

PEERS: Evaluation of an Undergraduate-Led Near-Peer Community Health Mentorship Program

Tony Trabulsi¹, David Hartman¹, Vyshnavi Davuluri¹ and Dr. Andrew Kapral^{1#}

¹University of Houston

#Advisor

ABSTRACT

PEERS is a program at the University of Houston that offers a near-peer mentorship experience to high schoolers. Utilizing a project-based learning model, the program aimed to introduce under-served high school students to community health topics through a mentorship model with University of Houston undergraduates. PEERS is unique among other university mentorship programs by offering a community health learning experience through a competition format between teams of students. As part of the 2021-2022 PEERS program, students participated in reflective journaling as part of an internal program evaluation to explore the impact of PEERS on student fulfillment in three primary areas of interest including personal goals, views on community health projects, and mentorship experience. Through a manual thematic analysis approach, The PEERS leadership team analyzed 91 journal entries from over 20 high school students. Our findings indicate that the PEERS program had a positive impact on participating students, with students reporting that PEERS impacted their understanding of community health projects and empowered them to achieve their personal goals alongside the development of an enriching mentorship experience with their undergraduate mentors.

Introduction

This paper presents results from a program evaluation conducted to assess the impact of an undergraduate student-led, near-peer mentoring program on participating high school students. The authors examined responses to reflective journaling activities included in the program curriculum to assess student views and attitudes in three areas including personal goals, views on community health, and mentorship experience. The purpose of the evaluation, which was conducted by members of the program's student leadership team, was to identify connections between student attitudes and key program components, particularly those related to the project-based learning model utilized throughout the program. Results from this evaluation were used to inform modifications to program implementation and are presented here to support efforts of student leaders working to implement similar mentoring projects.

Project Engagement Encouraging Rising Students (PEERS) was an undergraduate-run near-peer mentorship program which targeted grades 9-12 in high schools and organizations across Houston (University of Houston, 2021). The year-long program was conceived in 2018 by undergraduates and supported by the University of Houston's Community Health Workers Initiative and University of Houston's Honors College. Utilizing a project-based learning model (PBL), the program aimed to introduce underserved high school students to community health topics by assigning students to actively design a health intervention project, based on the principles learned in the program.

The 2021-2022 PEERS structure consisted of University of Houston undergraduate mentors guiding teams of high school students in researching and designing their community health project. Undergraduate mentors facilitated weekly meetings at high schools with underserved students during which topics in community health were discussed. During weekly meetings, students individually journaled to reinforce their learning experiences through self-reflection and serve as an evaluation tool to track the program. Students were then divided into teams and guided by mentors to conduct research and create a project that addresses the social determinants of health and the yearly theme.

Inspired by the COVID-19 pandemic's effects on mental health, the 2021-2022 PEERS theme was: "If you had 5 million dollars, how would you improve mental healthcare in your Houston community?". Student teams were free to choose and address a topic that fell under this broad theme. At the end of the program, teams presented their projects before a panel of judges who evaluated each project and awarded prizes based on their rankings.

The primary objectives of PEERS included: (1) improving understanding of public/community health among underserved students through project-based learning education; (2) providing an enriching mentorship experience between underserved high school students in the Houston area and motivated University of Houston students; and (3) offering opportunities for personal growth, and professional and academic development to both high school students and university undergraduates. Since its inception in 2018, the program has worked with over 200 high school students and 100 undergraduates. The 2021-2022 semester saw PEERS partner with several local high schools and a nonprofit organization to deliver the program to over 40 high school students.

Background

The PEERS program model employed a project-based learning approach designed to expose students to community health topics through near-peer mentoring relationships between undergraduate and high school students. PEERS' multiple project-based learning elements provided students with substantial freedom to direct their own projects, allowed for multiple opportunities to publicly present their work, and presented ongoing opportunities to engage in metacognitive activities through reflective journaling and discussions. Each element of the program was designed to cultivate an improved learning culture around underserved students and incorporated evidenced-based practices.

Project-based learning (PBL) underpins the structure of PEERS and is a learning approach that has been used in educational programs. PBL is known to encourage an enriching learning environment among students which rivals traditional forms of learning (Balemen & Keskin, 2018; Chen & Yang, 2019; Loyens et al., 2023; Strobel & van Barneveld, 2009). Blanchard et al. (2015) evaluated *Beyond Blackboards*, an after-school program that utilizes a project-based learning approach and is similar to PEERS in terms of structure and scope. This research-based program targets a lack of awareness around Engineering among underserved middle-school students through a mentorship design involving college undergraduates and industry mentors. In a study conducted to understand the program's impact on student interest in Engineering topics, Blanchard et al. (2015) found that students who participated in the program reported gaining a greater interest in Engineering topics and a new understanding of real-world problem-solving techniques due to *Beyond Blackboards'* team-based design. These findings suggest that similar programs which utilize PBL may also have a positive impact on their target population.

Near-peer mentorship is also an important aspect of the PEERS program and has been shown to result in positive changes in awareness, knowledge, and attitudes (Dodd et al., 2022; Tenenbaum et al., 2014; Zaniewski & Reinholz, 2016). Near-peer mentorship connects mentors and mentees similar in age. In a study evaluating a STEM near-peer mentorship program at Walter Reed Army Institute of Research, Tenenbaum et al. (2014) found that mentorship experience fostered interest in STEM topics. This program also bolstered engagement among high school mentees in STEM and reinforced undergraduate mentor commitments to the STEM fields. This indicates that mentorship in similar programs may enhance the student's experience in educational programs.

The reflective journaling format PEERS employed in 2021-2022 is beneficial for improving and evaluating student experience in educational programs. Reflective writing is known to be an effective practice that reinforces and extends learning among students in educational programs while also allowing for improved program assessments (Allan & Driscoll, 2014). Ahmed (2019) utilized thematic content analysis among female students' reflective journaling to extrapolate feedback on student perception of teaching style and effective teaching strategies for students. In a study designed to measure trust building through reflective journaling among health students in an interprofessional education program, Nortvedt et al. (2019) found that students were willing to share information and make themselves vulnerable through their journal entries. Reflective journaling has been established as a useful tool for measuring and tracking attitudes among students and is an effective analysis method.

Methods

Evaluation of journal entries was conducted by the PEERS leadership team and began once the school year and PEERS program concluded for 2021-2022. The interdisciplinary evaluation team consisted of 3 undergraduate students with backgrounds in Nutrition, Psychology, Biology, and Medicine & Society. The journaling checkpoints utilized in the evaluation were designed in a staggered manner that prompted student mentees to write about their views in connection to the program goals utilizing a longitudinal question/prompt design. Each journal entry probed and tracked three target topics relevant to the PEERS program: (1) mentee personal goals, (2) views on community health projects, and (3) mentorship experience.

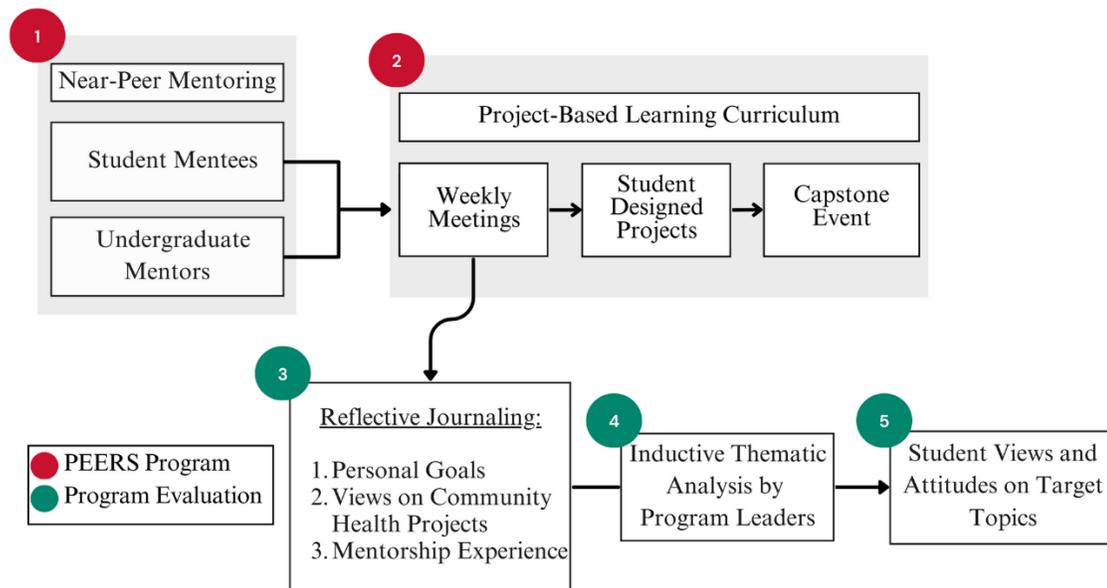


Figure 1. PEERS Program Evaluation Structure

Each target topic was evaluated at two points as part of a paired checkpoint model (e.g., checkpoints 2 and 4). Journaling occurred using Google Forms, with entries automatically organized into a Google Sheets database and kept confidential from students and mentors by PEERS leadership. Students individually journaled under the supervision of PEERS mentors at the beginning of weekly meetings for 10-15 minutes, a total of 5 times during the 2021-2022 program. Students were encouraged to write openly and candidly about their views and attitudes and assured that their responses were confidential and would not be shared with their mentors or teachers. Responses were collected from students according to the timeline below:

Checkpoint 1: Personal Goals (October 2021)

Checkpoint 2: Views on Community Health Projects (November 2021)

Checkpoint 3: Mentorship Experience (February 2022)

Checkpoint 4: Views on Community Health Projects (March 2022)

Checkpoint 5: Personal Goals and Mentorship Experience (April 2022)

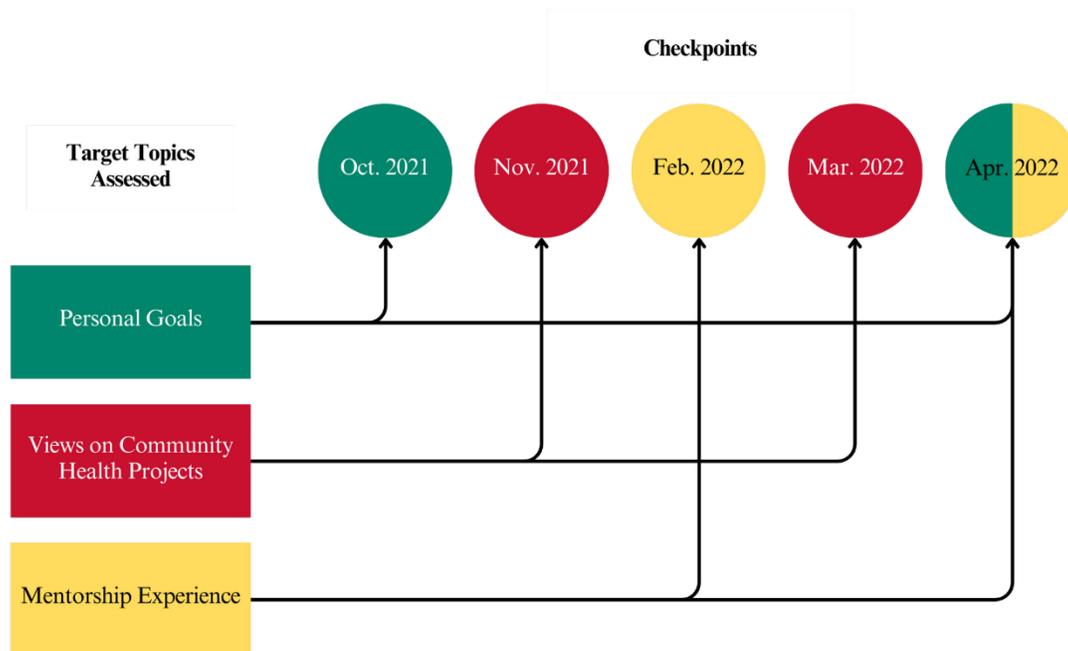


Figure 2. PEERS Evaluation Timeline

Our evaluation was performed using a thematic analysis technique. Thematic analysis is an ideal approach to analyzing broad data sets as it allows for flexibility in the analytical process yet provides a simple framework to identify and assess any themes present in data (Braun & Clarke, 2006). Specifically, we found our data suited to an inductive approach, as we chose not to construct a pre-existing coding frame and preferred a data-driven model in which the students' journal entries themselves drive a coding framework and the conclusions around the evaluation. In addition, the scope of our evaluation is well suited to a semantic or explicit analysis rather than a latent one, as we intended to summarize and discuss patterns in our data to identify significance and correlation to the PEERS program rather than take a fundamentally interpretative approach to the journal entries.

Braun and Clarke (2006) and Nowell et al. (2017) outlined a 6-phase process for an ordered thematic analysis which our evaluation team employed to evaluate our data accurately and transparently. In phase 1, each member of our team familiarized themselves with the data by making a copy of each checkpoint containing journal entries for their individual and personal review. Each member then kept a personal written record of their thoughts and attempted to identify general concepts and themes clearly evident in each writing sample across the different checkpoints. As Braun and Clarke (2006) state, phases 2 and 3 of the analysis call for generating initial codes from the data and sorting the codes into overarching themes respectively. For our purposes, we found it more suitable to overlap these phases to preserve the context of each entry. As Nowell et al. (2017) and Braun and Clarke (2006) point out, this phasic analytical process is not necessarily linear and allows for flexibility in-between the phases. Each member of our team individually generated preliminary codes and sorted them into general themes. Once the evaluation reached phase 4, each member of the team came together to discuss our notes and review the emerging themes in the data. Phase 4 was biphasic, as we first reviewed individual journal entries and codes to agree upon a unified meaning for each student's writing. After this, we then discussed each checkpoint as a whole to identify prevalent themes and ensure that the individual entries fit within the themes identified. In phase 5, the team collectively organized and identified the themes

present and reflected on their connection to the program’s objectives. Finally, phase 6 was characterized by the refinement of overarching themes and write-up of the analysis by each team member.

Results

Thematic analysis of 91 student responses (see Table 1) revealed several themes and attitudes of note linked to each of the three program objectives. For clarity, findings will be discussed and presented within the context of each target topic and also in conjunction with the checkpoint in which they emerged. Sample responses will be included along with findings which represent student attitudes.

Table 1. Count of student responses to each reflective journaling checkpoint

Checkpoint	Responses Received
Checkpoint 1	21
Checkpoint 2	19
Checkpoint 3	20
Checkpoint 4	22
Checkpoint 5	9

Personal Goals

In checkpoint 1, students were prompted to write about their personal goals. Nearly 67% of students reported that attending college was one of their top priorities. These responses were often naturally coupled with goals of graduating high-school and career ambitions. One student wrote “My personal goal is to first graduate high school, then get into a good college/university and study either to be an ultrasound technician or a vet”. While not in the majority, a subset of students shared personal goals that extended beyond their academic and professional pursuits. For example, some reported focusing on their physical health and fitness as personal goals. Other students shared their mental health struggles and discussed plans to address them. Interestingly, some students shared a desire to be more involved with their local communities. One student wrote “Another goal I have is to help others and make a difference in the community that will affect the children and teens for the better”. Although most students tended to focus on academic goals, we noted a wide variety of personal goals that spanned many passions and interests.

Checkpoint 5 followed up on the students’ personal goals and asked if PEERS has changed or impacted their goals or influenced how they view them. Nearly all students reported no change in their personal goals. One student wrote about a desire to practice activism among minority communities in checkpoint 1. In checkpoint 5, this student also reported a desire to serve communities in-need and those most impacted by social changes. Notably however, over 55% of students cited the PEERS program as having a direct impact on how they view and approach their personal goals. One student’s personal goal was to become calmer under stress. This student then stated “PEERS has guided me in a way that allowed me to become organized in a stress-free manner. I am now able to plan my events through a calendar and do my work without stressing”. Some students also cited PEERS’ mentorship aspect as what helped them approach their personal goals. One student directly stated that their PEERS mentors guided them in achieving their personal goals. Students in this checkpoint generally maintained their personal goals over time but reported that PEERS helped them gain a new perspective on their goals.

Table 2. Sample student responses to reflective journal prompts related to personal goals

Checkpoint	Sample Journal Entry	Theme(s)
Checkpoint 1	“Some personal goals I have for myself is to graduate high school in top 50 and become a forensic pathologist assistant.”	Graduate high school, Focus on career
Checkpoint 1	“Some of my goals are to get into my top choice college and get a degree in aerospace engineering. Another one of my goals is to eventually join the Airforce. When it comes to goal setting, I believe that the goals can be as large or small as you please.”	Attend college, Focus on career, Goal setting
Checkpoint 5	“No, my goals are still the same, I want to be a professional actor. PEERS has influenced me the view life difference and to stand up and go after for what I want in life.”	Focus on career, PEERS influence
Checkpoint 5	“My personal goals have not changed since last year. I probably said something about helping those in need or giving more awareness to the social changes happening. Especially right now with the only law we have to protect women’s bodies, I think it really ties into your [sic] group project.”	Activism in social issues, Connection to PEERS project

Views on Community Health Projects

Checkpoint 2 focused on the students’ views towards community health projects and prompted students to discuss why they believe some community health projects fail and who is responsible for improving a community’s health. Students in this checkpoint provided a wide variety of responses addressing why community health projects fail. The most frequently mentioned aspect was mismanagement or lack of finances, implicated in approximately 40% of student discussions. One student wrote “I feel that the reason some fail is because they [projects] don’t have enough funding to open up as a project”. Students also identified the goals and scopes of community health projects as problem areas that may impact a project’s success. Students generally said that projects fail because their intended effects are too broad and are not permanent solutions. One student wrote “Some [projects] fail because they are temporary fixes.... and can’t be done long term”. Many students also discussed consistency as a major problem, stating that many projects do not follow-through on their plans to achieve their goals. Students generally identified organization and consistency as pathways to success among community health interventions. Other concerns addressed by students included cultural and language barriers, misidentification of target populations, limited trust and participation by community members, and incompatibility with existing health interventions. Students in this section were also asked to share their views on who they believe is responsible for improving the health of a community. Over 57% of students indicated that they believe the people in a community are responsible for improving health in their own community. Many of these students also highlighted the role and importance of young people in improving community health. One student stated “I think everybody is responsible for the improvement of the health of a community because a community is a system that involves work from everybody.... I think young people carry a lot of responsibility for this because we are the future and generations after us depend on our ideas for their wellbeing”. The remaining students wrote that the government and institutions are primarily responsible for improving a community’s health. One student said “the government is responsible for everything that is involved in the community”. Some students also reported that a balance between government intervention and a community’s own efforts ultimately improve community health. One student wrote “Although the government body should be supportive in the role, the people who are apart of the community need to be responsible for themselves and their peers”. Responses in this checkpoint reflect the general views that financial issues are often responsible for community health project failure as well as an overarching belief that community members are responsible for improving the health of their own communities.

In checkpoint 4, students were asked if PEERS had changed their perspective on community health projects or who they believe is responsible for improving community health. In addition, students were also asked to share their strategy for their own PEERS project so that it does not fail. Students surveyed in this section generally reported that PEERS had no impact on their views as to why projects fail and provided a range of opinions with no one unified theme. Compared to checkpoint 2, only 31% of students highlighted mismanagement or a lack of finances as a contributor to the failure of community health projects. One student said “they [community health project organizers] use up most of the money in just the plan... but they don’t have much money to either finish it [their community health project] or just apply some money where they can grow”. However, many students reported that PEERS gave them a better understanding of community health projects. One student wrote “I believe as a result of PEERS I have gained a better understanding of the work that goes into community health projects”. On who is responsible for improving community health, over 70% of the students polled identified the people in a community as responsible. Many of the remaining students stated that both communities and government institutions are responsible for improving the health of a community. On improving health, a student said “I believe it is up to everyone. Everyone including the popular citizens and political leaders”. When it came to their own project strategy, students reported that they would generally place an emphasis on project structure and planning. One student said “I will make sure a plan is perfectly thought out and basically planned out before actually taking action and implementing a Community health project”. Some students even made mention of implementing a monitoring system, with one writing “I will make sure our project is successful by being consistent in checking up on our target group”. Journal entries in checkpoint 4 revealed that while PEERS did not significantly impact student views on why community health projects fail, it did provide students with a better understanding of projects. Additionally, the majority of students feel that communities are responsible for improving their own health and emphasized careful project planning to ensure their own project’s success.

Table 3. Sample student responses to reflective journal prompts related to views on community health projects and responsibility for improving community health

Checkpoint	Sample Journal Entry	Theme(s)
Checkpoint 2	“[Projects fail due to a lack of] Help for students Latinos or Hispanic, in Language in English in the school, or [a lack of] help a [sic] students with families and other countries, and other option is help a [sic] students with mental health as depression, or other more.”	Support for students of different backgrounds, Support for Mental Health
Checkpoint 2	“The younger generation has more of an influence on recognizing the problems present within our community. However, even though they bring the problem out to the light, it is up to the “adults” to listen and actually do something about it.”	Young people are responsible, Power dynamic in addressing community health
Checkpoint 4	“I believe we as a whole are responsible for our health in the community. We have the power to change things for the better and that is what PEERS is teaching us. All the different types of health are affected from our surroundings and how we surround ourself.”	Community is responsible for health, Sense of empowerment, Environmental influence
Checkpoint 4	“I still believe these projects fail because lack of awareness and lack of funding that people won’t help with. These projects don’t have enough funding to further help themselves...”	Interventions fail due to financial issues

Mentorship Experience

In checkpoint 3, students were asked to write about their mentorship experience and whether they felt their mentors have been helpful in explaining topics to them as well as their comfort level with regard to discussing health, college, and career advice. Approximately 60% of students surveyed in the first checkpoint indicated that they were generally comfortable with talking to their mentors and addressing a variety of topics. Students reported that their mentors were very easy to talk to and several cited the narrow age range between them as being pivotal. One student wrote “I would be comfortable talking to my mentors about all the aspects simply because they are close in age to me and they would understand what I’m experiencing since they were just in my shoes”. Approachability emerged as one of the most common themes referred to by students in addition to a general feeling of trust within each group. The remaining 40% of students expressed hesitancy to discuss topics with their mentors and share personal details. Many of these students stated that they are generally private and prefer not to share their personal thoughts or emotions. One student wrote “I really don’t like people knowing what and how I’m thinking or feeling”. However, even these students stated that they like and respect their mentors and indicated a willingness to seek out advice and develop a relationship with them. One student stated “I am aware that they are older than me and most likely wiser. I feel that if it was a need be situation, I would feel that they would provide me with great educational advice”. In general, the feedback from students in this checkpoint indicated a high level of comfort between students and mentors.

Checkpoint 5 revisited the students’ relationships with their mentors and asked if they felt more comfortable speaking with them since the beginning of the PEERS program. Over 65% of students surveyed reported that they felt more comfortable around their mentors than when previously polled in checkpoint 3. One student said “I in fact do feel as though we have become closer. We can converse very easily and be on a friendly basis. Of course, we talk about the project and ask for help but we also have conversations about other topics as well”. Nearly all students expressed positive feedback on their mentorship experience, with students describing their mentors as friendly, understanding, and helpful. Describing their mentors, one student wrote “They are helpful with the project as well and they helped us so much throughout the time we’ve been with them”. However, 35% of students polled in this checkpoint reported challenges in developing a strong relationship with their mentor group. No one unified perspective was established among this group as each student shared different reasons for their lack of connection. One student stated that they felt that their mentors were not able to answer questions effectively and often did not know much about the project. Another student said that they do not see their mentors often enough to develop a relationship stating, “I only see them once a week, so I really don’t get the chance to interact with them a lot since we have to focus on our project”. Overall, most students in checkpoint 5 reported having developed strong relationships with their mentors. However, some students felt as if their mentors were not able to connect with them due to a variety of reasons.

Discussion

Our findings show that after a thematic analysis of the students’ journals, it became apparent that student attitudes, goals, and mentorship relationship with their mentors were impacted as they progressed with PEERS over time. The degree of impact varied among the three primary topics covered, so we will explore each separately.

Table 4. Sample student responses to reflective journal prompts related to views on the mentorship experience.

Checkpoint	Sample Journal Entry	Theme(s)
Checkpoint 3	“Yes I am comfortable [with their mentor]. I’m a people person and I constant [<i>sic</i>] feel the need to know what others are thinking. Wanting to know everyone’s opinions and thoughts. My mentor is very kind and respects my thoughts.”	Comfortable with mentor-mentee relationship, Mutual respect exists between mentor and mentee
Checkpoint 3	“Yes, I do feel comfortable talking only with a mentor about advices [<i>sic</i>]... I’m the first one going to college so no one in my family knows how to help really. Having a mentor would really help me since I have no idea in what things I should do.”	Comfortable with mentor-mentee relationship, Mentors help mentees with college advice
Checkpoint 5	“I have felt comfortable since the start of PEERS. My group has always been comfortable with all the PEERS since the start. We ask a range of many questions... They are helpful with the project as well and they helped us so much throughout the time we’ve been with them.”	Comfortable with mentor-mentee relationship, Mentors help mentees understand topics
Checkpoint 5	“I feel extremely comfortable talking to my mentors. In particular... [the student’s mentors] even provided a comfortable environment that allowed me to speak about my fathers mental health. I recall telling my mentors about my dilemma in deciding a college. They then provided advice and helpful resources and information in order for me to make my decision. They also allowed me to see a new perspective in that I should be grateful for being in this position. Their words of advice were extremely helpful in allowing me to relieve my stress.”	Comfortable with mentor-mentee relationship, Mentors help mentees with life advice, Mentors help mentees with college advice

Personal Goals

Although students did not report major changes in their personal goals between checkpoints 1 and 5, clear patterns emerged in their goal setting along with a sense of empowerment around achieving their goals due to the PEERS program. We did not anticipate there to be significant changes reported in students’ personal goals over the two checkpoints, as the program did not offer formal counseling to students on goal-setting and future planning outside of casual conversations between students and mentors. Data from checkpoint 5 confirms this, as the vast majority of students reported that their personal goals had not changed after time in PEERS. Attending college and graduating high school were the most common personal goals reported by students. A focus on academics and higher education was expected, as the PEERS program likely attracts highly motivated students already interested in academic achievement. It is interesting to note that the student’s career interests were highly varied and covered a range of professions and industries. Although PEERS does not target recruitment efforts to only students with specific interests, the program’s subject matter suggests that it may only be appealing to students with comparable career interests. However, our findings suggest that the PEERS program attracts students of different personal interests and not only those interested in community health/healthcare fields. This can also be inferred as a sizable number of students discussed goals outside of career focuses and academics. Notably, several students discussed social activism as major personal goals. The connection to PEERS is evident, as the program’s subject matter heavily centers around empowering students with the knowledge to improve community health in their local communities. Many students cited improving their own mental health as a primary personal goal. This is notable as improving mental health was the central theme of the program during 2021-2022. It has been well-established that the COVID-19 pandemic and its effects, specifically social

distancing and isolation, have greatly impacted the mental health and wellbeing of students (Anderson et al., 2022; Deolmi & Pisani, 2020; Holm-Hadulla et al., 2021). Therefore, it may be that students had identified their mental health as primary focus areas for their goal setting independent of PEERS' influence. Despite not seeing change in students' self-reported personal goals throughout the school-year, a majority of students accredited the PEERS program with directly impacting how they view and approach their goals. This is significant as PEERS influence on personal goals was not expected to occur over the 2 checkpoints. Students highlighted a new-found sense of empowerment and attributed this directly to their experience in the program. At its core, PEERS aims to encourage personal, professional, and academic growth. Our findings suggest that the program shows promise in these dimensions by providing a safe environment in which students can discover better ways to learn, understand problems, manage their time, and explore their future academic and professional options.

Views on Community Health Projects

Students shared strong views on why many projects fail as well as a mostly unified belief on responsibility for community health, but also discussed several unexpected topics and strategies connected to project success and the improvement of a community's health. A surprising majority of students in checkpoint 2 expressed views that a lack of- or mismanagement of- finances are the primary elements that lead to the failure of community health projects. This was unexpected as we expected a more varied response profile due to our student population and their diverse backgrounds and experiences. Checkpoint 4 revealed that students also reported that PEERS had no impact on their views for why projects fail and that their views generally did not change. This was disappointing as we perceived student views to be limited in their perspective and wished to see growth in their opinions due to our program. This lack of change may be due to the greater focus of the program being on how to run a community health project, rather than failures in particular. However, PEERS aims to improve understanding of community health topics which includes identifying failure modes in health programs. This suggests that in the future, PEERS may need to place more emphasis on the many components that allow for the success or failure of community health projects and discuss more real-life examples. Although most students did not change their views, it was found that less students implicated financial reasons as their rationale for project failure. It is interesting that this pattern emerged after students spent time in the program, as PEERS places an emphasis on the social determinants of health and explores the structure of community health projects so that students may build their own successful project. Several students also accredited PEERS with providing them with better understanding of community health projects. This is likely due to students' exposure to project elements, design, and real-world examples. Several students discussed the scope and goals of projects and identified them as major contributors to failure. This may suggest a connection to PEERS, as students learn project organization throughout the program and how to apply it in their projects. Some students also touched on cultural and language barriers that may affect project success. As underserved students in Houston communities are the primary target population for PEERS, this finding may represent the diversity of the PEERS student body and their personal experiences.

When it came to responsibility for community health, a majority of students felt as though the community itself is primarily responsible. This pattern only became more pronounced in the following checkpoint. This positive finding was expected, as PEERS aims to empower students to take action in their own communities. Compared to checkpoint 2, responses in checkpoint 4 also elaborated more on the role of government, institutions, and the healthcare system. Students referenced a general sense of shared responsibility among communities and institutions, with no one party exclusively responsible. We also consider this a positive finding, as while PEERS aims to empower community individuals to take charge of their own health, the program emphasizes collaboration among institutions and communities to improve health outcomes. Interestingly, many students felt as though young people are responsible for the health of their respective communities. This was an interesting but unexpected finding, and may indicate a relationship between the program, young people, and community health. It should be noted that PEERS does not explicitly emphasize young people's role in community health, so it is unlikely that these views resulted from the

program. However, it may indicate that PEERS attracts students who feel a sense of responsibility for improving their community's health and wish to learn about how to take action. Our findings indicate that by participating in PEERS, students were able to learn in a way that broadened their understanding of community health projects. The PBL method utilized in PEERS assisted the mentees in reflecting on ways they could further the impact of their community health project. Similarly, this learning method allowed students to better study components of community health projects and incorporate them into their own designs.

Mentorship Experience

The student mentorship experience proved to be an overall positive experience for students, with many students reporting the development of a fulfilling mentor-mentee relationship. Checkpoint 3 journal entries indicated that a majority of students were comfortable with their mentors and open to developing a relationship. In spite of its positive implications, we did not expect such a high number of students to be so comfortable with their mentors at baseline. This may be attributable to the fact that the first checkpoint tracking mentorship (checkpoint 3) was delivered in February 2022, already several months after the program had started. It may be that students had already grown comfortable with their mentor group and begun to develop close relationships. Additionally, checkpoint 5 showed that students only grew closer in their relationships with their mentors, with the majority stating they felt more comfortable with their groups than when previously asked. This could also be seen with the reported wide range of topics students would discuss with their mentors, likely due to an increased sense of trust among the group. Students also discussed the narrow age gap between them and their mentors as a factor that allowed them to grow closer together. This is to be expected of a successful near-peer format, as it allows for the development of closer and more meaningful connections among students and mentors. The reoccurring theme of mentor approachability is also a positive sign of an effective near-peer mentorship design. Although many developed strong relationships with their mentors, some students reported finding it difficult to be comfortable around their mentors. Interestingly, these students reported being more reserved in general, particularly in checkpoint 3. This implies that, regardless of PEERS' mentorship aspects, these students find it difficult to connect socially and have unique needs and learning styles which are not all met by PEERS. Due to the program's time limitations surrounding weekly meetings and meeting frequency, students found it difficult to connect with their mentors. However, some students in checkpoint 5 reported finding it difficult to connect with mentors due to the mentors themselves. Frequently mentioned challenges included some mentors' knowledge gaps and a constrained time frame to develop a meaningful relationship. These findings are noteworthy as they provide insight into the program's weak points from a student perspective. To better address these concerns, future PEERS programs may need to better train mentors so that they are more capable of answering student questions. Additionally, an emphasis should be placed on mentors spending more time with more introverted students to provide a better experience for their unique needs. The PEERS mentorship experience was overall a strong suit of the program and facilitated a more enjoyable and helpful learning environment among students.

Limitations

Several limitations existed in this evaluation, with an inability to generalize findings to a broader population. This is because the PEERS program is designed to exclusively target underserved high school students in the Houston area. A high dropout rate was noted among student replies, specifically in checkpoint 5. Journaling also exclusively relied on online collection methods which may have impacted journal content.

Conclusion

The primary objectives of Project Engagement Encouraging Rising Students (PEERS) were to improve understanding of community health through project-based learning (PBL), provide an enriching mentorship experience, and offer opportunities for personal, professional, and academic growth and development. Through our reflective journaling evaluation design, we aimed to understand how near-peer mentorship and PBL impact the student experience of our 3 target topics of the program's objectives, including student personal goals, views on community health projects, and mentorship experience. Our findings suggest that overall, students reported the PEERS program as being a positive experience that empowered them, offered them a better understanding of community health projects, and allowed them an enriching mentorship experience with their mentor group. More work is needed to better understand the impact of PEERS on community health understanding among students as well as personal growth among students due to the program. Additionally, a future evaluation may explore the PEERS experience for undergraduate mentors and allow for a cross-evaluation between mentors and mentees to further improve the program.

Acknowledgements

The PEERS program receives support from the University of Houston Honors College and the Hewlett-Packard Enterprise Data Science Institute at the University of Houston. The authors gratefully acknowledge the support of Dr. Andrew Kapral and the cooperation of PEERS mentors and mentees, and faculty and staff at participating high schools.

References

- Ahmed, A. M. (2019). Students' reflective Journaling: An IMPACTFUL strategy that informs instructional practices in an EFL writing university context in Qatar. *Reflective Practice, 20*(4), 483–500. <https://doi.org/10.1080/14623943.2019.1638246>
- Allan, E., & Driscoll, D. (2014). The three-fold benefit of reflective writing: Improving program assessment, student learning, and faculty professional development. *Assessing Writing, 21*, 37–55. <https://doi.org/10.1016/j.asw.2014.03.001>
- Anderson, K. N., Swedo, E. A., Trinh, E., Ray, C. M., Krause, K. H., Verlenden, J. V., Clayton, H. B., Villaveces, A., Massetti, G. M., & Holditch Niolon, P. (2022). Adverse Childhood Experiences During the COVID-19 Pandemic and Associations with Poor Mental Health and Suicidal Behaviors Among High School Students — Adolescent Behaviors and Experiences Survey, United States, January–June 2021. *MMWR. Morbidity and Mortality Weekly Report, 71*(41), 1301–1305. <https://doi.org/10.15585/mmwr.mm7141a2>
- Balemen, N., & Keskin, M. Ö. (2018). The effectiveness of project-based learning on science education: a meta-analysis search. *International Online Journal of Education and Teaching, 5*(4), 849–865. Retrieved from <https://iojet.org/index.php/IOJET/article/view/452>
- Blanchard, S., Judy, J., Muller, C., Crawford, R. H., Petrosino, A. J., White, C. K., Lin, F.-A., & Wood, K. L. (2015). Beyond Blackboards: Engaging Underserved middle school students in engineering. *Journal of Pre-College Engineering Education Research, 5*(1), 2. <https://doi.org/10.7771/2157-9288.1084>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Chen, C.-H., & Yang, Y.-C. (2019). Revisiting the effects of project-based learning on students' academic achievement: A meta-analysis investigating moderators. *Educational Research Review, 26*, 71–81. <https://doi.org/10.1016/j.edurev.2018.11.001>

- Deolmi, M., & Pisani, F. (2020). Psychological and psychiatric impact of COVID-19 pandemic among children and adolescents. *Acta Bio-medica: Atenei Parmensis*, *91*(4), e2020149. <https://doi.org/https://doi.org/10.23750/abm.v91i4.10870>
- Dodd, S., Widnall, E., Russell, A. E., Curtin, E. L., Simmonds, R., Limmer, M., & Kidger, J. (2022). School-based peer education interventions to improve health: A global systematic review of effectiveness. *BMC Public Health*, *22*(1), 2247. <https://doi.org/10.1186/s12889-022-14688-3>
- Holm-Hadulla, R. M., Klimov, M., Juche, T., Möltner, A., & Herpertz, S. C. (2021). Well-Being and Mental Health of Students during the COVID-19 Pandemic. *Psychopathology*, *54*(6), 291–297. <https://doi.org/10.1159/000519366>
- Loyens, S. M., van Meerten, J. E., Schaap, L., & Wijnia, L. (2023). Situating Higher-Order, Critical, and Critical-Analytic Thinking in Problem- and Project-Based Learning Environments: A Systematic Review. *Educational Psychology Review*, *35*, 39. <https://doi.org/10.1007/s10648-023-09757-x>
- Nortvedt, L., Norenberg, D. L., Hagstrøm, N., & Taasen, I. (2019). Enabling collaboration and building trust among health science students attending an interprofessional educational project. *Cogent Medicine*, *6*(1). <https://doi.org/10.1080/2331205x.2019.1669401>
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods*, *16*(1). <https://doi.org/10.1177/1609406917733847>
- Strobel, J., & van Barneveld, A. (2009). When is PBL More Effective? A Meta-synthesis of Meta-analyses Comparing PBL to Conventional Classrooms. *Interdisciplinary Journal of Problem-Based Learning*, *3*(1). <https://doi.org/10.7771/1541-5015.1046>
- Tenenbaum, L. S., Anderson, M. K., Jett, M., & Yourick, D. L. (2014). An Innovative Near-Peer Mentoring Model for Undergraduate and Secondary Students: STEM Focus. *Innovative Higher Education*, *39*(5), 375–385. <https://doi.org/10.1007/s10755-014-9286-3>
- University of Houston. (2021, July 29). *Project Engagement Encouraging Rising Students*. PEERS - University of Houston. Retrieved September 13, 2022, from <https://uh.edu/honors/Programs-Minors/co-curricular-programs/data-and-community-health/honors-in-community-health/peers/>.
- Zaniewski, A. M., & Reinholz, D. (2016). Increasing STEM success: a near-peer mentoring program in the Physical Sciences. *International Journal of STEM Education*, *3*(14). <https://doi.org/10.1186/s40594-016-0043-2>