Partners at Woodland Forrest
Supporting Participation in Intensive STEM Summer Camp

Making Connections Strategy 6
Building Relationships With Families and Youth to Get Buy-In for Pursuing Intensive STEM Opportunities

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Effective coordination across home, school, and out-of-school settings requires intentional brokering across settings work that bridges communication and goals between settings for youth. Making connections across these contexts is vital for creating connected learning environments, as supportive relationships between youth, teachers, and family members can deepen youths’ interest-driven learning (Peppler et al., 2020). In addition to supporting interest development, relationships that teachers broker with youth and families can connect youth to community resources for learning (e.g., Roque, 2016).

Educators can also encourage family members to work alongside youth as learners and coaches and connect youths’ current educational experiences to family histories (e.g., Brahms & Werner, 2013). When considering how to broker opportunities for making connections to families and connect youth to present and future STEM opportunities, educators designing for learning and making connections ought to take into account that parents and families need easier ways to learn about STEM opportunities for youth that are built into their daily lives (e.g., Cho et al., 2019).

The systematic ways in which educators work to cultivate and sustain relationships with youth and families have the potential to be replicable while still being unique to a given context. For example, as part of the making connections project, partners at Woodland Forrest, a school site affiliated with the University of Alabama and the Alabama Afterschool Community Network (ALACN), are working to support connections for middle school girls to an intensive STEM opportunity. This year, their after-school program, called Project IMPACT, is structured as an after-school STEM enrichment program that will culminate in the girls attending Space Camp in Huntsville, Alabama. Though Space Camp is already an extraordinary incentive, the leaders in Alabama are attuned to the need for student and family buy-in to participate in such a program and are carefully cultivating family relationships to support girls taking part in this opportunity. Below we describe the systematic family brokering work being done at this site.
Space Camp as an Intensive STEM Experience

Located on the grounds of the U.S. Space & Rocket Center museum at NASA’s Marshall Space Flight Center, Space Camp in Huntsville, Alabama is a STEM-focused educational camp that was founded in 1982, described as “the ultimate educational experience combining real-world applications of science, technology, engineering, and mathematics” (Space Camp, 2022). The organization provides a range of learning opportunities, yet its flagship experience, Space Camp, is a week-long sleepaway program in which young people are immersed in the real-life simulated experience of what it is like to be an astronaut. Camp “training” includes preparation for astronaut-like experiences such as daily life on the International Space Station, team-building activities, and other simulations that its website describes as involving “dynamic problem solving and critical thinking—21st century learning skills required in the workplace” (Space Camp, 2022). Space Camp also highlights notable alumni on its website, including a number of attendees who became astronauts, inspired by their Space Camp experiences. Though the cost of space camp is high ($1-2K per person for a weeklong camp), they offer scholarships and form partnerships with organizations that support pathways to Space Camp for low-income and minoritized youth. Still, not all interested students can access Space Camp as a resource, nor do many youth who may be interested even know that Space Camp exists or could be an option for them. Demographic on Space Camp attendees indicates that 45% of attendees are female and 55% are male. By income level, only 7% of attendees come from households making less than $50,000 per year, with only 3% from households under $30,000. 16% of attendees come from households within the $50,000-$99,000 income bracket, while 51% come from households making $100,000 or more, and 34% of those come from households making $150,000 or more ($26% preferred not to say).

Overwhelmingly, Space Camp serves children who identify as white (70%). By comparison, out of the 16 girls in the Project IMPACT program described here, 18.75% were white and 81.25% were Black/African American. The coordinator estimated that the majority of families have a household income between $30,000 and $70,000. Project IMPACT and partners in Alabama are working closely with families to design programming that addresses inequitable participation structures, barriers of access to information, funding, and awareness of STEM opportunities like Space Camp.

Woodland Forrest and Project IMPACT STEM After School Program

As part of the making connections project, ALACN is using stipends to pay Taylor to design and implement the STEM program in her role as STEM coordinator, to provide program materials needed for projects and activities, and to send the selected girls to Space Camp at the conclusion of the program. Taylor explained that they took nominations from classroom teachers at her school and the affiliated middle school in Tuscaloosa, recruiting girls who showed a STEM interest and would be a good fit for the program. She said that they initially sent out about 30 invitations, and 16 girls signed up. This year, the program includes six middle school students and 10 4th-5th graders. In our first interview, we discussed the recruitment and retention of the group. Taylor explained:

“Okay, so I have 16 girls, and they are all still showing up so that is amazing. I know for middle school it gets hard — there are two girls, and their transportation has to be their parents, and they don't get out of school until 3:10. And we're going to start at 3:30, and so it is great that they're still coming. They probably miss more frequently than other people, but for the middle schoolers I have a bit more grace because they have to travel.”
The Project IMPACT program runs on Tuesdays and Wednesdays from 3:30-5pm. A typical day in the program includes the girls first getting a snack and engaging in a “sisterhood activity” (i.e., a bonding activity) and then open sharing about anything from their day and/or weekend. At around 3:45 they begin delving into the day’s activity and problem (e.g., environmental impact, deforestation) they are going to address that day. Taylor explained that they then launch into prototyping or researching for about an hour, and by 4:50 they are cleaned up and ready to go home. They end the class with a stand-up activity during which they share a reflection on how they were resilient or brave that day or just share something funny or interesting that happened.

To keep girls interested in attending, Taylor explained that the afterschool STEM program was designed around the girls’ interests in STEM. The girls took an initial STEM survey that asked them about their feelings toward STEM and interest in future STEM careers. Interestingly, though they voluntarily signed up for the after-school program, in response to the question of what they hoped to gain from their participation, many of the girls wrote, “I don’t know.” Taylor explained that even with varied levels of investment in the program (i.e., from “I don’t know” to one student with a clear goal who told Taylor that she knows she wants to go to Stanford and major in business), it’s about “offering options for them to be here whether it’s in person or virtual and… just letting the girls pick what they do [so that] they have an entry point into [STEM].”

For the curriculum, Taylor described a multifaceted approach to integrating STEM that draws upon partnerships with the University of Alabama and the Million Girls Moonshot. For one unit of study, Taylor explained how through a specific partnership with education students at the University of Alabama, the girls first came up with a topic on their own — in this case, it was fashion — and then together they came up with “pieces of fashion that they wanted to know more about related to STEM.” The sketch below shows how this topic of interest (i.e., fashion) was broken down into STEM-related focus areas (e.g., environmental impact), and then that focus area became something around which to define a problem and then consider ways to design to solve for that problem. A student-centered, constructivist approach to developing curriculum that integrates elements of design thinking is more challenging, but as Taylor explained, it offers more “buy-in” from the girls so ultimately makes her job easier in the long run. Taylor also explained that they implement lessons from the TechBridge Girls program that is offered through their work with the Million Girls Moonshot.

Figure 4. Sketch of the afterschool STEM program curriculum

Background on STEM Coordinator and University Partners

Taylor previously taught fifth grade for four years and now works as the STEM Coordinator at Woodland Forrest (PreK-5th). She was offered the position of STEM coordinator when the previous one retired and decided to “go for it” despite having little STEM background and it being “nerve racking” to leave teaching fifth grade, which she called her “home” and “sweet spot.” She explained she did not have much experience with STEM prior to working for Tuscaloosa City Schools. Growing up, there wasn’t a huge focus on STEM in school, and in college she did not have to take any STEM-specific courses. Much of her experience and understanding of STEM came through STEM-specific trainings through connections from her school site. She took a training course through Code.org, which she described as “basic coding” and came back to help support her teachers in getting on the
platform and investing their students in it. She did a robotics training through the district using Sphero, BeBot, and Lego WeDo. She is currently enrolled in a computational thinking case study with the University of Alabama. Through these professional developments, Taylor made connections to other program leaders to help her make sense of how others were implementing lessons. Taylor is working on how to integrate the robots into the curriculum at her school and how to create a culturally responsive STEM curriculum for their students.

As the STEM Coordinator, one of Taylor’s goals is to work toward STEM certification for Woodland Forrest. In collaboration with her principal, she is trying to figure out what their school needs to get to that level and to keep a commitment to STEM “long-lasting.” Her role sometimes consists of doing STEM model lessons with a focus on STEM integration, co-teaching with other teachers, and observing teachers implement STEM integration. Her role as the STEM Coordinator provides a “nice balance” since she still loves to work with students but also thrives in helping her peers learn and implement that learning.

Taylor also described how connections supported her in providing high-quality experiences for the girls in Project IMPACT. Her connection to Dr. Lisa Fowler (Clinical Associate Professor of Elementary Education at The University of Alabama and serves as the Director of STEM Education in ALACN) made this opportunity possible. Dr. Fowler was previously her professor when she was an undergraduate at University of Alabama. Dr. Fowler’s research is focused on supporting underrepresented girls in STEM and informal STEM learning and the development of STEM identity. She has supported the development of STEM family nights that aim to support sustainable learning partnerships with families. Their latest in-person family night for Project IMPACT, which included STEM stations from industry partners and engineering groups in April 2022 drew over 500 attendees.

**Systematizing Building Supportive Relationships with Families to Broker STEM Connections**

To Taylor, the key driver of buy-in for the Project IMPACT girls and their families is around the relationships they have developed. She explained, “it’s all about my relationship with the girls and their parents.” She taught almost all of the students currently in the after-school program and had previous relationships with the students.

“The parents are invested, we have really good relationships. They want good things for their kids. STEM camps are a big thing, and I know that a lot of our families, that’s not something that you can just shell out money for. And they really want their kids to have that opportunity, and so they’re willing to get them here or find a way to get them here most days.”

In addition to acknowledging the investment of families, part of Taylor’s approach to relationships with girls and their families is about connecting to a sense of shared humanity with the girls. She explained:

“Part of it is realizing that [the girls] are their own human and they have thoughts. They look for someone to treat them like an equal… I know that’s really weird and a lot of adults get put off by that, and I’m not saying ‘I’m amazing because I treat kids as an equal,’ but when you realize in their education you’re not above them, they’re in this, this is their education and you’re there to support them so speaking to them about what they want is really important, giving them space to express who they are in their thoughts.”

Shared humanity as a key point of departure for relationship-building supports Taylor’s approach. Additionally, acknowledging human personality differences is embedded in this approach. She explained this point further:

“And realizing that your own personality isn’t going to fit every student, so I think that’s another challenging thing is kids get put in a classroom, but it’s not always their fault that they don’t make a connection, you have different teachers and students have different personalities so there’s always going to be a student that you’re going to bump heads with but you’re the adult so you’re going to have to find a way around that just other adults personalities don’t mesh your personalities. Some kids aren’t just going to mesh with you and you have to build on that, show them that you’re there, that you’re the support system for them. I don’t know that I have a whole lot say, but I think just taking the time too to make positive connections with their parents. I always had a hard student and there were days where I probably wasn’t the most fair to that kid
and it wasn’t their fault, it was just our personalities were not compatible and I knew that but I would go home and I’d be like ‘that was my fault. That wasn’t really a problem, but I made it a problem.’ And so—all right I’m gonna get emotional—I think reflecting on that though anytime that happens, I’d come back the next day, and be very intentional about that student. But also make sure I made a positive contact with the student’s family.”

Rooted in a sense of shared humanity and connection, Taylor’s approach to relationship building with families is thoughtful and systematic. Taking the time to make positive connections with families, especially after a student has an especially difficult day, was one way in which Taylor systematized relationship-building. She explained that she always tries to attend sports or musical events when students invited her because she remembers that being important to her when she was a kid. She wants families to be able to contact her outside of school so she shared her personal phone number (her preference), though she knows several teachers who also set up Google Voice accounts as an alternative. On progress reports, she included specific notes for each child and wrote intentional examples, always explaining what “was going really well” and then also “where the student could grow.” Many of these techniques and ways of working came from information-sharing amongst her networks. For example, Taylor described her colleague and friend as “an amazing teacher,” explaining, “I would soak up everything she did” and “[I would ask her to] tell me everything. Tell me what I need to do.” To which her colleague/friend would reply something along the lines of “I’m writing positive notes home. Here’s why I write them. Here’s how I do it.” By building on the strengths of her networks, Taylor demonstrates a commitment to learning new ways to build relationships with families to refine the systems she has in place.

As a brief update on the project, the girls who were part of Project IMPACT were, in Taylor’s words, “begging to come back,” and many boys from the school were “begging” to be part of the project as well in future years.

**How Woodland Forrest Prepared for Building Relationships With Families and Youth to Get Buy-In for Pursuing Intensive STEM Opportunities**

- Making intentional and positive connections with youth and their families, especially after more difficult days
- Approaching relationship building with an eye toward shared humanity, yet acknowledging differences
- Brokering opportunities in ways that respond to youth and family needs (e.g., working around logistics of transportation or resource availability)
- Thoughtful and systematic ways to build family relationships are built into practice (e.g., sharing a personal point of contact, taking the time to write specific points of feedback on progress reports, offering alternative ways to participate remotely)
- Seek constant improvement by building on strengths of networks (e.g., other teachers, district and university leaders) to learn new systems and improve existing ones for brokering family relationships

![Figure 5. Draft mapping of strategies/approach](image-url)
About the Making Connections Project:
Fostering Connections and Pathways for Youth across STEM Learning Ecosystems

STEM Next and the Connected Learning Lab at UCI have partnered to support state and regional out of school networks as they develop and strengthen an ecological and connected approach to STEM learning. The case studies series represent real world examples that are part of a larger effort to develop and improve connection strategies that strengthen STEM learning ecosystems, centering the experiences, mobility, and futures of individual learners and their families across state and regional networks.

Each case study in this series takes a close look at a partner organization's approach to one of the eight strategies for connecting: 1) A wraparound approach; 2) Coordinating between in school and out of school; 3) Giving back to one's community; 4) Near peer or industry mentorship; 5) Translating youth interests in to STEM career opportunities; 6) Building relationships with families; 7) Curating online tools; or 8) Creating open portfolios. These case studies are not exhaustive; they are examples of coordinating and brokering that can be used to spark ideas and inspire growth.

For more information on the project and the strategies, visit https://stemnext.org/stem-pathways and connectedlearning.uci.edu/projects/making-connections/

References


