"Sometimes things suck [but] I'm not alone": Participatory Opportunity for Women Emerging Researchers (POWER)in STEM

Batsheva Guy and Tziporah Feldman

University of Cincinnati

ABSTRACT

The purpose of this study is to understand co-researchers' experiences while conducting a Participatory Action Research (PAR) project to explore their development as a team of co-researchers and as individuals. My co-researchers and I implemented a PAR project to study the lived experiences of women in science, technology, engineering, and mathematics (STEM) majors at the University of Cincinnati to inform undergraduate research program development. The current study is a process evaluation of the PAR approach that compiles and analyzes data such as group discussions, co-researcher reflections, and my own researcher memos**.** Findings revealed that co-researchers felt that their participation in the PAR group led to learning more about the experiences of women in STEM and enhanced their perceptions of their own experiences. Co-researchers also indicated gaining substantial knowledge about a broad array of research methods and participatory techniques within the field of action research. POWER members expressed both significant relationship development between co-researchers and personal growth and goal development throughout the PAR process.

KEYWORDS

Participatory Action Research; Participatory Methods; Women in STEM; Listening Guide; Intersectionality; Arts-Based Methods

"Sometimes things suck [but] I'm not alone": Participatory Opportunity for Women Emerging Researchers (POWER)in STEM

INTRODUCTION

Participatory Action Research (PAR) is a research approach that prioritizes iterative inquiry, reflection, engaging with participants, and social justice-oriented action (Herr & Anderson, 2015; Chevalier & Buckles, 2013). Within PAR, participants are considered co-researchers, actively involved in every step of the research process, from forming research questions to collecting and analyzing data, and ultimately disseminating findings (McIntyre, 2008). Co-researchers, defined as researchers in a community of interest who collaborate with primary investigators in academia, play a crucial role in shaping the research agenda (Vaughn et al., 2017; Wynn et al., 2016).

Collaborating with co-researchers has been shown to yield richer data by gaining inside perspectives into a population's experiences (Petrucka et al., 2016). This participatory approach values the experiential knowledge that co-researchers bring to the research endeavor, providing a more nuanced understanding that might be missed in traditional research approaches. Furthermore, co-researchers who actively participate in the co-design and co-implementation of research, report feelings of empowerment, acquire valuable research techniques, and gain leadership experience (Vaughn et al., 2017; Martin et al., 2016; Lazarus et al., 2014). Critical reflections on PAR underscore the importance of ongoing reflexivity to address power imbalances, potential biases, and ethical considerations that may arise during the research process (Greenwood & Levin, 2007). This commitment to ethical practices ensures that the participatory nature of the research remains authentic, respecting the rights and well-being of all involved.

Participatory Action Research (PAR) emerges as a transformative methodology for studying women in STEM, offering a departure from traditional quantitative and qualitative methods that often overlook the nuanced experiences of women scientists. In the male-dominated field of STEM, where gender disparities persist, PAR becomes a crucial tool for fostering inclusivity, empowering women, and promoting social justice. By treating participants as co-researchers, PAR not only validates their lived experiences but also allows them to actively shape the research agenda, ensuring that the study addresses their unique challenges, aspirations, and contributions (Gaskins et al., 2023).

Women in STEM often face systemic barriers, and conventional research approaches may not fully capture the complexities of their journey (Bloodhart et al., 2020). Collaborating with co-researchers facilitates a more in-depth exploration of the challenges and successes experienced by women in STEM, providing richer data that unveils the intricacies of their professional and personal lives. Beyond the academic benefits, such a participatory approach empowers co-researchers,

equipping them with valuable research skills, fostering leadership qualities, and instilling a sense of ownership in the research process (Guy & Arthur, 2021).

Moreover, PAR's emphasis on ethical practices ensures that the participatory nature of the research remains authentic, safeguarding the rights and well-being of all involved. In the realm of women in STEM, where issues of gender equity and representation are pivotal, PAR emerges as a potent methodology to amplify the voices of women, dismantle barriers, and pave the way for a more inclusive and equitable scientific community (Arthur & Guy, 2020).

The purpose of the current study is to understand co-researchers' experiences while conducting a PAR project to explore their development as a team of co-researchers and as individuals. My co-researchers and I implemented a PAR project to explore the lived experiences of women in STEM at the University of Cincinnati (UC) to inform undergraduate research program development. Because PAR values both process and product, this paper focuses not on the findings from the PAR project itself, but on co-researchers' perceived development and learning through conducting a PAR study. This study is a process evaluation of the PAR approach that compiles and analyzes data such as group discussions, co-researcher reflections, and my own researcher memos. Its purpose is to assess the development of the co-researchers as a whole and as individuals. For the process evaluation, this study utilizes a PAR framework alongside reflective practice to conduct the process evaluation, fostering collaborative engagement and methodological rigor, as well as emphasizing its significance in capturing the dynamic process of learning and change experienced by participants throughout and alongside their engagement in the project.

Understanding Intersectionality
Intersectionality, a term coined by legal scholar Kimberlé Crenshaw in 1989, refers to the interconnected nature of social categorizations such as race, class, and gender as they apply to an individual or a group, creating overlapping and interdependent systems of discrimination or disadvantage (Crenshaw, 2013). In the context of this study, introducing the concept of intersectionality is crucial for understanding the nuanced and complex experiences of women in the STEM fields.

Women's experiences in STEM are not homogenous, and intersectionality provides a lens through which to examine the unique challenges faced by women who navigate multiple layers of identity, including race, ethnicity, socioeconomic status, sexual orientation, and more. Intersectionality recognizes that these intersecting social categories can compound and influence the opportunities and barriers individuals encounter within the STEM disciplines (Espinosa, 2011). For example, a woman of color may face distinct challenges that differ from those of a white woman in STEM, highlighting how systemic inequalities based on race intersect with gender disparities (Armstrong & Jovanovic, 2017). Similarly, the experiences of LGBTQ+ women or women with disabilities within the STEM community may present additional hurdles shaped by the intersection of multiple identity factors (Cech & Waidzunas, 2021; Metcalf et al., 2018)).

By introducing intersectionality into the discussion, we gain a more comprehensive understanding of the varied experiences and disparities among women in these fields. This approach helps to move beyond a monolithic perspective on gender and STEM, acknowledging and addressing the diverse and intersectional nature of women's identities and challenges in the pursuit of careers in science, technology, engineering, and mathematics (Eason et al., 2023).

Research Questions
This process evaluation answers the following two research questions:
1. How do co-researchers perceive their learning as a result of the PAR project to understand both PAR and the experiences of women/women of color conducting/seeking UG STEM research?
2. How do the co-researchers view their experiences with PAR?

METHODS
Participants
Participants included the undergraduate co-researchers of a participatory research group at UC, Participatory Opportunity for Women Emerging Researchers (POWER) in STEM (n=6). Co-researchers were recruited through various email lists across the university, such as the undergraduate research office, and through targeting introductory STEM courses. Due to participants' schedules with their current research and work responsibilities, not all co-researchers were able to participate every semester. Table 1 includes co-researcher demographics. Table 2 includes information regarding the extent that which each co-researcher participated in POWER in the various phases of data collection in POWER from the beginning of the group in Fall 2016 through Spring 2017. The data collection for the PAR project itself included two qualitative, participatory methods, Group-Level Assessment (GLA) and Future Creating Workshop (FCW), two arts-based methods, Photovoice and Collage Inquiry, and a participatory group analysis session.

In our study, the incorporation of qualitative participatory methods (Group Level Assessment - GLA) and Future Creating Workshop (FCW) alongside arts-based methods (Photovoice and Collage Inquiry) reflects a deliberate choice to employ diverse approaches that offer unique strengths in capturing nuanced aspects of the co-researchers' experiences in STEM. The decision to adopt these distinct methodologies was driven by a commitment to a comprehensive and participatory understanding of the research phenomena, recognizing that different methods can illuminate different dimensions of knowledge.

Qualitative participatory methods, such as Group Level Assessment (GLA) and Future Creating Workshop (FCW), were selected for their capacity to facilitate collaborative discussions and introspective exploration. GLA involves structured group discussions guided by predetermined prompts, encouraging co-researchers to reflect collectively on their experiences (Vaughn & Lohmueller, 2014). FCW, or Future Creating Workshop, is a visual and interactive method where participants use visual prompts and creative elements to project their future aspirations and challenge (Guy & Feldman, 2021; Brydon-Miller et al., 2016). These methods provide a space for co-researchers to articulate their thoughts, share insights, and

collectively construct a narrative that captures the multifaceted aspects of their experiences in STEM.

Arts-based methods, including Photovoice and Collage Inquiry, were integrated to leverage visual and creative expressions in data production. Photovoice involves participants capturing images that represent their lived experiences (Griebling et al., 2013; Kessi et al., 2019), and Collage Inquiry invites co-researchers to create visual compositions reflecting their perceptions and emotions (Capous-Desyllas, 2014; Butler-Kisber & Poldma, 2011). These methods tap into the power of visual storytelling and creative expression, enabling co-researchers to communicate aspects of their experiences that may be challenging to convey through traditional verbal means (Guy & Rogers, 2022).

The study embedded these methods as integral components of the research activities. Co-researchers were actively involved in co-designing and co-implementing these methodologies. Workshops and training sessions were conducted to familiarize participants with each method, ensuring a shared understanding of their purpose and processes. The participatory nature of these methods allowed co-researchers to influence the direction of discussions, shape the visual representations, and collectively analyze the generated data.

Qualitative participatory methods, GLA and FCW, provided a structured yet flexible platform for group reflection, fostering a shared understanding of experiences. Arts-based methods, on the other hand, offered a creative outlet for co-researchers to express themselves visually, tapping into emotions and perspectives that might not be fully captured through verbal means alone. Overall, the adoption of these diverse methodological approaches aimed to harness the strengths of each method, providing a rich and multifaceted portrayal of the co-researchers' experiences in STEM. The integration of qualitative participatory and arts-based methods contributed to a holistic and participatory understanding, empowering co-researchers to actively shape the research process and articulate their experiences in a manner that goes beyond traditional qualitative data collection approaches.

Table 1:*Co-Researcher Names & Demographics*

Co-researcher	Year in school	Major	Race/Ethnicity
Natasha	1	Biological Sciences	White
Emma	2	Education, Psychology minor	White
Alice	2	Chemical Engineering	Black
Jessica	3	Biological Sciences	White
Molly	4	Biomedical Engineering	White
Tracie	4	Psychology	Appalachian

Notes. Co-researchers were given the option to select their own pseudonym. Year in school indicates each co-researcher's undergraduate year upon onset of POWER. Tracie self-identified as Appalachian when identifying her Race/Ethnicity.

Table 2*: Co-Researchers' Level of Participation in POWER*

Co-researcher	GLA	FCW	Photovoice	Collage Inquiry	Participatory Analysis
Natasha	X	X	X	X	X
Emma	X	X		X	X
Alice	X	X			X
Jessica	X	X	X	X	X
Molly	X	X			
Tracie	X	X	X	X	X

Notes. Co-researchers were given the option to select their own pseudonym.

Data Collection
Data collection included compiling notes from bi-weekly meeting discussions, written co-researcher reflections, and my own written memos. Co-researcher commitment was between 2-3 hours per week on average.

Group Discussions. During POWER in STEM bi-weekly meetings, an assigned note taker, one of the co-researchers, took notes on discussion topics, which included action research training, literature on qualitative and arts-based methodologies, and relevant studies surrounding women/women of color in STEM. I also reflected on the meetings and wrote up memos following each meeting. Memoing is a key aspect of qualitative data collection and analysis (Birks, Chapman, & Francis, 2008), and it is central to situating the research and documenting the data collection process (Herr & Anderson, 2015; Birks et al., 2008; James, Milenkiewicz, & Bucknam, 2007). The memos were written as both notes and reflections and included a combination of description of meetings and projects and interpretation of discussions (Birks et al., 2008).

Co-Researcher Reflections. Coghlan and Brannick (2010) emphasize the importance of reflection during the action research process, including the maintenance of a research journal, which can function to sustain record keeping

throughout the research process and also allow the researcher to self-evaluate. The current project involved my own reflections throughout the project with co-researchers, both in writing and verbally to the co-researchers. Following each semester with the group, the POWER in STEM co-researchers wrote a guided reflection of their experiences with PAR by responding to the following prompt:

"Please take some time to reflect on the POWER experience so far. You may simply free write, or consider all or some of the following questions:

- What have you learned from being a part of this participatory action research project?
- Did you experience anything that surprised you? If so, what?
- How is your experience different from what you expected?
- What impacts the way you view the situation/experience? (What lens are you viewing from?)
- What did you like/dislike about the experience?
- What did you learn about participatory action research?
- What are some questions that came up for you (future research questions, clarifying questions, etc)?
- What direction do you see this project going? Can you see yourself further engaging in participatory action research?"

Data Analysis
Bi-weekly discussion notes, co-researcher reflections, and my memos were thematically analyzed and integrated (Bazeley, 2012; Braun & Clarke, 2006) through the implementation of the Listening Guide (Doucet & Mauthner, 2008) as a tool for thematic analysis. According to Braun and Clarke (2006), a thematic analysis is meant to identify patterns within a qualitative data set. Thematic analysis involves a systematic method of creating codes, searching for and generating themes, followed by describing and identifying the themes (Braun & Clarke, 2006). I used the Listening Guide (Doucet & Mauthner, 2008) as a tool to thematically analyze co-researchers' written reflections. The Listening Guide technique involves multiple readings of a single narration to elicit multiple aspects of the co-researchers' experiences (Doucet & Mauthner, 2008). The Listening Guide offers a holistic and systematic analysis of narratives that leads to an understanding of not only the content, but also a reflection on how the content can be better understood.

To conduct my analysis, I printed out all the meeting notes and reflections and followed the Listening Guide, using my memos as a supplement to follow along with my thoughts throughout the meetings and PAR process. The Listening Guide process involved four readings: 1) a reflexive reading, 2) searching for "I" statements, 3) reading for relations, and 4) focusing on power relations (Doucet & Mauthner, 2008). The reflexive reading involved answering the question "what is happening?" whereby I read for recurring themes and the dominant narrative (Doucet & Mauthner, 2008). During the second reading, I read for statements in which the co-researcher referred to herself using "I" statements, which signals the way the co-researcher perceives herself, in this case within POWER. The third reading encompassed reading for both "social networks" and "close and intimate relations" (p. 406) that signal the co-researcher's relationships in POWER (Doucet &

Mauthner, 2008). During the fourth and final reading, I focused my attention on power relations that the co-researcher alluded to, such as within the STEM climate at the university (Doucet & Mauthner, 2008).

I color-coded each reading with colored highlighters and made notes in the margins. Following the Listening Guide process, I created an initial set of codes and uploaded the documents into Dedoose, a qualitative coding software. I began to thematically analyze the data while updating and condensing the codes. The process involved assigning phrases and statements to the initial codes, updating and adding codes if something new came up, searching for themes, and defining the themes (Braun & Clarke, 2006). I then divided the themes based on the research question each addressed, which are outlined and discussed below.

Ethical Considerations
In PAR ethical considerations are pivotal due to its collaborative and transformative nature. Key ethical considerations include issues of power dynamics, inclusivity, informed consent, and the potential impacts of research actions on participants and the broader community (Brydon-Miller, 2008). We identified and addressed each ethical consideration via the creation of a structured ethical reflection, which allows researchers to systematically develop an ethical framework that is based on a value system that aligns with PAR tenets (Guy & Feldman, 2023).

In the context of the current project, addressing power dynamics was a critical consideration. The collaborative nature of PAR inherently involves various stakeholders, each with their own perspectives and levels of influence. Ensuring an equitable distribution of power, giving marginalized voices equal weight, and fostering an atmosphere of shared decision-making were crucial in upholding ethical standards. This required continuous reflection on the researcher's role and acknowledgment of potential biases that could influence the research process (Brydon-Miller et al., 2015).

Inclusivity was another paramount ethical consideration. The PAR approach emphasizes the involvement of diverse participants, representing different backgrounds, experiences, and viewpoints. It was imperative to create a space where all participants felt valued and had the opportunity to contribute to the research process. This involved actively seeking out and addressing any barriers that could hinder the inclusion of certain voices, ensuring that the research was representative and respectful of the community it aimed to understand.

In terms of informed consent, the project prioritized transparency and communication. Participants were provided with clear information about the research objectives, methods, and potential outcomes. Ongoing communication was maintained throughout the project, allowing participants to make informed decisions about their involvement and to withdraw at any stage without facing repercussions.

The decision to focus on co-researchers' reflection practices as a methodological approach was deeply intertwined with these ethical considerations. By emphasizing

reflection as a process and space to engage with their POWER research experiences, the study aimed to empower co-researchers to critically assess their roles, contributions, and the broader implications of the research. This methodological choice aligned with the ethical principles of promoting participant agency, acknowledging their expertise, and fostering a continuous dialogue to address any emerging ethical concerns.

Through regular check-ins, feedback sessions, and reflexive discussions, the research team actively monitored and adapted to ethical considerations. This iterative process allowed for the identification of potential ethical challenges in real-time, enabling the implementation of responsive strategies to uphold the integrity and ethical standards of the PAR project. Overall, the commitment to ethical practices was not only a procedural requirement but also a fundamental aspect of cultivating a genuinely participatory and socially responsible research environment.

FINDINGS

Data revealed that co-researchers perceived significant learning through participating in PAR, and they indicated significant personal growth and relationship-building through their experience. Findings are separated by the two overarching research questions presented previously, and quotes from bi-weekly meeting notes and co-researcher reflections are included to describe salient themes that arose as answers to these two questions. Thoughts from my written memos are also represented in answering the research questions.

Research Question 1: How do the co-researchers perceive their learning as a result of the PAR project?

Co-researchers expressed learning in two main areas: "Women in STEM" and "Research Experience". Co-researchers expressed that through participating in POWER, they gained new insights about the lived experiences of both women/women of color in STEM. Co-researchers also indicated that they learned a great deal about different research techniques and methods, and they feel that they now have a good grasp of both action research and qualitative research methods.

Women in STEM. Through participation in this PAR project, co-researchers indicated heightened awareness and new knowledge surrounding the experiences of women/women of color in STEM fields. Throughout biweekly meetings, I observed that participants were starting to share examples from their own lives more often from their participation in POWER. As Jessica explained in her end of semester reflection, "the part about this experience that surprised me those most is what being observant has led to." Jessica expanded upon this, reflecting:

> "Before participating in POWER, I didn't pay much attention to the STEM environment's treatment of women or their behavior; however, since I began taking part in POWER and having those discussions, I've become aware of several harmful behaviors exhibited in the STEM fields both by women and against them."

Jessica brought this increased awareness up in our group discussion, as well, sharing an example of a class she was taking that was co-taught by a male professor and woman professor. Jessica explained that she noticed the woman was treated unfairly as compared to the man, stating, "I am noticing things like that now."

Prior to data collection within POWER, I facilitated discussions about literature surrounding the experiences of women in STEM. In my memos, I noted that once co-researchers started analyzing the GLA data, they began to notice how the literature connected to the GLA findings, for example. They even began to be surprised by the findings, given their experiences, with one woman indicating that she "didn't realize how important mentorship was, even working in a mentorship program." Jessica reflected on what she learned about women in STEM from the GLA process:

> "It was an eye-opening experience to see how my fellow peers at collegiate ages can distinguish and discuss the [adversities] of being a woman in STEM. Everyone in the GLA had a contribution to the discussion, with a consensus that being a woman in STEM is a gradually increasing over the years, but is a difficulty to be successful in with a lack of mentorship, confidence, equality, opportunities and support."

Alice agreed that she learned more about the barriers that women in STEM face, given the university climate, explaining,

> "I've learned that research as a woman in STEM has been a continuous advancing and empowering opportunity from women in the field but it is still flawed on equality in the opportunities between men and women, stereotypes and a lack of external and internal factors to bring women to research in STEM."

Alice also expressed that through data collection and analysis, she learned that women in STEM have many shared experiences, such as "dealing with competition, role models, difficulty, and seeking research." Molly agreed with this, stating that she was "surprised" by how much their experiences overlapped, "despite the vast difference in our majors and programs." Emma shared similar sentiments, explaining that she learned more about what the university has to offer for women in STEM: "I have learned so much this semester! I have learned a lot about the different programs that STEM offers for women and also different opinions that women in STEM have."

Tracie felt that she learned not solely about the shared experiences of women in STEM, but also about how diverse groups of women, such as underrepresented minorities, may experience the STEM field differently:

> "I think I was a little surprised at how much intersectionality played into the experiences people had. Race, gender, first gen students and immigration all seemed to play a big role in how the participants experiences research…I

truly appreciate the fact that we're returning a level of agency to a group that doesn't always have an equal platform to share their experiences."

From Tracie's statement, there is evidence that she gained information about the experiences of women in STEM and an appreciation and knowledge about PAR. Therefore, the POWER co-researchers not only learned more about the shared experiences about women in STEM, but how PAR can begin to help solve the problem at hand. Alice explained "being a part of the POWER experience has opened many insightful views on what research can accomplish in the STEM field."

Research Experience. Throughout their participation in POWER, the women gained significant research experience and learned about diverse methodologies and research approaches that they otherwise would not have gotten in their more traditional, quantitative-focused labs. The POWER co-researchers felt that through the use of PAR as an approach and utilizing participatory methods to answer real world problems, the group was progressing towards making a significant change at the university for women in STEM. Co-researchers expressed that our research group was different from their previous experiences because "in traditional research the acting part is very small, you don't really take any action." Co-researchers explained that PAR allowed them to "[use] our results to make a difference" and is "more likely to produce a result."

The co-researchers seemed to identify with and understand the action aspect of PAR, and they began "feeling that our research was making a positive change." I noticed that as the semester progressed, co-researchers became more confident discussing PAR concepts and coming up with well-informed ideas for data collection. Tracie, in particular, explained that engaging in PAR provided her with "a deeper understanding of the principles of research and its use in providing a voice to under-observed populations who may have less agency or voice associated with their daily struggles." Co-researchers also felt their values lined up with PAR, especially because, as Alice explained, "reflection and self-identification is such a vital part of the process." Natasha agreed with this, emphasizing how she appreciated "the importance of group work, reflection, and working towards a goal throughout the research experience."

The POWER co-researchers also expressed that they gained a considerable amount of experience and knowledge conducting PAR and the varied methodologies associated with a PAR approach. During our GLA debriefing discussion, one of the co-researchers described the GLA process as "very interactive, encourages people to respond fully and actually care versus having a survey in which people may just respond with full, thought through responses." Another co-researcher expressed that the GLA "gave…every participant the ability to voice their opinion," which is vastly different from the quantitative research she has experienced in which participants are "just a number." Co-researchers also felt that they learned a significant amount about analyzing qualitative data, with one woman explaining how she enjoyed the group qualitative analysis "because it's a very tactile way to organize, and one that left us with a visual, concrete representation of our conclusions, which I think is very valuable to the research process."

Co-researchers also saw the value in utilizing arts-based methods in conjunction with more traditional qualitative approaches. For example, Tracie compared her previous experience with more traditional interviewing methods to POWER's data collection methods:

> "I was thrilled at how much could be understood from projects that were generally arts-based or more interpretive, rather than the straightforward approach that comes from interviewing. I feel that a lot comes out in the process of creation that a person doesn't immediately get to in an interview setting."

Emma also shared that she "learned that… arts-based methods, are very hands on and individualistic. Everyone has their own unique experience and they are able to truly showcase this in arts-based methods." Jessica described her overall learning experience through utilizing various qualitative and arts-based methods:

> "I was a little skeptical (and ignorant) about the qualitative research methods. I didn't understand how collecting data through GLAs or Photovoice could yield any actual results, but, after participating in both methods, I grew less skeptical and aware of the value of qualitative data collection."

My personal memos indicated that the co-researchers became increasingly comfortable with qualitative data collection as we reached the end of the first semester of meeting and were equally excited to pursue arts-based data.

Learning Summary
Co-researchers perceived significant learning about both the experiences of women in STEM and research in general. Co-researchers expressed that they learned more about the barriers and support factors that women in STEM have and became more perceptive about their own experiences as women in STEM. Co-researchers also reflected learning about the overall university climate towards women in STEM. Co-researchers also explained that they gained a breadth of knowledge about both the PAR approach and a diverse array of qualitative and arts-based methods through their participation in this project.

Research Question 2: How do the co-researchers view their experiences with PAR?
Three key themes emerged regarding how the women viewed their experiences with PAR: (1) Relationship development, (2) Personal growth, and (3) Goal development. The women indicated that participating in PAR as co-researchers in a group led to increased social support and developing relationships with each other. Co-researchers expressed that they felt the PAR project led to significant achievement in terms of gathering insight into the lived experiences of women in STEM. The women in the group also developed a newfound passion for PAR and were anxious to fulfill their research goals of moving towards the "action" step of action research.

Relationship Development. Throughout the first semester that POWER met, I began to notice that the co-researchers were beginning to get to know each other and form bonds by means of their shared experience. For example, each POWER meeting began with a quick check-in, and I took note that as the meetings progressed, the check-ins became longer, and as a facilitator I had to guide the conversation back to the project. I noted in my memos that the women were getting more comfortable with each other during check-ins. They began connecting with each other through their mutual roles as research assistants, teaching assistants, and peer leaders. In their personal reflections, the women indicated this, as well. Emma expressed, "At first I didn't know how I would fit in/ provide valuable insight to the group. Overall, I have loved the experience and the other women I work with!" Natasha felt this sentiment, as well, explaining how she overcame her initial apprehension: "As I have begun to give more input, I also feel closer to the group and its purpose."

During a group discussion, POWER members agreed that it was "reassuring" to know that others are going through the same things and that amongst the POWER co-researchers they shared "similar identities in a lot of ways." Co-researchers expressed the notion that "my struggles are also your struggles" describing their shared experiences as women in STEM. At the end of the POWER's first semester, Molly described in her reflection:

> "What I like most is the opportunity to talk with other women in STEM fields. It is interesting to see what they have to say and how they feel about what I have to say about my personal experience. It is neat to see the overlap between all of our experiences, and the differences between."

Thanks to participating in POWER, Molly expressed, "I have developed many relationships, met many role models, and have interacted with many of my peers who are all contributing to how I am seeing this situation." Co-researchers felt that not only did their commonalities bring them closer, but so did the passion to achieve a common goal, including disseminating POWER's mission. Natasha shared:

> "Even when my schedule gets busy, I always look forward to meeting every Thursday. I am proud to be in this group with so many other successful women, and I love to share information about the group to other people."

Jessica shared a similar sentiment following POWER's second semester:

> "Sometimes things suck, classes are hard, peers are annoying, professors are rude, and it's been awesome having such a committed group of women to discuss those feelings with and to let me know that I'm not alone."

Personal Growth. Owing to the relationships co-researchers formed with each other, the women shared an overall sentiment of personal growth through their ongoing participation in POWER. Jessica expressed that "POWER has felt like a 'safe space' for me" that has allowed her to open up to her peers and gain confidence. Natasha also felt as if her self-esteem had improved through power, describing,

"especially focusing on arts-based methods helped me to gain confidence in my own voice and input." During POWER meetings, I noticed that co-researchers frequently made comments about how POWER was a nice break from their stressful lives, and that it was empowering to be a part of.

Members described that being a part of POWER has allowed them to express themselves through their personal experiences and become introspective, which they believed was empowering for them as women in STEM. Jessica explained how she "didn't realize how much identity was caught up in school work," and that POWER allowed her to explore her identity and personal goals. In her reflection, Tracie went on to explain:

> "I've enjoyed the sense of solidarity and belonging that exist[s] upon discussing the shared experiences we all have as women in STEM programs. I sometimes disliked the difficulty I had maintaining the appropriate distance to the topic."

The women also felt that POWER allowed them an "outlet for my frustrations" within their STEM experiences in college, which is both therapeutic and inspiring.

Goal Development. Through their participation in POWER, the co-researchers developed future research goals that they became passionate about pursuing, especially those related to taking action through PAR. Jessica reflected, "I totally can see myself engaging in action research [in the future]." Many of the women stated that they were "excited" to see the POWER group continue, and the research move forward, as a co-researcher expressed, "I feel like we have an opportunity to assess the state of women in STEM, and given more time, present an extensive picture to the University of our experiences." Tracie expressed that she wanted to continue to pursue the PAR approach in her future studies:

> "I would love to continue this kind of research. I think it's a spot-on discipline and the value they place on giving more agency to populations that traditionally don't have that is inspired and exactly where social research as a whole needs to be going."

Similarly, Alice felt that the current research project was leading to significant change, as she projected what her plans were with the group moving forward:

> "Due to our current involvement in the action research program POWER, I can see us encrypting a change in the STEM program to help women in STEM. We will be able to improve the programs based on a holistic approach to finding problems in the STEM field and then providing solutions."

The other POWER co-researchers agreed with Tracie's sentiment; they expressed that they would like to see not only the data collection and action continue for this project to build "a mentorship program for young women who want to join the STEM environment" to "target different obstacles that different women in STEM

face." They felt that this, in turn, could lead to "a more welcoming/ conducive STEM field."

Not only did the group as a whole develop research goals because of the PAR experience, but Jessica, in particular, also developed her own unique research agenda that she hopes to follow through with in her future graduate studies. Jessica expressed to me that she developed a passion for studying STEM education, stating, "through POWER…I've become really aware of the discrepancies in STEM education" and wanted to conduct her own personal research project on the topic. I am working with her on a one-on-one basis to help her obtain IRB approval and draft a survey to send to introductory science courses. Her reaching out to me demonstrated how the POWER group truly shaped her in developing her own research goals as she applies for graduate school.

Experience Summary
Co-researchers described their experience of being a part of POWER in STEM as being instrumental in relationship development, personal growth, and the development of research goals. As POWER met bi-weekly, co-researchers became closer to each other and formed a tight-knit group. POWER co-researchers also felt that they grew personally through their participation in POWER, such as through improving self-esteem. Co-researchers also indicated that they developed clear research goals by means of POWER activities.

DISCUSSION
The purpose of this study was to capture and understand the perceived learning and experiences of the POWER in STEM co-researchers through their participation in the PAR project. Findings revealed that co-researchers felt that their participation in POWER led to learning more about the experiences of women in STEM and enhanced their perceptions of their own experiences. Co-researchers also indicated gaining substantial knowledge about a broad array of research methods and participatory techniques within the field of action research. POWER members expressed both significant relationship development between co-researchers and personal growth and goal development throughout the PAR process. Both learning and relationship gain are reflective of the current literature, which demonstrates that participating in action research leads to significant learning (Vaughn et al., 2017; Martin et al., 2016; Lazarus et al., 2014), relationship building (Richardson, et al., 2017), and empowerment (Gordon & Edwards, 2012; Goodhart et al., 2006; McIntyre, 2003; Williams & Lykes, 2003).

Although these results are not surprising, they are especially important for the particular population of women/women of color. As Reid and Frisby (2008) explain, intersectional identities should be considered throughout action research projects. According to Houh and Kalsem (2015), it is necessary to pursue PAR initiatives in the context of intersectionality, because PAR "can reveal more sophisticated understandings of various forms of intersections" (p. 266). Therefore, the results of this process evaluation are significant given not only the population, but also the fact that co-researchers expressed their interest in exploring their intersectional identities throughout the project.

A primary contribution of this study to the overarching problem is that the involvement in this PAR project helped attend to the barriers that women/women of color in STEM face on a daily basis. As revealed in the PAR study, challenges that women/women of color in STEM face include lack of peer support and low confidence and self-esteem. Consequently, co-researchers expressed that participating in PAR helped them both develop relationships with their peers and improved their self-confidence. As such, becoming involved in PAR can be implemented to address, and perhaps even prevent, these barriers. Some of the needs of women in STEM can be met through the implementation of PAR, such as the need for external support. The POWER in STEM team implemented the need for support in their pursued action steps.

Action Defined
In the context of PAR, "action" refers to a deliberate and transformative process wherein individuals collaboratively engage in addressing real-life problems within their community or context (Mosher et al., 2014). This involves not only problem-solving but also an active commitment to social change. The action component in PAR is characterized by a cyclical process of planning, implementing, reflecting, and adjusting actions based on the insights gained, fostering an iterative and dynamic approach to addressing issues (Guy et al., 2020).

Ethical considerations in the action phase of PAR are paramount, as the collaborative nature of decision-making and implementation requires careful attention to power dynamics, inclusivity, and respect for diverse perspectives. Ensuring that all participants have an equitable voice in determining actions and acknowledging potential unintended consequences are essential ethical considerations. Additionally, addressing the potential impacts of actions on different stakeholders and marginalized groups is crucial to promoting ethical practices within the PAR framework (Guy et al., 2020; Reid et al., 2006).

The complexities of how change becomes achieved in PAR are intertwined with power relations, social dynamics, and the diverse needs of participants. Change may manifest at individual, community, or systemic levels, and navigating these complexities requires ongoing reflection and adaptation. Moreover, the PAR approach recognizes that the definition of "achievement" may vary among participants, emphasizing the importance of understanding and acknowledging diverse perspectives on success (Greenwood & Levin 2006; Reid et al., 2006).

In analyzing participants' reflections on their participation and accomplishments within the PAR approach, it becomes crucial to explore not only the tangible outcomes but also the transformative learning experiences and shifts in power dynamics (Ryan & Murphy, 2018). This reflective aspect contributes to a nuanced understanding of how change is perceived and experienced by participants, highlighting the multifaceted nature of PAR as a methodological and ethical framework.

METHODOLOGICAL REFLECTIONS

We acknowledge the diverse and significant experiences gained by women participants, emphasizing exposure to different research methodologies. This recognition provides an opportunity for methodological reflection on the various 'access points' offered by distinct research methodologies, specifically contrasting quantitative and qualitative approaches (Nielsen & Nielsen, 2006).

Quantitative methodologies, characterized by numerical data and statistical analyses, often offer structured frameworks for understanding broad patterns and trends. Quantitative methods provide co-researchers with a systematic approach to analyzing and interpreting data, enabling them to contribute valuable insights into the quantitative aspects of women's experiences in STEM, as well as develop the ability to uncover statistical patterns and trends that may inform broader discussions and interventions (Collins, 2023).

On the other hand, qualitative methodologies, involving in-depth interviews, narratives, and thematic analyses, provide a more nuanced exploration of individual experiences, allowing co-researchers to delve into the intricacies of their own stories (Charleston et al., 2014). This approach offers unique access points for understanding the qualitative aspects of participants' experiences, capturing the richness and complexity of their narratives. Our study recognizes the potential synergy between these methodologies, understanding that quantitative data can complement qualitative insights and vice versa (Slevitch, 2011). The integration of both approaches offers a more comprehensive understanding of the challenges and opportunities faced by women in STEM.

Our research is also positioned to contribute to existing work by providing opportunities to embed our findings into the broader landscape of research on women in STEM. Co-researchers, having gained expertise in both quantitative and qualitative methodologies, can contribute not only to our specific study but also engage with existing literature, adding nuance and depth to the collective understanding of gender dynamics in STEM fields.

This methodological reflection underscores our commitment to empowering co-researchers by providing them with diverse skills and access points within the research process. By offering a range of methodologies, we aim to ensure that the study's findings are robust, nuanced, and capable of contributing meaningfully to both the academic discourse and ongoing efforts to enhance inclusivity in STEM.

Considering Intersectionality

In our study, we are actively foregrounding participants' reflections on the intersectional experiences of women in STEM through a methodological emphasis on co-researchers' reflective practices. Recognizing the importance of capturing the diverse and nuanced aspects of women's experiences, particularly within the intersectionality framework, we have structured our research to provide a platform for participants to articulate and analyze their own narratives (Gaston Gayles & Smith, 2018).

Our approach involves open-ended and inclusive discussions that encourage co-researchers to explore various aspects of their identities, including but not limited to gender, race, ethnicity, socioeconomic background, and other relevant factors. By adopting an intersectional lens, we seek to unveil the complex interplay of these identity markers and how they shape participants' experiences within the STEM landscape. Our research design includes regular reflective sessions where co-researchers have the opportunity to critically engage with their own narratives and share insights into the multifaceted challenges and triumphs they face. These reflective practices serve as a space for participants to explore the intersections of their identities and articulate how these intersections influence their experiences, opportunities, and obstacles in STEM fields.

We also acknowledge the evolving nature of intersectionality and the fluidity of identities. To ensure a comprehensive understanding, our study promotes ongoing dialogue and reflexivity, allowing co-researchers to revisit and revise their reflections as their perspectives evolve. By foregrounding participants' reflections on intersectional experiences, our study aims to contribute to a more nuanced and holistic understanding of the challenges and successes faced by women in STEM. This approach aligns with the broader goal of promoting diversity, equity, and inclusion within STEM fields by recognizing and addressing the unique and intersecting factors that shape individuals' experiences in these domains.

Future Directions
Looking ahead, there is significant potential for the expansion and broader implementation of the study's framework on a university-wide scale. The establishment of several similar groups, whether organized by discipline or designed as interdisciplinary forums, holds promise for further advancing the program's impact. Creating discipline-specific groups could provide a more tailored and specialized approach, allowing participants to delve into issues and topics directly relevant to their specific field of study. This targeted focus might facilitate a deeper exploration of challenges and opportunities unique to each discipline, potentially leading to more specialized interventions and solutions.

Conversely, adopting an interdisciplinary approach, as illustrated in the current study, encourages the cross-pollination of ideas and experiences across different STEM disciplines. This broader perspective has the potential to foster a richer exchange of insights, encouraging participants to draw from diverse knowledge bases and challenging conventional disciplinary boundaries. The interdisciplinary model could be particularly valuable in promoting holistic discussions on gender dynamics in STEM, offering a more comprehensive understanding of the commonalities and variations in women's experiences across diverse fields.

In line with these future directions, we envision developing a structured guide that serves as a blueprint for creating and sustaining similar learning groups across the university. This guide would encapsulate the best practices, methodologies, and lessons learned from the current study. It aims to provide a resource that empowers university stakeholders, faculty, and students to initiate and lead their own learning groups tailored to the unique dynamics of their academic

environment.

By extending the program across the entire university, we aspire to create a network of interconnected learning communities that collectively contribute to empowering women in STEM. This expansion aligns with the broader mission of fostering inclusivity and gender equity within academic settings, ultimately creating a more supportive and enriching environment for women pursuing careers in science, technology, engineering, and mathematics.

CONCLUSION
In conclusion, our study highlights the paramount importance of fostering meaningful and equitable participation in Participatory Action Research (PAR) collaborations, particularly when engaging with co-researchers. To support and enhance their meaningful involvement, researchers must prioritize ongoing training sessions that equip co-researchers with the necessary skills and knowledge to actively contribute to the research process. Transparent communication, characterized by open dialogue and shared decision-making, is fundamental in establishing a collaborative and empowering research environment.

Recognizing and addressing the diverse needs and perspectives of co-researchers is essential. This involves acknowledging the intersections of identities, including but not limited to gender, race, and socioeconomic background, and adapting research methodologies to be inclusive and culturally sensitive. Researchers should actively seek feedback and be responsive to the evolving dynamics within the research collaboration, ensuring that the contributions of co-researchers are not only valued but also integral to shaping the research outcomes.

The success of a PAR collaboration hinges on a commitment to creating a supportive and inclusive space where co-researchers feel empowered to share their insights, challenge assumptions, and actively shape the research agenda. To end on a co-researcher's powerful quote:

> "Sometimes things suck, classes are hard, peers are annoying, professors are rude, and it's been awesome having such a committed group of women to discuss those feelings with and to let me know that I'm not alone."

By centering the voices and experiences of co-researchers, researchers can not only produce more robust and nuanced research outcomes but also contribute to the broader goal of advancing participatory and socially responsible research practices.

REFERENCES

Arthur, B., & Guy, B. (2020). " No, I'm Not the Secretary": Using Participatory Methods to Explore Women Engineering Students Experiences on Co-Op. *International Journal of Work-Integrated Learning*, *21*(3), 211-222.

Armstrong, M. A., & Jovanovic, J. (2017). The intersectional matrix: Rethinking institutional change for URM women in STEM. Journal of Diversity in Higher Education, 10(3), 216.

Bazeley, P. (2012). Integrative analysis strategies for mixed data sources. *American Behavioral Scientist*, *56*(6), 814-828.

Birks, M., Chapman, Y., & Francis, K. (2008). Memoing in qualitative research: Probing data and processes. *Journal of Research in Nursing*, *13*(1), 68-75

Bloodhart, B., Balgopal, M. M., Casper, A. M. A., Sample McMeeking, L. B., & Fischer, E. V. (2020). Outperforming yet undervalued: Undergraduate women in STEM. Plos one, 15(6), e0234685

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, *3*(2), 77-101.

Brydon-Miller, M. (2008). "Ethics and Action Research: Deepening Our Commitment to Principles of Social Justice and Redefining Systems of Democratic Practice." In The SAGE Handbook of Action Research: Participative Inquiry and Practice, edited by P. Reason and H. Bradbury, 199–210. 2nd ed. London: Sage.

Brydon-Miller, M., Gayá, P. Noone, P., Willatt, A., Book, C., Cohen, S., Nichols, A., Tetreault, L. & Williams, B. T. (2016). Pass the Parcel: The Ever Expanding Impact of Critical Utopian Action Research. Manuscript in preparation.

Brydon-Miller, M., Rector Aranda, A., & Stevens, D. M. (2015). Widening the circle: Ethical reflection in action research and the practice of structured ethical reflection. The SAGE handbook of action research, 596-607.

Butler-Kisber, L., & T. Poldma. 2011. "The Power of Visual Approaches in Qualitative Inquiry: The Use of Collage Making and Concept Mapping in Experiential Research." Journal of Research Practice 6 (2): 18.

Capous-Desyllas, M. (2014). Collage as reflexivity: Illustrations and reflections of a photovoice study with sex workers. In *Feminisms in social work research* (pp. 189-208). Routledge.

Cech, E. A., & Waidzunas, T. J. (2021). Systemic inequalities for LGBTQ professionals in STEM. Science advances, 7(3), eabe0933.

Charleston, L. J., Adserias, R. P., Lang, N. M., & Jackson, J. F. (2014). Intersectionality and STEM: The role of race and gender in the academic pursuits of African American women in STEM. Journal of Progressive Policy & Practice, 2(3), 273-293.

Chevalier, J. M., & Buckles, D. (2013). *Participatory action research: Theory and methods for engaged inquiry*. Routledge.

Coghlan, D., & Brannick, T. (2010). *Doing action research in your own organization*. Sage.

Collins, E. I. (2023). How to Do QuantCrit: A Reflexive Account of Applying Critical Quantitative Methods to a Study of Black Women in STEM (Doctoral dissertation, The University of Nebraska-Lincoln).

Crenshaw, K. W. (2013). Mapping the margins: Intersectionality, identity politics, and violence against women of color. In *The public nature of private violence* (pp. 93-118). Routledge.
https://www.taylorfrancis.com/chapters/edit/10.4324/9780203060902-6/mapping-margins-intersectionality-identity-politics-violence-women-color-kimberl%C3%A9-williams-crenshaw

Doucet, A., & Mauthner, N. S. (2008). What can be known and how? Narrated subjects and the Listening Guide. *Qualitative Research*, *8*(3), 399-409.

Eason, K., Gaskins, W., Guy, B., Martin, S., & Askarian, S. (2023). We Lose the Game Before We Start to Play: How Black Women Make Meaning of Their Experiences in Engineering Education. Journal of Black Excellence in Engineering, Science, & Technology, 1, 1-21.

Espinosa, L. (2011). Pipelines and pathways: Women of color in undergraduate STEM majors and the college experiences that contribute to persistence. *Harvard Educational Review*, *81*(2), 209-241.

Gaskins, W., Guy, B., & Arthur, B. (2023). Reflections on Implementing Participatory Action Research in Engineering. Journal of Education and Development, 7(3), 18.

Gaston Gayles, J., & Smith, K. N. (2018). Advancing theoretical frameworks for intersectional research on women in STEM. New Directions for Institutional Research, 2018(179), 27-43

Greenwood, D.J., & M. Levin. (2006). Introduction to Action Research: Social Research for Social Change. Thousand Oaks, California: SAGE publications.

Goodhart, F. W., Hsu, J., Baek, J. H., Coleman, A. L., Maresca, F. M., & Miller, M. B. (2006). A view through a different lens: Photovoice as a tool for student advocacy. *Journal of American College Health*, *55*(1), 53-56.

Gordon, S. M., & Edwards, J. L. (2012). Enhancing student research through a virtual participatory action research project: Student benefits and administrative challenges. *Action Research*, 1476750312439900.

Griebling, S., Vaughn, L.M., Howell, B., Ramstetter, C. & Dole, D. (2013). "From Passive to Active Voice:Using Photography as a Catalyst for Social Action." *International Journal of Humanities and Social Science* 3 (2): 16–28.

Guy, B. R., & Arthur, B. (2021). "I Am Not Alone": Impact of Participating in a Group-Level Assessment for Undergraduate Women Engineering Students. *ie: inquiry in education*, *13*(2), 10.

Guy, B., & Feldman, T. (2021). Deboning the Fish: Hosting a Future Creating Workshop with Undergraduate Women in STEM. *Innovative Higher Education*, 46, 591-603.

Guy, B. R., & Feldman, T. (2023). "Please Stop Bringing up Family Life; We're Here to Talk about Science": Engaging Undergraduate Women in STEM through a Participatory Action Research Project. *ie: inquiry in education*, 15(1), 8.

Guy, B., Feldman, T., Cain, C., Leesman, L., & Hood, C. (2020). Defining and navigating 'action' in a participatory action research project. *Educational Action Research, 28*(1), 142-153.

Guy, B. R., & Rogers, N. (2022). Photovoice in an Online Psychology of Gender Course: Facilitating Difficult Discussions and Increasing Student Engagement. *Feminist Pedagogy, 2*(1), 1.
Herr, K., & Anderson, G. L. (2015). *The action research dissertation: A guide for students and faculty*. Sage publications.

Houh, E. M., & Kalsem, K. (2015). Theorizing Legal Participatory Action Research Critical Race/Feminism and Participatory Action Research. *Qualitative Inquiry*, *21*(3), 262-276.

James, E. A., Milenkiewicz, M. T., & Bucknam, A. (2007). *Participatory action research for educational leadership: Using data-driven decision making to improve schools*. Sage Publications

Kessi, S., Kaminer, D., Boonzaier, F., & Learmonth, D. (2019). Photovoice methodologies for social justice. *Transforming research methods in the social sciences: Case studies from South Africa*, 354-374.

Lazarus, L., Shaw, A., LeBlanc, S., Martin, A., Marshall, Z., Weersink, K., Lin, D., Mandryk, K., Tyndall, M. W., & The PROUD Community Advisory Committee. (2014). Establishing a community-based participatory research partnership among people who use drugs in Ottawa: the PROUD cohort study. *Harm reduction journal*, *11*(1), 26.

Martin, R. E., Turner, R., Howett, L., Howard, T., Hanberg, D., Buxton, J. A., ... & Oliffe, J. L. (2016). Twelve Committed Men: the feasibility of a community-based participatory HIV-prevention intervention within a Canadian men's correctional facility. *Global health promotion*, 1757975916659045.

McIntyre, A. (2008). *Participatory action research* (Vol. 52). Sage Publications.

McIntyre, A. (2003). Through the eyes of women: Photovoice and participatory research as tools for reimagining place. *Gender, Place and Culture: A Journal of Feminist Geography*, *10*(1), 47-66.

Metcalf, H., Russell, D., & Hill, C. (2018). Broadening the science of broadening participation in STEM through critical mixed methodologies and intersectionality frameworks. American Behavioral Scientist, 62(5), 580-599.

Mosher, J., Anucha, U., Appiah, H., & Levesque, S. (2014). "From Research to Action: Four Theories and Their Implications for Knowledge Mobilization." *Scholarly and Research Communication 5*(3). doi:10.22230/src.2014v5n3a161.

Nielsen, K.A., & B.S. Nielsen. (2006). "Methodologies in Action Research." In Nielsen and Svensson (eds) *Action and Interaction Research-beyond Practice and Theory,* Shaker Publishing: Maastricht, Netherlands, (1-21).

Petrucka, P., Bassendowski, S., Goodwill, W., Wajunta, C., Yuzicappi, B., Yuzicappi, L., ... & Jeffery, B. (2016). Positive Leadership, Legacy, Lifestyles, Attitudes, and Activities for Aboriginal Youth: A Wise Practices Approach for Positive Aboriginal Youth Futures. *International Journal of Indigenous Health*, *11*(1), 177.

Reid, C., A. Tom, & Frisby, W. (2006). "Finding the 'Action' in Feminist Participatory Action Research." *Action Research 4* (3): 315–332. doi:10.1177/1476750306066804.

Reid, C., & Frisby, W. (2008). Continuing the journey: Articulating dimensions of feminist participatory action research (FPAR). *Sage handbook of action research: Participative inquiry and practice*, *2*, 93-105.

Richardson, C. G., Buxton, J. A., Pellatt, K., Mitchell, K., Durante, S. E., & Mathias, S. (2017). Naloxone and the Inner City Youth Experience (NICYE): a community-based participatory research study examining young people's perceptions of the BC take home naloxone program. *Harm reduction journal*, *14*(1), 34.

Ryan, A., & Murphy, C. (2018). Reflexive practice and transformative learning. In Ryan, A., Walsh, T., & Mayo, P. *Reflexivity and critical pedagogy* (pp. 67-87). Brill.

Slevitch, L. (2011). Qualitative and quantitative methodologies compared: Ontological and epistemological perspectives. *Journal of quality assurance in hospitality & tourism*, *12*(1), 73-81.

Vaughn, L. M., Jacquez, F., Zhen-Duan, J., Graham, C., Marschner, D., Peralta, J., ... & Cabrera, M. (2017). Latinos Unidos por la Salud: The Process of Developing an Immigrant Community Research Team. *Collaborations: A Journal of Community-Based Research and Practice*, *1*(1), 2.

Vaughn, L. M., & Lohmueller, M. (2014). Calling all stakeholders: Group-level assessment (GLA)—*A qualitative and participatory method for large groups. Evaluation review, 38*(4), 336-355.

Williams, J., & Lykes, M. B. (2003). Bridging theory and practice: Using reflexive cycles in feminist participatory action research. *Feminism & Psychology*, *13*(3), 287-294.

Wynn, T. A., Wyatt, S. B., Hardy, C. M., Walker, S. S., Thomas, T. F., Williams, A. G., & Partridge, E. E. (2016). Using community feedback to improve community interventions: results from the Deep South Network for Cancer Control Project. *Family & community health*, *39*(4), 234-241.

https://journals.lww.com/familyandcommunityhealth/abstract/2016/10000/using_community_feedback_to_improve_community.3.aspx