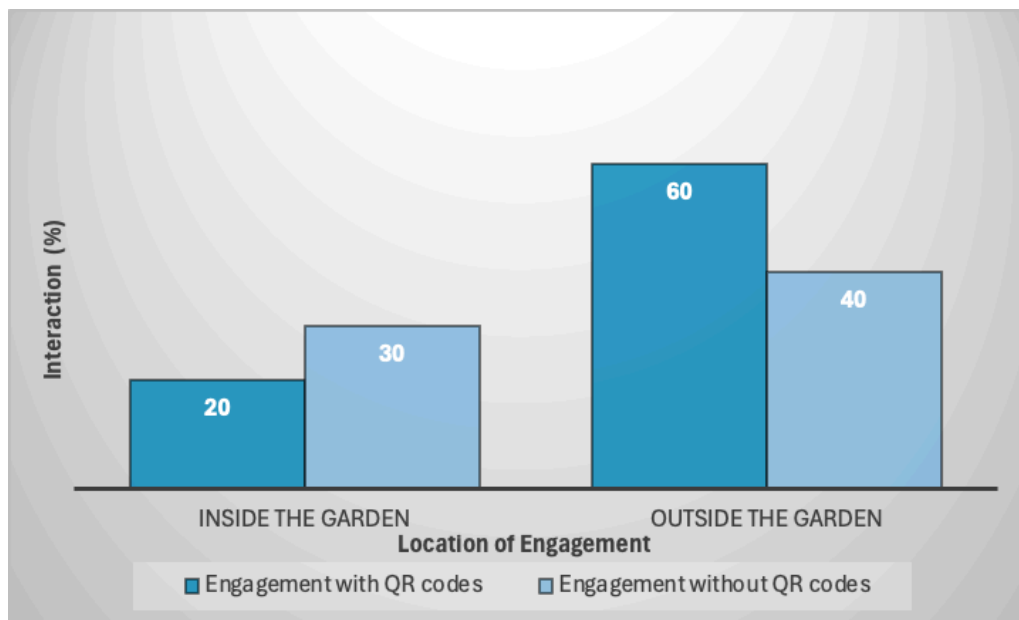


Figure 1: This figure showcases the percentages of interactions between inside and outside the Gardens, with and without the presence of QR codes.

## 6. Summary -Kadynce

Writing through all of these aspects of digital engagement has opened my eyes on how to increase engagement within the Missouri Botanical Gardens. The digital world has been revolutionizing society over the last several decades. Where we currently are with technology is just the beginning to another major boom. There is one major downside that the Missouri Botanical Gardens has seemed to struggle with, this being the lack of people using their “MyGuide”. This application is one of the Garden’s ways to implement digital engagement and technology within Garden grounds. There is also a present disconnect with the black community surrounding MOBOT. The patrons that walk the grounds do not represent the community that MOBOT sits in. This being said, with the addition of varying forms of digital engagement, these populations are bound to change. After analyzing our articles, the overall take away was that, social media platforms like Twitter and Facebook play a crucial role in peoples’ personal and professional lives. Social media has become a safe place where people can feel they belong to others who they don’t truly know. However, the feeling of belonging to a cause or feeling uplifted through your darkest times is one of the greatest things about social media.

Another take away is that QR codes are in fact helpful in learning environments and also works effectively for digital engagement. QR codes are the next step that can become this safe space to be yourself. Our hypothesis was answered; QR codes are not as complex nor set up in a similar way as a space like social media. With the presence of QR codes in the Gardens there is a strong possibility for positive engagement as long as they are implemented in the right way.

The data shown within the articles further supported our hypothesis. Most of the research papers conducted interviews with the participants. When asked about digital engagement, overall, the responses were in support of QR codes. It also appeared that there are typically better responses to digital engagement when the community is in the center of the thought process. Overall, we can come to the conclusion that when there is a safe space for those who feel the need to share their feelings so there is a connection made. So, if the Missouri Botanical Garden provided a space for those in the community to feel safe and represented, then that bridge could be built between the two. Once that gap/disconnect is fixed between the two parties, then a growing bond can be made and this relationship can move to the rest of St. Louis and then finally the Gardens patrons can represent their populations.

The next steps to address this question would have to start with having that conversation with our MOBOT partners to hear them out on what they believe the reasons for the disconnect are. Once that discussion is had with our partners, we must have a conversation with those members in the community. Our conversation with the members of the community must be open and honest. One key thing to keep in mind would be to be open minded to all options and thoughts. The only way to move forward and to increase diversity with the Garden’s patrons is for the Garden to make the first step into the community and make the Garden a space where all feel welcome.

## **Reflection- Kadynce**

The most shocking thing that was revealed by this research project was the fact that there was such a present dynamic on positive engagement. This is only said because that positive dynamic is not present in the Gardens. The digital engagement side of MOBOT is one that is on the lesser side. The disconnect that the Missouri Botanical Gardens has with their surrounding community is one that definitely needs worked on, which is why my group is working on patching up this dynamic. This project did not really change my thoughts on science, and I only say this because of the varying types of science that I already knew that existed. I believe it is very important for the public to be made aware of these forms of science. The processes of surveying and interviewing that happens in the science community is one that people in society need to be aware of so they know what to expect if they are the next ones picked. Skills I learned from working on this project in the light of formulating future research questions is how to become concise and extremely clear in a research hypothesis. Every word in that hypothesis serves a purpose, so every word must be chosen with precision. One of the wonderings I have about future experiments is about what exact factors negatively affect digital engagement and how those factors rank.

## 7. Reference Page -Kadynce

- Digital, S. Q. "The Evolution of Mobile Phones: A 30-Year Journey." Mazuma Blog, 22 May 2023, <https://www.mazumamobile.com/blog/technology/evolution-mobile-phones-30-year-journey/>.
- Dissanayake, D. M. R., et al. "Social Media Marketing and Customer Engagement: A Review on Concepts and Empirical Contributions." *Kelaniya Journal of Management*, vol. 8, no. 1, July 2019, pp. 71–85. DOI.org (Crossref), <https://doi.org/10.4038/kjm.v8i1.7592>.
- Durak, Dr. Gurhan, et al. "QR CODES IN EDUCATION AND COMMUNICATION." *Turkish Online Journal of Distance Education*, vol. 17, Apr. 2016, pp. 42–58, <https://files.eric.ed.gov/fulltext/EJ1097236.pdf>.
- Goodman, Melody S., et al. "EVALUATING COMMUNITY ENGAGEMENT IN RESEARCH: QUANTITATIVE MEASURE DEVELOPMENT." *Journal of Community Psychology*, vol. 45, no. 1, Jan. 2017, pp. 17–32. DOI.org (Crossref), <https://doi.org/10.1002/jcop.21828>.
- How to Close the Digital Divide in Black America | McKinsey. <https://www.mckinsey.com/industries/public-sector/our-insights/closing-the-digital-divide-in-black-america>.
- Hui, Julie, et al. "Community Tech Workers: Scaffolding Digital Engagement Among Underserved Minority Businesses." *Proceedings of the ACM on Human-Computer Interaction*, vol. 7, no. CSCW2, Sept. 2023, pp. 1–25. DOI.org (Crossref), <https://doi.org/10.1145/3610180>.
- "Introduction to QR Codes." Digital.Gov, 2 Feb. 2023, <https://digital.gov/resources/introduction-to-qr-codes/>.
- Kavvadia, Leanne. "How Mobile Phones Have Changed over the Past 40 Years." *Air IT*, 18 Nov. 2020, <https://www.airit.co.uk/mobile-phones-over-the-years/>.
- Miller, Gabe H., et al. "Discrimination and Black Social Media Use: Sites of Oppression and Expression." *Sociology of Race and Ethnicity*, vol. 7, no. 2, Apr. 2021, pp. 247–63. DOI.org (Crossref), <https://doi.org/10.1177/2332649220948179>.

Shin, Dong-Hee, et al. "The Psychology behind QR Codes: User Experience Perspective." Computers in Human Behavior, vol. 28, no. 4, July 2012, pp. 1417–26. DOI.org (Crossref), <https://doi.org/10.1016/j.chb.2012.03.004>.

Vigliaa, Giampaolo, et al. "The Determinants of Stakeholder Engagement in Digital Platforms." Journal of Business Research, vol. 89, 2018, pp. 404–10, <https://www.sciencedirect.com/science/article/pii/S0148296317305234>.

"What Is Digital Engagement? What Drives Digital Customer Engagement?" Zendesk, 15 Apr. 2020, <https://www.zendesk.com/blog/digital-customer-engagement/>.

Yu, Yinan and Ramaprasad. "Engagement on Digital Platforms: A Theoretical Perspective." ICIS 2019 Proceedings, Nov. 2019, [https://aisel.aisnet.org/icis2019/business\\_models/business\\_models/9](https://aisel.aisnet.org/icis2019/business_models/business_models/9).