



Makerspace

Department of Assessment and Evaluation

CCISD Makerspace Program Evaluation

Clear Creek Independent School District

Program Evaluation

Presented to Board of Trustees on March 6, 2023

2022-2023 Board of Trustees	Program Summary Team
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CCISD Makerspace Program Evaluation

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Makerspace Program Evaluation

The purpose of program evaluations, gauges, and summaries in the Clear Creek Independent School District (CCISD) is multi-faceted and shall result in findings, conclusions, and recommendations that:

- Ensure program alignment with District goals and vision;
- Assess strengths and weaknesses of the program;
- Measure the success of the program in meeting its expressed goals; and/or
- Result in improvements in, revisions to, or discontinuation of the program.

A full program evaluation is a comprehensive, in-depth study of a program using measurable objectives on the fidelity, effectiveness, and impact of a program designed to support students. A program evaluation will include the findings, conclusions, and recommendations about the program.

Alignment to Community-based Accountability Pillars

Makerspace aligns with the following pillars of the Community-based Accountability System:

- **Student Learning and Progress:** We will provide support to meet the needs and aspirations of each student.
The Makerspace program aims to provide multiple modes of learning through exploratory inquiry.
- **Safety & Well-Being:** We will ensure safe and nurturing learning environments.
The Makerspace program aims to provide hands-on opportunities for students to learn through exploration while supporting students' emotional safety and well-being.
- **Engaged, Well-Rounded Students:** We will ensure each student is prepared to assume their role as a productive citizen.
The Makerspace program aims to meet the various needs of students through opportunities for building, crafting, and exploring technologies.
- **Community Engagement and Partnerships:** We will broaden and strengthen connections within our communities.
The Clear Creek Education Foundation and Boeing have funded grants to support Makerspaces across CCISD.

Alignment to the CCISD Strategic Plan 2020-2025

Makerspace aligns with the following strategy:

- **Inspire Student Achievement, Agency, and Growth:** Educational tools and designated learning spaces exist at each campus in CCISD to improve the students' learning experiences.

Alignment to Superintendent Targets

Makerspace aligns with the following Superintendent Targets:

- **Physical and Emotional Safety:** We will foster a safe and nurturing environment.
In addition to connecting and extending core content, Makerspaces offer a safe place for students to explore, create, learn, and relax in an environment that is conducive to innovation and social and emotional learning.

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[Alignment to Vision 2030: Profile of CCISD Learners](#)

Makerspace aligns with the following:

- **Creators & Critical Thinkers:** Makerspace encourages students to innovate, ponder, and build in the physical spaces designated for makerspace activities throughout the CCISD libraries.
- **Communicators & Connectors:** When working collaboratively, students communicate and connect with each other with a common goal in mind.
- **Collaborators & Contributors:** Makerspace activities provide opportunities for a shared responsibility and accountability to others through sharing of thoughts, ideas, and abilities.
- **Compassionate & Confident:** Collaborative work in makerspace areas promotes the development of interpersonal skills, which results in opportunities for students to pursue their interests and conquer obstacles.

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Background of Makerspace

What is a Makerspace? According to US News Global Education (2022), “Simply put, a makerspace is a place where you can make things.”

“It is further defined as a DIY space for exploration where people can gather to create, invent, and learn.” (Institute for Arts Integration and STEAM, 2021)

In CCISD, a makerspace is housed in the campus libraries. Makerspace allows students to focus their creativity into building or making something using the tools and resources provided, such as 3-D printers, robots, other tools used in robotics, technology tools, craft items, and software.

“Typically, “making” involves attempting to solve a particular problem, creating a physical or digital artifact, and sharing that product with a larger audience. Often, such work is guided by the notion that process is more important than results.” (*Education Week: Herold, B. (2016) The Maker Movement in K-12 Education: A Guide to Emerging Research*)

Through trial and error, students may fail at first, then try again, which allows them to experience and further develop feelings of perseverance, determination, and grit.

“Libraries have always been the place to get a book, do research, and spend time reading in a quiet place. Today’s libraries still have those areas, but now with so much more. When you walk into CCISD libraries you see exploration, collaboration, and creation. Students are utilizing 3D printers to create prototypes, leading classes and groups on robotic component design, Minecraft, and coding. Students are flying drones, composing music on digital audio systems and using green screens to illustrate content knowledge such as scientific processes and animation.” (Bay Area Houston, 2019)

The makerspace definition, as defined in CCISD, is areas throughout the campus libraries that include activities, projects, and/or items that allow hands-on learning and exploration.

Learning and Innovation

Makerspaces can support content areas through various activities and extensions. For example, makerspace activities can be incorporated into ELA instruction using audio/visual tools and/or materials used to construct props, settings, and characters. (Eduporium, 2023).

Social and Emotional Learning

Makerspaces allow students opportunities for character development, such as teamwork, challenging activities that allow students to fail through trial and error, and the promotion of design thinking, which facilitates feelings of empathy. (Demco, 2022)

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CCISD Makerspace Program Components

Staffing

The table below shows the number of elementary, intermediate, and comprehensive high school campuses along with the number of staff members who support the libraries.

	Elementary	Intermediate	High School
Number of campuses	27	10	6 (5 comprehensive + CVHS*)
Library Staff	1 librarian/campus	1 librarian/campus	1 librarian and 1 aide/campus

**1 librarian/no aide*

Structure

While some of the elementary, intermediate, and high schools share the same floor plans in CCISD, there are varieties in the space available for makerspaces. In some libraries, mobile makerspaces exist to combat the space limitations.

Makerspace Components

According to Haskell Education (2022), there are learning and physical components of a makerspace. The learning components are listed below:

- **Design Thinking** - defining, creating, testing, recreating to enhance idea development and progression. Students learn that failing is an option, which will lead to further development and extension of ideas.
- **Social/Emotional Learning** – students may set goals, problem solve, and build relationships with their peers and to foster their individual learning experiences.
- **Global/Digital Citizenship** – students learn and practice accountability, communication, and collaboration to inspire achievement, agency, and growth. If working with technology, students should understand the importance of being a digital citizen, which signifies responsibility, accountability, and proper online etiquette.
- **Cross Curricular Education** – students are able to synthesize curriculum from their classes in order to connect prior knowledge with new learning experiences for a deeper understanding.

Learning and Physical Components in CCISD Makerspaces

The items and materials that make up these components vary from campus to campus in CCISD. Some items can be inexpensive or donated to makerspace areas, such as but not limited to straws, toothpicks, pipe cleaners, paint, tape, and paper.

Other items are commonly found in makerspace areas, but are more expensive, such as but not limited to Legos, Robots, 3D printers, Sphero, and circuits.

CCISD Makerspace Program Evaluation Questions

1. How is the makerspace program promoted in CCISD?
 - 1B: What professional learning opportunities exist for librarians, campus leaders, and teachers?
2. To what extent does makerspace support and align to student learning and innovation?
3. To what extent does makerspace support and align to student development (core values, character)?

CCISD Makerspace Program Evaluation

Research Methodology

In March of 2022, librarians were surveyed on their makerspace areas/equipment in their campus libraries. Thirty-eight librarians completed the survey in March 2022.

In January of 2023, surveys were distributed to students in grade 4 -12, librarians, teachers, instructional coaches, curriculum coordinators, and campus administrators. (Surveys can be found in Appendix A). Survey data was collected through January 20, 2023, and data was analyzed using Qualtrics.

The response rates for the January 2023 surveys are below. (All survey data shown in the following pages is from January 2023, unless indicated otherwise.)

Staff	Number	Students	Number
Campus Admin	17	Elementary	1,299
Coordinators	3	Intermediate	1,042
Instructional Coaches	43	High School	1,651
Librarians	33		
Teachers	615		
Total	711		3,992

The number of responses for the survey questions are listed either in the graphs or under the tables. Please note that the number of responses varies because we included both partial and full survey responses in the analysis.

CCISD Makerspace Program Evaluation

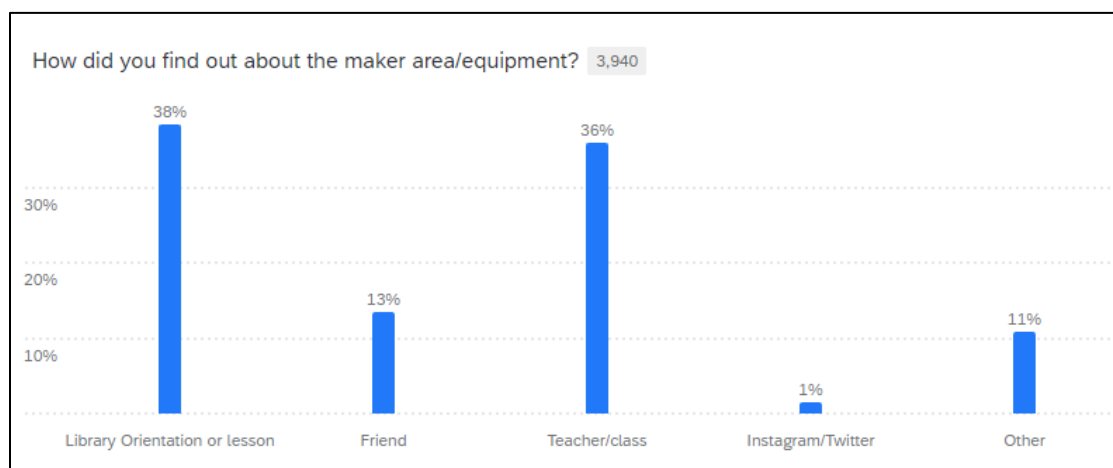
Research Question #1

1. How is makerspace promoted in CCISD?

Librarians created campus library courses for students and staff in itslearning, so students can access resources at school and at home. Activities at school are categorized by the type of activity, such as drawing, building, coding, recording, and engineering. Virtual activities include the use of Scratch, Minecraft, and other robotics and coding activities.

In the makerspace student survey in January 2023, students were asked how they found out about the makerspace area/equipment. Overall results are shown in the graph below and followed by leveled results in the table. (Survey response rates are shown beside the question in the graph.)

Overall Student Responses:



Overall, 75% of the students who completed the survey found out about makerspace through a library orientation or lesson or teacher/class. There is alignment between intermediate and high school student responses for this question, while elementary student responses showed an increase in the percentage of students who responded, “library orientation or lesson.”

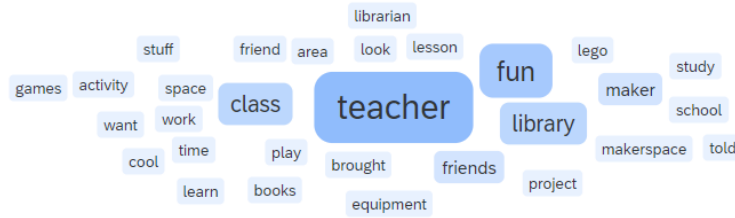
Student Responses by Grade Level Band:

Survey Question Answer Choice	Grade Level Bands		
	Elementary (N=1,289)	Intermediate (N=1,024)	High School (N=1,627)
Library Orientation or lesson	54%	32%	30%
Friend	8%	15%	17%
Teacher/class	28%	44%	37%
Instagram/Twitter	0%	0%	3%
Other	9%	10%	13%

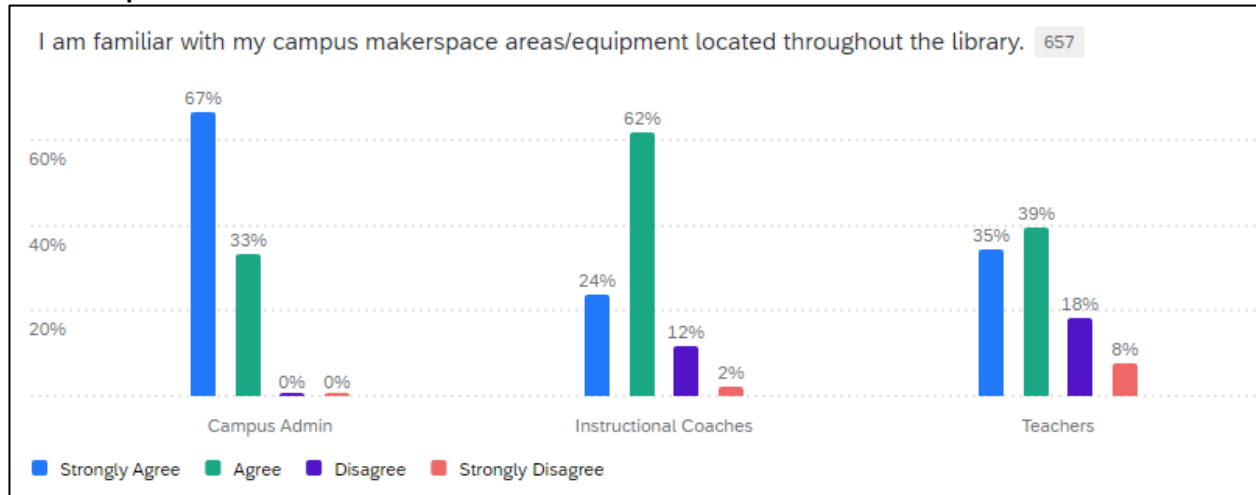
54% of elementary students reported finding out about the makerspace through their librarian, while 37%-44% of high school and intermediate students, respectively, reported finding out about the makerspace through their teacher/class.

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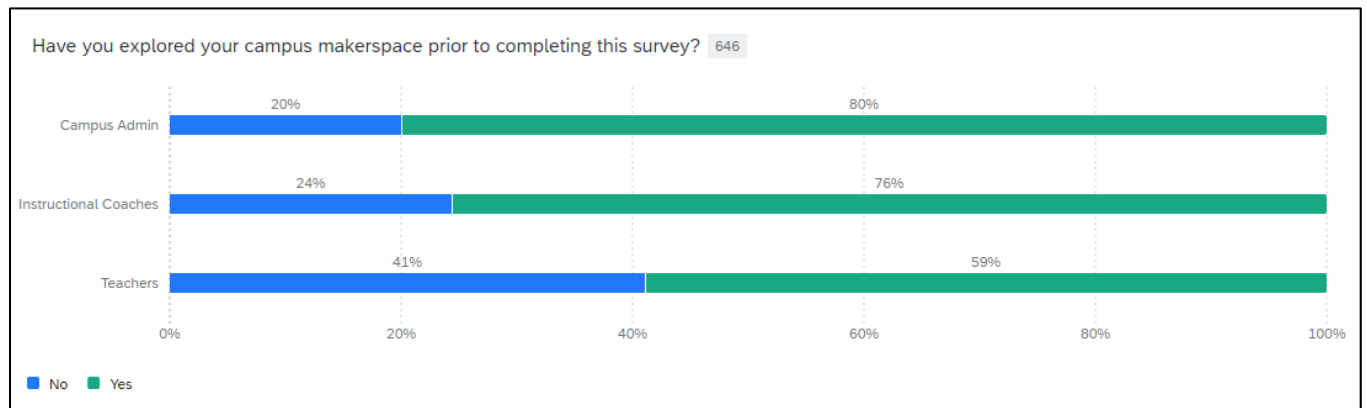
The word cloud below depicts the highest occurring terms students entered via open responses when asked what brought them to the makerspace.



Staff Responses:



When staff members were asked about their familiarity with their campus makerspace areas/equipment throughout the library, 100% of campus administrators agreed that they are familiar; the majority of instructional coaches and teachers agreed with the statement (strongly agree and agree), however, there were a variety of that included 14%-26%, respectively, of those who disagreed (strongly disagree and disagree).



The majority of staff members reported that they have explored their campus makerspace prior to completing the survey (59%-80%).

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Campus administrators, teachers, and instructional coaches were asked what they observed if they had explored their campus makerspace.

Instructional coaches observed: engagement, problem-solving, collaboration, variety of activities.

Campus administrators observed: critical/high level thinking, collaboration, and a variety of activities.

Teachers observed: variety of activities (Legos, bots, games) engagement, collaboration, and creativity.

Some of the specific comments are listed below:

Campus Administrators:

- ☆ *I've observed excited students (and an amazing librarian!) working with hands on activities including, but not limited to, Legos, circuits, Bots, puzzles, marble runs, arts and crafts and more.*
- ☆ *Opportunities for students and staff to engage in a variety of activities (puzzles, musical equipment, tactile activities), as well as access to some unique technology/equipment (3D & laser printers).*
- ☆ *Hands-on learning, exploration, experimentation, technology integration, collaboration, creativity, critical thinking, risk taking, etc.*

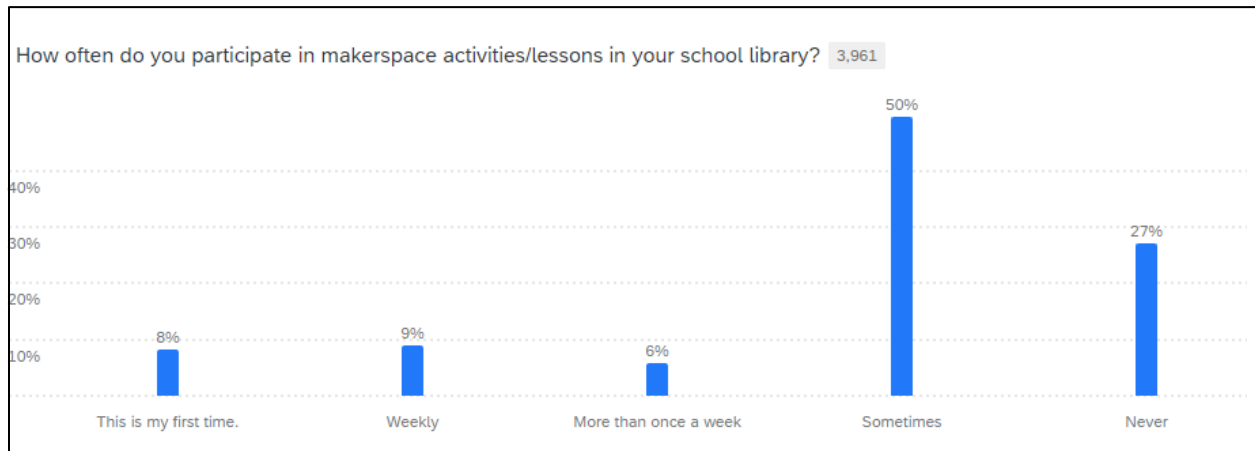
Instructional Coaches:

- ☆ *Kids collaborating and problem solving to complete projects.*
- ☆ *More options would be great for students.*
- ☆ *3D printer, T-shirt press, Lego wall, sewing machines, something for everyone to enjoy.*

Teachers:

- ☆ *Makerspace has lots of materials for students to use. It is organized and has items that are highly engaging.*
- ☆ *Lots of activities for children to choose from.*
- ☆ *Amazing resources available to students and staff of our campus to encourage creativity, independent thinking, and lifelong skills to help prepare them for life after high school.*

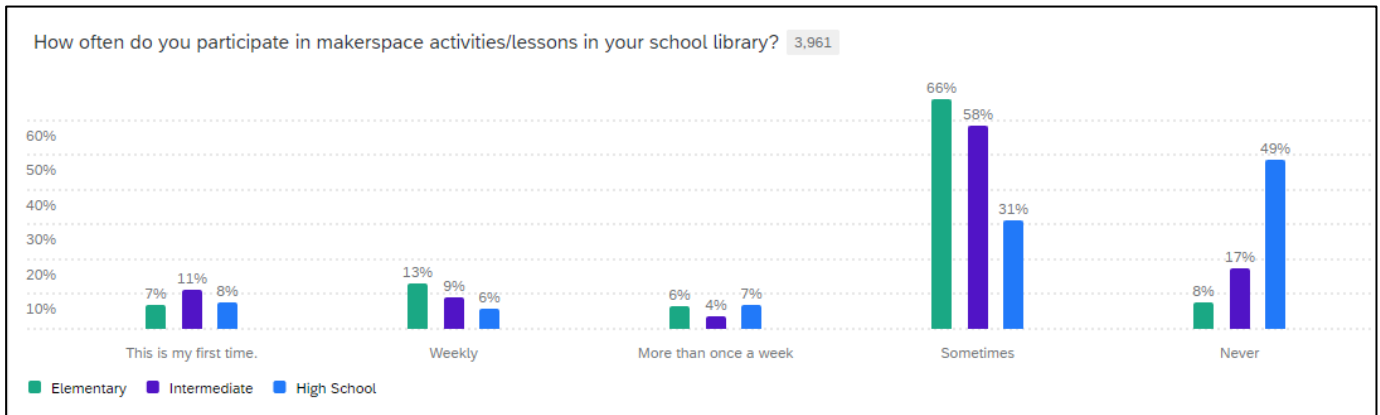
Overall Student Responses:



Half of students surveyed reported that they sometimes participate in makerspace activities/lessons in their school library. 15% report participating weekly or more than once a week.

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Student Responses by Grade Level Band:



When analyzing results by grade level band, the data shows that most elementary and intermediate students report sometimes participating in makerspace activities/lessons.

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Student Responses:

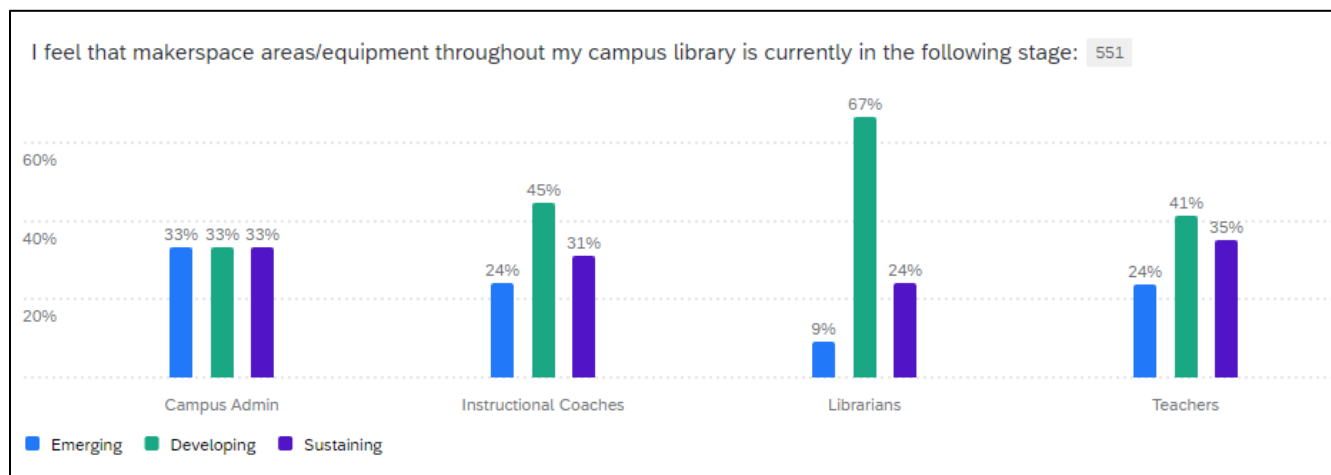
When students were asked (on a scale of 0-10) how likely they are to recommend the maker area/equipment throughout their campus to a friend, 62% of students surveyed selected a score of 6-10. When analyzed by level, 76% of elementary students selected 6-10; 63% of intermediate students selected a score of 6-10; and 50% of high school students selected a score of 6-10. Responses by level are shown below:

Response	Elementary	Intermediate	High School	Overall
0	2%	8%	12%	8%
1	2%	3%	3%	3%
2	2%	3%	4%	4%
3	3%	5%	4%	4%
4	4%	5%	4%	4%
5	10%	13%	22%	16%
6	5%	9%	8%	7%
7	12%	12%	10%	11%
8	16%	17%	11%	14%
9	11%	9%	5%	8%
10	32%	16%	16%	22%
Sum of 6-10 Scores	76%	63%	50%	62%

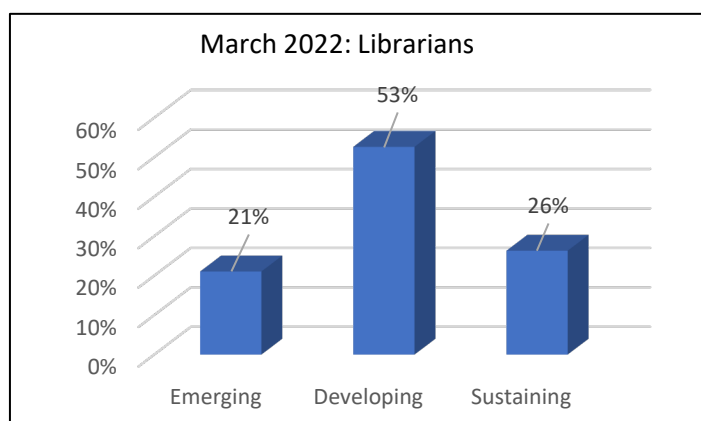
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1B: What professional learning opportunities exist for librarians, campus leaders, and teachers?

Staff members were asked about the current stage of makerspace areas/equipment throughout their campus library using the terms Emerging, Developing, and Sustaining. While campus administrators are equally split across all three levels, the majority of instructional coaches (76%) and teachers (76%) feel that their makerspace areas are Developing or Sustaining. The majority of librarians (91%) feel their makerspace areas are Developing or Sustaining.



In March 2022, 79% librarians reported that their makerspace areas were Developing or Sustaining.



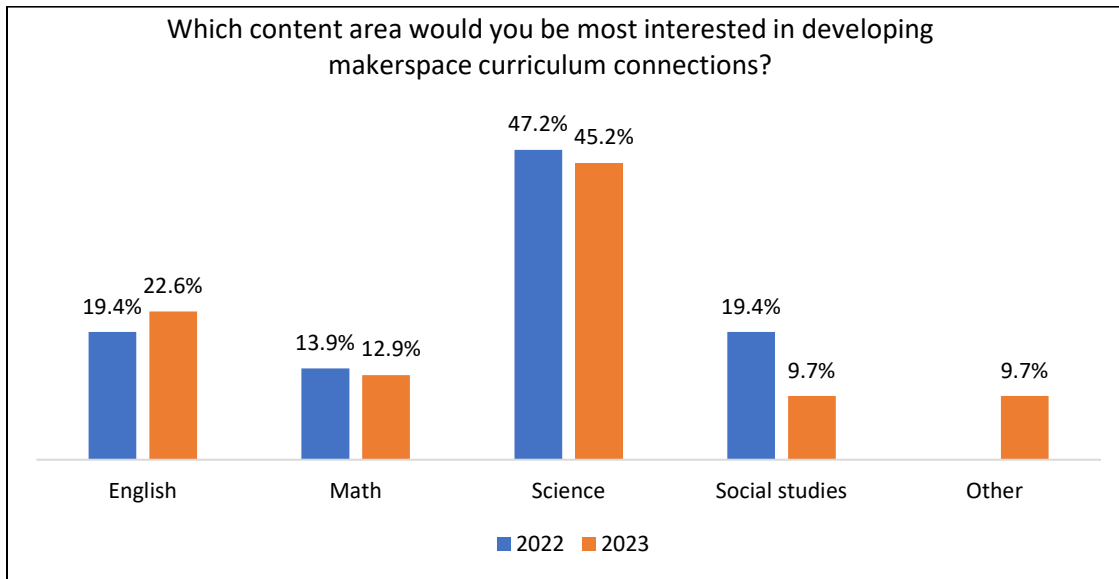
N=38

When asked what three things best support librarians' professional learning, the following themes emerged:

- ☆ Ideas
- ☆ Time with curriculum
- ☆ Funds

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Librarians:



N=March 2022: 36; January 2023: 31

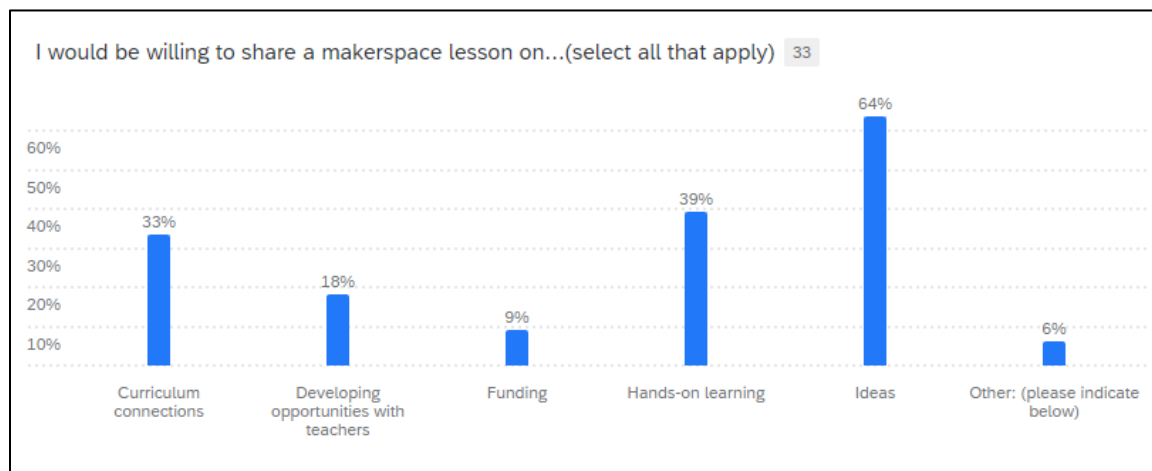
Science was the highest selected content area in both the March 2022 and January 2023 surveys by librarians when asked about the development of makerspace curriculum connections.

Other responses in January 2023 included music and art.

When librarians were asked about their favorite activity in the makerspace area, the responses included visual and performing activities, such as drawing, singing, music, instruments, and painting; building activities; and Robotics, bots, Legos, and Sphero activities.

Librarian Responses:

Librarians are willing to share lessons on the following topics shown below, which could potentially be included in district/campus level professional learning opportunities for the upcoming years. Overall, ideas, hands-on learning opportunities, and curriculum connections were the highest selected choices. Other (6%) included take-home kits and breakout boxes.



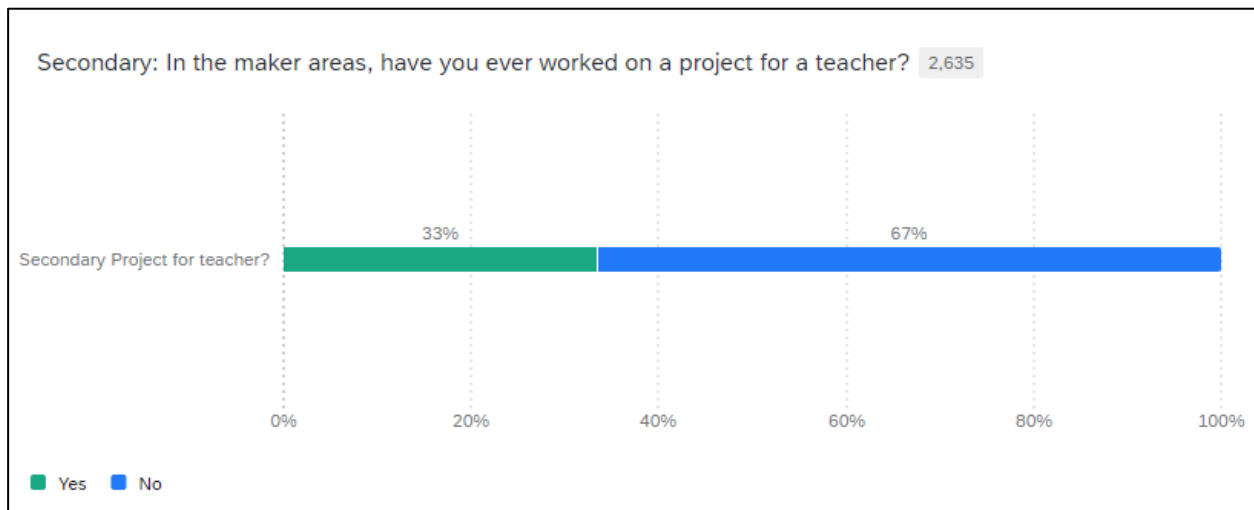
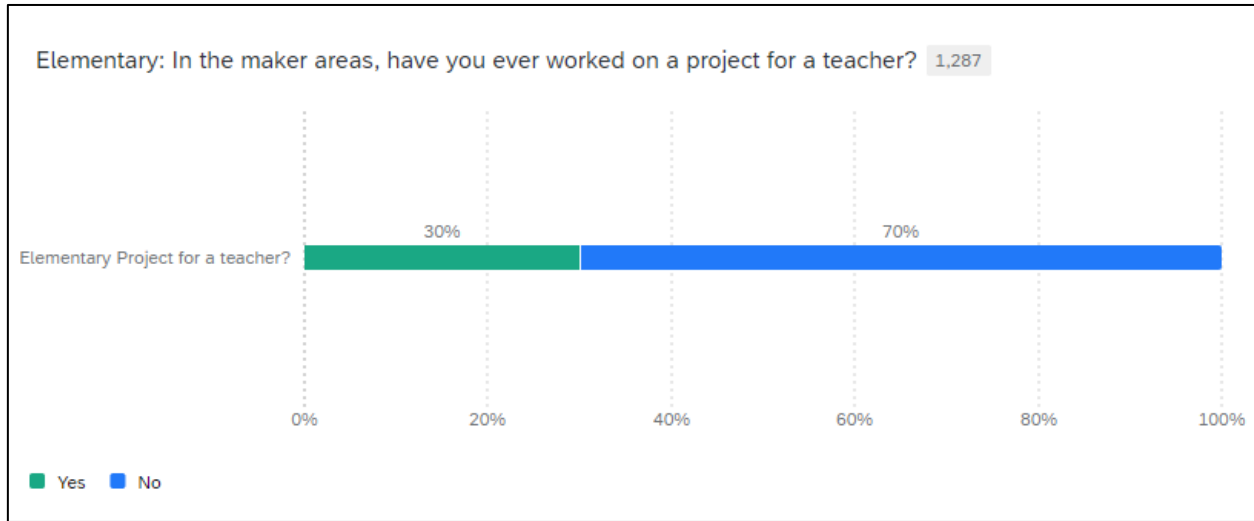
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Research Question #2

2. To what extent does makerspace support and align to student learning and innovation?

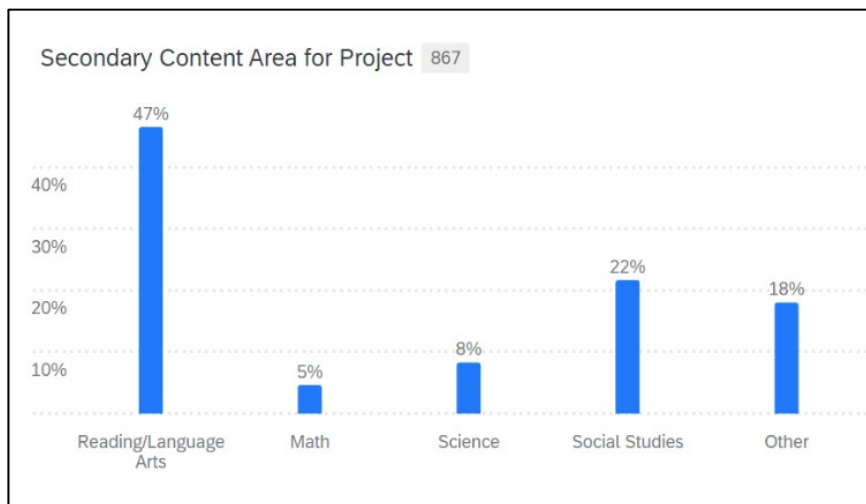
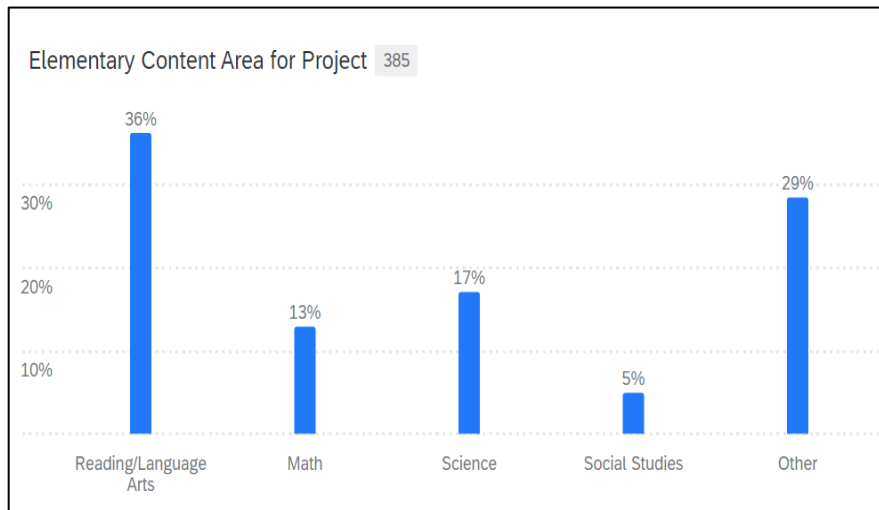
When students were asked if they have ever worked on a project for a teacher, the responses closely aligned between elementary and secondary, as seen below.

Student Responses:



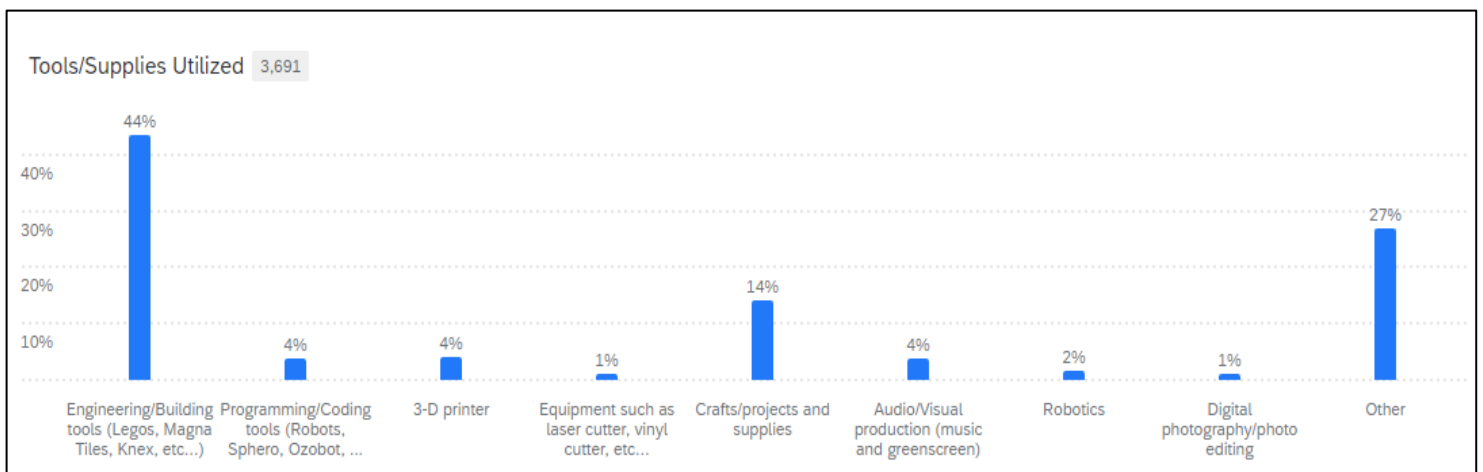
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When asked for which content area was their project, the responses varied by grade level band; however, Reading/Language Arts had the most responses at both elementary and secondary levels.



Student Responses:

When asked about the tools/supplies students utilized when in the maker areas, engineering/building tools was the highest reported category when compared to the others. Other tools/supplies (27%) included toys, food items (marshmallows), games, stickers, and drawing tools.



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Student Responses to Open-Ended Questions:

In which activities have you participated in the maker areas?

Of the students who reported participating in the makerspace activity, they indicated participation in Legos, drawing/arts and crafts, games/puzzles, and materials for building such as magnets, straws, cups, and tiles.

Have you built or created anything in the makerspace?

Of the students who reported building or creating something in the makerspace, they indicated items such as arts and crafts items built with tiles and cups to create towers, Legos, or items such as frogs, caterpillars, pumpkins, dinosaurs, hamsters, and mice.

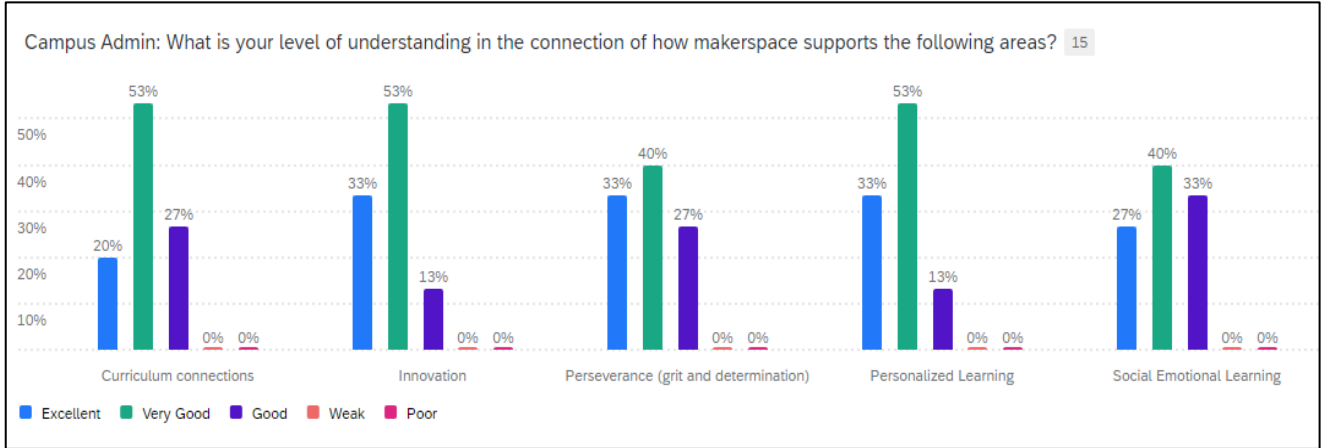
Have you utilized technology in the maker area? If so, please list which app or technology tool you used.

Of the students who reported utilizing technology in the maker area, they referred to Robotic and coding activities, such as Robots, Beebots, Ozobots, Sphero, and Scratch; technology devices such as tablets, iPads, computers, and printers.

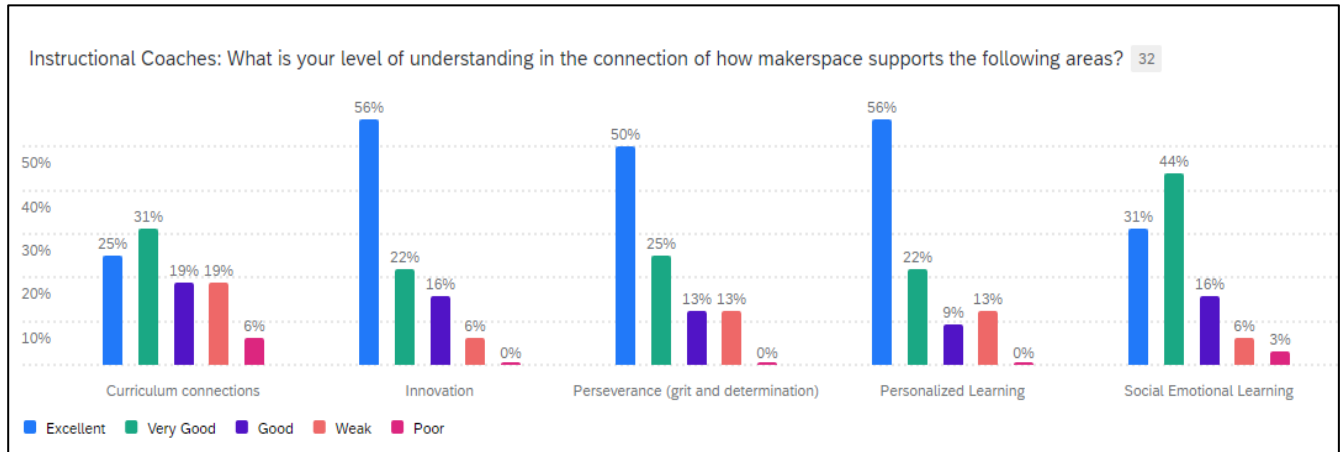
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Staff Responses: Campus administrators, instructional coaches, and teachers were asked about their level of understanding in the connection of how makerspace supports areas, including curriculum connections, innovation, perseverance, personalized learning, and social emotional learning. The responses for each group are shown in the graphs below.

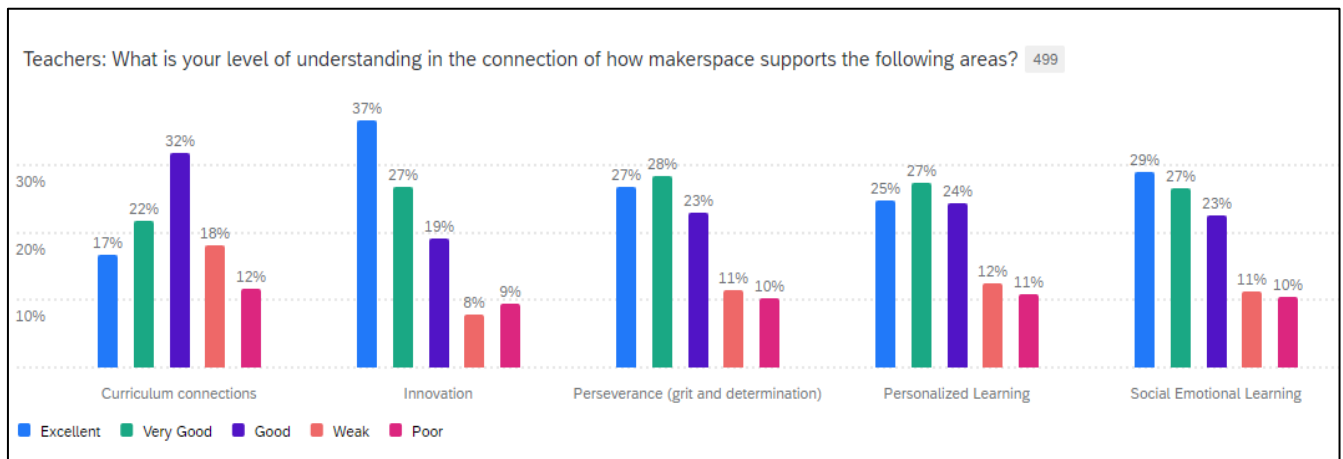
Campus Administrators:



Instructional Coaches:



Teachers:



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Staff Summary on Level of Understanding:

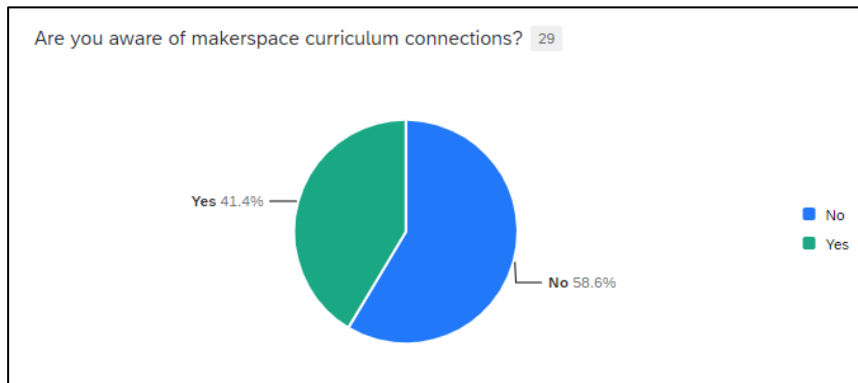
Campus administration, instructional coaches, and teachers reported their understanding of makerspace using a scale of excellent, very good, good, weak, and poor.

Instructional coaches reported their level of understanding as Excellent, or Very Good (75% or higher). 9%-25% reported their level of understanding as Weak or Poor, with the areas of curriculum connections, perseverance, and personalized learning having the highest combined percentages of Weak and Poor responses.

Many teachers reported their level of understanding in each of the above areas as Excellent, Very Good, or Good. 17%-30% of teachers reported their level of understanding in each of the above areas as Weak or Poor, with the area of curriculum connections having the highest combined percentages of Weak and Poor responses.

Instructional Coaches' Responses:

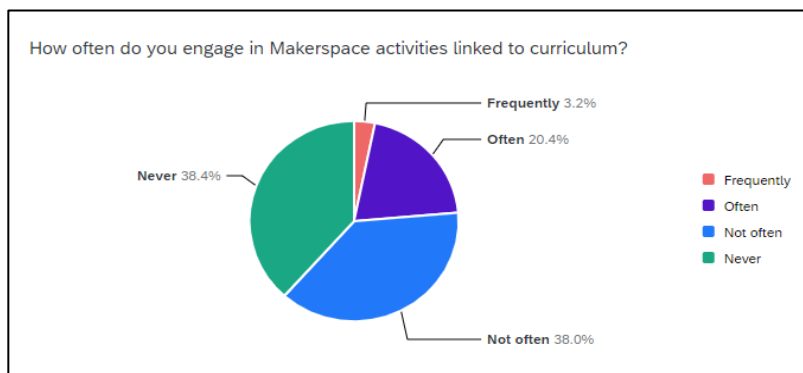
When asked, are you aware of makerspace curriculum connections, instructional coaches responded below:



41.4% of instructional coaches surveyed responded that they are aware of makerspace curriculum connections.

Teachers' Responses:

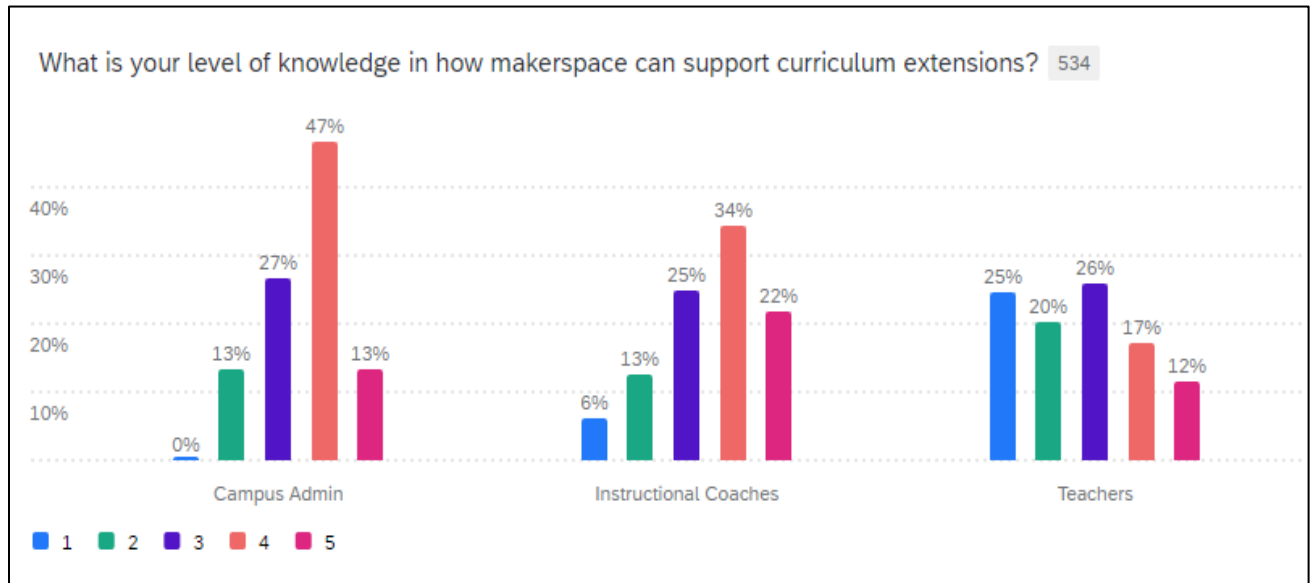
When teachers were asked how often they engage in makerspace activities linked to curriculum, they responded by selecting the responses shown below:



23.6% of teachers surveyed frequently or often engage in makerspace activities linked to curriculum.

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When asked, “What is your level of knowledge in how makerspace can support curriculum **extensions**?” Campus administrators, instructional coaches, and teachers responded to the following scale as shown in the graph below.



1=Poor 2=Weak 3=Good 4=Very Good 5=Excellent

While campus administrators and instructional coaches reported their level of understanding as Very Good or Excellent (60% and 56%, respectively), 29% of teachers reported their level of understanding as Very Good or Excellent.

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If respondents responded to the question shown above with a “1” or “5,” they were routed to an additional question seen below:

If they chose “1,” the next question was, “Please explain what work could be done to extend your knowledge.”

If they chose “5,” the next question was, “Please list examples of how makerspace has supported curriculum **extensions**.”

For those who selected “1,” their responses are summarized below:

Instructional Coaches: (2 responses)

- ☆ *I'm just not familiar with the makerspace. I know it exists. I just haven't experienced it.*
- ☆ *A simple explanation from the department will help me better understand how this program connects to library sciences, curriculum, and social/emotional needs.*

Teachers: There were 117 comments from teachers for this question. In summary, the predominate comments included those who were unsure, wanted to know what makerspace is, and wanted professional learning and training opportunities to expand their knowledge base.

For those who selected “5,” their responses are summarized below:

Campus Administrators: (2 responses)

- ☆ *Our librarian works with all content areas to provide opportunities for students to put into action the concepts they are learning in class. Our makerspace allows the content to come alive!*
- ☆ *Many of the makerspace resources are grant or donor funded based on cross-curricular teams' submissions of applications that support expansion of learning that starts in the classroom and builds to the innovative spaces of makerspace.*

Instructional Coaches: (4 responses)

- ☆ *Bots to explore maps or retell stories. Computational thinking skills that support metacognition that develop tenacity for curricular challenges.*
- ☆ *Genre exploration for Reader's/Writer's Workshop.*
- ☆ *Providing open-ended examples/applications for science concepts (marble run, Rube Goldberg machines¹, etc.).*
- ☆ *Science Rotational Energy - Physics are using my marble runs to teach rotational energy. They are also great for teaching force and motion, gravity, friction and drag.*

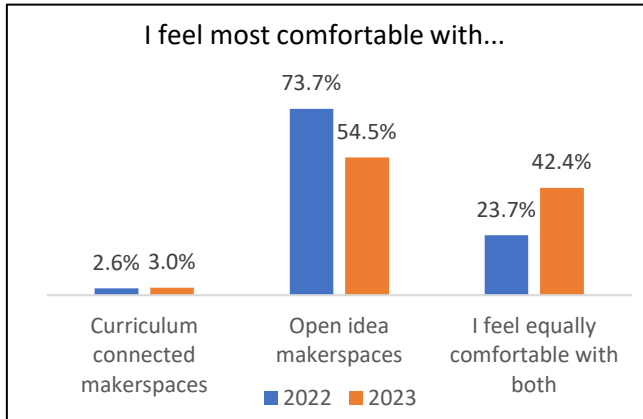
Teachers:

There were 51 comments from teachers for this question. In summary, the predominate comments included those who were unsure, STEM-related activities, such as enrichment activities that promote collaboration, exploration, and problem-solving.

¹ A Rube Goldberg machine is a contraption that uses a chain reaction to carry out a simple task. It performs a very basic job in a complicated way. (Wonderopolis, 2023)

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Librarian Responses:



N=2022: 36; 2023: 33

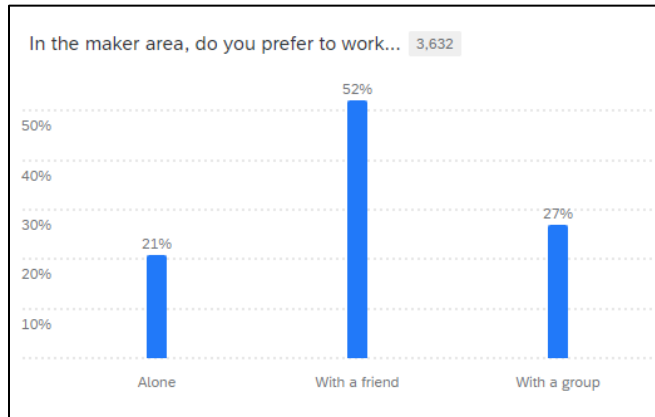
Librarians were asked the same question as shown in the graph above on both the March 2022 survey and the January 2023 survey. While their comfort level decreased by 19.2% in open idea makerspaces, their comfort level increased by 18.7% in both curriculum-connected makerspaces and open idea makerspaces. Their comfort level in curriculum-connected makerspaces increased by 0.4%.

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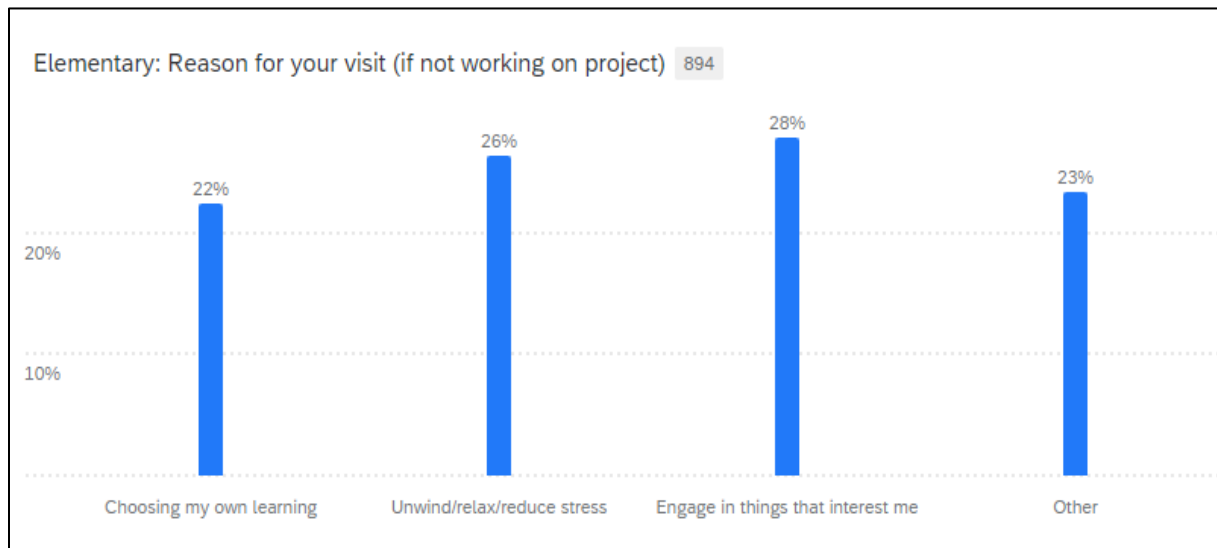
Research Question #3

3. To what extent does makerspace support and align to student development (core values, character)?

Cooperation is one of the character skills that students learn and practice in CCISD, which means working together with an end in mind. 79% of the students surveyed reported that they prefer to work with a friend or a group.



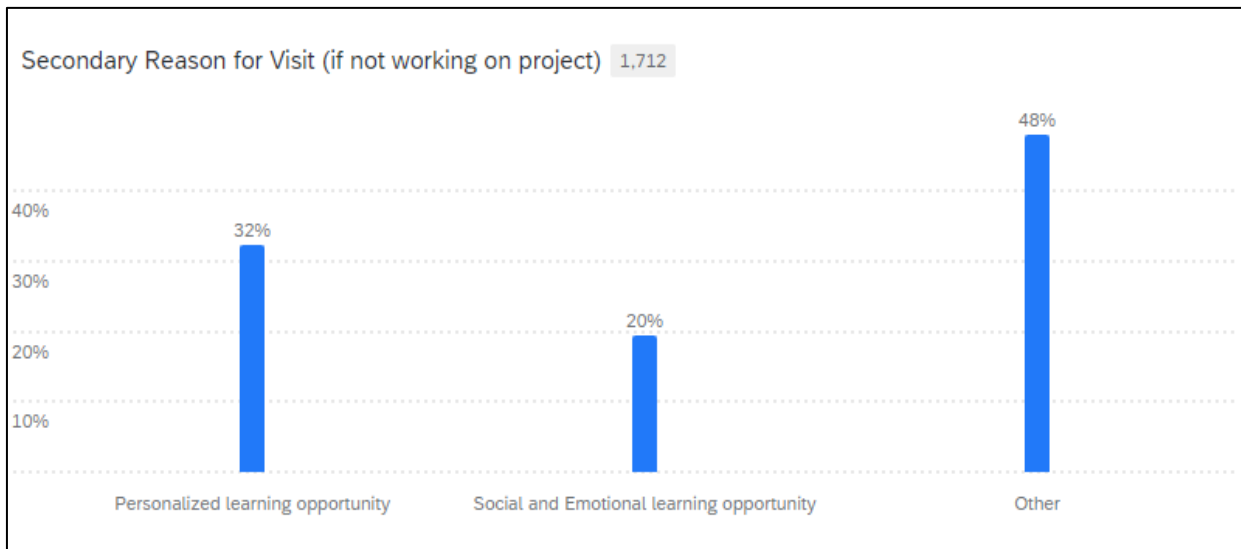
Students reported the reason for their visit to the makerspace (if not working on a project) as shown below:



Elementary students' choices are somewhat equally distributed amongst the choices; however, the largest percentages are unwinding/relaxing/reducing stress (26%) and engaging in things that interest them (28%). 23% selected other, which is summarized below.

Elementary students' other reason for their visit primarily consisted of weekly library visits.

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Secondary students preferred personalized learning opportunities over social and emotional learning opportunities. Nearly half of the students who responded to this question selected “Other,” which is summarized below.

Secondary students’ other reason for their visit included never visiting the makerspace, as well as other topics including visiting during lunch, hanging out with friend(s), and a class visit to the library.

Past surveys and research have shown that secondary students experience a high level of stress. Students may come to makerspace areas to decompress from their daily stressors. The beauty of the makerspace area is that often, the social and emotional learning happens secondary to the main project. For example, students enter the makerspace to create, build, play a game, participate in a puzzle, and before they realize, they have taken a break from their routine, and possibly engaged with their peers to work collaboratively on a task.

CCISD Makerspace Program Evaluation

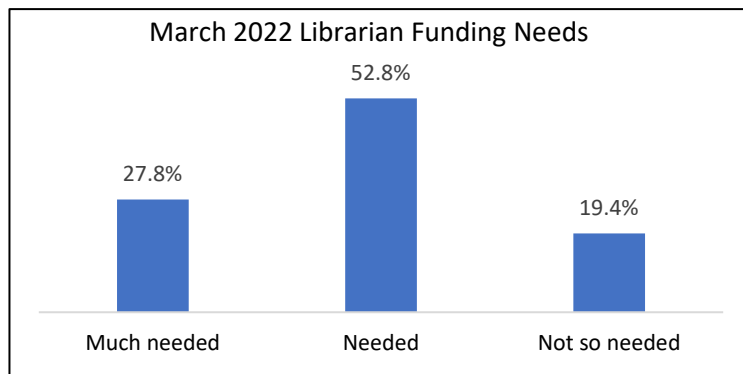
Financial Information

Makerspaces in CCISD began to take form prior to 2015 through grass-root efforts of individual librarians to create the makerspace areas on their campuses. In response, Ms. Ferrell, in 2016, began to explore options to expand the makerspace areas to all librarians. In 2019, Boeing awarded a \$100,000 grant to the Clear Creek Education Foundation (CCEF) to expand makerspaces at each intermediate campus in CCISD. Between 2016-2019, the CCEF funded 17 additional grants to teachers and students to either develop or expand makerspaces, which totaled over \$54,000.

Makerspaces originated in CCISD high school libraries with a Dell/CCEF donation of desktop computers, 3D printers, and \$5,000 for each high school campus.

Clear Creek ISD Friends of the Library, which is a 501(c)3 established in February of 2012 to help support campus libraries through grants (makerspaces, STEAM, and literature). Anyone connected to Clear Creek ISD may join this organization by completing a membership application. Annual contribution levels are based on five levels, including the following levels: reader, author, bookstore, publisher, and library level.

In March 2022, librarians responded to a question regarding certain areas of support. The graph below shows their funding needs. 80.6% of librarians surveyed expressed a need for funds.



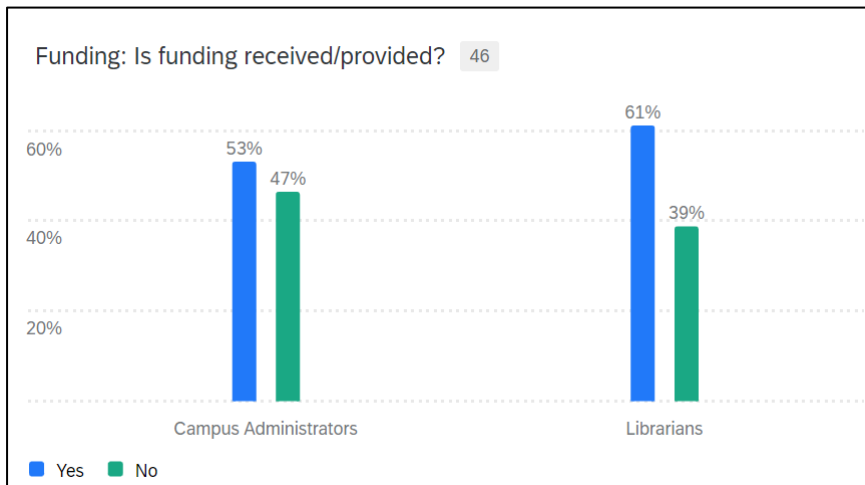
N=36

CCISD Makerspace Program Evaluation

In January of 2023, the survey question asked librarians and campus administrators if funding was received/provided. The graph below shows the responses of both groups. 61% of librarians surveyed responded “Yes.”

Campus administrators were asked, “Do you supply additional funding to your campus makerspace?”

Librarians were asked a two-part question, “Do you receive additional funding from your campus administrators for your library?” If they answered, “Yes,” they were directed to an additional question, “How much is designated for makerspace?”



N: Campus Administrators=15; Librarians=31

Campuses may use discretionary funds to support their campus libraries and/or makerspace areas.

Librarians reported that their funding varies depending on the supply or Title 1 funds that may be provided. About half of the librarians who responded “Yes” to the question above reported that their designated campus library funding ranges from \$200-\$1,000; however, those funds are not specifically designated for makerspace.

When staff members were asked about additional activities that they would be interested in seeing in the makerspace, the responses included STEM activities, variety of activities, such as Robotics, coding, art and music, and games.

When students were asked about additional activities that they would be interested in seeing in the makerspace, 3D printers, Legos, Robots, and arts and crafts supplies were the most frequently reported needs.

CCISD Makerspace Program Evaluation

Makerspaces in Action in CCISD:

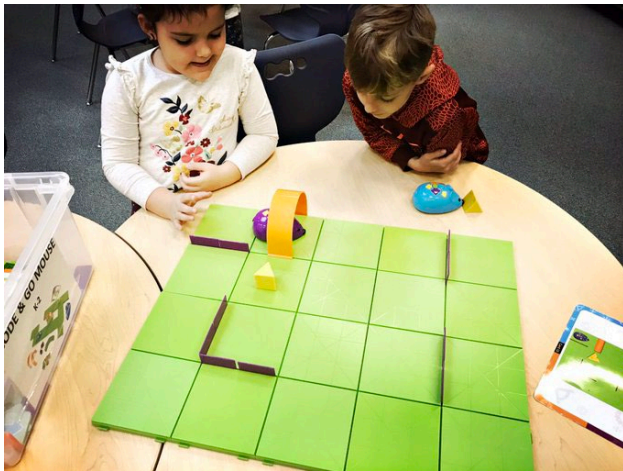
Below are photos and videos from CCISD students engaging in makerspace activities across elementary, intermediate, and high schools in CCISD.



Bay Elementary crafting tools



Brookside Intermediate crafting tools (beads)



Brookwood Elementary Code and Go Mouse

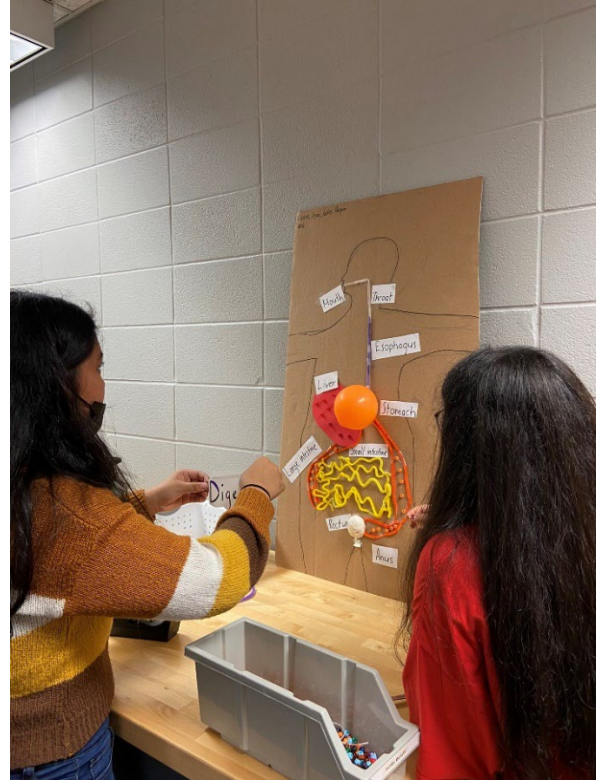


Clear Brook High School 3D printer

CCISD Makerspace Program Evaluation



Falcon Pass Elementary building/engineering



Seabrook Intermediate Human Systems



Landolt Elementary Makerspace various activities

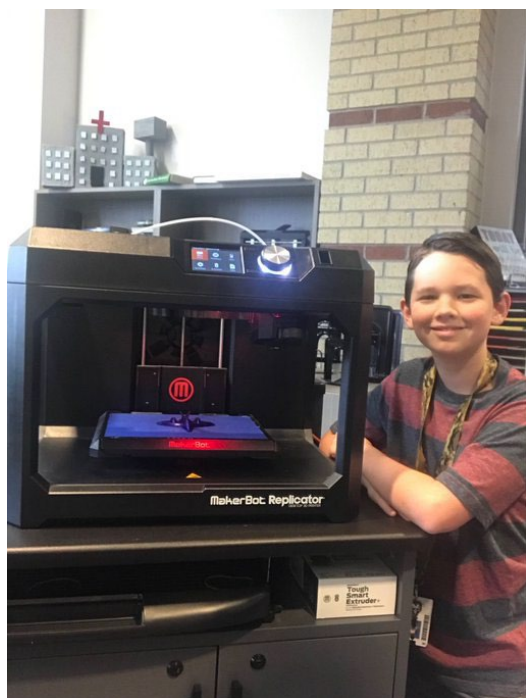
CCISD Makerspace Program Evaluation



League City Elementary building/engineering



Ward Elementary coding



Victory Lakes Intermediate 3D printer

CCISD Makerspace Program Evaluation

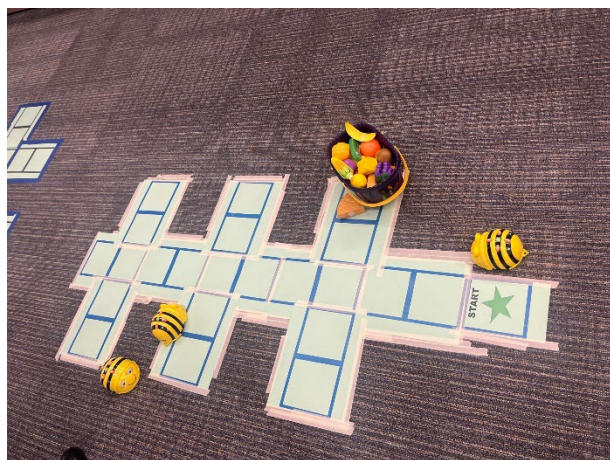


Photo credit: CCISD Twitter accounts

CCISD Makerspace Program Evaluation

Click the icons below to view videos of makerspace in action in CCISD!



Conclusion

The configuration of makerspaces varies in CCISD; however, according to the Journal of Educational Research (Nadelson, 2021), this is common in K-12 education. In conclusion, makerspaces allow students to take ownership in their learning, maximizing student agency (the ability to manage his/her own learning), as described in the CCISD Strategic Plan referenced on page 6 of this document. Through the exploratory activities available in the makerspace areas, students are utilizing higher level thinking and problem-solving skills while experimenting through trial and error, which develops students' perseverance, grit, and determination.

ELA classes consistently visit the library, especially at the elementary level, so elementary students are exposed more frequently to makerspace areas/equipment than their intermediate and high school peers (*reference page 11*). Many students mentioned in their comments when asked the reason for their visit that they had never been to the makerspace. As referenced in the Community-Based Accountability Reports, students have many opportunities to engage in extra-curricular activities, and they can choose from a multitude of opportunities afforded to them in CCISD. Some students may or may not choose to participate since makerspace is not a requirement, but instead an opportunity that they may explore.

Since many secondary students reported never visiting their campus makerspace, continued promotion of makerspace through increased communication and showcases may prompt curiosity and increase student visits and engagement in campus makerspaces.

Some staff members reported that they were unsure about makerspace, and they expressed the need for professional learning and training opportunities to occur.

CCISD Makerspace Program Evaluation

Superintendent Recommendations

1. Continue to promote makerspace through professional learning and learning walks for teachers, librarians, instructional coaches, and campus leaders.
2. Explore ways to prompt student curiosity to increase participation in campus makerspace areas.
3. Explore opportunities for makerspace curriculum connections through collaborative conversations.
4. Explore additional funding for makerspace to expand opportunities for students across the district.

CCISD Makerspace Program Evaluation

Glossary of Terms

3-D Printer – a special type of printer that prints objects as opposed to paper

Beebots – programmable robots

Coding – the collection of alphanumeric characters in certain computer languages that allow the user to develop certain types of outputs using technology

Crafting – using two or more items to create something new

Dash – Robots that operate from coding and contain sensors, which enables it to interact with its surroundings

Greenscreen - a large green screen that serves as a backdrop to incorporate digital images and effects

Magna Tiles – educational toys used for promoting students' creativity

Makerspace - Makerspace areas include activities, projects, and/or items that allow hands-on learning and exploration. These areas can be found throughout campus libraries.

Ozobots – Robots used for coding purposes

Prototype – an early development of a creation

Scratch – free programming application, housed in CCISD's Software Center (accessible on every device)

Sphero – programming robots and "littlebits." *"Our coding robots, design-and-build kits, curriculum, and engaging lessons and activities encourage exploration, imagination, and perseverance."* [STEM Kits & Robotics for Kids | Inspire STEM Education with Sphero](#)

Resources

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<https://artsintegration.com/makerspace-manual-for-k-12-schools/>

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<http://www.evergreeneducation.org/itie2016/KurtiArticlePart3.pdf>

Nadelson, L. (2021) *Journal of Educational Research. Makerspaces for rethinking teaching and learning in K–12 education: Introduction to research on makerspaces in K–12 education special issue*. [Full article: Makerspaces for rethinking teaching and learning in K–12 education: Introduction to research on makerspaces in K–12 education special issue \(tandfonline.com\)](https://www.tandfonline.com/doi/full/10.1080/00220272.2021.1911111)

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CCISD Makerspace Program Evaluation

Appendix A: Surveys

Students

Definition of a Makerspace: Makerspace areas include activities, projects, and/or items that allow hands-on learning and exploration. These areas can be found throughout campus libraries.

Maker area/equipment refers to this area/space described above. As you complete the survey, please keep that description in mind.

- ☆ How often do you participate in Maker activities/lessons in your school library?
 - This is my first time.
 - Weekly
 - More than once a week
 - Sometimes
 - Never
- ☆ How did you find out about the Maker area/equipment?
- ☆ In the Maker areas located in the library, are you working on a project for a teacher?
- ☆ What brought you to the Maker area/equipment? (open-ended)
- ☆ In which activities have you participated in the Maker area? (open-ended)
- ☆ What tools/supplies have you utilized in/with the Maker area/equipment? (select all that apply)
 - Engineering/Building tools (Legos, Magna Tiles, Knex, etc...)
 - Programming/coding tools: Robots, Sphero, Ozobot, Dash, etc...)
 - 3-D printer
 - Equipment such as laser cutter, vinyl cutter, etc...
 - Crafts/projects and supplies
 - Robotics
 - Audio/Visual production (music and greenscreen)
 - Digital photography/photo editing
 - Other (please specify) _____
- ☆ Have you built or created something in the Maker area? If so, please list.
- ☆ Have you utilized technology in the Maker area? If so, please list which app or technology tool you used.
- ☆ In the Maker area, do you prefer to work...
 - Alone
 - With a friend
 - With a group
- ☆ How likely are you to recommend the Maker area/equipment to a friend? (Likert scale of 0-10)
- ☆ What other Maker activities or supplies would you be interested in exploring? (open-ended)

Teachers

- ☆ What is your level of familiarity with your campus Makerspace? (Likert scale of 1-5)
- ☆ How often do you engage in Makerspace activities linked to curriculum?
 - Never
 - Not often
 - Often
 - Frequently
- ☆ Have you explored your campus Makerspace prior to completing this survey? Yes or No
- ☆ What are some activities you'd like to see in the Makerspace in addition to what is currently there? (open-ended)
- ☆ What is your level of understanding in the connection of how Makerspace supports the following areas:
(Grid 1-5 Likert Scale)
 - Personalized Learning
 - Curriculum connections
 - Social Emotional Learning
 - Innovation
 - Perseverance (grit and determination)
- ☆ What is your level of knowledge in how Makerspace can support curriculum extensions?
Likert scale of 1-5 - branch on 1 and 5
1=please explain what work could be done to extend your knowledge
And
5=please list examples of how Makerspace has supported curriculum extensions.
- ☆ I feel that Makerspace on my campus is currently in the following stage:
 - Emerging
 - Developing
 - Sustaining

Instructional Coach/Curriculum Coordinator/Campus Admin:

- ☆ What is your level of familiarity with *your campus* Makerspace? (Likert scale of 1-5)
(Instructional Coaches/Principals)
Coordinators: What is your level of familiarity with Makerspace in CCISD?
 - ☆ Have you explored your campus Makerspace prior to completing this survey? Yes or No
Coordinators: Have you explored a Makerspace in CCISD? Yes or No
 - ☆ What are some activities you'd like to see in the Makerspace in addition to what is currently there? (open-ended)
 - ☆ What is your level of understanding in the connection of how Makerspace supports the following areas:
(1-5 Likert Scale grid)
 - Personalized Learning
 - Curriculum connections
 - Social Emotional Learning
 - Innovation
 - Perseverance (grit and determination)
 - ☆ What is your level of knowledge in how Makerspace can support curriculum extensions?
Likert scale of 1-5 - branch on 1 and 5
1=please explain what work could be done to extend your knowledge
And
5=please list examples of how Makerspace has supported curriculum extensions.
- I feel that Makerspace on my campus (ICs/teachers) (in CCISD) (coordinators) is currently in the following stage:
- Sustaining
 - Developing
 - Emerging

Instructional Coach/Curriculum Coordinators only:

- ☆ Are you aware of Makerspace curriculum connections? Yes or No
- ☆ How can Makerspace activities support curriculum initiatives? (open-ended)

Campus Admin only:

Do you supply additional funding to your campus library? Yes or No

- ☆ Any additional thoughts?

CCISD Makerspace Program Evaluation

Makerspace Survey Questions

Librarians

- ☆ With makerspaces in my library, I feel:
 - I am speed rolling! (Sustaining)
 - I can keep up! (Developing)
 - I am trying to get my roller skates on! (Emerging)

- ☆ I feel most comfortable with...
 - Curriculum connected Makerspace
 - Open idea Makerspace
 - I feel equally comfortable with both.

- ☆ My favorite type of Makerspace activities include: (Open-ended)

- ☆ I would be willing to share a Makerspace lesson on...
 - Ideas
 - Hands-on learning
 - Curriculum connections
 - Developing opportunities with teachers (for connections to curriculum)
 - Funding
 - Other: _____

- ☆ I'm interested in conducting a learning walk. Yes or No

- ☆ Areas in which I need support:
 - Learning walks to see Makerspace in action
 - PL-ideas
 - PL items/hands-on learning
 - PL-curriculum connections
 - Opportunities with teachers (for connections to curriculum)
 - Funding
 - Other: _____

- ☆ What three things would best support your Makerspace professional learning? (open-ended)

- ☆ Which content area would you be most interested in developing Makerspace curriculum connections?
 - Science
 - English
 - Social Studies
 - Math
 - Other: _____

- ☆ Do you receive additional funding from your campus administrators for your library? How much is designated for Makerspace? (open-ended)

- ☆ Any additional thoughts?

CCISD Makerspace Program Evaluation

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Clear Creek Independent School District Mission Statement

The mission of the Clear Creek Independent School District, the visionary leader igniting learning for all, is to ensure each student achieves, contributes, and leads with integrity in a safe and nurturing environment distinguished by authentic relationships, service before self and the spirit of exploration.