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Connection, Engagement, and Belonging: Exploring Young Women's Positive Experiences for Building Inclusive STEM Classrooms

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This qualitative study was designed from an appreciative and positive research focus to examine how and why young women engage in, succeed, and persevere in STEM courses. The objective was to gain student perspectives on improving gender equality in STEM education. From the questionnaire and focus groups with participating women university students enrolled in STEM courses three themes emerged (a) Relational Connection with teachers and/or students, (b) Engagement with STEM Curriculum that reflected influential pedagogical learning cultures, and (c) Cultures of Belonging and inclusion. This research offers insight into positive factors for women's success in STEM academics and careers.

Cette étude qualitative a été conçue dans une optique de recherche appréciative et positive afin d'examiner comment et pourquoi les jeunes femmes s'engagent, réussissent et persévèrent dans les cours de science, technologie, ingénierie et mathématiques (STIM). L'objectif était d'obtenir le point de vue des étudiantes sur l'amélioration de l'égalité des sexes dans l'enseignement des STIM. Le questionnaire et les groupes de discussion auxquels ont participé des étudiantes universitaires inscrites à des cours de STIM ont permis de dégager trois thèmes : (a) le lien relationnel avec les enseignants et/ou les étudiants, (b) l'engagement dans le programme de STIM qui reflète des cultures d'apprentissage pédagogiques influentes, et (c) les cultures d'appartenance et d'inclusion. Cette recherche offre un aperçu des facteurs positifs pour la réussite des femmes dans les études et les carrières en STIM.

Globally there is an increasing focus on ways to encourage and support young women in the pursuit of science, technology, engineering, and mathematics (STEM) academic disciplines. Women still tend to represent a minority in STEM academic classrooms and the workforce (National Center for Science and Engineering Statistics, 2023). To date, research has generally reflected a deficit-model approach to understanding the deterrents to attraction and retention, where the general view has centred on comparatives and establishing why young women cannot and do not succeed in these courses or programs (for example see Swafford & Anderson, 2020). Here the focus has been on negative attitudes and adjustments required to reform opinion (Frome & Eccles 1998; Jacobs 1991). To counter this decline, there has been an increase in directed programming across all levels of schooling to excite, encourage, and engage young women into STEM domains (Donmez, 2021; Heaverlo, 2011; Milam, 2012; Murphy et al., 2019). However,

even with the targeted improvement initiatives in Canada, there have not been significant gains in gender equality in the STEM fields (Frank, 2019).

Though trying to solve the problems facing women in STEM is an essential research focus, we contend that paying attention to a more positive approach to retention and support for women in STEM may offer new research insights. Based on our positive organisational research approach to examining flourishing in schools (Cherkowski et al., 2020; Cherkowski & Walker, 2018) we use an appreciative, research approach (Reed, 2006) to identify and learn from the positive deviants in STEM, those female students who, for various reasons and with a diversity of educational background and supports, select, remain in, and thrive in STEM courses or programs. With this study that focuses intentionally on young women's own stories of what contributed to their success in STEM, we aimed to provide an alternate perspective for research and practice on supporting young women in STEM, focusing on what attracts them and how they experience success in STEM learning environments. This positive research focus may offer new insights on how to improve the quality of the experiences for girls in STEM courses lending to increased pursuit of women into STEM professions, and potentially offer new insights about how to design programs, practices, and policies for supporting and promoting success for young women in secondary STEM classes.

Background, Rationale, and Theoretical Framework

The literature framing this study is drawn from research in positive psychology, organisations, and education, as well as research on girls in STEM. Research in positive psychology focuses on positive outlooks, habits, and mental models that support the growth of further positive behaviours and conditions (Fredrickson, 2008; Seligman & Csikszentmihalyi, 2000). This is in stark contrast to the traditional focus on a deficit-model approach (Seligman, 2002, 2011). Findings show that focusing on and growing happiness (Carr, 2004; Diener, 2000; Fredrickson & Losada, 2005), grit (Duckworth et al., 2007), and gratitude (Lyubomirsky et al., 2005), for example, improves learning, relationships, and health among other associated benefits (Seligman, 2011). Positive education promotes academic achievement alongside improvement in wellbeing (Knoop, 2011; Seligman et al., 2009). Similarly, research in positive organisational studies focuses on strengths-based and positive organising (Quinn, 2015) where an emphasis on virtuousness (Cameron, 2008; Cameron & Caza, 2004), compassion (Lilius et al., 2008), meaningfulness, and high-quality relationships (Achor, 2011; Dutton & Heaphy, 2003) leads to the development of further strengths, increased resilience, and improved commitment and vitality in the workplace (Bakker & Schaufeli, 2008; Luthans & Youssef, 2007).

Although research in these positive fields does not deny or ignore the existence of challenges, struggles, and trauma, findings from research in positive psychology indicate the benefits and advantages of adopting appreciative, positive, and generative perspectives and practices for individuals and groups in personal and professional contexts.

The theoretical framework for this study provides an alternative to the traditionally deficit-focused research on girls in STEM, shifting the focus from what is wrong with girls to the various forces, factors, and dynamics influencing young women's positive experiences in STEM courses and educational programs. For example, research in STEM has demonstrated that in learning, differences between boys and girls can be understood in terms of the teaching approaches used (Gross, 2014; Gross et al. 2016). For example, research indicates that engaging and maintaining a long-term interest in math and science for girls requires providing learning activities and

pedagogy that are connected to personally relevant elements of interest in life (Bottia et al., 2015; Pashler et al., 2007). Research also indicates that learning environments that support autonomy, relatedness, and growth mindsets (Murphy et al., 2019) and those that have authentic representation of text, sound, and images that mirrored their own gendered, cultural, and racial backgrounds (Brown & Eduoard, 2017) generated greater female STEM student participation and achievement. This connected and positive approach to engagement increases girls' interest and exploration of STEM pursuits (Mosatche et al., 2013).

Literature suggests that it is also necessary to expose young women to female role models who have achieved success in math or science (Lin, 2016; Prieto-Rodriguez et al., 2020; Zeldin & Pajares, 2000). This role modelling is often difficult to achieve, most notably in predominantly rural areas where there are particularly low levels of women in science and engineering. In this study, we aimed to provide an alternative and unexplored perspective to add insights and understandings through a focus on the positive forces, factors, and dynamics that may contribute to fostering a sense of success and flourishing for young women in STEM. The issue of engagement of young women is fundamental to both gender equality and enhancing diversity. As young women are a minority within STEM disciplines, those who are already engaged require attention, as do the structures and characteristics that drive their resilience. For example, girls generally report more negative feelings such as anxiety, less confidence, and less self-efficacy about math (Ganley & Vasilyeva, 2011; McGraw et al., 2006; Miller & Bichsel, 2004; Murphy et al., 2019), but little effort has been placed on the young women who have interest in and pursue STEM fields. It is likely that their attitudes will differ drastically from those young women who have avoided STEM disciplines. In as much as attitudes shape our approach, they inform persistence and success in academic career choices. For example, evidence indicates that the "digital divide" results not from gender differences in skill or experience with computers but from gender differences associated with perceived competence (Cooper & Kugler, 2009). To gain insight into why female students do persist and to understand more about the experiences that have shaped how they see themselves in relation to their STEM courses, we used an intentionally positive perspective in this study. By focusing on positive traits and capacities such as resilience, flow, grit, and positive relationships (Csikszentmihalyi, 1997; Deci & Ryan, 2000; Duckworth et al., 2007; Dutton & Heaphy 2003; Luthar et al., 2000; Ryan & Deci, 2000), we aimed to gain an understanding of participants' positive experiences in STEM.

Methods

We used a qualitative approach to answer our main research question: What are the factors, forces, and conditions that positively influence young women to participate and achieve success in STEM academic programs? The research was approved by the UBC Okanagan Behavioural Research Ethics Board (#H18-02198) and carried out during the COVID-19 pandemic, where we were required to meet online with participants. We recruited 26 University students from first- and second-year STEM courses through notices and email delivered through their online Canvas Course shells (Table 1). Participants represented a range of STEM disciplines including first- and second-year math, calculus, chemistry, physics, and applied science courses. Female identifying students were invited to share with us their memories of their experiences in STEM secondary courses through an online questionnaire and focus groups. This questionnaire was designed to collect general demographic information and to elicit responses to questions about participants' experiences in STEM in their secondary classrooms, approaches to learning, and ways they might

Table 1

Participant Information

Year of Study	Completed Survey	Participated in Focus Groups
First year	n=22	n=14
Second year	n=2	n=1
Fourth year	n=1	n=1
Graduate student	n=1	n=1

Table 2

Survey Questions Measuring Student Interest and Success in STEM Courses

Overarching Question	Agree/Disagree
Q1. I think I succeeded in my grade 10–12 science, math, and/or technology classes because	I worked really hard
	The teacher encouraged me to do well
	I tried really hard
	It was easy for me
	My teacher made me feel good about being a science student
Q2. I liked grade 10–12 science, math and/or technology classes because	My learning was relevant to my life
	I felt like the knowledge from these subjects helped me make a difference in the world
	The learning helped me achieve my goal of pursuing a STEM-related degree in university

see themselves as STEM students. Our specific focus for STEM classes was chemistry, physics, calculus, and computer science courses. Participants answered demographic questions to understand personal and academic metrics e.g., high school graduation year, University degree program, and year of study. Questions to understand their interest and success in secondary school STEM courses gave choices of *agree* or *disagree* e.g., *I think I succeeded in my science classes because … I worked really hard* (Agree/Disagree; see Table 2). Finally, four open-ended questions asked participants:

> Think back to your previous grade 10-12 science, math and technology classes in the past few years. What types of things did your teachers do that helped you enjoy science and/or encouraged you to want to take more science and/or math classes?
>
> Thinking about what it has been like to be a girl in your science classes throughout your grades 10-12 years, describe for us how you have felt in class, paying attention to whether you felt that being a girl made a difference in a positive or negative way to your experiences.
>
> What have you noticed about how other girls in your classes experienced their grade 10-12 science classes? If you had to describe what they likely felt during and after a class, what would you say?

Upon completion of the survey, participants were invited via email to participate in a focus group hosted on Zoom. These group conversations provided the opportunity to gain further information and insight into their experiences as female students in STEM classrooms during their secondary school experiences.

We did an initial round of data analysis on the questionnaire responses to determine a set of themes that would guide the development of questions for a focus group conversation. We inductively analyzed the questionnaire responses using a constant comparison method (Glaser & Strauss, 1967; Johnson & Christensen, 2012), whereby each item of information was classified into categories that gradually emerged as the data were examined.

We noted several themes emerging from the questionnaires, including understandings of gendered representation in high school STEM classrooms; rich descriptions of female confidence development in STEM; understandings of overcoming negative stereotyping for women in STEM; stories of connection and invitation by teachers into STEM learning and the importance of seeing their teachers positively connected to and engaged with the content; and the impacts of hands on learning and real life connections to STEM. These themes were used to generate the set of questions used in focus group conversations. A total of 17 participants (Table 1) took part in one of three focus group conversations organized to identify positive factors and forces in their STEM classroom experiences. These focus groups were held on Zoom and lasted between 45 and 60 minutes. The conversations were recorded and transcribed and then inductively analysed for emerging categories, patterns, trends, and themes (McMillan & Wergin, 2002).

One researcher (SC) served as facilitator of the group conversations and the other two researchers (ES, JJ) listened, observed, and took notes. We met after the focus groups to share our insights and ideas and to share our observations with each other as part of our data collection process. The focus groups were a good opportunity for us to explore in more depth with our participants their understandings of and experiences in STEM courses. Participants were able to engage in dialogue with each other and hear about each others' experiences and share with us what it means to them to be a young woman in STEM courses. Although we purposefully designed the focus group conversation prompts to elicit positive perspectives, we remained open to the stories that came up (Baldwin, 2005; Barone, 2007; Clandinin & Connelly, 1994) and noted the ways these participants experienced challenges, obstacles, disappointments, and frustrations, and how they were able to overcome these and persist in STEM.

Findings

Through analysis of survey and focus group data collected in this study, three overarching themes were identified that positively influence young women to participate and achieve success in STEM academic programs. These three themes that arose were: a) Relational Connection that reflected participants' valuing of relationships formed with their teachers and/or other students and made a difference to how these participants enjoyed their time in STEM classes; b) Engagement with Curriculum that reflected the teacher pedagogy and cultures of teaching and learning that influenced these participants' engagement with the curriculum; and c) Cultures of Belonging that reflected how these participants felt a sense of invitation and inclusion in the classroom. Although each of these themes is described and discussed separately, we noted the interweaving of these themes in the ideas shared by our participants and recognize the interconnection of all themes as important influences for how these participants felt inspired and confident to pursue STEM academics and build positive identities in STEM.

Relational Connection

Many of the stories we heard describing why and how these participants felt motivated to pursue

STEM coursework in secondary school included an appreciation for and valuing of the relationships that they experienced, often with the teachers, that made them feel a sense of enjoyment of these classes. The participants shared about the importance of feeling that the teacher cared about them as individuals and also the importance of feeling like the teacher cared about science, that they were engaged and connected to the content. These relationships helped students to see that they mattered to the teacher and that the teacher wanted them to engage with and succeed in the class. For example, one survey participant shared:

> The teachers of my high school math and science classes showed that they care about students beyond just an academic level. At the beginning of the year my teachers went around the classroom and tried to get to know us students on a personal level. I think this was important to do so because it forms a connection between the students and teachers that makes students more comfortable to ask for help if they are confused at any of the concepts that come across as challenging. Throughout the entire school year, the teachers tried to continually connect with students by sharing things about their lives and smiling and saying hi in the hallways to us in their classes. Specifically, science speaking, my AP Physics teacher would often host evening telescope opportunities in the school field where he would bring out his telescope on a clear evening when there was something noteworthy happening (i.e. full moons, meteor showers, or just letting us experience the technology). Acts like these show true care and support from the teachers that engages students, makes them feel as though they can be successful and motivated to continue with sciences.

Along with the examples from most of the participants of the importance of feeling connected to their teachers, they shared with us that this connection was often heightened if they had a female teacher in their STEM classes. As one participant shared about the importance for her of having connections and relationships with students and female teachers:

> My computer science teacher was a woman, which was really cool in and of itself. We made a lot of fun projects in her class because she loves game development, and we also worked with her to start up the school's code club for younger kids. That was huge because it brought us all together and I really feel like the computer science room was my home away from home because of the connection that I had with my teacher as well as other students, who became my good friends.

Connections with teachers and students seemed to be an important condition for these participants' sense of enjoyment, engagement, and success in STEM. One survey participant indicated "building a connection with my teachers helped me to be more interested in the material" and another conveyed the importance of the personal connection with teachers who:

> reached out to tell me about opportunities for me, such as math competitions. They held me reliable, and they checked in when my grades took a hit, when I wasn't attending classes. They always answered questions when I had any and never brushed me off … they allowed for me to come in outside of class time for help.

Throughout the focus groups and survey responses, we noticed the influence of relational connections on how these participants felt they mattered and were encouraged to pursue and succeed in STEM.

Engagement with Curriculum

Classroom cultures that encouraged meaningful engagement with the curriculum were important conditions for why these participants felt a sense of engagement with STEM academics. Participants described instances of teachers bringing the curriculum to life in the classroom through experiential learning in and out of the classroom, as well as connections to lived experiences in social media, history, and the happenings within the community. They also recounted the impact of having guest speakers who were excited about science, field trips to interesting science sites, and the importance of seeing their teachers own engagement and interest in the curriculum. For example, one survey respondent shared:

> My classes were geared more towards experiments and practical learning which helped me understand tedious concepts very well. One of the most memorable classes in these years was my grade 11 health sciences where we dissected a pig's heart and kidney. I enjoyed learning things through visual/hands on method. This was when I realized my interest towards a career in the STEM field.

In the focus groups, we heard stories of teachers who brought the fun and interest in science alive in the classroom, such as the participant who recounted: "So my physics teacher, I had the same guy for two years, built pressurized air guns and we'd turn our desks sideways. He would launch golf balls to the wall and through the roof. This guy was just insane." Another participant described how she appreciated the concepts of math being explained in a very concrete way as she recounted how her teacher

> … made me realize that math, science, it didn't come from nowhere and it wasn't just memorizing formulas or changing numbers, doing a bunch of equations. It actually makes sense and my teachers really inspired me basically to see math and science in [the] everyday world.

The participants also described many ways that teachers created conditions in their classrooms for students to build on mistakes to grow thinking in science. One of the participants talked about the impression that was made on her for the importance of learning from mistakes by one teacher who allowed opportunities to improve and re-submit assignments. This participant shared:

> Something she [the teacher] did, which was different from any teacher I've ever had, is the first half of the semester, she gave us redos on all the assignments. So, you had to submit it in on time obviously to get the new opportunity. Let's say you got a certain grade on the assignment, you had the chance to resubmit it and take her feedback and what she said to improve on and then apply it to your work. So that was an incentive for people to, one, boost their grade to get a better mark, but also realize where their mistakes were and understand the information better, and really overall engage with the information.

As was shared with us through the participant responses and stories, seeing science as a lived experience, where content connected with real-world experiences, as well as opportunities to try out and play with the science through experiments and activities that enabled learning successes to be built from mistakes, were important pedagogical influences for how and why these young women felt they succeeded and contributed to carrying on in STEM academics.

Cultures of Belonging

Experiencing STEM classrooms where the culture was one of invitation and inclusion that resulted in a perception of belonging was a repeated theme within the participants' stories of positive STEM schooling experiences. These participants shared how feeling seen and valued in the classroom and where they felt that all students were made to feel that they belonged and were included was an important influence for them succeeding in STEM classes. One focus group participant shared her awareness of the importance of inclusion in classrooms, describing:

> And it was such a beautiful learning experience because our teachers, like my physics teacher, always treated us equally. There was no division between boys and girls. We were all the students. We all learned as we were experiencing things. And if anyone needed help, he would always be ready to provide it, be it a girl or a boy, and any day. So, you just approach him and he will be yes, I am there to help you. You're my student. So, that was such an enriching experience to study physics, because you would have that confidence [to know] that I am not separated, I get the same attention, and I have the resources to receive help and I really get the help to excel in this subject.

Many of the stories of inclusion and a sense of belonging seemed to be described as growing out of collaboration that was an overarching principle in the classroom. For example, one focus group participant described:

> We had a big aspect of group work and collaborative work. I remember in my grade 12 physics class we would start off with a challenge problem, but it would be something that could be almost insolvable, like it's an ambiguous question that you would work on with the group. And you would change up your groups every once in a while, and work on the whiteboards, so I like that because it was open, and kind of like how we started this session. We got to know each other and it gave people an opportunity to fail almost, but in a supportive environment. And it gave everybody the same environment. And he was challenging everybody equally.

Similarly, a survey respondent described the role of collaboration in creating cultures of belonging and inclusion:

> I was challenged with my thinking and perspectives and allowed time to collaborate with other students in my class allowing time for self-discovery within my learning. When teachers allowed time to collaborate with others it allowed me to teach others which helped solidify my knowledge and in turn helped another student as well.

For these participants, their interest in and commitment to STEM as an academic pursuit seemed to grow and solidify within learning cultures that promoted collaboration, inclusion, and a sense of belonging. For these participants, experiencing STEM classroom cultures that encouraged relational connections, provided different opportunities to engage with curriculum as a lived experience, and created a sense of belonging and inclusion seemed to create conditions that fostered and inspired their confidence in STEM and a positive STEM identity.

Discussion

This study was intentionally focused on the experiences that contributed to a small group of

participants' understandings about why they have persisted and succeeded in STEM areas in school. The participants spoke about the challenges and barriers that they faced along the way, as indicated in much of the research on women in STEM, and provided stories about resilience and motivation supporting how and why they persevered. The findings highlight the importance for teachers to create conditions for female students to feel a sense of connection, engagement, and belonging in STEM environments. These findings align with positive organisational research that framed this study, showing how paying attention to building positive emotions and experiences contributes to improved learning, resilience, productivity, and other qualities important to learning (i.e. Bakker & Schaufeli, 2008; Duckworth et al., 2007; Dutton & Heaphy, 2003; Seligman, 2011). We recognise the ongoing need to reduce barriers and challenges for women in STEM, which include a lack of female role models and perceptions of a glass ceiling for women in STEM, and that STEM education tends to be directed at boys (Swafford & Anderson, 2020). Similarly, research indicates that negative stereotypes about young women's abilities in science and math by parents, teachers, and general society has destructively shaped young women's attitudes towards STEM (Shapiro & Williams, 2012; Starr & Simpkins, 2021). However, based on the findings of this study, we suggest that paying attention to what works well and grows resilience and motivation for young women to succeed in STEM classrooms offers new contributions for research and practice in STEM teaching and education that may result in improving female STEM students' classroom experiences.

Students in this study spoke of the centrality of feeling seen and valued within STEM communities of learning. The classroom cultures of belonging were described to be one of invitation and inclusion and were often described to be highly collaborative in nature. These findings align with research indicating that a perception of belonging to a STEM community is central to contributing to positive attitudes and achievement in STEM (Walton et al., 2015) and developing meaningful identities in STEM (Carlone & Johnson, 2007). These findings also align with research indicating increased sense of belonging and motivation for female students who perceive their gender to be compatible with STEM and perceive a culture of social support (London et al., 2011). Finally, these findings align with those of Means et al. (2021), who found that intentionally inclusive oriented STEM high schools can create cultures of learning in which female students (and other underrepresented students) might identify more strongly with STEM learning and careers, contributing to them persisting and achieving in these fields.

Students in this study also spoke about how their feelings of connection with STEM teachers contributed positively towards their interest and success in the classroom. Some of the young women in this study highlighted the important roles that having a female teacher played in deepening their connections to STEM. These findings align with those of Solanki and Xu (2018) who concluded in their study of instructor gender influence on student motivation in STEM that having a female instructor increased the STEM engagement and interest of the female students. The findings in our study point to the importance for students to feel a sense of connection to and recognition by their teachers. Further research is needed to examine the relational connections that young women form with their teachers (gender inclusive) to determine the types of recognition students receive from their teachers that are beneficial to creating interest and pursuit of STEM. Support for the importance of understanding teacher recognition is evident from literature on how students build identities in and engage with STEM (Avraamidou, 2020; Carlone & Johnson, 2007; Hughes et al., 2020; Lee, 2012; Rodriguez et al., 2019). Our study builds upon this research, and we suggest that this described value of feeling recognized by their teachers as a legitimate learner and doer of STEM, increases interest and engagement. Our study also shows

that when young women are recognized as being capable and valued through their relational connection with STEM teachers, they are also gaining interest towards succeeding in STEM learning environments.

Finally, the findings in this study highlight the importance of paying attention to how teachers are engaging young women in learning about STEM as an important part of how these students develop interest and ongoing engagement in STEM learning. STEM learning cultures that inspire and capture the imagination of students and provide access to inspiring experiences in STEM that aid in the development of interest and competence development can reinforce further engagement in STEM for young women (Bottia et al., 2015). Participants in this study shared classroom experiences that were especially meaningful to them, including instances of experiential learning and connection to lived experiences. These lived experiences were described as connections to social media, history, and community. Various previous studies have reported that learning cultures that focus on personal relevance of STEM learning may support traditionally marginalized students (including young women; Hinnant-Crawford, 2016; Zeidler, 2016). Additionally, current studies suggest that providing interesting and relatable classroom experiences that explore and work to resolve societal challenges with socio-scientific approaches increase opportunities for positive feeling to incite curiosity and interest in STEM (Patterson & Johnson, 2017; Wang & Degol, 2017). Similarly, research also indicates that a focus on locating opportunities within local communities for students, especially those traditionally marginalized in STEM, to engage in enacting social change provides powerful opportunity to position students to think in complex ways about how their cultural and gendered knowledge can be used in tandem with their STEM knowledge (Calabrese Barton et al., 2020; Morales-Doyle, 2017; Schenkel et al., 2019).

Our findings highlight the important roles of educators to engage in the interconnected work of (a) building important relational connections with young women in their secondary STEM classes in ways that recognize young women as legitimate members of STEM communities, (b) designing classroom learning experiences in which young women can engage in making important connections between STEM learning and their lived experiences in the world and (c) creating cultures of belonging in their classroom contexts that invite and include young women in STEM. Further research is needed to understand the ways educators might best create STEM learning cultures that support connection, engagement, and belonging for girls and young women in their classes in ways that encourage these students to persist and achieve in these still male-dominated fields (Frank, 2019).

Limitations

We acknowledge that the findings of this study are informed by the perspectives of a small sample of participating women from a single university setting in British Columbia, Canada and these university students may remember differently with the passing of time and layers of experience in university. We acknowledge that these students were Canadian and International undergraduates, and there is never just a single way of experiencing STEM classrooms, and this was evident in our sample. Finally, we acknowledge that although our study was deliberately focussed on positive appreciative perspectives, which does not deny the challenges and struggles that may have contributed to young women's interest and persistence in STEM fields, it may have narrowed our findings to include only positive influences.

Conclusions

The findings in this study indicate that the ways in which young women find relational connection in secondary STEM communities, engage with secondary STEM curriculum, and experience cultures of belonging in secondary STEM classrooms can influence how young women engage, succeed, and persevere in STEM. We aimed to contribute to developing knowledge and practice about the positive factors that foster the pursuit of STEM academic classes that we see as a precursor to the future quest for employment and long-term profession in STEM domains. Aligning with research on female persistence in STEM and STEM identity, we extended understanding of (a) how relational connection with STEM educators and/or students make a difference in how young women enjoyed their time in STEM learning environments, (b) how experiences in engagement with curriculum affects interest development in STEM, and (c) how classroom cultures that are oriented towards belonging in STEM can be perceived by young women as promoting inclusivity in STEM. This research offers a new approach to understanding young women's experiences in STEM courses as a way of identifying opportunities for developing programs and designing policies for attracting young women to STEM and creating conditions for them to succeed through building on what young women describe about what is working well. Additionally, although the focus is on girls, we think the insights gained from this research will be transferable indicators to increase participation for all peoples in STEM. This will induce a positive change towards increasing diversity in STEM.

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