A Program Evaluation of a Promising Peer Tutoring Program

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I look at this juncture not as an ending, but as a beginning. I look forward to what lies before me and know that my future will be richer as a result of having gone through this experience.

Executive Summary

In 2017, the College[1] launched the Math Champions program, a peer tutoring and mentoring program that provides academic support to students enrolled in mathematics courses that have historically had low success rates. As a part of this program, students who have performed well in math are recruited to serve as "Math Champions." These Math Champions are embedded in selected sections of math courses and work with the instructor of record to support the students enrolled in the course. During class, they assist with collaborative learning activities or provide one-on-one support to students who need extra help, and they offer out-of-class tutoring to students. The Math Champions are required to meet with their faculty mentors weekly, which ensures their mastery of the course content and provides an opportunity for the faculty to offer mentorship and professional coaching to their assigned Math Champions. The college recently expanded the program to create Writing Champions who are embedded in selected English courses.

The College has experienced some early success with the Math Champions program. The program has received recognition from the Achieving the Dream (ATD) Reform Network because of the promise that it has shown in moving the needle on key student success outcomes such as course success, retention, and completion of remedial coursework (Achieving the Dream, n.d.). During an initial consultation with the college's Provost in the fall of 2021, she indicated that the institution was pleased with the potential that the Champions program holds for supporting the success and growth of its students. Noting that the college conducted a program evaluation of the Math Champions program in 2017 during its inaugural year, the Provost explained that the college was motivated to conduct an evaluation of the Champions program in

[1] Pseudonym

its current iteration to determine how effectively the program is operating, with an interest in ensuring that the program's current practices are aligned with best practices in peer tutoring program delivery. At the time of this consultation, because the organization had to grapple with maintaining its services in midst of the COVID-19 pandemic, the college also had an interest in learning about the ways in which the pandemic had impacted the program's implementation.

The purpose of this project was to 1) evaluate the Math Champions program's success in meeting its current goals and aspirational goals that are suggested by literature in the field and stakeholder feedback and 2) offer recommendations for improvement and potential program expansion. Specifically, this investigation sought to answer the following questions:

1. How effective has the Champions peer tutoring program been in meeting its current academic and affective goals?
2. What gaps do program participants perceive when comparing actual program performance to desired performance?
3. What do participants perceive to be some of the specific challenges impacting program performance?
4. What practices do participants consider to be successful elements that could be adapted by other units seeking to offer similar peer tutoring programs?

Social constructivist theories of learning undergird the program theory that serves as a foundation for the Math Champions program and provide support for the implementation strategies adopted by the program. This theoretical framework informed the development of the surveys, focus groups, and semi-structured interviews used in this study, which included questions designed to discern the nature of the relationships between the program participants and their perceptions of the learning and social gains that they made as a result of participation in

the program. Van Tiem et al. al.'s (2012) Performance Improvement/HPT model of program evaluation—a model that focuses on identifying gaps between an organization's aspirations and its actual performance in an effort to identify areas in which performance may be improved--served as the conceptual basis for the program evaluation's design and shaped the areas of inquiry included in the data collection tools.

Key Findings

Research Question 1: What are stakeholders' perceptions of the program's achievement of its academic and affective goals?

Finding 1-Stakeholder Relationships: Stakeholders' survey feedback suggested that the relationships between the tutors and students were largely supportive of the achievement of program goals; however, faculty interview respondents indicated that some tutors have difficulty making connections with students. Additionally, tutor participants in the focus groups described wide variations in the nature of their relationships with students. In the surveys, focus groups, and interviews, faculty mentors and tutors described having positive and productive working relationships.

Finding 2-Goal Attainment: A proposed chi-square analysis that would compare the course success and retention rates of students who participated in tutoring to those who did not was not possible because the institution did not have the data necessary to conduct such an analysis. Surveys administered to students, tutors, and the faculty; focus groups with the tutors; and interviews with program faculty and staff revealed stakeholder's perceptions of the program's achievement of its goals. While all program stakeholders suggested that the program has experienced some success in achieving its academic and affective goals, the tutors' and program staff's perceptions of the achievement of the program's aims were more optimistic than those of

the enrolled students, and faculty placed more emphasis on affective gains than on academic achievement when asked about program impact.

Finding 3-Tutoring Usage: A large proportion of students did not participate in the available out-of-class tutoring, and for those students who did attend tutoring, the program did not have formalized processes for tracking session attendance.

Research Question 2: What gaps do program participants perceive when comparing actual program performance to desired performance?

Finding 4-Professional Development: Program participants indicated that it would be helpful to provide additional training for the tutors in tutoring techniques, the use of Web conferencing platforms and tools, and the use of various online math instructional software packages. They also noted that there would be value in providing in-person workshops or written documentation of best practices in program delivery so that tutors and faculty mentors could learn from each other and optimize program performance.

Research Question 3: What do participants perceive to be some of the specific challenges impacting program performance?

Finding 5-Space: Program administrators and faculty pointed to the lack of a dedicated physical location near the primary math instructional spaces where the Math Champions tutors could provide tutoring and program participants could collaborate as a challenge for program delivery.

Finding 6-Variation in Program Practices: The tutors described a wide range of variation in their level of interaction with students in their assigned courses, and program administrators also indicated variations in faculty use of the tutors during class, noting that some faculty do not take full advantage of the support offered by the Math Champions tutors.

Research Question 4: What practices do participants consider to be successful elements that could be adapted by other units seeking to offer similar peer tutoring programs?

Finding 7-Embedded Tutoring: Faculty mentors and program administrators suggested that when the tutors actively interact with students during class time, they provide valuable supplemental academic support and expand faculty capacity to meet the needs of students. Math Champions faculty also noted that as the demand for online courses has increased, the Math Champions have proven to be valuable assets in monitoring classroom activity and engaging students who may be having difficulty or who are off task.

Recommendations

Based upon the findings, I offer the following recommendations for the Math Champions program:

Recommendation 1-Attendance Data Collection: The Math Champions program should develop formalized attendance tracking mechanisms to document students' participation in tutoring sessions. The program currently lacks formal processes for tracking students' utilization of the tutoring services provided by the Math Champion tutors. Developing a system for attendance tracking at the individual user level would position the program to share valuable data with institutional stakeholders, including overall usage statistics and analyses of the program's efficacy.

Recommendation 2-Service Delivery: Consider the expansion of online tutoring support and non-traditional service hours to encourage greater student use of tutoring. Students indicated that lack of time was one of the major barriers to participation in out-of-class tutoring services, and faculty and administrators noted that the college's commuter culture and students' personal and professional obligations could prohibit them from participating in tutoring. The College already

expanded online academic services during the COVID-19 pandemic. Offering additional online tutoring outside of the normal operating hours for the Learning Commons could facilitate increased student participation in tutoring.

Recommendation 3-Enhanced Support for Math Champions and Faculty Mentors: Develop a more comprehensive training protocol for Math Champions to include more pedagogical instruction and instruction in the use of various technology tools that are required to operate successfully in virtual classroom environments. Because stakeholder relationships are key in the program's understanding of how it will achieve its academic and affective goals, this enhanced training should also include efforts to help the Math Champions learn to establish productive working relationships with the students in their assigned classes. The Math Champions program could capitalize on the more intensive tutor training that is required for tutors who are hired by the Learning Commons. The training provided to the tutors in the Learning Commons is based upon the College Reading and Learning Association's (CRLA) guidelines for tutor training programs. CRLA-aligned training includes training content that is designed to help tutors learn to build rapport with students while maintaining appropriate professional boundaries. The program should also offer professional development opportunities for faculty who serve as mentors to support them in optimizing the assistance of the Math Champions who are assigned to their courses. Lastly, the program should consider the creation of a Canvas LMS community to serve as a virtual space for Math Champions and faculty mentors to share successful program strategies.

Recommendation 4-Leverage Partnerships: Capitalize on the current partnership with the Learning Commons to assist with program administration needs, such as tutor scheduling, training, and tracking of session attendance. While program participants expressed a desire to

reestablish a separate tutoring space for the Math Champions, it may be advantageous for them to focus instead on leveraging the existing partnership that they have with the Learning Commons and to continue to use the Learning Commons as the service delivery site for the Math Champions program's tutoring. This would allow them take advantage of the Learning Commons' existing tutoring infrastructure. An opportunity exists for the Math Champions program leaders and the leaders in the Learning Commons to collaborate to develop tutoring guidelines for the Learning Commons that are mutually beneficial and that may help to alleviate some of the concerns that Math Champions program participants have about service delivery rules in the Learning Commons.

Recommendation 5: Continuous Improvement Before Expansion: The program should work to improve processes and verify outcomes for the existing Math Champions program before expanding the program's delivery model into other disciplinary areas of the college. Based upon the Math Champions' feedback, there was considerable variation in the way in which Math Champions were engaged to work with students in the classroom. Their involvement with students in the classroom environment ranged from very hands-on support of learning activities to instances in which the Math Champion had no contact with the students in the classroom setting. Peer-to-peer interaction is a key variable in producing the outcomes expected in the program's theory of change. The program should work to create a more homogenous in-class experience in the Math Champions program and document these strategies before the program model is expanded into other academic areas.

Recommendation 6-Transportable Practices: The Math Champions program's practice of embedding tutors in classrooms and giving them the opportunity to assist students with learning activities one-on-one or in small groups should be considered as a transportable practice for other

areas of the college that have an interest in adopting academic support strategies that are comparable to those of the Math Champions program. The value-added by the presence of an embedded tutor in the Math Champions program is a program practice that could be equally useful in other kinds of classroom settings.

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Introduction

The completion agenda, a reference to efforts to help greater numbers of U.S. students attain college credentials, has been a major focus in higher education since 2009 when it was given greater attention by the Obama administration (Kilgore & Wilson, 2017). At the same time, some colleges and universities have removed placement testing and academic remediation requirements that were traditionally viewed as a means to identify students who needed help and to give them academic supports that would promote their successful completion of credit-bearing courses and their persistence until the completion of academic credentials. Because of data that showed lower completion rates for students who were enrolled in developmental courses and perceptions among policy makers that remedial or developmental coursework serve as barriers to college completion, many institutions abandoned this traditional approach to promoting college readiness in favor of immersive or co-requisite experiences in which students are placed in gateway-level courses immediately (Schrynmakers et al., 2019).

This shift in institutional practices can prove challenging for students who enroll in community colleges, which are open-access institutions that admit all applicants who have high school diplomas, regardless of their academic backgrounds or college-readiness. Many of the students who attend community colleges are low-income, returning adults, underrepresented minorities, or first-generation college students (Kilgore & Wilson, 2017), and limitations in their K-12 educational experiences or lags in the time between high school and college can contribute to this student demographic's lack of preparedness for the academic demands of college, with 68% of enrolled community college students needing some form of remedial coursework because of a lack of core mathematical and communication skills upon entry in college (Center for Community College Engagement, 2016). Research suggests that placing students in the

appropriate level-courses and providing institutional supports are key to student success (Saxon & Morante, 2014). Without institutional practices designed to determine appropriate course placements for these students, some of them may experience difficultly completing early coursework.

Community colleges throughout the nation face the challenge of helping academically underprepared and underserved students meet the challenges of college life and successfully complete their coursework and attain academic credentials. The Center for Community College Student Engagement (2012) has identified tutoring as one of a number of high-impact educational practices that are supportive of the success of community college students, and many institutions have included tutoring as one of the interventions designed to support the academic achievement of their students. Peer-to-peer tutoring is one model for providing tutoring services.

In 2017 my partner organization, which hereafter will be referred to as "the College" because of their desire to remain anonymous, launched a peer tutoring program called Math Champions that provides academic support to students enrolled in mathematics courses that have historically had high failure rates. As a part of this program, students who excel in math are recruited to serve as peer tutors. These "Math Champions" are embedded in selected sections of math courses and work with the instructor of record to support the students enrolled in the course. During class, they assist with collaborative learning activities or provide one-on-one support to students who need extra help, and they offer out-of-class tutoring to students. The College recently expanded the program to create Writing Champions who are embedded in selected English courses.

In my initial consultation with the College's Provost in 2021, she indicated that since the program had been operational for a few years, the institution felt that it was important to assess

the program to ensure that it was operating as effectively as possible. At the time of this consultation, because the organization had to grapple with maintaining its services in midst of the COVID-19 pandemic, the College also had an interest in learning about the ways in which the pandemic had impacted the peer tutoring program's implementation. In this capstone project, I undertook a program evaluation of the Math Champions peer tutoring program. The purpose of this project was twofold:

1. To evaluate the program's success in meeting its current goals and aspirational goals that are suggested by literature in the field and stakeholder feedback.
2. To offer recommendations for improvement and potential program expansion into other areas.

Organizational Context[2]

The partner organization is a community college located in northwest Florida. The College offers 70 associate degrees and technical certificates. The institution's core academic mission includes preparing students for transfer to four-year institutions for the completion of baccalaureate credentials and awarding associate-level degrees and technical certificates that are aligned with workforce needs and that will equip students to secure good employment opportunities.

Student Profile

The majority of the students at the institution are female, under twenty-four years of age, and identify as non-White. The college is located in one of the most economically disadvantaged zip codes in the state of Florida, with 43% of its students eligible for Pell grants. Some of the

[2] Citations that would identify the partner organization have been removed from this paper to honor the organization's request for anonymity. The capstone's author has maintained records of the sources of the material and may be contacted with follow-up questions.

College's students have deficits in the foundational math, reading, and writing skills that they need for success in college-level coursework when they enter the institution ([Name redacted, personal communication, February 16, 2021).

Students' lack of readiness for college-credit coursework can be particularly challenging in the state of Florida because in 2013, the Florida legislature passed Senate Bill 1720, which prohibited postsecondary institutions from requiring placement testing or enrollment in developmental education courses for the majority of entering students. With the exception of a subset of students who completed 9th grade in Florida prior to the 2003-2004 school year and active duty military students, students are exempted from the placement testing that would have previously resulted in some students being enrolled in developmental courses so that they could remediate some skills before entering college-credit courses. Students in this exempt population may opt to enroll in developmental courses if they feel they need the support. However, many students bypass this option and instead choose to enroll directly in the entry-level math and English courses for which they may lack the requisite skills, and institutions are tasked with providing supports that can help them succeed in these courses.

In a study of the impact of SB 1720 on Florida students' performance in math courses, Shand (2019) found that for most students, there were no significant differences in student performance in math, regardless of the route that they chose for placement and math course enrollment. However, she did find that minority students who bypassed placement testing and went into the entry-level math course underperformed when compared with other students in the course. This kind of outcome could prove challenging for an institution like the College that serves a large percentage of minority students and seeks to promote equity in academic achievement for all of its students.

The Need for Academic Supports

This reality of having underprepared students who end up in remedial courses or who immediately enroll in gateway courses places the onus upon Florida institutions to develop interventions and wraparound supports to foster the success of these students. The College has been intentional in designing a variety of supports to promote the success of its students. One of the major strategic focuses of the college is what they call the Culture of C.A.R.E. (Connections, Academics, Resources & Engagement). Among the major priorities of the Culture of C.A.R.E are efforts to promote student success and close academic achievement gaps among groups of students.

One of the specific academic supports that the college initiated is a peer tutoring program referred to as the Math Champions program. The Math Champions program was launched in 2017 in response to the college's concerns about low course success rates in developmental and gateway math courses. Course success is defined as earning a "C" or higher in a course. The Math Champions program initially targeted MAT 0028, MAT 1033, and MAC 1105. MAT 0018, MGF 1106, and MGF 1107 were later added as target courses. While the launch of the Math Champions program predates the College's Culture of C.A.R.E. initiative, its purpose and strategies are aligned with the C.A.R.E. initiative's efforts to provide supports for student success.

For this peer tutoring program, students who have a 3.0 GPA in mathematics, an overall 2.8 GPA, and a faculty recommendation are recruited to become Math Champions, serving as peer tutors and mentors for students enrolled in sections of targeted math courses. The Department of Transitional Studies (a division of the college focused on developmental education), in collaboration with the Department of Mathematics and Science, runs the Math

Champions program. The Math Champions partner with the faculty members teaching selected sections of math courses. They are embedded in the courses and attend lectures to assist students during class time, and they also offer tutoring services to these students outside of class, primarily in the college's Learning Commons. While the main responsibility of the Champions is to serve as peer tutors and to provide supplemental academic support to students, the program's leaders also hope that positive relationships between the peer tutors and their tutees will develop organically and that through these relationship tutees will come to view the Champions as role models and feel more connected to the college community.

Students who serve as Math Champions receive a tuition stipend valued at $800.00, a book stipend of up to $200.00, and they are given priority status for course registration. The College's financial aid department allocates the funds for the Math Champions' stipends. A math faculty member serves as the program coordinator and manages the day-to-day operations of the program. The program coordinator is given release time that is equivalent to the teaching load for one course to serve in this capacity. Since the genesis of the Math Champions program, other departments at the college have expressed an interest in replicating the program, and in Fall 2020, the college began using Writing Champions to support students enrolled in English Composition I (ENC 1101).

Program Impact

The college has had some early success with the Math Champions program. In the pilot phase of the program, they observed better course success outcomes (percentage of students earning a "C" or higher), improved term-to-term retention, and improved rates of student completion of developmental-level coursework. In recognition of the impact of the college's student success initiatives, it was designated as a Leader College by the Achieving the Dream

(ATD) Reform Network. ATD assigns the Leader College designation to colleges that have done exemplary work in supporting student success and that have been able to implement student success strategies that have proven to promote student success over time. One of the student success initiatives at the college that is highlighted by ATD is the college's Math Champions program because of the promise that the pilot showed in positively moving the needle on key student success outcomes (ATD, n.d.).

Prior Program Evaluation

The college conducted a program evaluation for the Math Champions program in 2017. They found that the program showed promise in promoting student success and retention in the selected courses. Overall, program participants had positive feedback about the program and thought that it provided both academic and affective benefits to program participants. In this evaluation, the faculty and students noted that the peer tutors had good relationships with students. Faculty felt that the presence of the Math Champion gave them more time for individualized attention for their students, and they felt that the program made their students more likely to seek help as needed. The peer tutors who were surveyed as a part of this initial evaluation noted that they felt like they developed better communication and problem-solving skills as a result of participating in the program.

The program participants noted some areas in which the program could be improved. There was concern that students were underutilizing the outside-of-class tutoring services. Program participants also noted opportunities for improvement of the training that peer tutors received. There was some concern about the location in which tutoring services were provided and some difficulty that they experienced with integrating Champions tutors into the Learning Commons, where the college's general tutoring services were provided. There was also feedback

about how inconsistencies in the implementation of program delivery strategies in the different courses may have impacted student success outcomes, and it was noted that it would be valuable for the program to have structured processes for recording attendance in tutoring sessions. Program leaders noted that they used the feedback from this initial program evaluation to make some changes in program implementation.

Problem of Practice

During a consultation with the College's Provost in the fall of 2021, she indicated that the institution was pleased with the potential that the Champions peer tutoring program holds for supporting the success and growth of its students. However, the Provost acknowledged that it is one of a number of student success initiatives that the college is running simultaneously. As these student support efforts have proliferated, the College has found it challenging to dedicate the time and resources needed to gauge the effectiveness of the various initiatives that it implemented to provide wraparound supports for students.

The Provost explained that the College was motivated to evaluate the program's effectiveness in its current iteration because they want to realize the program's academic and affective goals for students, both the students who serve as peer tutors and those who participate in the program as tutees. She noted that it is also important to ensure that the program is achieving its intended impact to justify the use of institutional resources to support the program. In this initial consultation with the Provost, she expressed an interest in ensuring that the program's current practices are aligned with best practices in peer tutoring program delivery. At the time of this consultation, because the organization had to grapple with maintaining its services in midst of the COVID-19 pandemic, the College also had an interest in learning about the ways in which the pandemic had impacted the program's implementation. While the program

has experienced some success in meeting its aims, the College has an interest in achieving program outcomes at even higher levels and in making improvements that may be needed to amplify the program's achievement of its goals. The College also hopes to be able to use some of the information gleaned from this assessment to determine organizational readiness for scaling this academic support intervention because of institutional interest in expanding this support model to other discipline areas.

Literature Review

The Impetus for Tutoring in Community Colleges

Community colleges throughout the nation are faced with the challenge of creating support systems for academically underprepared students or students who are enrolled in courses with difficult course content. The Center for Community College Student Engagement (2012) has identified tutoring as one of a number of high-impact educational practices that can promote student success and retention in individual courses and contribute to their ultimate completion of college credentials. Tutoring approaches can take many forms, including one-on-one interactions and group-based sessions, and tutoring sessions may be facilitated by either professional tutors or students who serve as tutors for their peers. A number of institutions opt for the peer tutoring delivery model due to the benefits that such programs can provide to both tutors and tutees and because of the administrative advantages of using peer tutors rather than professional tutoring staff. Peer tutoring describes an academic scenario in which two students take on distinct roles. One of the students (the tutor) takes on the role of providing academic support and guidance to another student who is the recipient (the tutee) of this assistance (Topping, 1996). While these student-to-student tutoring relationships have traditionally focused on having a more skilled

student assist a student who is less skilled, there has been some movement towards matching students who are near in ability for these tutoring relationships (Topping, 1996).

The aims of undergraduate peers tutoring programs are varied. One of the purposes of peer tutoring is to help students master academic content or skills (Kim, 2015). Some programs also have the goal of helping students to develop soft skills, such as written and oral communication, that can be transferred to the workplace (Kim, 2015). Beyond these knowledge and skill objectives, some programs have the goal of promoting positive interpersonal relationships and helping students feel a greater sense of connection or engagement with the institution, which is connected with retention and academic success (Laskey & Hetzel, 2011).

Terminology

The terms *peer tutoring* and *peer mentoring* are sometimes used interchangeably in reference to academic support efforts in which students facilitate the learning of their peers. Peer tutoring is an academic support strategy in which students provide academic guidance to other students (Sanford, 2020). The peers who provide the academic support are commonly slightly more advanced academically than the peers whom they tutor (Sanford, 2020). Because the peer tutors have gone through similar academic experiences, they are able to relate to their tutees and may be viewed by these tutees as role models (Sanford, 2020). Sanford argued that this mentorship component may be even more important that subject matter knowledge in peer tutoring relationships (2020).

The Benefits of Peer Tutoring for Tutees

A number of studies have noted the academic benefits of participation in peer tutoring programs. For the tutees, the academic benefits include better academic performance and retention. In a study of at-risk students in a provisional admission status at a mid-sized private

college, researchers found that students who participated regularly in tutoring had higher GPAs, which was correlated with higher rates of persistence and retention (Laskey & Hetzel, 2011). Use of tutoring was linked to higher mean averages for students who used tutoring during their second attempt at a course (Colver & Fry, 2016). Use of tutoring has also been linked to better performance on placement exams that serve as a pathway to later coursework and academic progression (García et al., 2014).

An advantage of using peers as tutors is that they may be more relatable to students, and students have reported feeling that peer tutors present information in more interesting ways (Ashley, 1986), increasing the likelihood that students will seek out tutorial support. Studies have also found that participation in peer tutoring has the added advantage of promoting student engagement and increasing students' sense of belonging and integration into the college environment (Raymond & Sheppard, 2017). Laskey & Hetzel (2011) suggested that the interpersonal relationships that are built in peer tutoring contexts can promote retention of at-risk students because of the feelings of connection and belonging that students get through these interactions.

The Benefits of Peer Tutoring for Tutors

There can also be benefits for the tutors who provide tutoring assistance in peer tutoring programs. By working with tutees, tutors may deepen their own content knowledge through repeated rehearsal of the material, and time spent on session preparation can help them to begin to see the conceptual linkages between ideas (Galbraith & Winterbottom, 2011). Peer tutors for a dental program at the University of Pittsburg benefited academically by getting additional exposure to course content, and they also had an opportunity hone their teaching and tutoring skills (Wankiiri-Hale et al., 2020). In a study of the impact of peer tutoring on volunteer

mathematics tutors, Carmody and Wood (2009) found that although there was variation in the depth of mathematical understanding that individual peer tutors had, they all generally gained a better understanding of mathematics as a result of their peer tutoring activity. Tutors can also gain better academic self-awareness as a result of their tutoring activities. In a study of high school students who tutored their peers in biology, there was a degree of metacognitive awareness that resulted from tutors' efforts to prepare for tutoring sessions, as they recognized areas in which they lacked content knowledge and worked to fill the gaps (Galbraith & Winterbottom, 2011). Peer tutors have also reported gaining confidence and having positive interpersonal interactions as a result of serving as tutors (Carmody & Wood, 2009).

Administrative Benefits of Peer Tutoring

There are administrative advantages that can be gained by implementing peer tutoring programs. Peer tutoring can be a more cost-effective option for providing academic support to students. From an economic perspective, peer tutoring may provide an opportunity to teach more students for less (Berghmans et al., 2013). Many institutions face resource shortages, and utilizing peer tutoring can be a means of providing valuable supplemental academic support in academic contexts in which student-teacher ratios are higher (Kim, 2015). It might also provide time savings and allow college staff to devote time to other endeavors (Berghmans et al., 2013).

Tutor Selection

When selecting peer tutors, program coordinators consider a number of factors. Programs often seek to recruit students who have been successful students themselves, as they will need to be able to model effective learning strategies for their tutees, and prior course grades are commonly used to screen for this characteristic (Sanford, 2020). It is also common for peer tutoring programs to rely upon faculty recommendations and feedback in the hiring of peer tutors

(Sanford, 2020). While academically talented students are often sought for peer tutoring roles, some studies have shown that peer tutors who are close in ability to tutees or who have gone through developmental education themselves can be effective tutors because they are better able to relate to students who need assistance (Sanford, 2020). Large skills differentials between tutors and tutees can actually negatively impact tutor motivation and interest in the work (Topping, 1996). Peer tutors should have content competency and good interpersonal skills, demonstrating qualities like patience, kindness, and ability to relate to tutees (Mohr, 1990).

Tutor Training

Tutor training efforts may be focused on disciplinary content and tutoring technique. In a study done on behalf of the League of Innovation for Community Colleges, Mohr (1990) conducted a survey of the peer tutor training programs of a number of community colleges and completed a literature review to glean some of the common and recommended practices for peer tutor training. Peer tutor training programs are often offered in training sessions of a few hours in length, or they can be more extensive and structured as lengthier training courses (Mohr, 1990). Recommended tutor training topics include things like interactive tutoring techniques, referral and study skills, learning theory, and working with specialized student populations (Mohr, 1990). Interactive training techniques, such as role play, are encouraged over use of passive formats like lecture (Mohr, 1990).

Capitalizing on existing institutional resources to support tutor training can also prove beneficial. For instance, because effective communication skills are important in successful tutoring interactions, it can be helpful to have writing center staff provide some training to tutors across academic disciplines (Kim, 2015). In a study of a tutor training program for novice tutors, tutors indicated that it would have been helpful for them to receive some subject-based training

so that they would have mastery of discipline-specific terminology and skills needed to tutor in some subject areas (Beukes & Maree, 2011). Subject-matter experts in the academic departments may be valuable allies in ensuring that tutors possess the content knowledge needed to tutor successfully in their assigned discipline areas, serving as mentors and providing subject-specific training for tutors (Beukes & Maree, 2011). Beukes & Maree (2011) suggested that providing skills-based training as a baseline and then progressing to more discipline-specific advanced training may be a good strategy for tutor training.

Some studies suggest that training that is focused on tutoring skills may be more beneficial than content-based training. In a comparison of the tutoring performance of tutors who had received content-based training and those who received skill-based training, Hsiao et al. (2015) found that tutors who received the skills training provided better feedback and that tutees found the feedback more motivating. Their study suggests that pedagogical knowledge may be more critical than content knowledge in assisting tutees with complex learning tasks. Peer tutors often rely upon directive or "telling" behaviors in their sessions with students rather than utilizing facilitative or constructivist strategies (Berghmans et al., 2013). However, tutors who are given training that better equips them to provide deeper explanations may positively impact student performance. In a study of the impact of tutor feedback on students' revision of research questions, researchers found that when tutors elaborated and provided more justification for their feedback, tutees performed better on the revision task (Gielen et al., 2010).

Although many tutor training efforts are brief, one-shot opportunities, there is scholarship that suggests that providing ongoing and more in-depth training is helpful in promoting optimal peer tutor performance. Staff attrition is a natural part of peer tutoring

programs, but however short-lived their tutoring assignments may be, there is value in providing continuing professional development to peer tutors (Clarence, 2016).

Technology can be a useful aid in delivering tutor training. For instance, institutions may capitalize upon their existing online learning management systems (LMS) to house tutor training materials and engage tutoring staff in asynchronous discussions (Crouse-Machcinski, 2019). Use of such systems can increase tutor access to materials, improve efficiency in training and documentation, and create a platform in which program administrators can continually work to develop training materials (Crouse-Machcinski, 2019).

Tutor Training Certification

The College Reading and Learning Association (CRLA) offers an International Tutor Training Program Certification to postsecondary institutions that offer tutoring services. CRLA's purpose in offering this certification is to help institutions "develop and deliver exemplary training" (CRLA, 2018). As a part of the certification process, institutions must demonstrate that they address some core topics as a part of their tutor training protocols (CRLA, 2018). There are three levels of certification that an institution may earn (CRLA, 2018). Training for the first level of certification must address issues like strategies for beginning and ending a tutoring session, active listening techniques, learning theory, and compliance with FERPA and Title IX guidelines (CRLA, 2018). More advanced theories and skills must be addressed in order for institutions to earn Level 2 or Level 3 certification (CRLA, 2018). CRLA requires that the majority of the training hours be conducted in a live and interactive fashion (CRLA, 2018). Receiving CRLA certification for a tutor training program is considered a gold-standard among tutoring program practitioners. The certification lends legitimacy to tutoring programs and is a marker of excellence and commitment to providing high-quality academic support services. It also

encourages institutions to be intentional about drawing upon best practices in academic support to provide professional support to their tutors and effective tutoring to students.

Partnership and Holistic Support of Students

Promoting the completion of academic credentials is an issue of increasing concern in the nation's community colleges, and studies suggest that it is valuable for various functional units of a college to collaborate to support students in persisting until they graduate. Student success efforts such as the Completion by Design initiative sponsored by the Bill and Melinda Gates Foundation stress the importance of redesign of academic experiences so that students' progression at postsecondary institutions is more integrated and seamless. One of the recommendations of Completion by Design is that student services and academic supports should be more integrated to promote the persistence and success of community college students (Nodine et al., 2011). Coordination among tutoring centers and other academic and non-academic units at the college is one way to holistically support the success of students (Kim, 2015). It can also be helpful for tutors who provide tutoring in various disciplines to partner with departments in which those disciplines are taught to build support systems for students (Kim, 2015).

Embedded Tutoring

The format in which peer tutoring is offered may vary by institution. One strategy used by some institutions is to embed tutors in classes. One approach to embedded tutoring is for peer tutors to attend class sessions and to actively support classroom learning through strategies like facilitating collaborative learning groups (Sanford & Steiner, 2021). This kind of approach can be beneficial because it provides an additional layer of support in the classroom and opportunities to get students more actively engaged in classroom learning (Sanford & Steiner,

2021). This kind of arrangement can also provide valuable marketing for an institution's learning center and introduce students to available tutoring support (Sanford & Steiner, 2021). Supplemental Instruction (SI), sometimes called Peer-Assisted Study Sessions (PASS) at some institutions, is one of the more widely used embedded academic support strategies (Sanford & Steiner, 2021). The SI approach was launched at the University of Missouri-Kansas City (UMKC) in 1973, and UMKC established the International Center for Supplemental Instruction that trains higher education professionals in the use of this support methodology (UMKC, 2022). SI focuses on providing support to students who are enrolled in historically difficult classes (UMKC, 2022). In this model, peer tutors, referred to as SI Leaders, attend the lecture component of a course and then offer out-of-class group study sessions to students who are enrolled in the targeted courses (UMKC, 2022). These sessions focus on collaborative learning, and SI Leaders work to help students review course content while also learning helpful study strategies (UMKC, 2022). A systematic review of literature related to the impact of SI methodology on student learning outcomes confirmed earlier findings that participation in this intervention promoted positive student outcomes such as higher rates of course success and retention, higher mean averages, and higher graduation rates (Dawson et al., 2014). Even if institutions do not adhere strictly to the model of SI and PASS programs, a number of tutoring programs borrow some of their methodology from these strategies (Sanford & Steiner, 2021).

Research Limitations

While there is a great deal of interest in determining the benefits and impact of peer tutoring programs, there are some limitations to the available research. Many of the studies of peer tutoring impacts are quasi-experimental, and they do not have defined experimental and control groups or randomly selected study participants. The challenge in defining research

subjects in this way is an outgrowth of the way in which higher education institutions often provide academic support services to students. Academic support services like tutoring are typically available to all enrolled students. When studying tutoring's use as an academic intervention, it would be ethically challenging to offer the treatment to one set of students and exclude other students from participating in the intervention. Many institutions would be resistant to limiting student access to academic support services that could prove beneficial to them in the interest of conducting pure research. In addition, much of the research that is done is this area is focused on localized contexts and has varied methodological strategies because of variation in tutoring program design. Sample sizes in these studies are also often quite small, and because participation in the interventions is through self-selection, it is challenging to get a representative sample of participants. These factors make it difficult to generalize about results arising from a given research study. With these limitations in mind, however, these studies represent the understanding of peer tutoring in higher education to date and offer direction for peer tutoring programs and assessing the impact of such programs.

Conceptual Framework

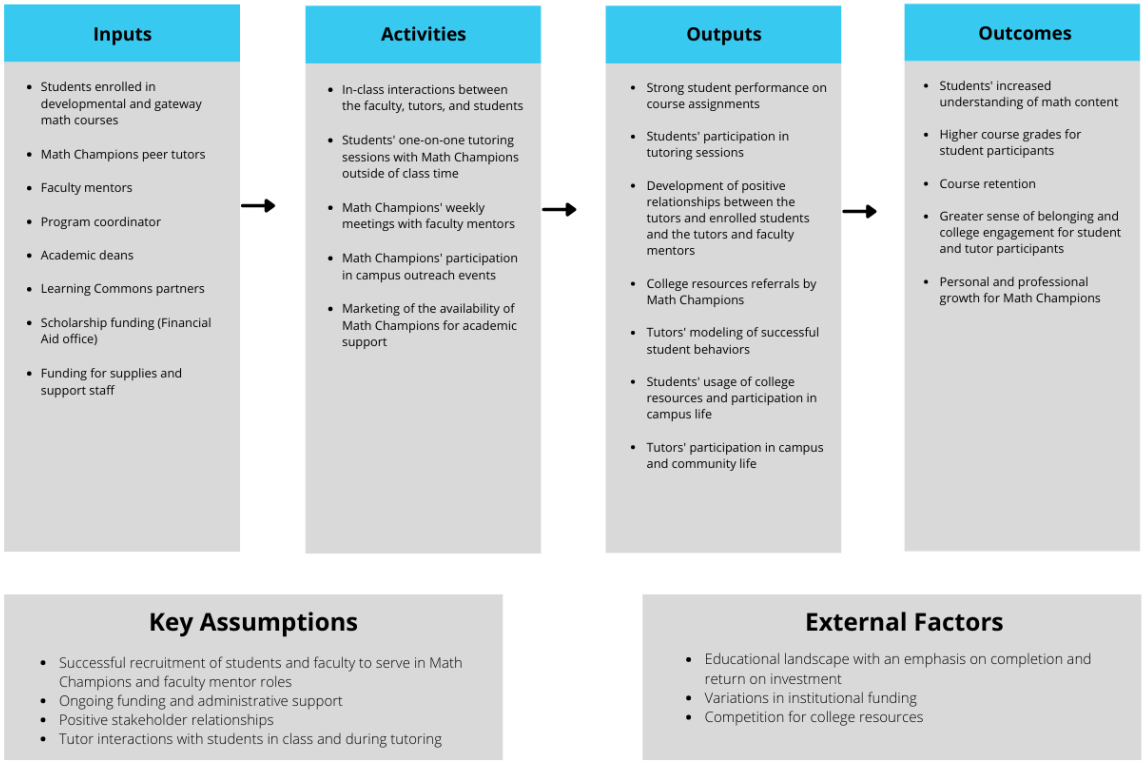
The Math Champions program's theory of action (or logic) is built on a number of assumptions grounded in social constructivist theories of learning. These assumptions emerge in both the vision of the program and in the implementation strategies adopted by the program. The program's theory of change includes an assumption that participation in certain types of interactions can produce positive academic and psychosocial outcomes for both the Math Champions (tutors) and the students who are enrolled in the targeted math courses (tutees). The desired outcomes for the students who are enrolled in the classes include higher levels of course success and retention, a greater sense of belonging, and increased institutional engagement. For

the Math Champions, program administrators expect that program participation will produce outcomes such as deeper mathematical understanding and the development of valuable soft skills such as a leadership and communication. The program's theory of action is focused on creating an academic community in which the interactions between the tutors, the students, and the faculty lead to the realization of the desired program outcomes. Key components of the program design include:

- Embedding the tutors in the targeted courses so that they may establish rapport with the students, assist them with course content, and model good student behavior.
- Requiring the tutors to meet with their faculty mentors weekly to ensure their content-based competency and to give faculty an opportunity to support the tutors' personal development through coaching and mentorship.
- Encouraging the enrolled students to attend tutoring outside of class time to further their math skill mastery, with the assumption that their existing relationships with the Math Champions will serve as an impetus to participate in tutoring.

Figure 1 is a logic model that presents a visualization of how the Math Champions program is intended to work and includes key assumptions that are relevant to program execution and external factors that may impact the program.

Figure 1*: *Math Champions Program Logic Model



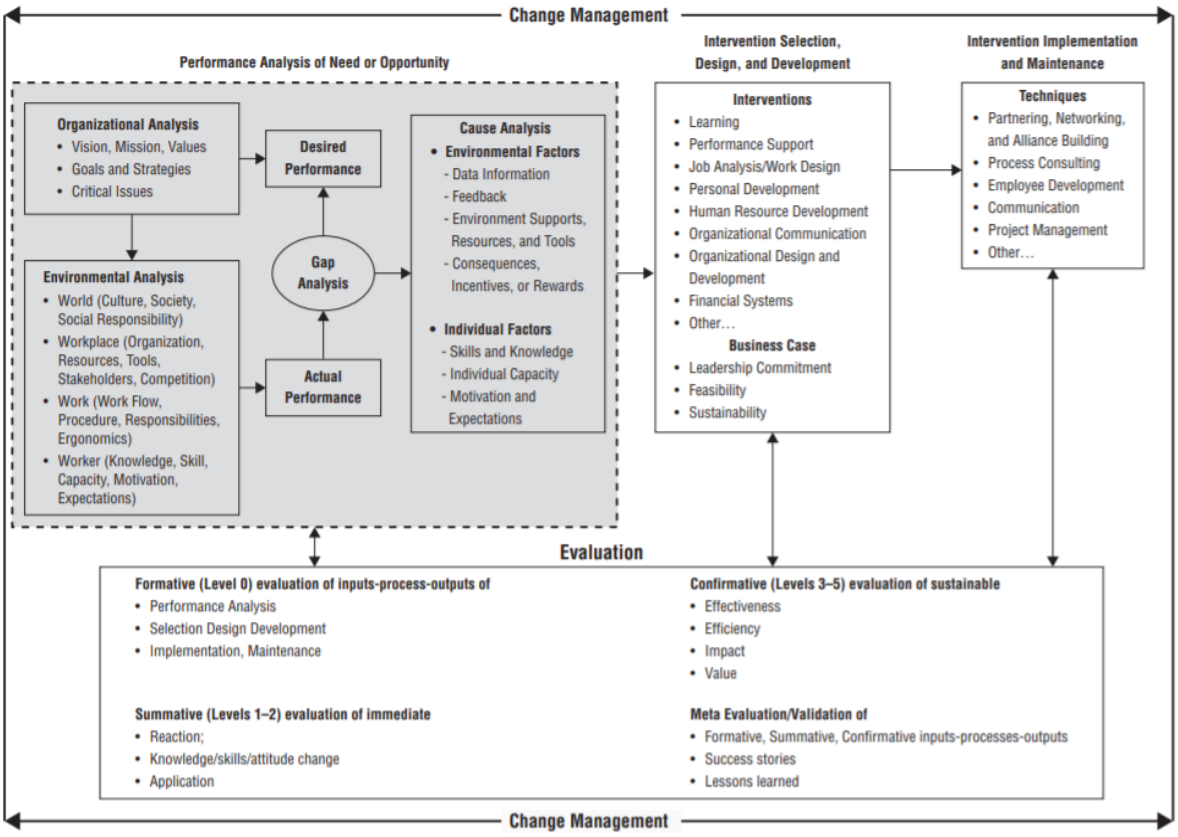
Social constructivist theories of learning emphasize the collaborative nature of learning. This perspective on learning was heavily influenced by the work of Lev Vygotsky, a Russian psychologist who argued that social interactions were central to cognitive development. Vygotsky (1978) used the term zone of proximal development to describe "the distance between the actual developmental level as determined by individual problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers"(86). In this construct, more experienced individuals help students learn what they could not learn alone. As a part of this co-construction of knowledge, the learner develops the skill and confidence needed for mastery of learning objectives (Velez et al., 2011). Through this social constructivist lens of learning, a peer tutor may be viewed as one of these more knowledgeable individuals and thus capable of facilitating students' learning (Velez et al., 2011). In the Math Champions' program design, they seek to recruit students who have demonstrated high levels of math mastery and who may have previously taken the courses in which they will be providing academic support. Because of their prerequisite knowledge, these peers are positioned to assist their peers who are less experienced in successfully navigating the mathematics courses.

Velez et al. (2011) argued that Piaget's emphasis on the role that peers play in cognitive development is relevant in the context of peer tutoring. Piaget contended that learner interactions with others may be described along a "continuum from constraint to cooperation" (Velez et al., 2011). In the power dynamic with someone like a teacher, an authority figure, learners may feel more constrained, which could hamper the learning process (Velez et al., 2011). However, in working with their peers, students may feel a greater sense of cooperation, thus creating an environment in which their learning is deeper and more sustained (Velez et al., 2011).

The theoretical framework that undergirds the Math Champions peer tutoring program informed the development of the surveys, focus groups, and semi-structured interviews in this study, which included questions designed to discern the nature of the relationships between the program participants and their perceptions of the learning gains that they made as a result of participation in the program.

Because the College's goal for this capstone project was program evaluation, an appropriate design had to be selected for the evaluation itself. The Performance Improvement/ HPT model of program evaluation is a useful tool for delineating some of the areas of inquiry that should be explored in a program evaluation that seeks to discern program effectiveness and to identify possible program enhancements. The Performance Improvement/HPT Model brings together an organization's aspirational goals and its actual performance and looks for areas where there may be gaps between the two (Van Tiem et al., 2012). A goal of this kind of inquiry is to identify causes of any misalignments that exist and to design strategies to improve program outcomes (Van Tiem et al., 2012). The model is shown Figure 2.

Figure 2: *The Performance Improvement/HPT Model*

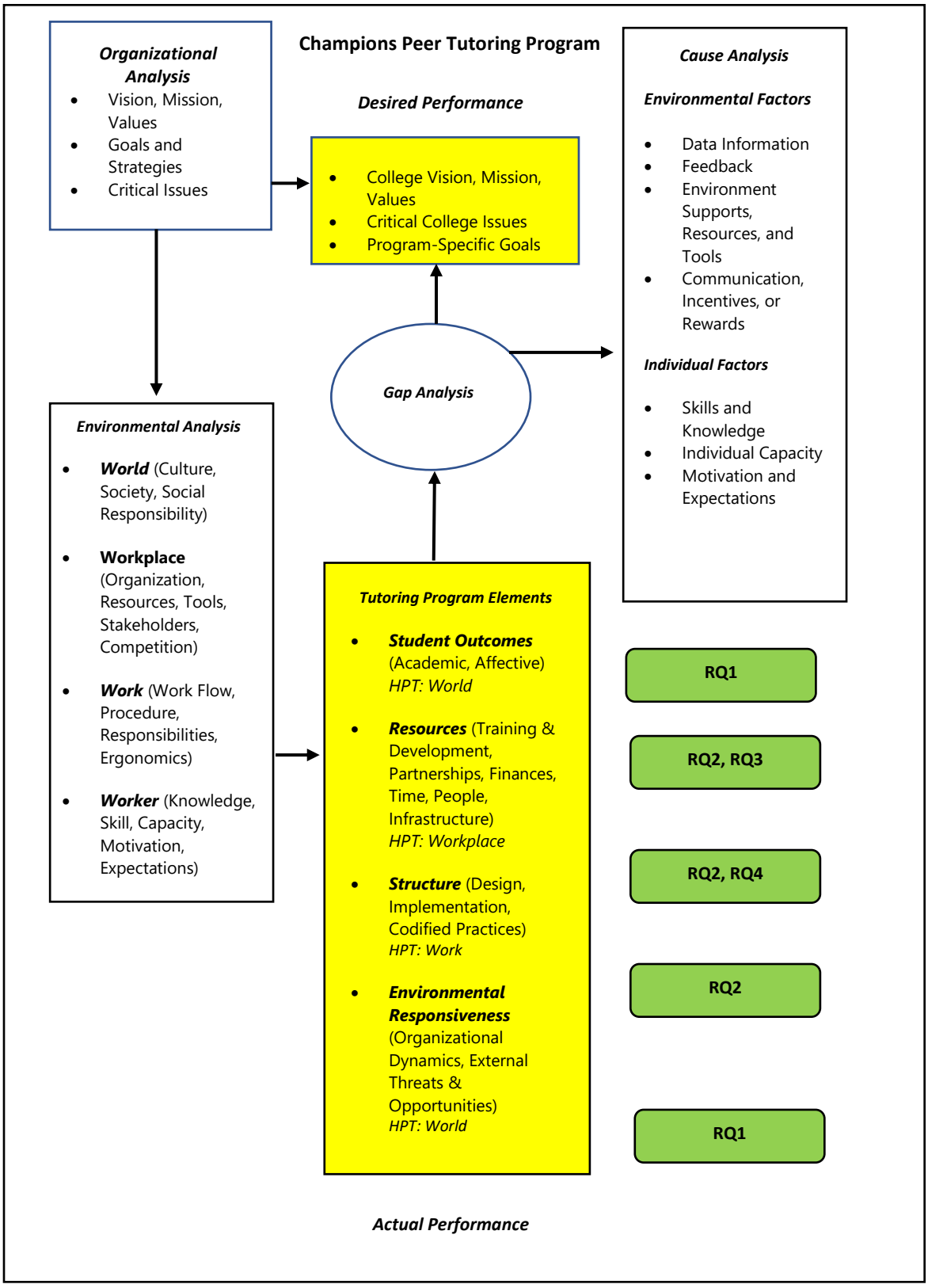


Performance Analysis of Need or Opportunity (highlighted in grey in Figure 2) is the first phase of the Performance Improvement/HPT model (Van Tiem et al, 2012), and this capstone focused on this phase in its evaluation of the Math Champions program.

To use the model as a guide for an evaluation of the Champions peer tutoring program, I overlaid this general evaluative model with context-specific variables because as Rossi et al. (2019) have noted, a well-designed program evaluation should be tailored to the specific context in which it is undertaken. Practitioner experience and a review of literature revealed some key considerations for evaluating the effectiveness of a peer tutoring program. Figure 3 represents a merger of the Performance Analysis of Need or Opportunity phase of the Improvement/HPT

Model (grey area in Figure 2) and context-specific factors relevant to the Math Champions peer tutoring program (highlighted in yellow in Figure 3).

Figure 3: *Performance Improvement/HPT Model Contextualized for the Champions Peer Tutoring Program*



A performance analysis begins with an examination of the organization's mission and values and identifies the critical goals that are linked to these larger organizational aims (Van Tiem et al., 2012). In the case of the Math Champions program, key goals include learning gains for the students enrolled in the targeted math courses and for these program participants to experience higher rates of course success and retention and to ultimately matriculate with a credential. An affective goal for the students is development of a greater sense of belonging and integration into the college environment. The program also seeks to promote the personal and professional growth of the Math Champions peer tutors. These goals for the enrolled students and the student tutors are linked to the larger institutional mission of providing "a learning environment that prepares students for success in a global economy by offering higher education pathways, workforce opportunities, and civic engagement" and the following priorities in the College's current strategic plan:

> (2.2) Provide **integrated, targeted support services** that promote student success.
>
> (2.4) **Assure equity in outcomes** for all groups in relation to persistence, degree and certificate completion, and transfer rate.

The performance analysis phase of the Performance Improvement/HPT model also considers environmental factors that contribute to the actual performance of an organization (Van Tiem et al., 2012). Key dimensions of the environmental analysis are as follows:

- World- external considerations such as society, culture, and social responsibility
- Workplace-internal considerations such as available resources, tools, and human resources policies
- Work-job design considerations such as workflows, ergonomic issues, stakeholders, and competition

- Worker-personal considerations such as skill level, knowledge, motivation, capacity, and expectations. (Van Tiem et al. al., 2012)

This program evaluation considers the types of environmental factors that are relevant to the Math Champions program. This phase of program analysis also includes a consideration of causal factors that are contributing to the outcomes that a program is currently experiencing. The Performance Improvement/HPT model shaped the formulation of questions for the data collection tools and provided a structure for the capstone project's design.

Research Questions

There are four major stakeholder groups in the program who can help to elucidate both the strengths and the challenges of the Champions peer tutoring program: students, tutors, faculty, and program staff. Members of each of these stakeholder groups participated in the data collection process. I used a variety of data types to answer the project's key research questions. The following research questions guided the investigation:

- Research Question 1: How effective has the Champions peer tutoring program been in meeting its current academic and affective goals?
- Research Question 2: What gaps do program participants perceive when comparing actual program performance to desired performance?
- Research Question 3: What do participants perceive to be some of the specific challenges impacting program performance?
- Research Question 4: What practices do participants consider to be successful elements that could be adapted by other units seeking to offer similar peer tutoring programs?

The project questions were derived in part from consultation with the College and linked to what they hoped to learn about program performance. In addition, the questions were designed with an

awareness of the characteristics of effective peer tutoring programs and areas of inquiry suggested by the Performance Improvement/HPT model for inclusion in a program evaluation that seeks to assess program effectiveness.

Project Design

Data Collection Plan

The Performance Improvement/HPT model begins with an Organizational Analysis of Need or Opportunity that is designed to gather information about institutional priorities and program goals. In the initial conversation with the Provost, she identified program goals that fall into two domains: academic and affective. The study design included efforts to collect data about how the program was performing--considering the degree to which it was meeting its goals, the program's interactions with other college stakeholders, the availability of resources needed to support program execution, and any practices that might serve as barriers to program delivery. This component of the evaluation is what the Performance Improvement/HPT model refers to as an Environmental Analysis. The third layer of the Organizational Analysis of Need or Opportunity in the Performance Improvement/HPT model is Cause Analysis, and the Math Champions program evaluation design included efforts to determine what program stakeholders felt were the causes of the program's current outcomes.

I drew on a range of available data to answer the project's research questions. Table 1 provides an overview of the project's guiding research questions and the primary data collected to answer these questions.

Table 1: *Overview of Research Questions and Collected Data*

Research Question	Data Collected
Research Question 1: What are stakeholders' perceptions of the program's achievement of its academic and affective goals?	• Student survey • Tutor survey • Faculty survey • Tutor focus groups • Semi-structured interviews with faculty and program administrators
Research Question 2: What gaps do program participants perceive when comparing actual program performance to desired performance?	• Student survey • Tutor survey • Faculty Survey • Tutor focus groups • Semi-structured interviews with faculty and program administrators
Research Question 3: What do participants perceive to be some of the specific challenges impacting program performance?	• Student surveys • Tutor surveys • Faculty surveys • Tutor focus groups • Semi-structured interviews with program faculty and staff

Research Question	Data Collected
Research Question 4: What practices do participants consider to be successful program elements that could be adapted by other units seeking to offer similar peer tutoring programs?	• Tutor focus groups • Semi-structured interviews with program faculty and staff

Research Question 1: Program Goal Attainment

Research Question 1 focused on the extent to which the Math Champions program met its goals. Study design included efforts to collect data about the accomplishment of both the program's academic and affective goals and the quality of stakeholder relationships, which are pivotal to the achievement of program aims.

Stakeholder Relationships. The establishment and maintenance of positive stakeholder relationships are critical components in the program's accomplishments of its aims. The program's theory of action is based upon the assumption that students will view the tutors as relatable figures and feel comfortable reaching out to them for academic support and look to them as models of appropriate student behavior. There is also the hope that these peer-to-peer relationships will serve as a bridge that will help students feel more connected to the college community so that they will become actively engaged in campus life. The program also assumes that the Math Champions and their faculty mentors will develop relationships that are supportive of the personal and professional development of the tutors. Questions designed to collect stakeholder feedback about the nature of the interpersonal relationships among program

participants were included in the stakeholder surveys, tutor focus groups, and faculty interviews. Following are examples of questions related to stakeholder relationships:

1. I viewed the Peer Leader who was assigned to my class as a role model. (Student survey)
2. How would you describe your relationship with the students who were in the class section that you were assigned to? (Tutor focus groups)
3. I was able to establish a good rapport with my Champions Peer Leader. (Faculty survey)

Academic Goals. The program has two academic goals that it views as markers of program success. The College hopes to see high rates of course success and course retention in the population of students who actively participate in the Champions peer tutoring program. To assess whether the program has had an impact on course success and retention, I proposed conducting a chi-square analysis to compare the course success and retention rates of students who participated in the program to those of students who did not participate in the program. Completion of this analysis required attendance records for the students who participated in tutoring sessions with the Math Champions as well as final course grades for all of the students who were enrolled in the targeted courses. After the project commenced, I learned that the attendance records needed for the chi-square analysis would not be available.

To gain additional information about the program's academic performance, I included related questions in the stakeholder surveys and interview and focus group protocols. To gauge stakeholders' perceptions of the academic impact of the program, the student, tutor, and faculty surveys included questions such as the following:

1. When the Peer Leader assisted us with activities in class, it helped me to have a better understanding of the course material. (Student survey)

2. I made positive contributions to students' learning when I assisted them with course content during class. (Tutor survey)
3. My students' overall course performance was better as a result of having a Champions Peer Leader embedded in my class. (Faculty survey)

In the focus groups with the Math Champions and the semi-structured interviews with the faculty and program administrators, I asked more open-ended questions to determine whether participants would elaborate on the kinds of responses that they provided in the surveys. For instance, I asked, "What do you think are the strengths of the Champions program?" to create an opportunity for respondents to identify any academic benefits that they associated with participation in the program.

Affective goals. In addition to promoting the academic success of students in the targeted math courses, the Math Champions program has a goal of promoting positive social and behavioral outcomes for the enrolled students and the peer tutors. For example, the program seeks to help both groups of students feel a greater sense of belonging at the institution and to push them to take advantage of available college resources and participate in campus life. They also hope that through their work in the program and their relationships with their faculty mentors, the Math Champions will grow personally and professionally. Questions related to these aims were included in the following data collection tools: stakeholder surveys, focus groups with the Math Champions, and semi-structured interviews with the faculty and staff. Following are examples of questions that were included in these tools to elicit stakeholder feedback about the accomplishment of various affective outcomes.

1. Do you feel you have grown in any way as a result of participating in the program? (Tutor focus groups)

2. The meetings with my assigned Champions Peer Leader were beneficial. (Faculty survey)
3. What do you think are some of the strengths of the Champions program? (Faculty and program administrator interviews)

Research Question 2: Potential Program Goals

Program administrators and faculty previously identified academic and affective goals for the program. To answer Research Question 2, I sought to use the semi-structured interviews and focus groups to gather stakeholder feedback to determine if there may additional goals that the program should pursue based upon stakeholders' perceptions of program gaps. Examples of the focus group and interview questions are as follows:

1. What are some areas in which the program could be improved? (Tutor focus groups)
2. Are there any resources or potential partners at the college that you wish could be included in the program? (Faculty and program administrator interviews)

Research Question 3 Program Challenges

Research Question 3 aimed to identify any challenges that might be impeding the implementation of the Math Champions program. I used surveys, focus groups, and semi-structured interviews to identify these potential challenges. I targeted stakeholders who played an active role in program implementation—faculty, tutors, and program administrators--because they could provide valuable feedback about the program's practices. Because of the potential that the COVID-19 pandemic had to disrupt program execution, I asked all stakeholder groups about its impact on program implementation. The following are examples of questions from these instruments:

1. Did the COVID-19 pandemic have an impact on your performance in class? Please explain. (Student survey)

2. What are some of the ways in which the program could be improved? (Tutor focus groups and faculty and program administrator interviews)

Research Question 4: Promising Practices

Research Question 4 sought to identify program practices that program participants felt were effective and that may be replicated by other units of the college that may wish to adapt the Math Champions model. I used the focus groups with the Math Champions and semi-structured interviews with faculty and program staff to answer this question. The following question was the primary question used to gather stakeholder feedback about successful practices: "What do you feel are the strengths of the Champions program?"

Data Collection Tools

Survey Construction

I used the Qualtrics survey platform to design the stakeholder surveys. The surveys primarily consisted of yes/no or Likert-type questions and included a few open-ended questions to allow for any additional feedback that respondents wanted to provide. Program stakeholders often refer to the Math Champions as "Peer Leaders," so this terminology is reflected in the phrasing of the survey questions. The student version of the survey included demographic questions to determine the age range, race, and gender of respondents. I included these questions because of the institution's interest in achieving equity in student outcomes. While I had this opportunity to collect data from students, I captured these demographics in the event that there were enough student responses to allow for a meaningful disaggregation of student responses based upon these demographics. All of the stakeholder surveys included demographic questions designed to determine in which of the math courses the participants engaged with the Math Champions program. I included skip logic in the student survey to ask follow-up questions based

upon respondents' answers to the core survey questions. For instance, if students indicated that they participated in tutoring, the survey then skipped them to questions related to how frequently they participated in tutoring and who helped them when they did seek tutoring.

Student Surveys

The Dean of Transitional Studies disseminated the student survey via e-mail to all of the students (N=220) who were enrolled in class sections with Math Champions embedded in them. This convenience sampling methodology was employed in an effort to garner some student feedback in a context in which it has historically been difficult to get responses from students. I offered entry into a prize drawing for a number of Amazon gift cards to incentivize the enrolled students' completion of the student survey. There were 46 responses to the student survey. Two of the student responses were removed from the dataset because they were duplicates. I identified the duplicates by reviewing the IP addresses and names of the respondents. The response rate for the student survey was 20%, with 44 unique student respondents. Please see Appendix A for a complete listing of the student survey questions.

Faculty and Tutor Surveys

I disseminated the Math Champions' surveys and the faculty surveys to all of the Math Champions (N=8) and faculty mentors (N=7) because of the small number of individuals from these stakeholder groups who were connected to the program during the Fall 2021 semester. The Dean of Transitional Studies sent the survey to these stakeholders on my behalf. Please see Appendix B for a complete listing of the tutor survey questions. The response rate for the tutor survey was 75%, with six out of the eight Math Champions responding to the tutor survey. Five of the seven faculty mentors completed the survey, for a response rate of 71%. Please see Appendix C for a full listing of the questions included in the faculty survey.

I deployed surveys in October 2021 in hopes of getting participant feedback (particularly for the students) before they faced the distractions of holidays and end-of-term coursework. Beginning with the surveys also positioned me to observe initial trends in stakeholder feedback and to use this knowledge to plan for follow-up questions during the semi-structured interviews and focus groups. For instance, recognizing that student survey responses indicated low levels of tutoring participation, I asked the faculty and tutors questions related to tutoring participation.

Semi-Structured Interviews

I conducted semi-structured interviews with the program coordinator for the Math Champions program, who was also a teaching faculty member with Math Champions embedded in her courses. Because of her dual role, I was able to get her feedback through the lens of both a program administrator and a faculty mentor. I also interviewed the Dean of Transitional Studies and the Dean of Mathematics and Science, who were the two deans who founded the Math Champions program. Lastly, I conducted semi-structured interviews with two faculty members who either were currently serving as Math Champions faculty mentors or who had served in the role in previous academic terms.

Interview protocols are included in Appendices D and E. The length of the interviews ranged from approximately 22 minutes to an hour. I hosted interviews in either the Zoom or Webex Web conferencing platforms. I conducted interviews from November 2021 through December 2021, based upon participants' availability.

Focus Groups

I conducted the focus groups in December 2021 using the Zoom Web conferencing platform. I invited all of the Math Champions (N=8) to participate in the focus groups, and I offered two focus group sessions to accommodate their class schedules. Five of the eight Math

Champions participated in the focus groups. I offered entry into a prize drawing for Amazon gift cards as an incentive for participation in the focus groups. Please see Appendix F for the focus group questions.

Program Artifacts

To get a sense of organizational context and to understand some of the program's core practices and policies, I reviewed program documents, Web content, and training materials. The program documents included the Math Champions program handbook that outlined the expectations for the tutors. I also reviewed the College's strategic plan in an effort understand the Math Champions program's aims within the larger context of the organization's mission and goals. The program coordinator shared a video recording and PowerPoint slide show of a training session that was used for the Math Champions during the Fall 2021 semester, and I reviewed this material to understand what a typical training session for tutors was like.

Data Analysis

Surveys

Because I used the Qualtrics survey tool to create the stakeholder surveys, I also used Qualtrics to generate descriptive statistics and data visualizations for survey results. Qualtrics allows users to view the survey results by metrics such as response count or percentage. I chose to report the responses by percentage and the goal was to use the initial survey data to identify general trends in stakeholders' perceptions of program effectiveness and to provide direction for follow-up questions that would be asked during the focus groups and semi-structured interviews (Merriam, 1998). For example, the descriptive statistical outputs allowed me to determine the distribution of survey participants' level of agreement about the positive academic impact of the

program and prompted me to probe more about academic impact during the interviews with faculty.

Semi-Structured Interviews and Focus Groups

In my first pass at the interview and focus group data, I compared the video recordings of these sessions to the system-generated text transcripts and made any necessary content corrections to the transcripts. I uploaded the corrected transcripts to the Atlas.ti qualitative data analysis software. Using the coding functionality in Atlas.ti, I used an open-coding approach to assign initial codes to the stakeholder feedback (Merriam, 1998). I started with broader codes such as *Strengths* and *Challenges* that were aligned with the kind of environmental assessment of the program that I sought to achieve and linked to the research questions. I also began to assign sub-codes if more specific topics emerged in relation to these broader categories. For example, after I began using the code *Strengths,* I created a sub-code called *Academic Impact* to document instances in which respondents spoke of their perceptions of the impact that work with the Math Champions had on their students' academic performance. Atlas.ti allowed me to assign multiple codes to the same passages if appropriate and to retrieve quotations by code label. As I coded, I used the Atlas.ti tools to create a codebook that contained definitions of each of the codes, and I also used the memo function in Atlas.ti to capture my observations as I reviewed the data. After this initial round of coding, I reviewed all coded passages, noting codes that had the highest numbers of assigned passages (which I viewed as areas in which there was a high level of stakeholder agreement). During this review, I also determined whether there were codes that were duplicative or whether the assigned codes accurately reflected the nature of the content, and I adjusted code assignments as appropriate. Lastly, I used the Code Group function in Atlas.ti to

group the codes into more thematic groups that were aligned with the project's key research questions to facilitate translating these data into findings. See Appendix G for the codebook.

Program Artifacts

The purpose for collecting the program artifacts was to understand the program's core operations and the program's relationship to the broader organization, and I relied upon basic content analysis to get sense of these dynamics.

Findings

Research Question 1: Program Goal Attainment

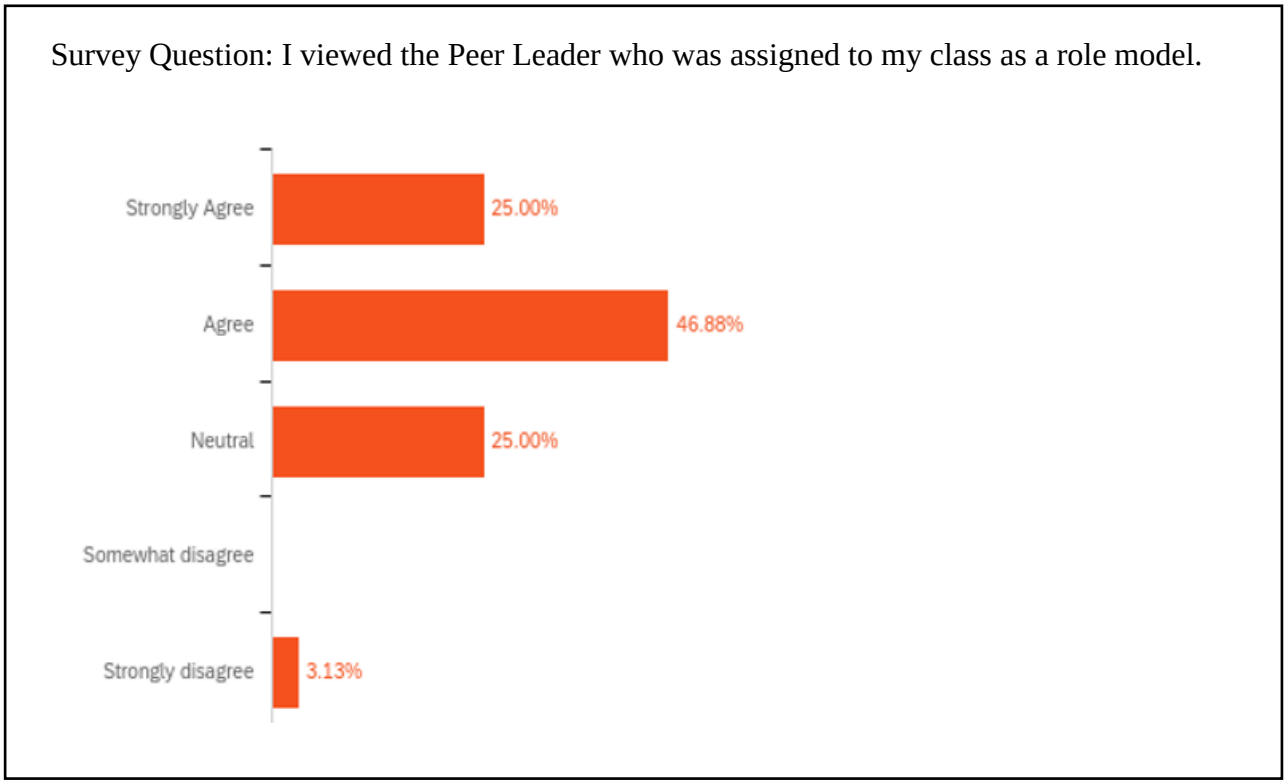
Research Question 1: What are stakeholders' perceptions of the program's achievement of its academic and affective goals?

Finding 1- Stakeholder Relationships

Stakeholders' survey feedback suggested that the relationships between the tutors and students were largely supportive of the achievement of program goals; however, faculty interview respondents indicated that some tutors have difficulty making connections with students. Additionally, tutors described wide variations in the nature of their relationships with students. Faculty mentors and tutors described having positive and productive working relationships.

Positive relationships among program participants are foundational to the program's achievement of its academic and affective aims. The stakeholder surveys contained questions that were designed to provide a sense of the quality of the interpersonal relationships of the program participants. One of the program's goals is for the Math Champion to serve as a mentor who can model good student behaviors for the enrolled students. 72% of the student survey respondents (n=32) strongly agreed or agreed that the Math Champion was a role model (see Figure 4).

***Figure 4**: Student Perceptions of the Math Champions as Role Models*



Note: These data represent student responses (n=32) to the survey administered to students in the target courses.

While the majority of student survey respondents reported viewing the Math Champion as a role model, 25% were neutral and 3% of the respondents strongly disagreed with the statement related to the Math Champion's status as a role model.

In the surveys, tutor and faculty perspectives on the Math Champions' relationships with students were more positive. In the survey for the Math Champions, 83% of the respondents (n=6) strongly agreed or agreed that they had a good relationship with the students in the classes that they were assigned to, and 80% of the faculty survey respondents (n=5) strongly agreed or agreed that the Math Champion had a good relationship with the students who were enrolled in the class.

Faculty mentors and Math Champions also had positive perceptions of their relationships with one another. The survey for the Math Champions included questions about their relationship with their faculty mentor. 83% of the respondents (n=6) strongly agreed or agreed that they had a good relationship with their faculty mentor. The faculty version of the survey included a question about the quality of the relationship that the faculty members had with their assigned Math Champions. 100% of the faculty respondents (n=5) strongly agreed or agreed that they had a good rapport with their assigned Math Champion.

Interview and focus group participants elaborated on relationships among program participants. When asked about the impact of the Math Champion's presence on her students' performance in class, a faculty mentor indicated that some Math Champions experience challenges establishing relationships with students due to personality characteristics:

> You know, you walk a fine line, because you want the Math Champions to be the leader, to take that leadership role in your classroom. But at the same time, you know, sometimes there are Math Champions that are not maybe as vocal as others or maybe their leadership skills initially are not as strong as others. And then you do kind of walk that fine line of, I don't want to step on what their role is as the peer mentor in the classroom, but I want them to get connected to students. They really need to connect too. So, sometimes that's a challenge.

The Math Champions described their relationships with students on a spectrum ranging from not having "any relationship" to having "developed some kind of friendship."

Finding 2-Goal Attainment

While all program stakeholders suggested that the program has experienced some success in achieving its academic and affective goals, the tutors' and program staff's perceptions of the

achievement of the program's aims were more optimistic than those of the enrolled students, and faculty placed more emphasis on affective gains than on academic achievement when asked about program impact.

Academic Program Goals. The College strives to accomplish both academic and affective goals in the Math Champions program. Academic aspirations include higher course success and higher course retention for the students who are enrolled in the course sections in which Math Champions are embedded. They also hope that both the tutors and the tutees will deepen their mathematical understanding as a result of program participation.

Academic Goal Attainment. The program evaluation began with surveys administered to key program stakeholders to gauge their perceptions of the program's impact. All of the stakeholder surveys included questions related to the academic impact of participation in the Math Champions program.

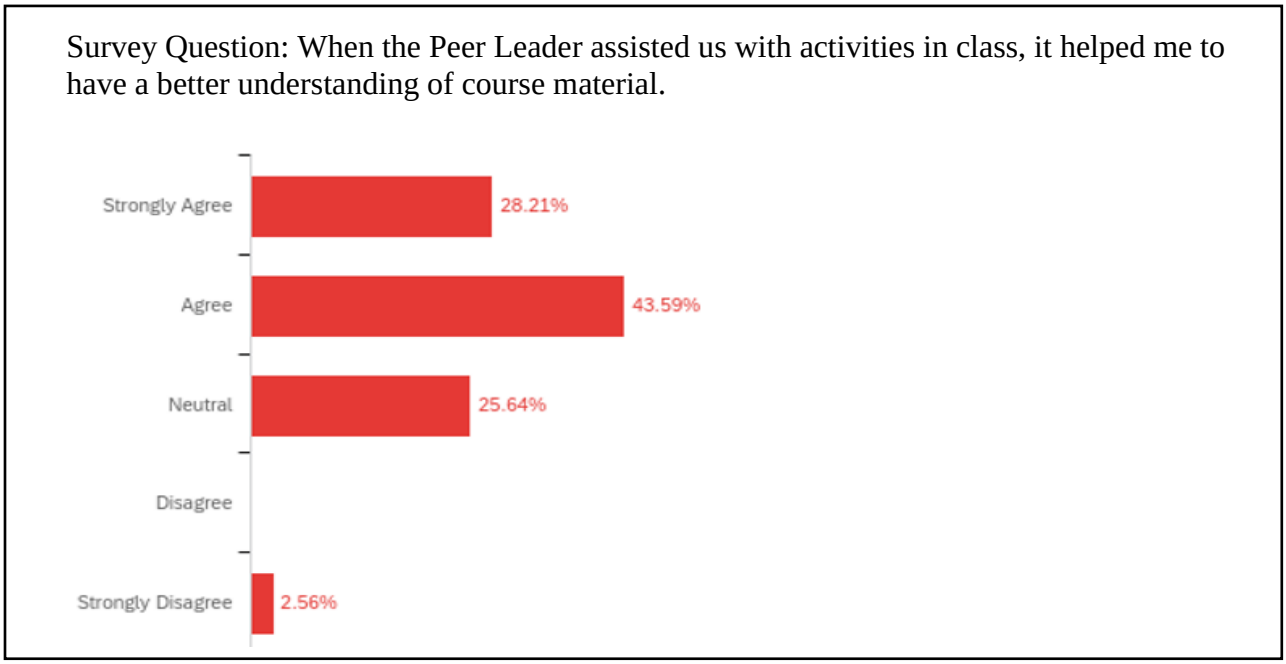
The Math Champions who completed the tutor survey had positive perceptions of their academic impact on students. In the tutor survey, 100% of the peer tutor respondents (n=6) agreed or strongly agreed that they made positive contributions to students' learning when they worked with them on content during class. 83% of the peer tutor respondents (n=6) strongly agreed or agreed that their interactions with students who visited the Learning Commons for tutoring were beneficial to these students.

Faculty survey respondents also had positive views of the academic benefits that students gained from their work with the Math Champions. The faculty version of the survey had two questions that were related to the impact that the Math Champions had on students' academic outcomes. When asked whether having a Peer Leader embedded in their class helped their students to better understand the course material, 100% of the faculty respondents (n=5) strongly

agreed or agreed. 80% of the faculty respondents (n=5) strongly agreed or agreed that their students performed better overall as a result of having the Peer Leader embedded in the course.

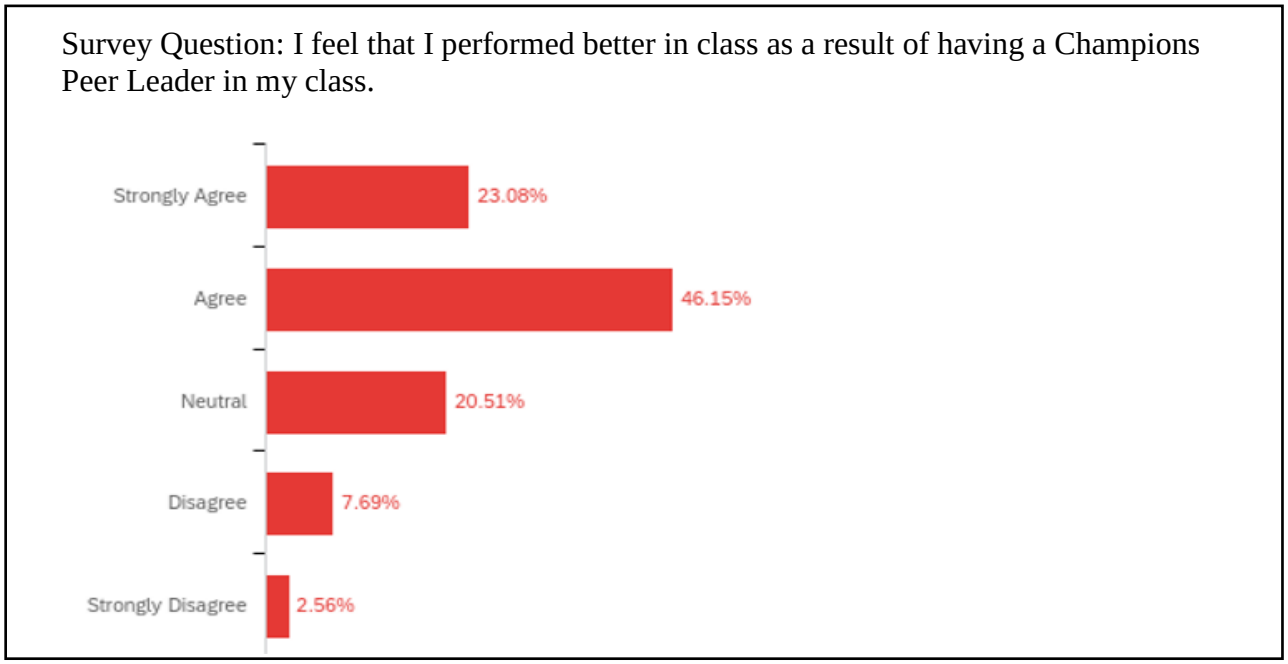
There was more variation in the enrolled students' perceptions of the academic gains that they made as a result of these interactions, with some students expressing a level of dissatisfaction. The survey for the students who were enrolled in the targeted math courses included questions designed to gauge the extent to which they felt that their interactions with the Math Champions helped them to perform better academically. 71% of the student survey respondents (n=39) strongly agreed or agreed that having the Math Champion assist them with activities in class helped them to better understand the course material. 69% of the student respondents (n=39) strongly agreed or agreed that they performed better academically as a result of having a Math Champion in class. Figures 5 and 6 show the full range of students' responses to survey questions related to academic impact.

***Figure 5**: Student Perceptions of Math Champion Impact on Content Understanding*



Note: These data represent student responses (n=39) to the survey administered to students in the target courses.

***Figure 6:** Student Perceptions of Math Champion Impact on Course Performance*



Note: These data represent student responses (n=39) to the survey administered to students in the target courses.

After the dissemination of the surveys, I conducted semi-structured interviews with two faculty mentors, the dean of Transitional Studies, the dean of Mathematics and Science, and the Math Champions program coordinator (who was also a faculty mentor) and hosted focus groups with the Math Champions to get more in-depth feedback about their experiences in the program.

I asked all of the faculty and administrative interview participants questions about the strengths of the program or the impact that they felt that the program had on students. In the interview with the dean of Transitional Studies, she noted that early program data about the academic impact of the program was promising:

> . . . initially we saw some exciting data that showed that the classes with a Math Champion in them outperform the classes without the Math Champions, and then later on, we even just disaggregated data by race and noticed that black students in particular who were in classes with Math Champions have higher rates of success.

Their methodology for this data analysis was to compare student performance in courses based upon the presence of a Math Champion in the class. This method did not consider the extent to which students interacted with the Math Champion. The dean noted that there was a time gap since they had an opportunity to complete this kind of success analysis.

When I asked a veteran faculty mentor whether the presence of the Champion in class had an impact on her students' performance in the course, she affirmed that it did for a limited group of students:

> Sometimes I felt like it did because my more vocal students who would seek out help from the Math Champion, or who the Math Champion would be able to identify as one who needs, you know, their assistance, like for them, I would see them come in, like, hey,

> so and so, oh, I have a question for you after class. Like, I would see that, but then other times, you know, I would feel like some students didn't feel that connection.

As a follow-up question, I asked if she perceived that participation in tutoring had an impact on her students' performance in class, and she said the following:

> Yes, I would say so. It helped to build their confidence for sure. And for my shy students, you know, you can sometimes sense, like a feeling of just kind of relief knowing that, you know, there's going to be another opportunity to ask questions to somebody else at another time, maybe after there's been a little bit of an opportunity for concepts to kind of sink in and marinate, if you will.

These selected comments reflect the tenor of faculty feedback about the program's impact on their students. Although the faculty would have direct knowledge of students' academic performance, they did not emphasize these kinds of achievements when asked about the impact of the Champions and focused most often on affective outcomes. They tended to focus instead on the availability of the academic support, or they talked about some of the affective benefits of students' work with the Math Champions, citing things like lowered anxiety or increased confidence.

In the focus group with the tutors, one tutor described how working in the program helped her "keep . . . [her] math skills up to date." Other tutors agreed with this participant's belief that program participation helped them to augment their own mathematical understanding, with one Math Champion noting that she had developed the ability to solve problems more quickly as a result of working in the program.

Affective Program Goals. In the affective domain, program leaders expect that both the Math Champions (the tutors) and the students who are enrolled in the targeted courses (the

tutees) will experience a number of social benefits as a result of their participation in the program. The College aims to create an experience for the Math Champions—both through their interactions with their peers in the classes and their faculty mentors--that helps them to develop skills such as leadership, communication, and assertiveness that they can translate over into success in both their personal and professional lives. For the students who are enrolled in the courses (the tutees), they want their interactions with the Math Champions to serve as a vehicle for them to become more socially integrated into the institution and to take advantage of college resources designed to support their success.

Affective Impact on the Enrolled Students. Faculty and program administrators identified some of the affective gains that they felt that enrolled students made as a result of their participation in the Math Champions program. One dean believed that program participation positively impacted students' help-seeking behavior, crediting the program with "connecting . . . students to . . . resources and taking away the hesitancy about reaching out for help, especially for first time in college students." A faculty mentor concurred that the program connected students to resources: "I think it did help a lot of students understand that there was genuine concern about them being . . .successful in the class, and . . . getting connected to resources." In addition to feeling that the program made students feel more comfortable about seeking help, this faculty member also felt that the program had a community-building function:

> I think it [the program] did help to form community within the classroom because . . . there was someone outside of just the instructor that was always available for them as a go-to-person. They had questions about anything regarding the course, . . . and then in general, I would see students ask questions about registration and other things on campus.

This faculty response speaks to a belief that the program played a role in helping students feel like a part of the campus community and to become more engaged in the life of the campus.

Academic Impact on the Math Champions. The Math Champions expressed positive views of the program's impact on their personal and professional growth. The version of the survey completed by the Math Champions included questions about the impact that the program had on their development of skills such as problem-solving and leadership. A summation of these survey results is provided in Table 2. Overall, the Math Champions survey respondents (n=6) had a high level of agreement about the program having fostered their personal growth.

Table 2: *Tutors' Perceptions of Program Impact on Personal Growth*

Survey Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The program has strengthened my communication and interpersonal skills.	50%	50%	0%	0%	0%
The program has strengthened my problem-solving abilities.	50%	50%	0%	0%	0%
The program has strengthened my leadership skills.	50%	33%	17%	0%	0%

Note: These data are tutor responses (n=6) that are extracted from the survey administered to the Math Champions tutors.

In the interviews and focus groups, the program administrators, faculty, and the Math Champions themselves agreed that participation in the program helped the Math Champions to grow as leaders. One dean said, "what I do find as a strength of this program is that we are grooming leaders." One of the faculty mentors agreed that leadership development for the Math Champions is a strength of the program: "Well, I do think that, of course, one of the strengths is

helping the actual Math Champions to develop, you know, stronger leadership skills, communication skills, tutoring skills, mentoring skills." During the focus groups with the Math Champions, the majority of them identified improved leadership skills as one of their takeaways from the program, a sentiment that is encapsulated in the following comment from a tutor: "I feel like it adds a lot to your personal skills, public like, you know, your social skills, I would say, and interaction with people, professionalism, leadership. . . ." One tutor noted the program's impact on her career trajectory, stating that she now has plans to pursue a career as a math professor. Other affective benefits that Math Champions indicated that they gained from the program included better time management skills and "professional networking [and] getting out into the community."

Finding 3-Tutoring Usage

A large proportion of students did not participate in the out-of-class tutoring, and for those students who did attend tutoring, the program did not have formalized processes for tracking session attendance.

A key assumption of the theory of action that drives the Math Champions peer tutoring program is that students will participate in tutoring when it is available. Program participants pointed out that students are not taking advantage of the tutoring support that is available to them. The student version of the survey asked students whether they participated in out-of-class tutoring services. The survey contained skip logic that took students to additional follow-up questions depending upon how they responded to this initial question. 59% of the survey respondents (n=39) indicated that they did not participate in tutoring. Of those respondents who indicated that they did not participate in tutoring, the two reasons that they cited for not participating in tutoring included not feeling that they needed tutoring and lack of time.

The Math Champions focus group and faculty and staff interview participants shared the view that students were not participating in tutoring at desired levels. Although the dean of the mathematics indicated that she felt that students were participating in tutoring at the level that program leaders desired, the remaining study participants agreed that the students underutilized the out-of-class tutoring services that were available to them. One of the faculty mentors noted that student participation was inconsistent:

> It's hit or miss, and that's one of the things that my Math Champion, um, when I asked them for areas of improvement, they would hope or they wished that more of the students in the class would reach out to them for help.

A Math Champion said that she only had one "regular" who came for tutoring consistently and indicated that they [the Math Champions] had come into the program "expecting that there wasn't going to be a lot of traffic" because they had been told that demand for services might be low. The dean of Transitional Studies speculated that one of the causes of the low tutoring utilization was that the college is a "commuter school," where students "take their classes and then they're gone. When they leave here, they go to work or they have to take care of children." This dean indicated that program stakeholders routinely spent time trying to brainstorm about how they might boost tutoring participation.

The program also lacks formal processes for tracking tutoring utilization. When asked if they kept attendance records for the students who participated in tutoring, the program coordinator said, "We don't really keep track of that." She did note that when the Math Champions performed their tutoring in the Learning Commons, students used the QLess online check-in system to sign in for tutoring appointments, and attendance records might be extracted from that system. However, if the Math Champions tutored students in alternative locations or

online, they did not have consistent attendance records. The math dean described their current system as an "honor system" in which the Math Champions have their individualized methods for tracking when students visit them for help. She felt confident that they share this information with their faculty mentors and would be able to report this out if they were asked to do so.

Research Question 2: Potential Program Goals

Research Question 2: What gaps do program participants perceive when comparing actual program performance to desired performance?

Finding 4-Professional Development

Program participants indicated that it would be helpful to provide additional training for the tutors in tutoring techniques, the use of Web conferencing platforms and tools, and the use of various online math instructional software packages. They also noted that there would be value in providing in-person workshops or written documentation of best practices in program delivery so that tutors and faculty mentors could learn from each other and optimize program performance.

The tutors and faculty agreed that tutors had adequate content-based preparation for tutoring. In the tutor version of the survey, 100% of the tutor respondents (n=6) strongly agreed or agreed that they were adequately prepared to provide tutoring assistance to students. Likewise, 100% of the faculty survey respondents (n=5) strongly agreed or agreed that the Math Champions assigned to their classes were adequately prepared to assist their students. In the student focus groups, one of the Math Champions indicated that she felt like she had content-related resources that she needed to be able to successfully perform her work. She pointed to having access to the Lumen online courseware and being able "to sit there and do the homework

alongside the people I tutored so that we could collaborate and so I could . . . freshen my awareness of . . . the topic."

Though there was some consensus among the tutors that the structure of the program supported their content knowledge, Math Champions identified some areas in which it would be helpful to have additional professional development. One Math Champion described how it would be valuable to have a handbook or hands-on training in use of some of the technology tools that they had to start using once the College shifted to offering more online classes in response to COVID-19. She shared an example of how she felt uncomfortable using a digital pen that she was given for use on the whiteboard in Zoom because she had not received advanced training on using the device and felt that it was "really unprofessional that first session until . . . [she] figured out how to use all that." Program administrators and the faculty mentors concurred that there was a need to make sure that the tutors received technology training. One faculty member noted that making this shift to more technology training was required during COVID and that going forward, it would be a necessity to place more emphasis on technology in the training:

> Maybe just because of the nature now of how things are, and we are probably going to be in this whole Zoom world for who knows--maybe this is just the thing now forever. I would maybe just say, make sure that technology piece is part of the training.

In addition to technical skills like managing Web conferencing software tools, one of the deans also noted the importance of helping tutors learn how to deliver support in different modalities because "the strategies that you use in the online environment" are "definitely different from the in-class environment."

While program administrators and faculty felt that the existing training for the tutors was effective, some study participants identified a need for some tutoring-skills training support for the tutors. The program coordinator (who is also a faculty mentor), another faculty mentor, and one of the deans agreed that overall they do a good job with tutor training in the Math Champions program. The program coordinator explained that for their training for the Math Champions program, they "have pretty much depended. . . on the Learning Commons to do . . . [their] tutor training." She noted that in the Learning Commons, "they're always doing training over there" and that they require the tutors who work in the Learning Commons to do more extensive training (aligned with CRLA Level 1 requirements) while the Math Champions program focuses on "the basics" and then puts the tutors into the classroom environment. She felt that this focus on the basics was okay because she had not had any of the Math Champions come to her to say that they "don't feel comfortable tutoring." However, during her interview, she did suggest that the tutors could benefit from "some type of leadership component" or "work on the tutoring component as far as making sure that they know how to tutor because a lot of kids, just because they're good at math doesn't mean that they know how to explain it to someone else." During a focus group with the tutors, one of the Math Champions indicated that it would be helpful to have some training with "patience." When prompted further, she confirmed that she meant that it would be helpful to have some training in how to successfully navigate interactions with students during a session.

One of the faculty interview participants indicated that professional development related to best practices would be helpful for the tutors and faculty mentors. She suggested live training or a common document where they could share strategies that have worked for them:

> I think it would be cool for them to have, like workshops on different things that they did for different professors just to kind of share the wealth, in terms of the wealth of knowledge that one person has, and everyone just keeps adding buckets to this. . . . I just feel like it would build upon our menu of different ways that we can have our Math Champions assist our students. So, I mean, not only having a workshop where Math Champions share what they've done, but also, you know, just a living document like a Google Doc and everyone kind of put in different things that they've used. And then, of course, the instructors could do the same.

This faculty mentor believed that collaboration could better position them to meet the needs of students and foster their success.

Research Question 3: Program Challenges

Research Question 3: What do participants perceive to be some of the specific challenges impacting program performance?

Finding 5-Space

Program administrators and faculty pointed to the lack of a dedicated physical location near the primary math instructional spaces where the Math Champions tutors could provide tutoring and program participants could collaborate as a challenge for program delivery.

When questioned about the weaknesses of the program or resource needs, faculty and program administrators identified space as a concern. They noted that previously the Math Champions program had a dedicated space that was referred to as the Math Hub, where the Math Champions could offer their tutoring services. One of the deans noted that they "made it nice." It was a renovated space that housed a bank of computers. It served not only as a functional space where tutoring services for the program could be delivered, but it was also a gathering space

where the Math Champions could congregate and socialize. The program coordinator described it as kind of a "clubhouse" for the Math Champions. The space was also coveted by faculty and became a location where they wanted to hold their office hours and could thus come into contact with the Math Champions and students.

The College reallocated the space that was previously utilized as the Math Hub so that it could be used as a training space as the college worked to implement a newly adopted enterprise resource program (ERP) that drives the college's business and student services functions. The Dean of Transitional Studies noted that early in the college's ERP implementation efforts, they experienced problems and delays in rolling out the student affairs components. These delays in implementation were costly and drew the attention of the college's Board of Trustees. The Board insisted that there be no further delay and that they move quickly to get staff trained on the system. The Math Hub space was viewed as an ideal training location because of its centrality on campus and the availability of computers in the space. Interviews revealed that program stakeholders had a sense of ownership of the space, referring to it as "our space." The dean of Transitional Studies felt consternation about the space having been taken from them without an opportunity to provide feedback about the proposed change: ". . . they decided that they wanted to use our space and we didn't have a say in it. They just took it." She was hopeful that they would be able to regain the space for use by the Math Champions program.

Beyond being a common area where Math Champions and the faculty could meet, faculty and program leaders felt that the Math Hub was supportive of the program's mission of engaging students in the use of tutoring services. Because of the Math Hub's proximity to the classrooms where the majority of the math courses are taught, they felt that there was a greater likelihood that students would visit this space for tutoring. They believed that having to travel across

campus to the Learning Commons, where the Math Champions are currently working, could serve as deterrent to student usage of tutoring. Having a tutoring delivery location that is ideally located and that would incentivize tutoring participation is directly related to the Math Champions program's theory of action. In order to reap the benefits that are associated with participating in tutoring programs, students must actually attend sessions.

Once the Math Champions program lost its dedicated space, Math Champions tutors began working in the College's Learning Commons, the primary delivery site for tutoring at the College. The program coordinator and one of the Math Champions described feeling constrained by the rules imposed in the Learning Commons. The program coordinator explained that the Learning Commons had stricter guidelines regarding tutoring session length and made the Math Champions cut off their sessions with students once they reached the maximum time limit and questioned why the Math Champions tutors could not operate more autonomously:

> We've also had some issues where the Learning Commons has rules. Like, they can only work with a student for 30 minutes, and then they have to tell the students, "That's it. I can't help you anymore." And, you know, they have their reasons why and the whole bit. But still, I mean, we're paying the Math Champions, and not the Learning Commons, and so that's kind of been an issue. Ans so we'd really like get them back to having their own area.

One of the Math Champions described a scenario in which he had visited the Learning Commons for tutoring and was limited in the amount of assistance that he could receive because of session time limits:

> . . . we're working and it was alright and he [the tutor] says, "Alright, 30 minutes is up. Goodbye." I was like, "What? What are you talking about? . . And then I'm like,

> "There's not anyone else here. " And he's like, "That's crazy, you know. I guess I can have like five minutes." That's kind of odd.

This feedback from these program stakeholders suggested that rules in the Learning Commons were too restrictive and could be preventing students from getting the help that they needed.

Finding 6-Variation in Program Practices

The tutors described a wide range of variation in their level of interaction with students in their assigned courses, and program administrators also indicated variations in faculty use of the tutors during class, noting that some faculty do not take full advantage of the support offered by the Math Champions tutors.

During the interviews with the program administrators, one dean indicated that some faculty mentors do not optimize their use of the Math Champions assigned to their classes: "we have some [faculty] . . . I will acknowledge, that don't quite use their Math Champions well in the classroom" and she suggested that the variation was linked to instructors' "teaching styles." She pointed out that some of the Math Champions have complained about this. She believed that it would be better to recruit faculty who use "active teaching strategies" but said that sometimes faculty selection is driven by the scheduling availability of the tutors. The other dean noted that length of participation in the program might impact the facility that the faculty mentors had with utilizing the Math Champions who were assigned to their classes:

> . . . some of our mentoring faculty have been with us since the beginning of the program so they understand what needs to happen. The ones who are new, they may need a little bit more time to adjust, to figure out their rhythm with their mentee. . . So it may not come as easy or as natural to them as it was for someone who has been with the program for the last two or three years.

The way in which the Math Champions interacted with students in the classroom seemed to be dependent upon the faculty mentor with whom they were paired, and the opportunities that they had to interact with the enrolled students varied significantly. During a focus group with the tutors, one Math Champion spoke of how she appreciated "how broad of a scope" she was given "when it came to interacting with students" while another Math Champion asserted that she had little interaction with students during class time:

> For me there wasn't really much interaction inside of the classroom. Most of what took place . . . between me and students was mostly outside of the classroom, whether it was in the Learning Commons or during my Zoom office hours. So we, mostly for my class at least, I kind of just sat in the class and paid attention and made sure that I was on the . . . same page as the teacher.

At the extreme end of the spectrum, one Math Champion reported having no interactions with the students in his assigned class because his faculty mentor told him that he did not have to attend lecture:

> Yeah, well, from my perspective, my class was a Zoom. It was what we call [college name redacted] Live, so a synchronous experience, and so I did not ever go to class. Because I discussed that with Professor [name redacted] at the beginning, and he said, that "you don't need to. Like what are you going to do? I'm already giving instruction. It's fine."

The inconsistencies in the Math Champions' interactions with students in class could prevent the program from achieving its aims.

Research Question 4: Promising Practices

Research Question 4: What practices do participants consider to be successful program elements that could be adapted by other units seeking to offer similar peer tutoring programs?

Finding 7-Embedded Tutoring

Faculty mentors and program administrators suggested that when the tutors actively interact with students during class time, they provide valuable supplemental academic support and expand faculty capacity to meet the needs of students. Math Champions faculty also noted that as the demand for online courses has increased, the Math Champions have proven to be valuable assets in monitoring classroom activity and engaging students who may be having difficulty or who are off task.

The program design of the Math Champions program is to embed the tutors in targeted course sections to assist with in-class activities and for the Math Champions to later offer out-of-class tutoring support to students during their scheduled office hours. During the semi-structured interviews, faculty mentors spoke of the value of having the Math Champions present in the classroom. One faculty mentor said that having an embedded Math Champion is a "huge strength." She felt that having the Math Champion there helped to expand her reach with students:

> Just having another set of hands, especially, you know, in larger classes. . . . sometimes I can have . . . over thirty students, and it's just not possible to . . . make my way to every person.

One of the other faculty mentors also spoke of how the Math Champions helped to expand her instructional capacity:

> We do problems in class. I demonstrate the questions, and they [the enrolled students] answer me as I go through, but then at the end of the section, we have what we call "you tries" and that's where the students work on the problems, and I circulate around the classroom to see if everybody's understanding it, and that's where the Math Champion really comes in handy because they're circulating also. So instead of me trying to get to twenty-five or thirty students and see if they got questions right, I'm only trying to get to fifteen because the Math Champions help the other half.

A faculty member also spoke of how helpful the Math Champions have proven to be in an online instructional environment because they can monitor questions in the chat and can notice if students "are not really engaging" and reach out to offer support while the instructor continues with the lesson. She also noted that at some point during the semester, she turns to her Math Champion for feedback on what the class dynamics are like so that she and the Math Champion can collaborate to better support students:

> Usually after we've had maybe a couple of weeks of classes, one of the conversations that comes up is you know, "What can we be doing differently? What kind of vibe are you getting from the students in the classroom? Do they feel like, does it seem as though they feel good about what we're going through? Do they feel comfortable? Do they feel confident? Are they feeling nervous? Are they feeling lost? " And then we talk about different things that we could do on both of our ends to help support our students.

The dean of math and science suggested that sometimes the Math Champions come up with "innovative ideas for helping students" as a result of their work with them in the classroom. On the whole, program faculty and administrators had very positive views of the value that the Math Champions add to the classroom.

While 71% of the respondents to the student version of the survey indicated that they strongly agreed or agreed that having the Math Champions assist them in class helped them to better understand the course content, these respondents did not elaborate further on the academic impact of having the Math Champions in class with them.

Recommendations

There are some key recommendations for the College that may enhance the performance of the Math Champions program and facilitate their future capacity to determine the impact of their student support efforts.

Recommendation 1-Attendance Data Collection

The Math Champions program should develop formalized attendance tracking mechanisms to document students' participation in tutoring sessions.

Study participants noted that they do not have standardized mechanisms for documenting tutoring session attendance. The current informality of session documentation prevents the program from more directly measuring the impact of the tutoring services provided by the Math Champions because service usage cannot be consistently tracked at the level of the individual student. While the College has previously measured program impact by comparing course success outcomes for students who were in sections with Math Champions to those of students in course sections without Math Champions, there are some limitations to this approach. Because of the variation in the way in which Math Champions are deployed in different sections of the target courses, it is difficult to say that all students in those sections have received the same "treatment." It is possible in these classroom scenarios that some students have had a great deal of contact and interaction with the Math Champion while others have not. With this kind of variability, it is difficult to pinpoint the presence of the Math Champion as the variable that has

made the strongest contribution to the outcomes experienced by students in these course sections.

Although there is naturally a degree of variability in any one-on-one tutoring session, in this one-on-one context, there is documentation of a student having received some form of academic assistance. Merging tutoring session attendance data with course grade data could provide a better means for measuring the academic impact of students' work with the Math Champions. Capturing student usage data that contains students' ID numbers facilitates the correlation of this user data with an institution's grade and demographic records (Sanford & Steiner, 2021). These kind of data analyses can be a powerful way for tutoring programs to tell the story of the impact of their services and may be disaggregated by student demographics (Sanford & Steiner, 2021), which can be particularly valuable for institutions like the College that have an interest in promoting equity in academic outcomes for its students.

Recommendation 2-Service Delivery

Consider the expansion of online tutoring support and non-traditional service hours to encourage greater student utilization of tutoring.

There was a high level of consensus among program stakeholders that students underutilized available tutoring services. Students indicated that lack of time was one of the major barriers that prevented them from taking advantage of tutoring services. Faculty and program leaders pointed to the college's commuter culture and students' work and personal obligations as deterrents to tutoring usage. During the focus group, one of the Math Champions suggested that being more flexible with tutoring offerings may be valuable to students. The College already had to expand online course offerings in response to COVID-19. Additional expansion of tutoring opportunities in the online modality could make it more convenient for working students with personal and professional obligations to access tutoring support during

hours when the college's physical Learning Commons facility is closed. This approach could also be helpful to working parents, who would be able to access help from home without having to make childcare arrangements.

Recommendation 3-Enhanced Support for Math Champions and Faculty Mentors

Develop a more comprehensive training protocol for Math Champions to include more pedagogical instruction and instruction in the use of various technology tools that are required to operate successfully in virtual classroom environments, and offer professional development opportunities for faculty who serve as mentors to support them in optimizing the assistance of the Math Champions who are assigned to their courses.

Tutors in the College's Learning Commons, the primary site for tutoring services at the college, participate in more extensive training than do the tutors who are hired as Math Champions. The Learning Commons tutors participate in tutoring that is guided by the College Reading and Learning Association's (CRLA) Level 1 tutor training guidelines. To be eligible for Level 1 tutor training program certification, institutions must guarantee that their tutors have participated in at least ten hours of tutor training, the majority of which must be live and interactive (CRLA, 2018). They must also document that tutors have provided 25 hours of live tutoring before being certified (CRLA, 2018). This requirement ensures that they have had an opportunity for the kind of hands-on experience that is supportive of increased tutoring skill. Tutor training programs that are certified by CRLA are required to address a number of topics related to pedagogy and effective management of tutoring sessions. This kind of skills-based training could prove useful to the Math Champions. While they have content-based support as a part of the program's structure, program participants have indicated that they could benefit from technique-focused training. Since the Learning Commons is currently offering this kind of

training, the infrastructure is already in place to support comparable training for the Math Champions, who could join the college's other tutors for these planned training sessions.

Program participants also expressed a need for enhanced training in the use of various technology tools that are critical to delivery of tutoring services in online learning modalities. Sanford and Steiner (2021) suggested that training related to online tutoring delivery should be included as standard part of tutor training efforts. Since the advent of COVID-19, by necessity, institutions have had to shift to provide more online service delivery options. In this new educational landscape, it is important for the Math Champions program to align its program practices with current service demands to remain relevant and to accomplish program goals. If the Learning Commons has not yet placed greater emphasis on online tutoring skills, the Math Champions program leaders could collaborate with leaders in the Learning Commons to further flesh out this content for the mutual benefit of all tutors at the college.

One of the faculty mentors suggested providing opportunities for the Math Champions and faculty mentors to collaborate and share information about program practices that have proven to be successful. She envisioned both live workshops and some kind of an online repository where program participants could share information and tips about how to best support students within the program's structure. The college is currently using Canvas as its learning management system (LMS). The Canvas LMS allows users to create communities in which users may self-enroll. In a Canvas community, there is the opportunity to upload training modules and assessments and to use a discussion board. Crouse-Machcinski (2019) spoke of the value of having used an LMS to support peer tutor training at West Chester University of Pennsylvania. The Math Champions program could create a Canvas community that they can use to house training materials and resources provided by the Math Champions and the faculty

mentors. They could also use the discussion forum feature in the community to create a space for asynchronous exchange of ideas among the faculty and tutors.

Recommendation 4-Leverage Partnerships

Capitalize on the current partnership with the Learning Commons to assist with program administration needs, such as tutor scheduling, training, and tracking of session attendance.

While program participants expressed a desire to reestablish a separate tutoring space for the Math Champions, it may be advantageous for them to focus instead on leveraging the existing partnership that they have with the Learning Commons and to continue to use the Learning Commons as the service delivery site for the Math Champions. Because the primary focus of the Learning Commons is tutoring support, they have the staff and physical and technological resources needed to support successful tutoring operations. Not only can the Math Champions benefit from participating more fully in the tutor training that is offered through the Learning Commons, but they can also capitalize on the attendance tracking tool that is used in this department. The Learning Commons currently uses the QLess online check-in and appointment-booking system. By concentrating all of their tutoring support in the Learning Commons, the Math Champions program may capitalize on usage reports that can be downloaded from the QLess system. These usage reports would track student usage of tutoring at the individual student level and would facilitate more direct measurement of the Math Champion's impact on students' academic performance. Additionally, continuing to work in the Learning Commons provides safety for both the tutors and tutees in the Math Champions program and helps to mitigate some of the legal or ethical concerns that could arise when tutoring is provided in unmonitored spaces. There was a feeling among Math Champions stakeholders that the rules for service delivery in the Learning Commons are too restrictive, so

there may be value in some cross-departmental collaboration to revisit guidelines and to see if a compromise may be reached that meets the needs of all parties.

Recommendation 5-Transportable Practices

The Math Champions program's practice of embedding tutors in classrooms should be considered as a transportable practice for other areas of the college that have an interest in adopting academic support strategies that are comparable to those of the Math Champions program.

Math Champions program leaders have an interest in identifying the elements of the Math Champions program that have been most successful because of institutional interest in expanding the Math Champions model into other academic discipline areas. The Math Champions program's practice of embedding tutors in classrooms and giving them the opportunity to assist students with learning activities one-on-one or in small groups should be considered as a transportable practice for other areas of the college that have an interest in adopting academic support strategies that are comparable to those of the Math Champions program. Faculty believed that the program's practice of embedding tutors in the classes has proven to be a capacity-building strategy that allows the faculty to reach a greater number of students during class time, particularly in classes with large enrollment counts. Math Champions faculty also noted that as the demand for online courses has increased, the Math Champions have proven to be valuable assets in monitoring classroom activity and engaging students who may be having difficulty or who are off task. One faculty mentor also noted the value of having the Math Champion weigh in on the current pulse of the class and suggest ways in which they might better meet the needs of students. The value-added by the presence of an embedded tutor in the Math

Champions program is a program practice that could be equally useful in other kinds of classroom settings.

Recommendation 6-Implementation Fidelity

Work to achieve greater implementation fidelity for the existing Math Champions program before continuing expansion into other discipline areas.

Implementation fidelity refers to an effort to ensure that a program is "delivered with sufficient quality, frequency, and intensity to the targeted beneficiaries to realize the intended benefits"(Rossi et al., 2019, p. 92). There was considerable variation in the way in which Math Champions were engaged to work with students in the classroom. Their involvement with students in the classroom environment ranged from very hands-on support of learning activities to instances in which the Math Champion had no contact with the students in the classroom setting. Peer-to-peer interaction is a key variable in producing the outcomes expected in the program's theory of change. The program should work to create a more homogenous in-class experience in the Math Champions program and document these strategies before the program model is expanded into other academic areas.

Conclusion

The Math Champions program has some notable strengths, particularly in its ability to enhance the classroom learning experience and to produce positive social outcomes for program participants. Program leaders should document the strategies that are helping to produce these positive outcomes so that they may be magnified and experienced more broadly in the program. There are opportunities for improvements to program practices that can help the program to operate more effectively. While stakeholder feedback suggests that the program has made an academic impact on the students who are enrolled in the course sections in which Math

Champions are embedded, the program should implement documentation strategies, such as maintaining formal attendance records, that will enable it to more clearly tell the story of the impact that they are making on the student outcomes that are valued by the institution. Providing enhanced professional development opportunities for the faculty and the Math Champions will enable them to optimize the program's supports for learners. Working to create a more consistent classroom experience for program participants can also support the program's achievement of its goals. Leaning in to its relationship with the Learning Commons may also provide the Math Champions program with benefits that have not previously been considered. With an intentional focus on implementing some key improvement strategies, the Math Champions program will be well positioned to achieve its mission and to serve as an example for departments at the College that hope to have a comparable impact on student success.

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Appendices

Appendix A: Student Survey

Champions Peer Tutoring Survey 2021- Student Version

Start of Block: Default Question Block

Q1 You have received this survey because you are enrolled in a class that has a Champions Peer Leader connected to it. The Champions program is conducting this survey to gather feedback from program participants so that they may use this information to ensure optimum program effectiveness. Please answer the questions that follow to the best of your ability.

Q2 In which of your courses was the Champions Peer Leader embedded?

- ☐ MAC 1105
- ☐ MAT 0018
- ☐ MAT 0028
- ☐ MAT 1033
- ☐ MGF 1106
- ☐ MGF 1107
- ☐ ENC 1101

Q3 When the Peer Leader assisted us with activities in class, it helped me to have a better understanding of the course material.

- ○ Strongly Agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly Disagree

Q4 I feel that I performed better in the course as a result of having a Champion Peer Leader in my class.

- ○ Strongly Agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly Disagree

Q5 I visited the Learning Commons for one-on-one tutoring outside of class time.

- ○ Yes
- ○ No

Skip To: Q6 If I visited the Learning Commons for one-on-one tutoring outside of class time. = No

Skip To: Q7 If I visited the Learning Commons for one-on-one tutoring outside of class time. = Yes

---

Q6 I did not participate in tutoring in the Learning Commons because . . .

- ○ I did not feel like I needed tutoring.
- ○ My schedule would not allow me to attend tutoring sessions.
- ○ I wasn't aware of the availability of tutoring.
- ○ I couldn't find a tutor when I visited the Learning Commons.
- ○ Other. Please explain. _____

Q7 When I visited the Learning Commons for tutoring, I was helped by

- ○ The Champions Peer Leader who was assigned to my class
- ○ Another tutor in the Learning Commons

Skip To: Q8 If When I visited the Learning Commons for tutoring, I was helped by = The Champions Peer Leader who was assigned to my class

Q8 How many times did you visit the Learning Commons for one-on-one tutoring this term?

- ○ 1-3 times
- ○ 4-6 times
- ○ 7-9 times
- ○ 10 or more times

Q9 I viewed the Peer Leader who was assigned to my class as a role model.

- ○ Strongly Agree
- ○ Agree
- ○ Neutral
- ○ Somewhat disagree
- ○ Strongly disagree

Q10 Did the Champions Peer Leader refer you to other resources on campus?

- ○ Yes. Please list the resources that were recommended in the space below.

  _____

- ○ No

Q11 Did the COVID-19 pandemic have an impact on your performance in this class? Please explain.

_____

_____

_____

_____

_____

Q12 Is there any other feedback that you would like to offer about the Champions peer tutoring program?

_____

_____

Q13 Please enter your contact information below if you wish to be entered into a drawing for a gift card as a result of completing this survey.

- ○ Name _____
- ○ E-mail Address _____

End of Block: Default Question Block

Appendix B: Tutor Survey

Champions Program Survey 2021-Tutor Version

Start of Block: Default Question Block

Q1 You have received this survey because you have served as a Peer Leader in your college's Champions peer tutoring program. The Champions program is conducting this survey to gather feedback from program participants so that they may use this information to ensure optimum program effectiveness. Please answer the questions that follow to the best of your ability.

Q2 In what course did you serve as a Champions Peer Leader?

- MAC 1105
- MAT 0018
- MAT 0028
- MAT 1033
- MGF 1106
- MGF 1107
- ENC 1101

Q3 I was adequately prepared to provide tutoring assistance to students.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Q4 I had all of the resources and support that I needed to be a successful Champions Peer Leader.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Q5 I clearly understood what was expected of me as a Champions Peer Leader.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Q6 I made positive contributions to students' learning when I assisted them with course content during class.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Q7 I had a good relationship with the students in the class that I was assigned to.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Q8 My interactions with students who visited the Learning Commons for tutoring were beneficial to these students.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Q9 I met regularly with my faculty mentor.

- ○ Yes.
- ○ No. Please specify what served as a barrier to regular meetings. _____

Q10 I had a good working relationship with my assigned faculty mentor.

- ○ Strongly Agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly Disagree

Q11 The program has strengthened my communication and interpersonal skills.

- ○ Strongly Agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly Disagree

Q12 The program has strengthened my problem-solving abilities.

- ○ Strongly Agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly Disagree

Q13 The program has strengthened my leadership skills.

- ○ Strongly Agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly Disagree

Q14 The incentives for serving as a Peer Leader were sufficient.

- ○ Strongly Agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly Disagree

Q15 Is there additional feedback that you would like to share about the Champions peer tutoring program?

_____

End of Block: Default Question Block

Appendix C: Faculty Survey

Champions Peer Tutoring Survey 2021- Faculty Version

Start of Block: Default Question Block

Q1 You have received this survey because you are a faculty member who has had a Champions program peer tutor embedded in your class. The Champions program is conducting this survey to gather feedback from program participants so that they may use this information to ensure optimum program effectiveness. Please answer the questions that follow to the best of your ability.

Q2 In which of your courses was a Champions Peer Leader embedded?

- [ ] MAC 1105
- [ ] MAT 0018
- [ ] MAT 0028
- [ ] MAT 1033
- [ ] MGF 1106
- [ ] MGF 1107
- [ ] ENC 1101

Q3 The Champions Peer Leader who was assigned to my class was adequately prepared to assist my students.

- ○ Strongly Agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly Disagree

Q4 Having a Champions Peer Leader embedded in my class helped my students to better understand the course material.

- ○ Strongly Agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly Disagree

Q5 My students' overall course performance was better as a result of having a Champions Peer Leader embedded in my class.

- ○ Strongly Agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly Disagree

Q6 The Champions Peer Leader had a good relationship with the students in my class.

- ○ Strongly Agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly Disagree

Q7 I met with my Champions Peer Leader regularly.

- ○ Yes
- ○ No. Please specify what served as an obstacle to regular meetings. _____

Q8 The meetings with my assigned Champions Peer Leader were beneficial.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Q9 I was able to establish a good rapport with my Champions Peer Leader.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Q10 The Champions Peer tutoring program was executed well this term.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Q11 Is there any other feedback that you would like to offer about the Champions peer tutoring program?

_____

_____

_____

_____

_____

End of Block: Default Question Block

Appendix D: Faculty Interview Questions

QUESTIONS FOR SEMI-STRUCTURED FACULTY INTERVIEWS

Deployment Plan: The Primary Investigator (PI) will conduct semi-structured interviews with faculty who are participating in the peer tutoring program at the partner institution. These interviews will be conducted after faculty participants have completed the faculty survey and will serve to deepen understanding of program operations. The interviews are scheduled to occur in November 2021.

1. What do you feel are the strengths of the Champions program?
2. What are some areas in which the program could be improved?
3. How would you describe your relationship with your assigned Champion?
4. In what ways did having a Champion assigned to your class impact your students?
5. How would you describe your students' engagement with the tutoring services that the Champion offered outside of class?
6. In what ways did COVID impact the ability to implement the Champions program in your class?
7. What recommendations would you make for future training for tutors in the Champions program?
8. Are there any resources or potential partners at the college that you wish would be included in the program?

Appendix E: Staff Interview Questions

QUESTIONS FOR SEMI-STRUCTURED STAFF INTERVIEWS

Deployment Plan: The Primary Investigator (PI) will conduct semi-structured interviews with staff who are participating in the peer tutoring program at the partner institution. The interviews are scheduled to occur in November 2021.

1. What do you feel are the strengths of the Champions program?
2. What are some areas in which the program could be improved?
3. How would you describe students' engagement with the tutoring services that the Champions offered outside of class?
4. Are there any resources or potential partners at the college that you wish would be included in the program?
5. In what ways did COVID impact the ability to implement the Champions program?

Appendix F: Focus Group Questions

QUESTIONS FOR PEER TUTOR FOCUS GROUP

Deployment Plan: The Primary Investigator (PI) will conduct a focus group with the tutors who provide tutoring support in the peer tutoring program at the partner organization. These focus groups will be conducted after peer tutors have completed the tutor survey and will serve to deepen understanding of program operations. The focus group is scheduled to occur in November 2021.

1. What do you feel are the strengths of the Champions program?
2. What are some areas in which the program could be improved?
3. Did COVID have any impact on your ability to perform your role as a Champion?
4. How would you describe your relationship with the students who were in the class section that you were assigned to?
5. Are there any resources or supports that you wish you had this semester?
6. What recommendations would you make for future training for tutors in the Champions program?
7. How would you describe your relationship with your faculty mentor?
8. Do you feel you have grown in any way as a result of participating in the program?
9. In what way has program participation shifted your thinking about your future educational or career goals?

Appendix G: Codebook

ATLAS.ti Report Capstone Project Codes

- **Academic Impact**

Groups:

Goal Attainment

Comment:

> Refers to the academic impact of program participation

- **Administration**

Groups:

Program Practices

Comment:

> This code refers to the logistics of program administration, such as required work hours, collection of timesheets, work responsibilities, program scope, and tutor selection/recruitment

---

- **Affective Impact**

Groups:

Goal Attainment

Comment:

Refers to the affective or social impact that the program has on participants

- **Attendance Tracking**

Groups:

- Goal Attainment

Comment:

Refers to attendance tracking processes

- Challenges

Comment:

> Ways that the COVID-19 pandemic impacted program implementation

---

- **Faculty Preparation and Engagement**

Groups:

- Fulfillment of Needs

Comment:

> The extent to which faculty are prepared to and do capitalize on having the MCs in class.

- **Instructor's Impact**

Groups:

- Goal Attainment

Comment:

> Refers to the impact that the instructor can have on students' academic performance

---

- **Interactions in Class**

Groups:

- Program Practices
- Transportable Practices

Comment:

> This code refers specifically to the way in which MCs interacted with students in class for academic tasks.

- **Marketing**

Groups:

- Program Practices

Comment:

> Refers to strategies used to market the availability of MC services

---

- **MCs as Students**

Groups:

- Other

Comment:

> This code refers to the program's effort to ensure that the MCs themselves are successful as students—always keeping their student identity in mind.

- **Modality**

Groups:

- Program Practices

Comment:

> Refers to how the modality in which a course or tutoring is offered impacts the program

---

- **Partnerships**

Groups:

- Fulfillment of Needs

Comment:

> Other campus groups with whom they might partner to the benefit of the Math Champions program

---

- **Peer Relationships**

Groups:

- Goal Attainment
- Program Practices

Comment:

> Describes the nature of the relationships that the MCs had with their peers.

- **Program Scope**

Groups:

- Program Practices

Comment:

> Refers to the courses that are currently covered by the MC program.

Relationship with Faculty Mentor

Groups:

- Goal Attainment

Comment:

> Describes the nature of the relationship that they had with the faculty mentor.

- **Resources**

Groups:

- Fulfillment of Needs

Comment:

> Refers to resources that are available to support program administration.

- **Scheduling Challenges**

Groups:

Challenges

Comment:

> Deals with the challenges of getting MCs scheduled tor targeted courses

---

- **Space**

Groups:

Challenges

Comment:

> Refers to comments related to having space available for the MCs to interact with students.

- **Strengths**

Groups:

Transportable Practices

Comment:

> Refers to general strengths of the program that might potentially be transposed to other disciplines.

- **Support from Staff**

Groups:

Fulfillment of Needs

Comment:

> Refers to the extent which the tutors felt like they were supported by staff

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- **Technology**

Groups:

- Fulfillment of Needs

Comment:

> Refers to MCs use of technology in the fulfillment of their work.

- **Training**

Groups:

- Fulfillment of Needs

Comment:

> Training provided to the MCs

- **Tutoring Usage**

Groups:

- Goal Attainment

Comment:

> The extent to which students participate in the tutoring that is offered through the program and/or efforts made to encourage tutoring participation