Shared Impact Report - 2023

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Organization Overview

The Southern Oregon STEM Hub region is vast and contains diverse school districts. From Medford, with just under 14,000 students, to Pinehurst with 12; the Southern Oregon STEM Hub aims to serve all by being an innovative leader in our statewide network. Southern was one of the first STEM Hub regions to pilot YOUSCIENCE, an aptitude and interest assessment modeled after the same assessment used by the military. The student-friendly version provides not just results of a student's aptitude but is an expansive tool for students as they explore education pathways and careers. This tool has led to youth-demand in our region for CTE courses. We have seen an amazing 200% increase in CTE course enrollment during Fall of 2022 and we believe much of this is connected to our efforts with YOUSCIENCE.

We were proud to be the pilot region for this tool and excited that many of our middle and high schools have seen the value of this program.

Evaluation Methodology

The aim of our evaluation was to see what kind and quality of impact the Southern Oregon STEAM Hub is having on the educators and partners. To understand this, we explored two broad evaluation questions:

1. What kind and quality of impact are we having on educators and partners?
2. What aspects of our program are causing this impact?

Qualitative Data Collection and Analysis

For the qualitative portion of the evaluation, we utilized an in-depth interview protocol to gain data about the structural, qualitative changes resulting from our program. We delimited our population to encompass educators and partners in the region with at least some level of direct engagement with the hub. We conducted a total of 34 interviews. Our population size for this evaluation was approximately 265 educators and 85 partners. We used a purposeful stratified sampling technique to select a representative sample from the population we serve. Our sample size was 16 educators and 10 partners. We also interviewed seven students (some students were interviewed in pairs). These were drawn from the following strata of our population:

- County (Jackson, Josephine, Klamath)
- School District
- Educator Role
- Industry, Community or Education Partner

Our interview team consisted of Karla Clark, Amy Lukens, Heather Armstrong, Mimi Davis and Aaron Cooke. We convened one-on-one interviews lasting from between 45 minutes and one hour in length and collected interview data using voice recording or the Otter voice-to-text transcription app.

We then analyzed the data inductively using a modified version of thematic analysis. Each interviewer analyzed the data from their interviews individually to identify initial themes. Together, we developed common themes from all of the interviews collectively. We identified the overarching and inter-interview themes that emerged from the full scope of our data analysis to illuminate the collective insights and discoveries. We mapped these themes visually and examined the dynamics among the themes, causes and catalysts of the themes, new or surprising insights related to the themes, and relationships between the themes that were revealed in the data. We then determined the most significant and meaningful discoveries and brought them forward as findings.

Quantitative Data Collection and Analysis

For the quantitative portion of the evaluation, we utilized a questionnaire to collect data on our quantitative indicators of impact. We administered this instrument to approximately 250 educators and 37 partners and had a response of 23 educators and 8 partners, a 9% educator response rate and 22% partner response rate. The data

were analyzed primarily using measures of central tendency. We identified key insights, patterns, and gaps within the data and incorporated these discoveries into the related findings. The most significant insights from the quantitative data are described in the following narrative.

Limitations

The evaluation was conducted during the early spring of 2023. Our community is still in a state of transition since the COVID 19 pandemic, and many people are working overtime and with limited staffing and time to contribute to additional activities such as participating in our survey or interview. The response for personal interviews was greater and received greater response than the response to survey.

Findings

Finding 1: *Growth Mindset*

The data reveal that the STEM work being done by the hub allows educators to think outside the box and step outside their comfort zone as teachers. They are becoming comfortable with challenging themselves when incorporating STEM into their classroom. One interviewee said, "If it doesn't challenge you, it doesn't change you." Another shared,

> I've had to be humbly honest, in recognizing faults. I've had to use an open mind and I've had to take risks of trying things that have been out of my comfort zone, maybe something I haven't tried before, and be okay with failing or not working perfectly the first time and trying again.

The survey data confirmed growth in this area, with 66.67% of teachers and 83.43% of administrators indicating at least some increase in being able to better model investigation and experimentation in their education profession (See Figure 1). However, it also shows there is still room for improvement, as only 40% of teachers and 33.34% of administrators showed a significant increase.

Figure 1. Through the STE(A)M hub, I am better able to model investigation and experimentation in my own professional practices.

	6.67%		6.67%			
Educators (n=16)		20%		26.67%	13.33%	26.67%
Administrators (n=6)	16.67%		50%		16.67%	16.67%

0%   20%   40%   60%   80%   100%
Percent of responses

☐ Unsure ☐ Not at all ☐ A little ☐ Some ☐ Quite a bit ■ Very much

One educator talked about the power of being inspired by seeing the successes of others, saying,

It's helped my growth mindset a lot...because I know from our conversations we had during our meetings, other people stepped outside their comfort zones, they tried things, and they were successful.

Integrating STEAM across curricula is also helping teachers do more for their students without adding one more thing to their already full plate. Teachers are seeing the value in maintaining high expectations for students and are contributing to the development of both independent and collaborative learners. One interview said, "I think just being able to see that science education is do-able. More like to be doing science, it takes more of a mindset than it does a knowledge base."

There is also a growing understanding that STEM is for every student and a commitment to delivering STEM through an equity strategy, both in how the region is served and as an implementation strategy in the classroom. This has contributed to breaking down the stereotypes regarding teens and STEM and shown that STEM can not only engage teen students but provides them with a reason to learn. One interviewee talked about this shift, saying,

I think even when I first started in education...there [could] be discrimination amongst age even. And I had someone tell me I shouldn't teach a lesson because seventh graders weren't capable of that. And I said, "Yes, they are." They absolutely knew this, and I jumped in and they 100% were able to achieve that.

Interviewees noted that things are moving in the right direction but there is still more work to be done in terms of building sustainable programs and developing more programs and opportunities for students. One interviewee reflected on this, noting,

It's not a job that's ever finished. And that's challenging for people that like to finish things and check off boxes. We have a lot of student needs that come and go and pandemics that come and go and all kinds of different law changes and edits and rules and regulations and standards. I think it's just being okay [with] that. It's that change is a constant and improvement is a continual process.

Finding 2: *Creating Connection and Belonging*

Teachers and partners shared in the interviews that they feel affirmed in voice and belief through the work being done by the STEM hub and broader network. When the STEM Hub creates opportunities for collaboration it strengthens teacher and partner voices. One said, "It's bringing together the schools and programs in our region. Instead of in silos." Another shared,

When it's been more active, [the Rural Learning Collaborative has] been useful to be able to see there are other educators that are like minded to myself. I may be somewhat the exception in Butte Falls, but there are other people out there who think that way.
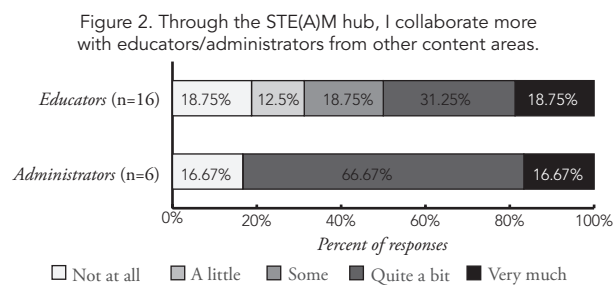
The data confirm that the STEM Hub is known in the community for its collaboration efforts and that many large projects across the region and across education and the community are done through the STEM hub. The hub brings people together and through brainstorming, common ground is found and then there is recognition that we are like-minded people, working toward STEAM for all students, regardless of demographics. One interviewee said, "If you reach out to people, they're there and they want to help because everyone wants the youth to learn more skills in America." Another said,

> The STEAM Hub has helped to be able to talk to other people who are doing a lot of project-based learning hands on and seeing how others are incorporating and making things more equitable and reaching to underserved populations. So, seeing what other people are doing versus trying to reinvent the wheel I think is really important.

Another noted the impact this has on his students, saying,

> I think one of the things from me is just at a very philosophical level, using STEM to show students who aren't necessarily exposed to the broader world, that I've been able to expose them to some different career opportunities.
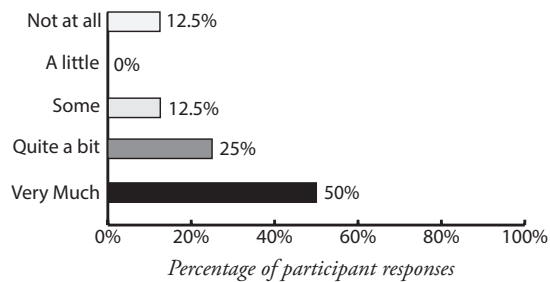
Interviewees talked about the benefits of taking the time to build personal relationships and connect across grades and curricula. Survey data show that 50% of teachers and 83.34% of administrators agreed that through the STEAM hub they are collaborating 'quite a bit' or 'very much' more with educators from other content areas (See Figure 2).

Figure 2. Through the STE(A)M hub, I collaborate more with educators/administrators from other content areas.

	Not at all	A little	Some	Quite a bit	Very much
Educators (n=16)	18.75%	12.5%	18.75%	31.25%	18.75%
Administrators (n=6)	16.67%		66.67%		16.67%

Percent of responses

Of the partners surveyed, 75% reported being better connected to partners offering STE(A)M learning opportunities (See Figure 3).

Interviewees also noted the validation that comes from meeting appreciative former students and the value of learning alongside students. One said, "There's some inward work you need to do and that's just been really pretty powerful for me to reflect on my own beliefs."

Figure 3. I am better connected to partners who are providing STE(A)M learning opportunities. (n=8)

Response	Percentage
Not at all	12.5%
A little	0%
Some	12.5%
Quite a bit	25%
Very Much	50%

Percentage of participant responses

Finding 3: *Awareness/Lack of*

Throughout the interviews, educators and partners talked about the role of the STEM hub in creating awareness of STEM and STEM opportunities in the community. The data reveal that people want to engage in STEM but must first have an awareness of the opportunities available to them. One partner said, "My greatest challenge may be not always knowing what's happening on the STEAM Hub's end. And so, my lack of knowledge might limit my brainstorming capacity for finding ways to connect."

Teachers who are aware, are more excited to engage in other STEM opportunities and then come looking for them. When teachers have awareness of resources, they engage more with STEM, staying current with new technology, regional projects, conversation, support, and professional development.

When partners are aware of what is happening in the classroom, what the needs are, and where the excitement is, they are more able to support. One interviewee said,

I think one of the things is getting more and more industry partners on board with that and see that return on investment, if you will; of making those career connected learning opportunities, whether it's job shadowing, or work-based learning, or internships, or visiting classrooms or site visits.

The data show that awareness of STEAM and CCL opportunities in the region is growing and interview data confirms that things are headed in the right direction at a state level. People feel there is a clear vision in place to guide the process. However, there is also agreement that there is work yet to be done and room to grow.

Interviewees talked about the lack of capacity people have for awareness and seeking out opportunities to engage in STEM. One said,

It's so nebulous and it's so abstract that even for me, sometimes it's difficult to be able to because I feel like I want to include as much as I can, but that's difficult when there are a million different tangents and really, there's not enough time to run them all down and do them effectively.

People also noted challenges around communication, from the hub, ESD, and the administration as well as a general lack of understanding of where to go for more

information. Professional development opportunities are often designed with a one and done approach, rather than a layered experience with ongoing support. One interviewee said,

> You know, it [professional development] has to build upon itself. Like if we have this goal in mind, what are, and I'm gonna use the word scaffold, but it's like what are the supports to get us to and then after that, what are follow up supports and continuing supports because then it gets dropped and forgotten.

Another talked about the confusion that can arise when messaging changes or is unclear. She said,

> That course was meant to be a PBL integrated project-based course integrating all subjects and then we went and labeled it STEM which is confusing, and it took the teachers away from thinking about doing integrated PBL and only doing projects that were focused on their specific standards they were hitting in their content area. That's interesting. I think I'd make some changes if I had to again, changing formats.

Finding 4: *Geography Rural*

The data confirm that many barriers to STEAM access and exposure remain for rural schools and communities. Rural schools are more likely to have new or less experienced teachers, and fewer resources, equipment, and supplies. Teachers often are tasked to teach several different classes and subjects. This stretches teachers thin and limits options for students. One said, "They [students] really don't have any exposure to scientists or people in STEM fields." Another commented, "The inequities that rural communities face and that rural STEAM hubs face are completely different."

Rural schools often do not purchase curriculum resources, which means the teachers have to create everything. This can be a great opportunity for creating a cohesive curriculum, but the lack of time and resources results in disjointed learning, especially since teachers are typically a professional learning community of one. One educator reflected on the isolation she feels regarding STEAM learning opportunities, saying,

> My isolation has been discouraging. It's just been hard just because of where my school is located. My team is a baby team. I feel like I don't have those resources in my immediate vicinity. But then when there's other things happening, like in the valley, and I could go to them, they're things that happen while I'm still in contract hours or they're so far, by the time I get there it's over. You know, I don't have that strong resource around me.

The physical distance that exists between schools, partners, and resources is significantly more challenging in rural communities. Even access to libraries can be limited. One partner noted,

> A challenge is thinking about the best ways to make sure we're equitably reaching all the folks who really need some hands-on STEAM facilitation from experts. Because some of these rural areas out in like Josephine County, or Klamath it might be

challenging for them to get as much hands on visits and support as they really could benefit from.

Interviewees confirmed that face to face learning is valued more heavily than virtual learning whenever possible. However, there was general agreement that virtual learning is welcome if it is the only means available to bring an opportunity to the community given, the challenges of geographical distance. Educators highlighted in the interviews the need for more STEAM Hub resources and staff that can go out to the schools in rural communities. However, there was also a realization that the capacity of the hub is also limited and that the small STEM team cannot be everywhere at once.

Survey data confirmed that there is growing advocacy among partners in improving access to STEAM education for all students. Of the partners who responded to the survey, 100% reported serving rural or remote communities. Seventy-five percent of respondents indicated that as a result of the STEAM Hub, they are significantly more active in improving access to STEAM for students with little or no access and more confident supporting STEAM education for underserved children and youth. In addition, 87.5% feel a greater urgency to provide STEAM opportunities for students who have been excluded.

Finding 5: *Student Voice and Choice*

The data show the value of incorporating student voice and choice and meeting students where they are at when creating STEAM opportunities and learning experiences. Previously dependent on industry needs, pathway development is now incorporating student aptitude and interest. YOUSCIENCE has been beneficial to this process, providing insights to students regarding their aptitudes (natural gifts, talents and problem-solving methods) and their interests. This self-knowledge helps a student with career and education planning and making choices. One partner shared,

> CTE classes [didn't used to fill] …And then they became full of all kids who want to actually be in that program because it was a strength and an interest [indicated on YOU Science]. We're seeing the direct benefit of having really an in-depth conversation with kids about their strengths and where they could have a future, trying it out for free while they're in high school. And the biggest evidence of that is our entry level classes. You know, totally for the right kids who belong there. And then we know that that's going to translate to the software load into your path of actually being followed, which is more and more of the right kids getting access to those job experiences, you know, when they graduate.
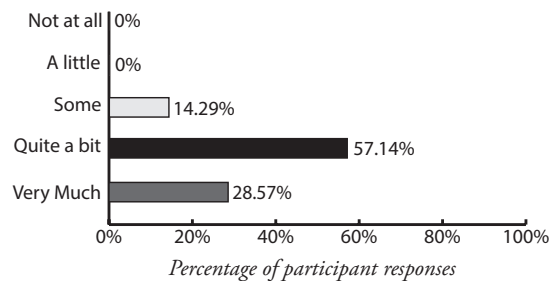
A student who was interviewed talked about their experience with CTE, saying,

> The most that this (CTE) has done for me is given good insight. Like, for me, I thought construction was what I was going to go into. But doing a few construction classes, I looked at it and I'm like, I can't really picture myself doing this for the rest of my life. It's kind of given me the opportunity to kind of see what does and it does not work for me.
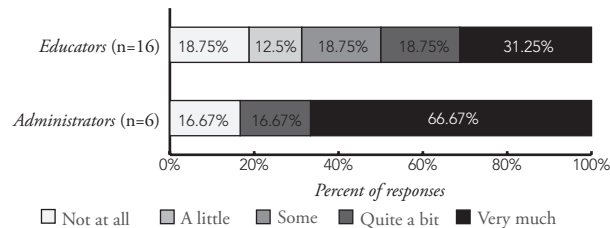
Survey data confirmed progress in this area. Of the partners surveyed, 75% reported that as a result of the STEAM Hub they were 'quite a bit' or 'very much' more able to show students the range of STE(A)M connected career options (See Figure 4).

Figure 4. I am better able to show students the range of STE(A)M connected career options. (n=7)

Percentage of participant responses

Administrators surveyed reported an 83.34% increase in their ability to support teachers in creating meaningful experiences for students as a result of the hub. While only 50% of teachers reported an increase in their ability to create these meaningful STE(A)M learning experiences, 68.75% reported at least some level of increase (See Figure 5). This indicates that progress is being made, though there is room for growth in ensuring the support of the hub and administrators translates into meaningful results in the classroom.

Figure 5. Through the STE(A)M hub, I am better able to create/help educators create STE(A)M learning experiences that are meaningful to all students.

Percent of responses

☐ Not at all   ☐ A little   ☐ Some   ■ Quite a bit   ■ Very much

Interviewees also highlighted the need moving forward to continue adapting strategies and existing mindsets to include non-college goers, who make up the majority of students in the community. Providing additional math supports, math 2+1 plus practical mathematics can be beneficial in supporting students going into all different pathways.

Finding 6: *Leading Districts*

The data show that districts have taken the support and resources available through the STEM Hub as a model and now they are dedicating their own funds and expanding their STEM offerings after our example. One educator said, "I think that also helped us as a school to be able to think, what can we do to provide those opportunities for those students?" Another said,
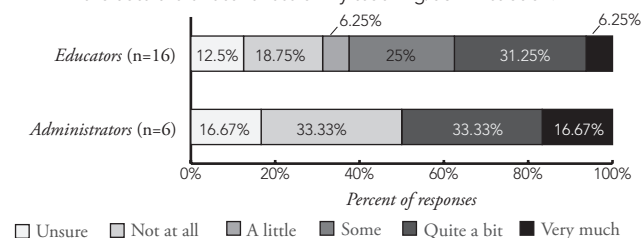
> Math has been the biggest impact and it has impacted me from knowledge of grasping the new Oregon standards and how seeing how they apply, getting practice and then specifically the professional development on coaching on how to coach teachers on changing the way they're teaching math or at least adjusting the way they're teaching math has been the biggest impact.

Educators talked about being able to make connections with industry partners through participation in the Industry Tours that were sponsored by the hub and SOREDI. These connections have allowed them to make further plans for their students and classrooms.

Interviewees noted the value in the hub's guidance related to decision making. Many community and education partners highlighted the 2020 CTE/STEM Needs Assessment conducted by the hub and how it helped to inform and guide in their own district or community planning. The hub also provides needed data resources, such as YouScience, demographic data, industry, and employment, along with support around data interpretation. One interviewee reflected on the impact this support has, saying, "It starts with analysis of data and information and creates a baseline for program improvement, leading to increased equity."

Of the educators surveyed, only 37.5% of teachers and 50% of administrators reported being significantly more comfortable using data to evaluate the effectiveness of their role in education (See Figure 6). This indicates there may be more work to do in regard to supporting educators in collecting, using, and interpreting data.

Figure 6. Through the STE(A)M hub, I feel more comfortable using data to evaluate the effectiveness of my teaching/administration.

	Unsure	Not at all	A little	Some	Quite a bit	Very much
Educators (n=16)	12.5%	18.75%	6.25%	25%	31.25%	6.25%
Administrators (n=6)		16.67%	33.33%	33.33%	16.67%	

Percent of responses

Finding 7: *Teacher and Student Empowerment*

Throughout the interviews, educators and partners talked about how the work of the STEM hub is empowering both teachers and students. Through access to resources and professional development opportunities, teachers are connecting, building communities of
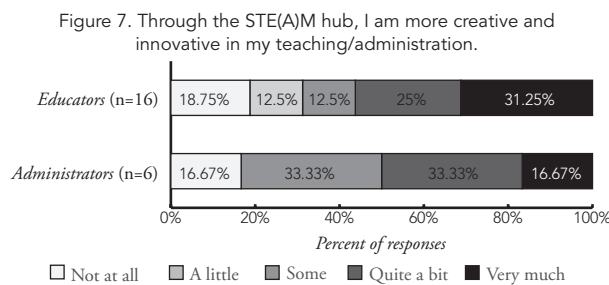
practice, and looking to each other for inspiration and support. One said,

> The entire Klamath Basin is made up of female high school, robotics coaches, and 120 coaches in our state, only 12 of them are female. So, we've got four here in the basin, and some of the most successful teams and so I think just supporting each other and working together.

Educators are also growing their confidence around STEM through hands-on activities and seeing the successful implementation of strategies and activities. One educator said,

> To hear the excitement of the teachers to get their hands on these robots and then also be able to take their equipment home. So, it's like it's giving them a foundation of how to use it and succeed - not just how to use the robot, but how to integrate it into their classroom with these larger learning goals in a meaningful way. And then giving them that equipment to use and following up with them. So, it's tiered and layered support.

In the quantitative survey, 68.75% of teachers and 83.33% of administrators responded that they were at least somewhat more creative and innovative in their educator role, with at least half of each group noting a significant increase (See Figure 7).

Figure 7. Through the STE(A)M hub, I am more creative and innovative in my teaching/administration.

	Not at all	A little	Some	Quite a bit	Very much
Educators (n=16)	18.75%	12.5%	12.5%	25%	31.25%
Administrators (n=6)	16.67%	33.33%		33.33%	16.67%

Percent of responses

Through the STEM engagement and exposure opportunities offered, students are finding a focus and their "why." One student interviewed said, "I can start taking care of myself and I think it [STEAMwork at NRC] really boosted my confidence." Another shared,

> It's given me the confidence to go after that in my future, like going to an art school and wanting to be a teacher and all those kinds of things that I think I might not have really had the absolute confidence [to do before]. Now I've just been really wanting to do that."

Educators are also inspired to empower their students and offer more leadership opportunities. One educator noted how she incorporated this into a recent camp, saying, "This last summer, I didn't run the camp. I let my kids run it."
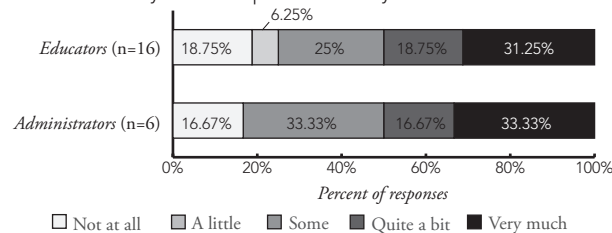
Finding 8: *Intrinsic Motivation*

The data show that intrinsic motivation is a key component for engaging students, educators, and partners in STEAM. It increases awareness, growth mindset, empowerment, and a passion for engaging all students. People with intrinsic motivation look at barriers and they problem solve, while others see hurdles as stuck points. Interviewees described the motivation they find in the face of challenges related to STEM. One partner said, "Nothing discourages me. Challenges, I think, an exciting challenge."

Of the teachers surveyed, 75% reported being at least somewhat better able to cultivate curiosity in their education profession as a result of the hub and 83.33% of administrators reported being better able to cultivate this in teachers (See Figure 8). Fifty percent of each group reported a significant increase in this area.

Figure 8. Through the STE(A)M hub, I am more able to cultivate curiousity in my education profession/in my educators.

	Not at all	A little	Some	Quite a bit	Very much
Educators (n=16)	18.75%	6.25%	25%	18.75%	31.25%
Administrators (n=6)	16.67%		33.33%	16.67%	33.33%

Percent of responses

Engaging in STEM is a way for students to foster their intrinsic motivation and curiosity. One interviewee noted, "By nature, most kids are curious." One student interviewed talked about the growth they have experienced through the STEAM integration at NRC, saying, With the view of myself, it's kind of just helped me grow, maybe not mature. I've always been a very mature person I hold myself more mature than others. I feel like but being able to just grow more into a collaborative hands-on working person in a way I've always been it's just helped me see that more."

Talking about how STEAM is opening doors for students and motivating them to follow new potential paths, one educator said,

> They actually are starting to see themselves as being scientists. And so for me, that I see as being really a huge win just because it is something that they would be and I see that they are getting the knowledge that they could go out and if they wanted to go on to college, that some of these kids would have the ability to do so would have the background to be able to do so, which I wouldn't necessarily have said about these kids several years ago.

Finding 9: *Systemic Hurdles (and opportunities)*

Throughout the interviews partners and educators highlighted the systemic hurdles that persist in STEAM education and engagement. High on the list of challenges is lack of capacity. Schools are struggling with a lack of time, scheduling conflicts for classes, and student attendance. One educator said,

It's really difficult to do any activities that last more than a class period and have any more partially just because attendance is still an issue for students and just, they struggle to be able to remember what they did from one day to the next or than last week.

Another noted the challenges of incorporating STEAM in an integrated way, rather than an added-on class, saying, "Like it's a playtime - we're playing I don't see what I'm learning out of it. And that's not how we want [a] STEM class to be so we just need to be careful if we are going to have a STEM class that it is not just a class, not just an elective." Another shared, "I think the intent is good, but the curriculum is not lending itself. From time restraints to pressure to stay and finish a set amount. There is a pressure to get through content."

Staffing issues impacting education as a whole, such as the need to fill positions through the use of emergency licenses and a lack of available substitutes present challenges for STEAM engagement as well.

Districts are having to spend available funding to help new teachers develop basic teaching practices, leaving a lack of funding for continuing STEAM education. The data show there is a collective vision for what is possible and necessary for STEAM education, but this vision needs to be backed up with resources to be realized.

Another challenge identified is a breakdown in communication within the network of partners. Community partners may not be aware of one another or may not be aware of their role in the collective effort. One said,

I'm not that aware of other community partners that do a lot of youth hands on STEM programming. Like Science Works does some. So maybe that's one thing I've realized that there should be more, more partnerships. How do we strengthen our partnerships beyond just the STEM lab in schools and our organization?
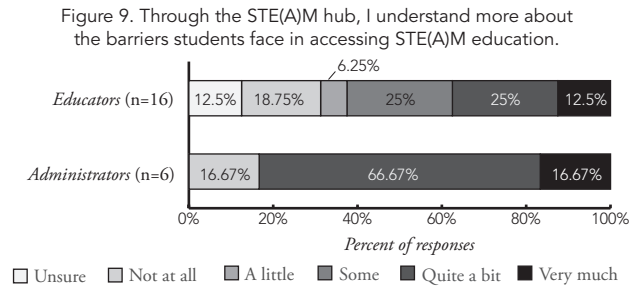
Interviewees also noted an ongoing clash between industry and education. Despite efforts to build connections, schools and organizations are still largely operating in silos and it is challenging to get industry partners in front of students. One said,

I think there's an opportunity within industry to have some entry level training in STEM. What is industry doing to support kids in being exposed to these different opportunities in our region? And then also setting up a program where they can gain some skills and gain some interest in what they're doing.

This widens the disconnect between student interests and career pathways. Students might know what they want to do but have no idea how to get there. The survey data confirm a growing awareness of these challenges. Of those surveyed, 83.34% of administrators, and 75% of partners reported a significantly better understanding of the barriers children and youth face in accessing STEAM education and learning as a result

of the work of the hub (see Figure 9). While teachers showed growth in this area, with 62.5% reporting some level of increase in their understanding, only 37.5% showed a significant increase. It is unclear whether that stems from a need for additional support to strengthen teacher's understanding, or if teachers began with a strong understanding prior to the hub's engagement, given the nature of their more direct work with students.

Figure 9. Through the STE(A)M hub, I understand more about the barriers students face in accessing STE(A)M education.

	Unsure	Not at all	A little	Some	Quite a bit	Very much
Educators (n=16)	12.5%	18.75%	6.25%	25%	25%	12.5%
Administrators (n=6)		16.67%		66.67%		16.67%

Percent of responses (0% – 100%)

☐ Unsure   ☐ Not at all   ☐ A little   ☐ Some   ■ Quite a bit   ■ Very much

The data also revealed opportunities for addressing these challenges and the progress that is being made. One talked about positive changes they see regarding funding at the state level. It was also noted that funding sources are dictating and driving change. It is now a common specification of many grants to direct dollars to historically marginalized student groups, creating opportunities for more resources and opportunities to become available for engaging those students.

Interviewees talked about opportunities for creating more connections within the network and more cross curricular work. One shared, "The long-term goal is to collaborate with our business students, and our art department and our engineers and have them working on a project together." Another said,

> I see an opportunity for advancing and advocating for STEM in maybe even more work with cross curricular educators, like reaching out to language arts and math or language arts and social studies teachers, and electives teachers and inviting them into these opportunities.

Finding 10: *Outcomes for loss of structure*

The data confirm that the challenges many students are experiencing today are impacting STEAM education as well. Interviewees noted that many students are struggling with a lack of self-regulation, interpersonal interaction skills, and low executive function. After a very tough few years, there is a lack of resilience affecting teaching practices and student outcomes. Student interactions are largely driven by a need for scaffolding and re-teaching.

Students are also not always connecting to the learning and inconsistent attendance makes it challenging for teachers to create continuous, connected learning experiences. In response to the question, "What makes you more committed now to seeing your friends in STEAM than you were before?" one student interviewee said, "It doesn't really matter to me that much. If my friends learned something, okay. But like, if they learned how to

do something cool, and yeah, I'll be like, hey, that's cool, but I won't like be affected by it." Students and teachers are also exhibiting a risk aversion, impacting their ability to envision what is possible. One student reflected,

> My dream job is to work in the astronomy field, the rocket science, things like that. That's my dream job. Am I going to be able to achieve that? Probably not. Probably the opportunities trying to find everything that goes into becoming a rocket engineer, for example, is a lot of hard work. And I don't think I'm in the place to make that risk into going into it.

An educator talked about his reluctance to utilize some of the resources available because of how his students were struggling with organization skills. "It wouldn't necessarily make sense to bring a lot of the things from the lending library just because right now we're having an issue with students taking care of materials."

The data suggests a need to meet people where they are and find opportunities to provide support, where possible. An administrator talked about the need to support teachers with STEAM integration, saying,

> Don't bite off more than you can chew as part of it, making sure that there's meaningful support all along the way. And that we have the time to think we have the time. I think sometimes we just have a good idea, and we just don't take the time to really do well.

One student interviewee noted, "I don't know much about STEAM. I've never done a whole lot, but I know the NRC is a great place. I can you know, get kids and then help them with whatever project we're building. I can lead them."

Conclusion

Steps Forward and Recommendations

- STEM Hub Newsletter will go out monthly. We started on this immediately and were able to publish the first one in June of 2023; positive feedback is already flowing! This is a priority because resoundingly our interviewees stated that once they found out about the STEM hub work, they wished they had known about it sooner and those that already know about the work wish that additional information was more free flowing and readily accessible.

- We aim to get social media up and running and more robustly than it has been in the past. We currently have a web page on our SOESD website: *https://www.soesd.k12.or.us/steam/* and we plan to dedicate regular time keeping the information up to date on this page. In addition to the web page, we plan to get Facebook and potentially X (formally Twitter) up and running to share out updates

and bring awareness to the work of STEM in southern Oregon and around the state. Currently there is not a start date on this, but we anticipate a start date of Fall 2023.

- Facilitate 2 - 4 meetings a year to give an overview of what is new, what is taking place, and what is about to happen and learn current needs and desires of our communities. These will begin during the fall of 2023 and be ongoing. This is important because through both our interviews and our local cabinet to cabinet meetings with our districts, it was communicated that people wish to see us face to face and more often, if possible, to learn about and collaborate with the STEM Hub.

- Visits to schools to engage with teaching teams will take place through both project-based learning and career connected learning opportunities. Again, with the desire for face to face and regular engagement, Zoom will be used when needed for support, but much of what we offer, we plan to make it in person and delivered locally by our local teacher leaders and STEM Hub staff.

- Visits to districts to engage with administrators will take place beginning the fall of 2023 on a monthly basis in each county to further meet the needs of showing up face to face and more often. Meetings with administrators will help our teachers gain the buy in and support of their administrators as awareness and understanding deepens within the schools and districts.

- Hire at least one more School Improvement Specialist or STEM Integration Specialist to expand our in-person offerings. This is important because as we hired one person to do this work last year, they quickly filled their schedule to capacity and the demand is greater than what we can offer with our current staffing.

- As we schedule both STEM Integration and Career Connected Learning opportunities for our schools, we aim to replicate a process we used for both our NASA and CS implementations last year. Rather than a "one and done" interaction with only one educator at a time, we gathered several educators and classrooms at one time, then provided tiered follow-up support for them over Zoom. Feedback from educators on this approach was positive and we see value in expanding this model of interaction.

- Hire a tech specialist and/or a media specialist: we have a need for consistent tech expertise in our media library. Recently we have experienced repeated staffing turnover which has created profound gaps in service and excellence. We are working with our fiscal agent on a solution to making this position meaningful for sustainability so that service can be seamless and excellent.

- Expand lending library to pair equipment for ease of use. This may be done with the use of braided funds from other sources partnering with the STEM Hub.

Already this spring, iPads were replaced for pairing with some existing equipment in the library as well as adapters purchased to help with additional devices. The purpose and importance of pairing devices with equipment is meant to ease the burden of trying something new in the classroom. If we offer a package deal, then the teacher may be more likely to check out an item knowing that they don't have to find additional components on their own in order to use the equipment.

- Expand youth voice work to keep getting their input and tell the stories of success and what they are excited about. This past biennium, we were able to capture video of students sharing their experiences with the YouScience platform. This video content helped with the recruiting of other school participation. During our SIP work, we interviewed students in addition to the requirement of interviewing.

- Middle school career fair with exploration activities are a needed activity to fill a gap for students. Conversation and planning started during the 2022-2023 school year. Continued planning, preparation and finally execution needs to take place. This may come by the way of district-by-district events or regional events located at a high school or community college. Industry and community partnership is willing to help carry this out. This could also involve high school student leaders as near peer examples showcasing projects and programs for middle school exploration.

- STEAM Schools has been a project that other hubs have partaken in; while we see value in this work, in southern Oregon, we have a need to continue building our foundation of STEAM identity where every educator sees themselves as a part of STEAM, as capable of teaching STEAM, and as able to interact with STEAM. As we increase our STEAM integration into our schools and communities through the work of our STEAM Integration Specialists and teacher leaders, we will be building STEAM schools grassroots style.

- Following our Educational Technology Summit, we have publicized this year's schedule of Ed Tech Cadre meetings, where we share out and help communicate upcoming offerings and continued learning around technology and computer sciences in the classroom. This will take place through the Ed Tech Cadre, partnering with the STEAM Hub and STEAM integration. Rather than a stand alone Ed Tech Summit event, this follow-up will promote depth of learning and understanding.

- New Teacher Fair takes place at SOU annually. This past year, our STEM Hub was represented at the teacher fair with the purpose of making our presence known and to encourage new teachers with the resources and opportunities that we provide. Continued attendance at this fair and others like it will assist the hub and community with awareness of the work we do together.

- Take the lending library and mobile maker space on the road to all three counties, setting up in the county libraries or the school library and media centers. Prior to 2020, there had been a plan to get our mobile maker space on a rotation (one in each county) so that schools could have it for a month at a time within their library and all the teachers could have access to check out the items. This plan came to a halt, and we are re-addressing this idea now with a plan to implement in the fall of 2023. With this rotation, media, and tech specialists as well as any willing educators will be trained up during an introductory lesson each month as the mobile maker space moves from district to district throughout the year.