

## **Assessing the Performing Arts Experience at a STEM-based Institution**

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**Abstract:** Past studies examined the role of performing arts within a STEM-based curriculum, but there has been little research to date on how to fully integrate the two into one unified program at the higher education level. A qualitative study was conducted utilizing a phenomenological approach vis-à-vis four focus groups with students engaged in the Performing Arts Scholarship Program at Rochester Institute of Technology in Rochester, NY. The commitment-trust theory of relationship marketing as well as self-efficacy theory were considered to ground the theoretical framework surrounding the success of the program and the experiences of a sample of 951 Performing Arts Scholars. Entering its fourth year of existence in fall 2022, the RIT Performing Arts Scholarship Program continues to evolve. Very little data has been collected as of the time of this study on the success of this program or the shared experiences of the students participating in performing arts at RIT. The results of this study confirmed that students are seeking to further blur the boundaries between the STEM and liberal arts degrees they are pursuing and their talents and passions in the performing arts. The researcher also uncovered how this program can be strengthened through the first-hand stories of participants involved in the music, theatre, dance, and technical production opportunities at RIT. Using those findings, recommendations are presented for other institutions seeking to implement a similar model for STEAM education while resolving certain tensions between STEM and STEAM to potentially come closer to finding a solid balance between the two.

**Keywords:** performing arts, higher education, STEAM, STEM, arts, liberal arts, scholarship, service, leadership, administration, retention, recruitment, student experience, music, theatre, dance, technical production, self-efficacy, commitment-trust

## **Introduction**

### ***Research Problem***

The intersection of performing arts and STEM fields (science, technology, engineering, and math) in higher education is a relatively new and developing concept. As such, minimal research has been conducted which attempts to explain how a university might establish a curricular structure to effectively integrate the two. This lack of research indicates universities are still working to determine the best way to fold arts into STEM, known as STEAM. This is not to say progress has not been made, but tensions between STEM and STEAM have been pinpointed in recent years (Mejias et al., 2019). Resolving these tensions can help institutions remain flexible and build a model that works well for students, faculty, staff, and administrators while supporting their strategic goals.

Several universities, including Rochester Institute of Technology (RIT) in Rochester, NY by way of its Performing Arts Scholarship Program (PASP), presently seek to gain a better understanding of how to successfully implement a STEAM based curriculum. Georgia Tech's Tech@Arts program, University of Michigan's Arts Engine, MIT's Center for Art, Science, and Technology, and Rensselaer Polytechnic Institute's Curatorial Program are comparable examples (<https://arts.gatech.edu>; <https://artsengine.engin.umich.edu>; <https://arts.mit.edu/cast>; <https://empac.rpi.edu/program/curatorial>). To find a reasonable balance between current models and the stresses of a newly developing concept and program on a higher education campus, this study sought to focus on the opportunities and benefits for the students these programs serve. Existing literature repeatedly shows engagement in the performing arts strengthens and enhances skills such as creativity, flexibility, collaboration, understanding, among many other positive traits and abilities (Dell'Erba, 2019). The question becomes how RIT and other universities can best ensure the development of these skills remains at the forefront of their planning and mission while continuing to deliver on expectations and promises of a solid educational experience.

### ***Background and Significance of the Study***

Like many colleges around the world, RIT is finding new, unique ways to stay ahead of the curve. This pertains to recruitment, retention, and graduation rates, as well as equipping its students with the skillsets required to be successful as they enter the workforce. RIT's President, Dr. David Munson, declared that he intends for RIT to become the leading university in performing arts for non-majors. He states, "We are seeking the most talented and creative students who can continue their passions for music, dance, theater, and the arts. RIT is a place where you can exercise your multiple talents, satisfy your thirst for learning and for doing, and experiment along the way" (Rochester Institute of Technology, n.d., Message from the President).

To reinforce this position, the university established the PASP in 2019. This program allows undergraduate students who are earning STEM degrees to continue to pursue their passions and talents in the performing arts, whether in dance, music, theatre, or technical production, through curricular and extracurricular opportunities.

Recent research confirms that engaging in the performing arts during college and learning how to communicate and collaborate effectively with students both in similar and different fields of study can strengthen skills for an individual's future success (Dell'Erba, 2019). Furthermore, these skillsets gained through the performing arts in college can be applied to students' lives in

general as well as beyond the college years. This is especially relevant in today's fast paced, ever-changing technological world, which is filled with blurred and complex boundaries, disciplines, and relationships.

### ***What is the Performing Arts Scholarship Program?***

Upon acceptance to RIT, undergraduate students have an option to apply for the PASP through a supplemental application. The application and audition process is fairly straightforward. The requirements are three short answer questions regarding past participation in and future aspirations for the performing arts and an upload of a brief video or audio file of the student performing or presenting on an artistic creation.

A panel of performing arts faculty review the submissions and provide ratings to Enrollment Management based on talent of the student and need of RIT. Then, once the scores are tabulated, annual financial awards ranging from \$500 to \$1,500 are extended to students based on the ratings submitted by faculty. To date, no student has been denied acceptance to the PASP. The requirements for maintaining the annually renewable scholarship are relatively loose as well. The student must only participate in one performing arts activity per year, curricular or non-curricular, whether it is acting in a play or singing in an a cappella group. It is important to note that RIT does not presently offer a performing arts major, though it does offer music, theatre arts, dance, and technical theatre minors and "immersions" for its undergraduate students to serve as a complement to STEM degrees (Rochester Institute of Technology, n.d.).

Regardless of the high acceptance rate and flexible requirements, the fact that RIT offers a benefit to students for participating in performing arts has proven to be an incredible incentive for those who are passionate about continuing their involvement in the arts while earning a STEM degree. The program welcomed first-, second-, third-, and fourth-year cohorts totaling 1,436 students and as of the fall 2023 semester, the fifth year of the program, there are 1,815 Performing Arts Scholars on campus (RIT Enrollment Management, personal communications, August 2023).

### ***Purpose of the Study***

The purpose of this study is to explore challenges, stressors, and demands of the Performing Arts Scholarship Program at Rochester Institute of Technology. In addition, through this research, RIT and comparable institutions can gain an understanding of how an arts program might be successfully integrated within a rigorous STEM-based curriculum to provide a positive experience for students. To accomplish this, the project was structured as a qualitative study using a phenomenological approach by way of focus groups consisting of a cross-section of Performing Arts Scholars from all three years. The PASP is still quite new (year three at the time of this study), so capturing and understanding the daily lived experiences of these students will prove vital for long term success of the program. Gathering multiple perspectives to paint a broad landscape of the student experience is paramount; considering the 951 students involved through the first three years who hold a diverse range of talents and interests, and the multiple external forces such as persistence, resource, and curricular, all equally driving the program.

### **Theoretical Perspective**

For the purposes of this phenomenological study, the research is grounded with theoretical perspectives supporting qualitative data collection and analysis. Two theories directly connected to and bolster the integration of performing arts and STEM are the self-efficacy theory

and the commitment-trust theory of relationship marketing. Self-efficacy theory is a theoretical perspective supporting the front-end experience of performing arts curricula. Commitment-trust theory grounds the connection between the back-end operations and the front-end. The two are linked together on some level as one needs to build the levels of trust and commitment required to experience true self-efficacy.

Self-efficacy is centered around the concept that a human being's level of personal confidence is a direct result of that person's achievement of certain accomplishments and positive reinforcements (Manorothkul, 2021). The higher the amount of achievement and number of singular accomplishments, the higher the level of self-efficacy. The fewer the number of achievements and accomplishments, the lower the amount of confidence and therefore, level of self-efficacy (pp. 1-2). It posits that a person gravitates towards an activity, environment, and community of peers in which they experience high amounts of achievement and accomplishment such as a vibrant and rewarding community of performing artists (Dell'Erba, 2019). The basis of the theory, as noted by psychologist Albert Bandura (1977), is that self-efficacy is not a constant, steady feeling, state, or belief; it can change over time based on the positive and negative experiences of a person (St. Jean, 2017).

For RIT to forge a community that allows students to experience high levels of self-efficacy, the program must ensure its operational structures can support such a large and demanding initiative on a consistent basis. The commitment-trust theory of relationship marketing provides insight and guidance for the PASP as to how this can be achieved. As Morgan and Hunt (1994) posit, commitment and trust towards a brand built through relationship marketing is a longer and gradual process—it is established through repeat exchanges as opposed to a singular transactional basis which has a more definitive beginning and end (p. 20).

Much exploration is still left to be done regarding both theories, their connection to each other, and implementation in combination with a performing arts program such as RIT's (Manorothkul, 2021, iii). This study provides an opportunity to further these theories in tandem.

### ***Literature Review***

STEAM is a relatively new term having first been used in 2006 by Georgette Yakman, a teacher and past president of the Virginia Technology Education Association (Nanni-Messegee & Burns Murphy, 2013). Through existing literature, it is revealed that STEAM is not as straightforward as simply science, technology, engineering, arts, and math, but rather multilayered and more intertwined. STEAM is defined by Yakman as "Science and Technology interpreted through Engineering and the Arts, all based in the Mathematical elements" (Yakman, n.d.).

Current research and literature exploring pedagogical models to support the intersection of arts and STEM is plentiful and includes meaningful findings (Bertrand & Namukasa, 2022). Most studies conducted to date have determined arts contribute measurable benefits to the traditional STEM curriculum and vice versa for STEM and the arts (Cobb Payton, White & Mullins, 2017). Existing research (Dell'Erba, 2019; Ghanbari, 2015; Roncaglia, 2021) posits the skills garnered through some element of arts (whether it be visual arts or performing arts) promote forward thinking, collaboration, communication, creativity, and emotional intelligence. Although these confirmations exist, there is a significant void regarding the ideal implementation of a combined arts and STEM curriculum on a higher education campus (Ghanbari, 2015).

Much research surrounding the health (emotional, social, and physical) and intellectual benefits of arts is either general in scope or focused primarily on K-12 students and/or older

adults; even then, it is usually centered on visual arts (Jacobs, 2019) and how universities educate future teachers to implement a STEAM curriculum for younger generations (Neimark, 2022). Existing research is sparse for arts serving as an extracurricular complementary offering on a STEM-based campus, as opposed to a fully integrated STEAM degree-offering university (Payton, White, & Mullins, 2017).

There are no known existing qualitative or quantitative studies on an engaged cohort of performing arts students within a STEM-based institution. In a 2017 study with dance students at North Carolina State University, researchers suggested further exploration into how the arts support STEM curricula and how STEM-focused universities are devising new and interesting ways to integrate arts for students' benefits (Cobb Payton, White, & Mullins, 2017).

Hume (2003) discusses the importance of building an invested and engaged community in the performing arts sector. They suggest developing a culture-based environment supported by strong service management conditions will provide individuals an experience they trust and believe in both during their time at college and following their graduation when they transition to alumni (Hume, 2003). The performing arts offers an avenue for students to fulfill their full sense of self and learn what it means to continually grow and improve both as an individual and as a member of a community (Roncaglia, 2021).

Current literature notes those in positions of leadership as administrators of higher education performing arts who are implementing these programs may not have received consistent or adequate training (McIvor, 2015). However, it is evident that individuals appointed to roles as arts leaders are vital for the success of their programs (Engdahl, 2012). As such, equipping leaders with the necessary knowledge and skills will make a difference for faculty, staff, and students to experience full commitment, trust, and self-efficacy.

Finally, most studies conducted on STEM and the arts to date conclude with a similar recommendation in that further research is required at the state, local, and university level for true lasting change to be realized in this area (Dell'Erba, 2019). Key tensions exist between STEM and the arts. For those tensions to be resolved, universities must first come to a better understanding of what exactly STEAM is and can be before it is able to bolster efforts at preparing students for entrance into the highly competitive and fast paced workforce of the 21<sup>st</sup> century (Mejias et al., 2019).

### ***Research Questions***

This study sought to address the following questions with the intention of exploring the relationship between the development of a committed and trusting performing arts ecosystem and community, the self-efficacy theory and corresponding levels of student retention, and RIT's investment in the PASP.

**Qualitative Question 1:** What role does performing arts serve in students' academic and personal lives at RIT, a STEM-based university in Rochester, NY?

**Qualitative Question 2:** How might RIT learn from the shared experiences of Performing Arts Scholars to improve and strengthen the program for future cohorts?

**Subquestion 1:** Using the findings from questions 1 and 2, how can RIT serve as a model for other institutions seeking to further integrate arts into STEM curriculum?

### **Role of the Researcher**

The researcher took great steps to limit bias and influence in skewing the data in one direction or another, particularly in any way that might impact this study's participants, a

relationship with RIT's PASP, and/or the future of the program. First, the researcher appointed an advisor from outside the performing arts ecosystem but one who is still aware of the RIT campus and higher education landscape. In addition, the researcher did not request additional data from or confer with faculty or staff directly involved in the performing arts at RIT regarding this study, except to secure necessary approvals to conduct the research. This was to avoid undue influence on the direction of the study or results. Even still, the researcher was challenged to remain a neutral, unbiased party especially in the focus group sessions. This is primarily due to his understanding of the history, status, and plans of the PASP and the performing arts ecosystem at RIT overall.

The researcher sought to gain a deeper understanding of how decisions made have impacted the student experience in an unexpected manner. Taking a back seat and observatory role allowed for insightful, open, and honest feedback from this study's participants and aided the researcher in learning from and about students' experiences. The researcher aimed to set participants at ease and establish rapport, beginning each focus group with a statement of the intent of the study, the goal to consistently uphold confidentiality, as well as relay the voluntary nature of the study.

## **Methods**

This study sought to examine the experiences of students enrolled in the PASP at RIT with the goal of gaining a deeper understanding of how RIT can strengthen the PASP and further enhance the overall relationship between arts and STEM. As previously noted, several tensions have been identified by prior research and literature between STEM and arts (Mejias et al., 2019); the study is also geared towards gaining a better understanding of those tensions and how they might be resolved through programs such as the PASP. As such, a phenomenological approach was a logical approach to explore the perspectives and stories of a subset of Performing Arts Scholars in their first, second, and third years of the program.

A qualitative research study comprised of four focus groups consisting of between four to nine Performing Arts Scholars per group was conducted. The focus groups were made up of scholars from a mix of the four main disciplines (music, theatre, dance, and technical production) and selected from all three years of the program's full cohort of 951 students. Broad inclusivity in selecting the scholars was deemed important to encourage robust discussion and ideation from the participants and to examine if one discipline is experiencing something entirely different from the others (and vice versa). The study's methods were constructed from the procedures and recommendations outlined in the literature of both Creswell & Creswell (2018) and Denscombe (2017), first beginning with a thorough, intensive sampling procedure.

### ***Sampling and inviting***

A sample of participants was drawn from the population of students involved in the PASP. The population of scholars was stratified by the disciplines of music, theatre, dance, and technical production. Random samples from each of the disciplines were selected using systematic sampling technique in which every  $n$ th numbered scholar on the respective discipline list was chosen (Creswell & Creswell, 2018, p. 150; Denscombe, 2017, p. 37). The final number selected was based on a percentage of the number of students in each discipline; between 1% and 12% to eliminate or reduce the chances of random sampling error.

Several key steps were followed to accomplish random sampling conducted by way of stratified sampling procedure. Lists from each of the four main disciplines were exported from

RIT's CampusGroups platform and randomized using the Excel random formula. From a randomized list, every 80<sup>th</sup> music scholar, 22<sup>nd</sup> theatre scholar, 8<sup>th</sup> technical production scholar, and 9<sup>th</sup> dance scholar on the respective discipline list was chosen. This ensured a balanced mix from each discipline.

Invitations were then emailed to randomly selected scholars from the researcher's RIT email address. An incentive of \$5 in Tiger Bucks (RIT campus currency) was offered (and subsequently paid) for the participants' time and contributions. Four additional rounds of random sampling were conducted before the researcher secured a suitable and balanced number of scholars to make up four focus groups at mutually agreeable times (Denscombe, 2017, pp. 205-206). In all, focus group one consisted of 7 scholars, focus group two consisted of 8 scholars, focus group three consisted of 8 scholars, and focus group four consisted of 4 scholars. Sampling and participation from a balanced mix of the music, theatre, dance, and technical production disciplines provided insight into each discipline and the extent to which participants voiced feeling that their faculty mentor (referred to as a "guide") supports their discipline and students.

Consent forms approved by the RIT Human Subjects Research Office were emailed to confirmed participants upon their acceptance to engage in the study. The consent form provided to each prospective participant detailed the background of the research purpose, the reasoning behind why the participants have been invited to take part, information about the focus group being completely voluntary and that participants can withdraw from the focus group at any time. The signed forms are stored on the researcher's computer and password protected.

### ***Data Analysis***

Transcriptions generated by Zoom were verified by the researcher, checking for typographical errors while listening to the audio recordings of the sessions twice. Names of participants and identifiers were removed from the transcriptions and replaced by pseudonyms. A master key was created with the names of the participants, their years, majors, and performing arts disciplines, along with pseudonyms. The master key is stored on the researcher's computer and password protected.

An iterative, hybrid inductive-deductive process (Creswell & Creswell, 2018) was used to code the data. This allowed the researcher the opportunity to cast as far a net as possible and ensure valuable information was not omitted from the participants' stories. The researcher then printed, analyzed, and color-coded the transcriptions twice. This allowed the researcher to spend time with and process the data through a fresh lens. The printed transcriptions are stored in the researcher's locked filing cabinet, along with the researcher's handwritten field notes which were typed and now stored on researcher's computer. During the second reading of printed transcriptions, the researcher generated and identified broad codes and themes by making annotations and handwritten markings on the transcriptions, referencing the field notes as well.

103 codes were extracted from the initial inductive coding process ranging from one-word codes to phrases and sentences. The information was compiled into a code book and organized by initial themes, categories, and concepts (Denscombe, 2017, p. 263) to help guide the second phase of coding through a computer-assisted qualitative data analysis software. The verified transcriptions were then imported into the qualitative software platform HyperResearch for further analysis and coding, again through an inductive-deductive hybrid process. The original code book was referenced but not relied on, as a means of validating the initial codes and conclusions drawn from reading the hard copy transcriptions. Coding through HyperResearch resulted in a reduced number of codes, totaling 54, within 8 code groups; the

codes again included single words and phrases. The two code books were then compared to identify further themes and commonalities.

The most frequently appearing codes between the four focus group transcripts were selected for further analysis. Those codes include *communication* (n=40), *access to opportunities and resources* (n=39), *finding balance* (n=36), *awareness and clarity* (n=30), *community and connection* (n=28), *space* (n=26), *networking and social activities* (n=24), *flexibility* (n=23), and *equitable support and opportunities* (n=21).

Throughout both the handwritten and software-based coding process, the researcher engaged in self-memoing to pinpoint potential connections, identify possible relationships between codes, and begin to comprehend commonalities between the participants' shared experiences.

## Results

### *Communication, awareness, and clarity are key*

One main area for improvement according to the shared experiences of the participants and the most frequently appearing code and common theme amongst all four focus groups pertains to the importance of communication. "Communication" was mentioned by 20 participants between the four focus groups —40 times in total. This is communication both from/with the administration of the program, the administration of the Institution, as well as internal communication between students. (Music Scholar 8, Music Scholar 3).

One of the primary vocalized desires of Performing Arts Scholars was the ability to connect, meet, and network with each other. Participants revealed they rely very little on PASP faculty and staff for information about opportunities, solutions, and information, which drives their performing arts experience on campus. Scholars receive information on opportunities from the rich performing arts offerings on the campus offered by Student Affairs, through its clubs and organizations, the College of Liberal Arts, through its music and theatre programs, and the National Technical Institute for the Deaf (NTID) Department of Performing Arts, vis-à-vis its theatre and dance classes and productions. These entities make up what is referred to as the "performing arts ecosystem" at RIT. To this end, the scholars use the PASP to inspire and facilitate their creative endeavors and involvement in the opportunities and happenings on campus.

Participants across all focus groups shared that the PASP has not done a great job communicating policies surrounding the requirements of the program, the opportunities the program affords to the scholars, as well as supporting opportunities in an equitable and balanced manner. Theatre Scholar 8 highlighted these communication troubles sharing,

"Things aren't communicated very well, things aren't very clear; there's been many times, where me and three friends will all be texting each other, trying to figure out 'when is this due,' 'when are we doing that,' 'what's happening in this community,' 'is there an event coming up, or is there not' —like things seem to still be kind of all over the place."

Theatre Scholar 7 concurred, sharing, "I kind of assumed that when I when I got on campus some of the vagaries that were in the Performing Arts Scholarship [Program] online material would be explained in person."

In addition, participants in three of the four focus groups conveyed that most of the email announcements regarding opportunities offered do not necessarily apply to them. For example, the participants noted a heavy focus on dance-related activities included the emailed



communications and those announcements are disseminated to the entire group, instead of filtered to a focused subset. Participants suggested there either be a more streamlined, less selective way communications are disseminated or fewer emails altogether and a main calendar where all opportunities are listed. Students could then filter and opt-in to the announcements they prefer to receive. They would like to experience more experimentation and blurring of boundaries between disciplines, a more balanced and holistic perspective of what's happening on campus and in the community, and less identification/limitation based on their assigned discipline (Theatre Scholar 8, Dance Scholar 2).

Theatre Scholar 7 focused on the importance of communication for the program and took it a step further recommending, "I think communicate more but not just 'say more,' you know, but like actually reach out in a meaningful way." Another suggestion shared across two of the focus groups is to conduct more formal, and perhaps an ongoing series of orientation and training sessions (about performing arts opportunities at RIT and practical skillsets). This would be helpful to resolve some of the confusion surrounding policies, procedures, and opportunities, and a chance to deliver more hands-on, practical learning opportunities which the scholars seek. Music Scholar 3 noted that,

"For the longest time, I didn't quite understand how the stipend worked or what did or didn't qualify as me participating. And anytime I was curious, I'd have to email my coach to clarify . . . so going through and having more information about that widely available would definitely be helpful."

This is in addition to the training many students at an experiential-based institution, as RIT is, are seeking in more practical and hands-on areas such as technical production (lighting, sound, set design, costumes, etc.). Speaking to this point, Theatre Scholar 5 offered an opportunity to Focus Group 3 sharing,

"My club has a lot of tech opportunities that I tried to advertise in every theater class I'm in because people don't know about it. We have 'build-weekends' that everyone is welcome to come to where we will give you as much training as possible to learn how to use our stuff — like we have that, it's just not advertised."

### ***Equitable access to opportunities, space, support, and resources***

The scholars receive a yearly tuition scholarship, which is their main recognition for participation in the PASP. However, they are also afforded opportunities such as enrichment experiences –tickets and transportation to local Broadway productions, concerts by the Rochester Philharmonic Orchestra, and workshops/master classes presented by world class artists such as Tony-award winning choreographer Garth Fagan. Each scholar is assigned a faculty guide, based on the discipline in which the scholar auditioned and the expertise of the guide, who is responsible for convening their cohort of scholars for social activities, performance opportunities, and simply being on call to answer any questions about the performing arts ecosystem.

Most participants agreed they are generally satisfied and place great importance on the number of performing arts opportunities to choose from. Theatre Scholar 7 described the importance of this element,

"There's the NTID stuff there's [RIT] Players' stuff, there's, I'm part of Foul Play, I'm part of you know, the comedy improv troupes on campus –that's been

most of my interaction with doing performing arts stuff on campus, but it's just the fact that there's so much to do."

It is not solely the opportunities and resources the program provides to the students that keep them engaged and inspired. Rather, participants revealed that what is important to the scholars and another area that can be fine-tuned and enhanced, is offering *equitable* access and representation for all disciplines. For example, Dance Scholar 1, is an aerial arts-focused student. Given that RIT does not have the facilities to provide for aerial arts activities (such as high enough ceilings or proper rigging points for silks) though, the student must drive 25 minutes to and from the Rochester Aerial Arts company in downtown Rochester to participate in their art form. They feel "lumped in" (Dance Scholar 1) with dance students —RIT does not have the expertise or resources needed to support aerial arts students.

Similarly, Music Scholar 2, shared that "personally there hasn't been a lot for electronic music or anything like that. I have talked to my coach about different educational opportunities, or other opportunities to just go see the performer itself, but nothing's really panned out." If the program plans to broadcast itself as an inclusive and diverse community and use inclusivity to create more of a breeding ground for collaboration, experimentation, and interdisciplinarity, it must find a way to better support the students it accepts, and specifically support nontraditional artforms (Dance Scholar 3).

Participants vocalized that it is as though the program is a closed off one-way street in terms of the opportunities being delivered to them. Production Scholar 5 suggested the program implement more of a democratic process when selecting the events and programs it provides to students. They recommended a voting process in which a list of opportunities is presented to scholars for their consideration and the top choices are funded and supported by the program.

### ***A balanced blend and a different way of thinking***

A strong sentiment surrounding the important role that performing arts currently serves in participants' academic and personal lives was apparent in all four focus groups. Furthermore, participant responses revealed insightful hopes and ideas on the role that performing arts *could* serve if RIT determines a path to seamlessly integrate arts and technology. Students hope to find a more natural balance between their academics and the performing arts activities they engage in on campus. While six participants referenced the performing arts as a chance to disconnect and destress outside of their demanding STEM-based courses, projects, and finals, most participants feel that the PASP enables them to find equilibrium between two areas of their lives they enjoy the most.

Theatre Scholar 4 and Music Scholar 7 shared it is less about decompressing and breaking away, but more an avenue for them to approach challenges and problems through a new lens and with a fresh perspective. They feel performing arts provides them with a chance to step outside their usual mindsets to explore and test different paths and approaches they may then be able to bring back to their core academic programs and apply new skills and thought patterns to. This gets at the heart of the STEAM agenda, as it is not a situation in which one area exists and takes authority over another in the curriculum, but rather an equitable and synergistic blend of all areas. Theatre Scholar 4 reflected on this noting:

"Personally, performing arts is more of an outlet for things that are different. I can't just do physics all day, so I do everything in my power to do very different kinds of things. And just having an opportunity to express myself emotionally, as well as logically, you know, in the same day is really important to me."

From a long-range perspective, Production Scholar 2 noted that RIT's STEM degrees could and should integrate more arts aspects into their programs to make them even more innovative and engaging to students. They reflected that "you don't get to be that creative inside of a management degree, especially with how RIT incorporates technology within our degree program so it's nice to be able to walk into the theater and just have fun with the lighting system and be able to figure out different ways you can enhance performance" (Production Scholar 2).

### ***Fostering community and collaboration***

PASP students' desire for collaboration and connection was palpable, even on Zoom. Dance Scholar 4 shared with the other participants (separate from questions asked by the researcher), "I would love to do collabs with all of you guys in your groups . . . I want us to be able to branch out." While it is clear the scholars can and will collaborate independently of the PASP, they seem to recognize that a main goal of the PASP is to create a community of performing artists on campus. The performing arts, Music Scholar 5 observed, has a "way of getting people who you wouldn't otherwise meet, like say they're in different programs, and you meet through music or through theater. I think that's a good thing the program has."

Theatre Scholar 5 pointed out that certain events may unfortunately only aid the scholars in developing an internal community and not one that bridges the gap with the greater community on campus. They voiced that it would be in the best interest of the program to expand its reach. Four other scholars commented on how the program feels separated from the larger performing arts community on campus. Music Scholar 8 noted,

"It kind of feels like the whole performing arts side of things is very separated and it could be brought a little bit more together. I know there's so many different clubs at RIT and I remember as a freshman I had absolutely no idea what was different between all the different groups."

On a collaborative level, several of the scholars shared that they simply want to get together to create with each other. It is less about faculty guidance and involvement in the activities they participate in and more about finding a way to exchange ideas (and their art) with each other. Music Scholar 2 commented,

"[It would] be cool to have some kind of highlighted collaborative part where, you know, if I have a track that I'm working on, and I want to have somebody make vocals for it, it'd be easy to then find the vocals in the Performing Arts Scholars [Program] with those people who do that. And then 'Hey, here's what I'm thinking, do you want to work together? Let's go to the recording studio and make something' –it'd be really cool to have all that streamlined..."

This example connects back to the need for enhanced communication as many of the scholars simply do not know how to get in contact with each other to offer an invitation for artistic partnership.

### **Discussion**

Results revealed that students' participating in the PASP and more broadly, performing arts at RIT, do not necessarily seek to have performing arts replace their core academic degree programs. Rather, they wish to have the performing arts combined with and complement those programs to find a stronger balance between each. This might, in the future, involve dual degrees or perhaps certain tracks within performing arts minors that align with the area of interest of the student but complement their home degree program (e.g. entertainment management, audio

production, etc.). This study revealed a few deficiencies which must be strengthened and improved for the Institution to ensure it fulfills expectations set for students who decide to apply for the program. Additionally, this study contributes to the lack of literature and research and provides a solid foundation for future studies on STEAM curricula in the higher education landscape. For example, existing known research on higher education STEAM initiatives has not provided longitudinal data from which perceived success of a performing arts program can be measured.

### ***Developing a performing arts ecosystem***

Despite reported frustrations, RIT students participating in the PASP voiced that they are exceptionally appreciative for the opportunity to continue their talents and passions in the performing arts as well as the recognition of being performing artists at a STEM institution. Through this greater recognition and general awareness of models such as the PASP, and thus a stronger performing arts community on campus, Theatre Scholar 8 feels RIT might be able to resolve some of the noted tensions. They shared,

“I think the performing arts community at the school itself exceeds my expectations on, just because STEM schools and tech schools get certain stereotypes of not welcoming or supporting creativity and arts as almost being at war with arts, which I think is insane because engineering and tech need so much creativity, so they really go hand in hand, but the two degrees always seem to feud with each other, despite that.”

This mirrors the research study of Cobb Payton, White, and Mullins (2017) whose “participants mentioned that STEM is often depicted as a geek, hard, male-dominated culture that fails to embrace flexibility, creativity, or diversity” (pp. 43-44). Theatre Scholar 8 reflected on this sentiment stating, “As a whole, performing arts at RIT is a very nice, wonderful, diverse ecosystem — it’s crazy to see people have all these different majors coming together and doing something they love.” In describing what makes the performing arts ecosystem on campus truly unique, separate from the PASP, Theatre Scholar 9 recounted their a cappella group’s recent success placing third at a national competition. The group faced stiff competition from other ensembles from colleges with conservatory-level music programs. The scholar noted it is the passion, drive and diverse/inclusive makeup of the students who all want to share in the creative pursuit that is what sets their ecosystem apart from others (Theatre Scholar 9).

As participants voiced, it is not solely the opportunities of attending shows, taking music lessons, or participating in productions that are important to scholars (though they are important). Instead, it is that the performing arts components of the students’ educational experience are of the same value and quality as their STEM degrees. Dance Scholar 2 shared that “being able to pursue performing arts with the same kind of quality that I’m pursuing my education with is really special and something I really value.”

Presently though, as the participants of this study shared, RIT is not elevating performing arts to a seamlessly integrated, valued level. Rather, the Institution currently treats performing arts more as an extracurricular support service —and the scholars have noticed. Theatre Scholar 7 hinted at this sentiment, “I have never felt different from a non-Performing Arts Scholarship student on campus in my ability to access certain opportunities.” The inequality between the arts and STEM on campus raises the importance of authenticity and intentionality when delivering an opportunity and service. Prior research confirms that deep learning and a fulfilling educational experience, especially in the arts, cannot occur without students letting their guard down and

opening themselves to what can be a vulnerable experience (Dell’Erba, 2019). Performing arts demands a sense of trust and purpose if one is to experience success.

This feeling could not be any more apparent in the stories of these scholars and threads to an application of the second theory used to ground this research, the commitment-trust theory. To make more efficient use of its limited resources, support, and time, RIT should find a way to incorporate students more in the “behind the scenes” processes. This could provide students with the practical hands-on experience they want. Seven of the study’s participants shared their desire to experience training sessions on practical skillsets that could be applied both to their performing arts experiences as well as their core academic degree programs, and upon graduation, employment positions.

To this end, Dell’Erba (2019) notes that STEAM education “focuses on the processes of learning and problem solving” (p. 4) and not just the final goal, product, or performance in this instance. To allow for these situations of trial and error and deep learning to occur, Dell’Erba points out that it requires and ultimately creates “a safe place” (p. 3) where students feel comfortable both physically and metaphorically. Furthermore, and matching participants’ shared stories, STEAM learning “encourages students to think about content and concepts from different points of view, using critical thinking skills to identify strengths and weaknesses of alternative solutions” (Dell’Erba, 2019, p. 5). STEAM enhances convergent/divergent, integrative thinking and decision-making skills –equally imperative in today’s highly complex world filled with experiences and situations where one is never like the next (p. 3). As confirmed by Theatre Scholar 4, it is less about the performing arts serving as an outlet for stress relief and more important for them to use the arts to gain a fresh perspective on a challenge or situation.

Connecting back to the self-efficacy theory, providing a fulfilling experience, and not just meeting but exceeding students’ expectations should be the PASP’s goal. Participants revealed they will have a more rewarding time through exposure to clear and consistent communication, equitable opportunities, hands-on/practical learning experiences, and access to proper resources and support. As a result, through providing an adequate combination of these factors, students will experience greater self-confidence and belief in themselves and their unique talents. They are then more willing and interested in taking a proactive, engaged, and participatory approach, filled with increased risks and challenges in the future if they feel they will again experience success towards achieving their goals (Manorothkul, 2021, p. 6). This aligns with the findings of Huser et al. (2020) who describe this phenomenon aptly, sharing “The arts give learners agency through creative, challenge, and diverse instructional strategies. As a result, they become more engaged, self-confident, and motivated about their learning experience.” (p. 7).

### ***STEM and Arts***

The results of this study confirmed key findings of the limited existing research on STEM and arts in higher education through participants’ shared experiences. For example, and as Huser et al. (2020) posit, “STEAM education empowers and immerses students and educators in inquiry, dialogue, problem-solving, and experiential learning that deepens understanding of all fields in their educational experience” (p. 3). It is evident that students at RIT agree with this sentiment too, particularly as demonstrated by their interest in further blurring the boundaries between their STEM education and experiences in the performing arts. Theatre Scholar 8 commented on the importance of “mixing the ability to use creative expression with the more technical side of things.” Many went so far as to note that an ability to integrate their preferred two fields of study was a main reason in their decision to attend the institution, sharing “RIT

stood out because it had the mix of the arts and tech” (Theatre Scholar 8). So, the challenge then becomes pinpointing how can RIT push this concept further —by blurring the boundaries between STEM and art even more and integrating the two to make this a full STEAM initiative. Production Scholar 1 suggested,

“It would honestly be more helpful if, like, STEM majors have more access to like fine art classes and things like that. I think if we want to claim to be you know, science, technology, engineering, arts, and math, then there might need to be more options for students in the STEM majors to include that somewhere in their curriculum.”

It was intriguing to learn from the participants’ responses that at present, RIT seems to be simply pursuing a path in arts integration (Huser et al., 2020, p. 4) —where arts and STEM coexist, but STEM takes precedence. As Production Scholar 1 indicated, the next logical step is to provide a pathway to participation for those who are not currently or directly participating in the arts. RIT must encourage and enable non-scholars to enroll in fine and performing arts courses, and vice versa for students in performing arts to collaborate with those in other fields. Right now, the existing structures and barriers between colleges on campus prevent this from happening in a seamless manner.

At this juncture, it is also important to consider where RIT and the PASP currently fit on the axis of the “Instrumental and pedagogical rhetorics of STEAM,” as introduced by Mejias et al. (2019). Three years ago, prior to the introduction of the PASP, RIT was in a position of being “one-sided instrumental and non-pedagogical” (Mejas et al., 2021, p. 219). The performing arts existed on the RIT campus, but with little to no connection to the colleges offering STEM degree programs. Now, however, with the introduction of the PASP and other initiatives implemented across the campus, RIT is in an interesting place, bridging the gap between the “mutually instrumental and non-pedagogical” and “one-sided instrumental and pedagogical” rhetoric (pp. 220-223). Based on students’ impressions as gleaned from the focus groups, it was discovered that: a) Students do not consider STEAM education within these strict parameters; they consider it in more hybrid terms; and b) The scholars are seeking a comfortable and equitable balance between their STEM degree programs and their performing arts experience.

This study highlights how students engaged in a dedicated performing arts program at a STEM-based institution experience the Institution’s efforts at integrating arts and STEM. The results from the four focus groups revealed that students appreciate the recognition of being a Performing Arts Scholar, though it is much less important to them than the richness of opportunities that exist within the campus environment (Theatre Scholar 2, Theatre Scholar 8). The participants seek a diverse array of performing arts opportunities offered in an equitable and balanced manner. In addition, the participants are interested in connecting and collaborating with each other, learning about each other’s interests, and building a performing arts community that is above and beyond any tuition-based incentive for engaging in the performing arts on campus.

This study’s findings reveal that a student’s first-hand experience greatly impacts their commitment to the program and their willingness to fully engage themselves in the opportunities presented. The study found that students wish to blur their academic degree programs and personal, extracurricular lives more fully, as they do not see the two as autonomous existences. While the information uncovered through focus groups provided some answers to the qualitative questions explored in this study and confirmed certain findings of prior literature, there are still further questions for future consideration given some limitations of the scope of this study. This

study's findings pave the way for future exploration into the intersection of arts and technology in modern higher education.

### ***Recommendations for practice***

Participants across two of the focus groups recommended a student ambassador program to help the PASP forge a stronger sense of community. Student mentorship, the participants feel, will help address communication issues between the scholars, faculty guides, and administration and will provide incoming students with first-hand guidance from other individuals who have experienced the same program. Focus group participants shared that most of the time when they have a question or need information, they rely on club leaders and third- or fourth-year students for guidance instead of the faculty. Music Scholar 6 shared that “the community is a strength, but it would create a greater sense of community having that student leader to bring us together.”

As Huser et al. (2020) posit, the arts are a unique field in that they encourage and enable students to connect, partner, and explore with other individuals (students). However, given the highly collaborative nature of the arts, participants will also rely on many connection and access points to get involved, solve their challenges, and discover new insights into how they approach a problem (p. 8). Providing these communication and support mechanisms for students to resolve their challenges and collaborate is paramount.

Secondly, RIT and any institution delving into STEAM for that matter, must raise awareness and clarity surrounding the mission and importance of STEAM. At RIT, much of the rest of the Institution does not fully know about the PASP, the opportunities and offerings in performing arts, or how performing arts can contribute to their programs. Participants appreciate the focus that RIT is putting on performing arts but feel more can be done to raise its profile to the same level as other opportunities. Regarding RIT adopting a full STEAM agenda, Music Scholar 2 shared “we're getting there but we're not quite there yet and there's definitely some stuff that could be better.” Performing arts should be broadcasted at an institutional level so “that way, it kind of [feels] like it is more of a recognized part of the university and not just a side program that's kind of going on over there” (Music Scholar 2).

Study findings indicate that RIT needs to develop a strong experiential learning program which demonstrates the importance of performing arts skillsets when addressing challenges in today's ever-changing technological industries. These practical experiences include cooperative learning opportunities, internships, study abroad programs, and other immersive experiences for students. As detailed in existing literature (Daniel & Daniel, 2013), and confirmed by the participants' suggested areas of focus (Theatre Scholar 5), these types of experiences are at the heart of and support the performing arts experience. The study also indicates that RIT should explore implementing a robust longitudinal assessment plan (informal and formal) to constantly survey the success of the program and the value it brings to the students' educational and personal experience on campus. Huser et al. (2020) point out that a standards-based assessment must be established. This is to gauge if the arts are being embedded into the educational aspects across the entire institution in an interdisciplinary manner that strengthens the students' experiences and success on campus and post-degree (p. 15).

In addition, as the participants in focus group 4 homed in on, there must be more connection between students' academic coursework and performing arts experiences, with priority access for enrolling in courses and recognition by academic advisors for students' performing arts interests. This is for both students in the PASP and students who have no experience in the performing arts to date. The arts are not an exclusive, elite club that only a

select few can participate in –the arts impact everyone on an innate human level (Manorothkul, 2021, p. 4).

Two thirds of participants expressed they would recommend this program to anyone, but when it comes to success in resolving the incorporation of arts into STEM to make STEAM, they feel more can be done from an institutional level to stabilize this connection. Music Scholar 1 noted “you see the disparities like between an engineering school versus COLA (College of Liberal Arts), for example. You see the difference; you see where the money's going. And I don't know, it's like, are we doing enough, or are we just like slapping some art on some, like computer thing?”

The above is not to say these scholars do not value the focus RIT places on the worth of a performing arts experience in combination with STEM education. It is quite the opposite, as Production Scholar 1 noted, “This is a tech school, but they want to actually prioritize the performing arts.” Theatre Scholar 3 concurred by sharing how it was “one of the things that made me know that RIT was the right place for me, because it was a way where I could express both my geeky technical side and my performing arts side.”

Theatre Scholar 3 provided a revealing description of the opportunity the PASP provides students in its current form: “The performing arts scholarship program here at RIT is a way for students at a technology school to find the opportunities and have the guidance to pursue their passions within performing arts while still being a full-time student.” It is clear through this scholars’ words and existing research that the two (STEM and performing arts) are still quite divided both at RIT and in higher education overall. However, this study’s results indicate that RIT can serve as a model to demonstrate that STEM and arts can not only coexist peacefully, but when fully integrated into a strong partnership, greatly enhance a college student’s educational experience.

### ***Limitations and Recommendations for Further Research***

The first limitation of this study is that it was conducted by a sole researcher with a limited budget and scope of time. Research surrounding STEAM at the higher education level only scratches the surface –mainly as STEAM in higher education is an incredibly broad, yet still newly developing, area of interest, education, and practice. These topics should be explored further by a team of researchers who can delve fully into various elements and areas of STEAM education, including not just performing arts but perspectives from STEM fields.

At present, there seems to be a lack of cross-campus clarity and buy-in surrounding the strategic initiative to strengthen the performing arts experience at RIT. Participants indicated their advisors rarely knew they were Performing Arts Scholars or how best to fulfill the requirements. By gaining a better understanding of where the fields outside of performing arts fit in with this initiative, the Institution could form a more comprehensive path towards integrating arts and STEM.

Furthermore, longitudinal studies surrounding the success and outcomes of Performing Arts Scholars and the PASP overall are important to learn how the implemented initiatives impact the success of the program and the students. A mixed methods study would be beneficial to test the assumptions and conclusions reached through these focus groups against the larger population of 951 scholars as of the time of this study and 1,815 scholars as of the start of academic year 2023-2024.

Another limitation of this study is that the PASP was only in its third year of existence at the time of the focus groups. As such, there were no alumni to interview on how the PASP



contributed to their higher education experience and/or how it aided them in becoming stronger job candidates in the rapidly changing, technologically reliant workforce of the 21<sup>st</sup> century.

It is evident from this study's focus group sessions that one of the most important aspects of the performing arts experience for participants is the ability to receive hands-on training in different areas and skillsets. These skills can complement their STEM education. Finally, given that RIT does not have a performing arts major, it would be key to conduct follow up studies in two, five, and ten years into the future to gauge how a degree program (if one is established) may impact the dynamic of the performing arts ecosystem on campus.

### ***Conclusion***

Questions remain surrounding what is next for RIT and how it and similar institutions can move STEAM education beyond simply arts integration (Huser et al., 2020, p. 4). Higher education universities seeking to seamlessly integrate arts and STEM are in a unique position; the challenge is to create an opportunity for students while still paving the way forward without complete information surrounding what it means to be a STEAM student. As Cobb Payton et al. (2017) conclude, "Given the lack of studies in the STEM and higher education domain, there is an opportunity to generate new data that may inform future research" (p. 41). Nonetheless, results gleaned from this study highlight key areas for the PASP to improve the service provided to students and inform RIT on how it could use the program to better resolve certain tensions between arts and STEM.

It is clear from this study and the passion exhibited by these participants that there is a strong demand for a performing-arts-infused educational experience. In today's ever-changing, digital landscape, the importance of a STEAM education is real. STEAM provides a unique opportunity for students to gain a more well-rounded set of skills and thought patterns, with creative, inclusive mindsets. It pushes them to think differently about every situation they encounter. Echoing the findings of Cobb Payton et al. (2017), RIT students "view the arts/dance as a critical mechanism to support institutional diversity and inclusion" (p. 43). It is not so much what is on the surface, but what lies beneath that makes it a rich, rewarding, and inclusive experience.

One of the most intriguing takeaways from examining the PASP and performing arts ecosystem at RIT is that the community's components—the clubs, performances, workshops, and opportunities within the ecosystem at the Institution—are where the value and learning actually exist. For RIT to effectively become a STEAM-based institution, the performing arts must be viewed less as an extracurricular support service and integrated more fully into the curriculum. RIT is headed in the right direction, though academic units must continue to forge partnerships across campus by way of transdisciplinary curricular development and collaborative projects. While RIT has made great strides towards this end, primarily due to a high influx of performing arts students, efforts must remain genuine and intentional. In addition, RIT must support these efforts from top to bottom; it cannot simply be the mission of a select few individuals or groups, or RIT using its existing position as a leader in STEM education and "slapping some art on" it (Music Scholar 1).

This study supports the notion that students will find a way to participate in performing arts regardless of the PASP, or any program, mainly because they do not need an incentive to engage in the arts—it is part of who they are on the most basic level. They will get together to share their works, ideas, and opportunities and collaborate towards achieving something greater than their contributions are on an individual level regardless of any program. This study confirms

that RIT's PASP presents a unique and vibrant way to resolve tensions between arts and STEM, illuminating how the two cannot only coexist peacefully but can join forces to create something better and stronger than either is on its own.

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