JUNE 2020

SHARP

Literacy

CORE PROGRAM

ANNUAL EVALUATION REPORT

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OVERVIEW

SHARP *partners with educators to foster a love of learning and brighten children's futures through innovative STEAM-based experiential programs*. Through programming and community outreach, SHARP strives to accomplish the following objectives:

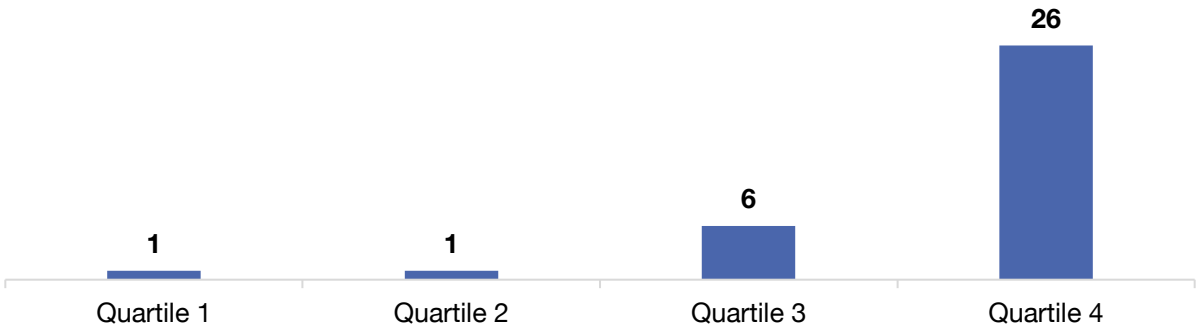
- Serve disadvantaged students.
- Instill a love for Science Technology Engineering Art and Math (STEAM).
- Provide memorable and transformative experiences that spark curiosity and motivate students to learn and explore.
- Strengthen students' life skills in teamwork and collaboration.
- Improve students' future competitive advantage.
- Serve as a valuable partner to schools, teachers and community organizations.

In order to carry out some of their objectives, SHARP provides a core program to schools serving students in grades K4 through 5 by visiting classrooms four times throughout a school year and utilizing an arts-integration approach, called the Artful Thinking Palette, to inspire students to think critically about what they are learning. Students are also engaged in reading and writing activities to provide a literacy rich learning experience. The following evaluation was conducted on behalf of SHARP Literacy to evaluate the impact of their core program in select schools for the 2019-20 school year.

SCHOOLS AND STUDENTS SERVED

During the 2019-20 school year, SHARP Literacy served 41 schools in the Milwaukee, Waukesha, and Racine communities. Approximately 54% (22 schools) of schools were classified as choice, charter, or private schools. SHARP Literacy also served students from a wide range of socioeconomic backgrounds. The average percentage of students qualifying as "economically disadvantaged" at a school served by SHARP was 85% and ranged from 15% to 99%.

Breakdown of Students Classified as "Economically Disadvantaged" by Quartile

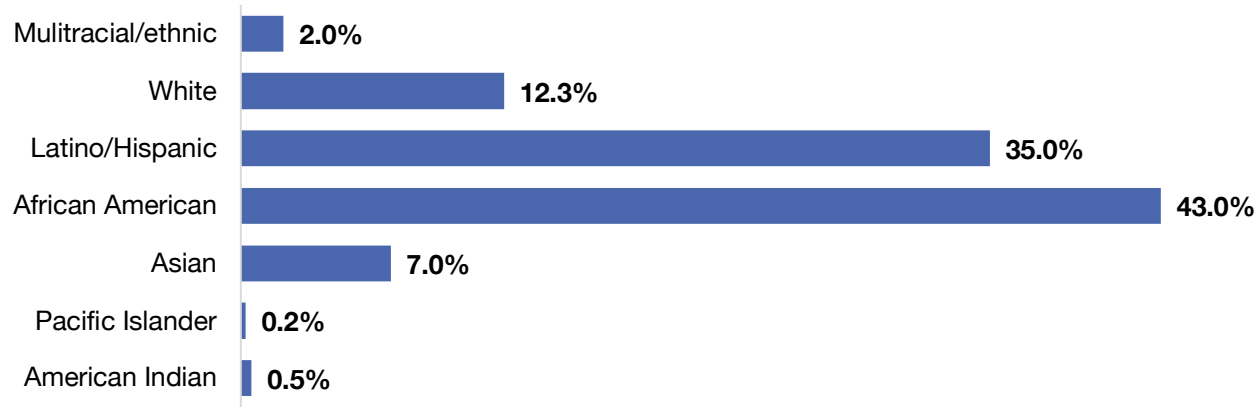


**Quartile 1 is defined as 1-24%, Quartile 2 is defined as 24-49%, Quartile 3 is defined as 50-74% and Quartile 4 is defined as 75-100%.*

The table above summarizes the schools that SHARP Literacy served and the percentage of students classified as economically disadvantaged at each school. SHARP served a preponderance of schools who are in the 4th Quartile (75-100%) of economic disadvantage, 63% of schools.[1]

The students that SHARP served during the 2019-20 school year were also considerably diverse with 88% of students classified as African American, Latino, Asian, or Multiracial/ethnic. The chart below summarizes the racial and ethnic breakdown of the students served by SHARP with the core program.

Percentage of Students Served Through SHARP Core Program by Race and Ethnicity



[1] Based on information obtained from the Wisconsin Department of Public Instruction (DPI) on the WISEdash public portal for 34 out of 41 schools. Some private and choice schools did not have publicly available demographic data.

EVALUATION METHODS AND PROCEDURES

To complete the evaluation aligned with SHARP's mission, the following methods were used:

Student Post-Reflective Survey

During the Fall of 2019, a team of SHARP staff and the external evaluator developed a new survey for students based on the mission and objectives of the organization to replace the previous pre-post assessment. The team determined that SHARP should examine the impact of the core program on students in two areas: critical thinking and self-efficacy. *Critical thinking* is one's ability to ask questions and solve problems using their acquired knowledge. The team believed that SHARP core programming should inspire students who participate in workshops to ask questions and report attitudes consistent with this idea. *Self-efficacy* refers to one's belief in their ability to complete a specific task. The team also believed that core programming should also increase the self-efficacy of learning for children served by SHARP. Specifically, students should feel more confident in their ability to complete tasks in the area of reading, which could also generalize to the areas of math and science. They also believed that self-efficacy is related to the love of learning, which aligns to SHARP's mission.

The team also considered appropriate practices for surveying young children and the issues with socially desirable responding.[2] This is very common in children, where they tend to respond in a way that they feel will please adults rather than sharing their honest opinion or thinking through their response to find their opinion. As such, the team considered an alternative survey approach where students complete their survey by reflecting on their experience with the workshops rather than completing a pre-post survey in an effort to minimize socially desirable responding.

The survey was administered by SHARP guides in person via paper and pencil during the Spring of 2020 with select schools after their workshops were completed. Guides were provided with a survey protocol designed by the external evaluator that explained a facilitated lesson and semi-structured script to teach children how to take the survey and the concepts of *before* and *after.* Prior to administering the survey, guides received training on the survey protocol and best practices in surveying children.

As a result of the pandemic and the abrupt closure of schools, not all schools receiving workshops were able to be surveyed. Therefore, the results contained in this report are considered a pilot and may not represent the full range of student perspectives. It

[2] Bensch, D., Paulhus, D. L., Stankov, L., & Ziegler, M. (2019). Teasing apart overclaiming, overconfidence, and socially desirable responding. *Assessment, 26*(3), 351-363. doi: 10.1177/1073191117700268

is anticipated that the survey will be administered as previously planned for the 2020-21 school year, if workshops commence as usual.

For a copy of the student survey, please refer to **Appendix A: Student Survey**. A deeper explanation of the survey is provided in the section on the results of the **Student Post-Reflective Survey**.

Teacher Feedback Survey

Teachers who worked with SHARP guides over the 2019-20 school year were asked to complete a short two-item survey to understand the teacher experience with the core program. The survey was sent to teachers via email with an electronic link to a Google form. Teachers who completed the survey were invited to share their email address to be entered into a raffle for a gift card.

STUDENT POST-REFLECTIVE SURVEY

As previously mentioned, a team comprised of SHARP staff and the external evaluator developed a new survey that measured the psychosocial impact of the core program workshops in the areas of critical thinking and self-efficacy. These areas were selected based on research regarding the impact of programs like SHARP's core program workshop. The surveys were then created using research-based measures in these selected areas.

Initially, it was planned that all schools receiving core programming would be administered the survey. This plan included 16 4th grade classrooms (602 students) and 11 5th grade classrooms (517 students). There was also a plan to pilot the survey with 3rd grade classrooms in 5 schools sponsored by Northwestern Mutual (227 students) as a test to see if the survey would still yield valid and reliable results with a younger group of students. This is especially important considering concerns about socially desirable responding when surveying children.

Unfortunately, the global pandemic forced schools to close abruptly before SHARP guides could get into all schools to survey students. As a result, only 3 schools were able to participate in the survey for a total of 107 students in 4th and 5th grades.[3] This yielded a response rate of 10% of the overall population of 4th and 5th grade students (1,119), which is a significant underrepresentation. The results contained in this report should be interpreted with caution considering the relatively small sample.

To examine before and after differences, a one-tailed paired t-test was used to compare the pattern of responses for the before and after ratings. All questions in the survey were found to have statistically significant differences between students' ratings from before their participation in SHARP workshops to now, or after participation.

[3] The schools that participated in the survey were River Trail Elementary, Catholic East School, and Messmer St. Rose School.

Therefore, it appears that students who participated in the workshops believed that they gained in self-efficacy and critical thinking as a result of the workshops. In the sections below, specific questions from the survey deemed imperative and most aligned to the workshops by SHARP staff are explored. To see a table with the results for all of the items on the survey, please refer to **Appendix B: Summary Table of Student Survey Results**.

CRITICAL THINKING

The critical thinking survey was developed based on research in the area of epistemic cognition in children. Epistemic cognition is a concept commonly used in science education research to measure how children acquire knowledge, make meaning of their acquired knowledge, and then use their acquired knowledge to solve problems.[4] The critical thinking scale used for this evaluation was developed by Elder (2002)[5] to measure changes in epistemic beliefs amongst students engaged in science education. Conley, Pintrich, Verkir, and Harrison (2004) used this scale to study changes in epistemic beliefs amongst Black and Latino 5th grade students in the area of science. The team believed that this scale, based on the research, was an appropriate scale to measure the impact of the SHARP workshops on whether students were being inspired to acquire new knowledge and use this information to think critically about their world.

The Epistemic Beliefs Scale is divided in to 4 subscales for total of 26 items. In order to prevent over-surveying students, only the Justification subscale, which is 9 items, was used.[6] To complete the subscale, students were asked to rate their agreement with specific epistemic beliefs using a 5-point Likert scale (1 = *strongly disagree*; 2 = *disagree*; 3 = *neither agree or disagree*; 4 = *agree*; 5 = *strongly agree*). To complete the scale, students were provided with dots that increased in size commensurate with their level of agreement. Using a post-reflective method, students were asked to rate their agreement with each statement *before* and now, *after*, SHARP workshops. The items on the survey were also revised to ensure that they were no higher than a 5th grade reading level according to Flesch-Kincaid.

It is important to note that although 107 students completed this survey ,not all items were answered in some cases that resulted in missing data. The number of responses will be indicated for each item in this report.

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[4] Conley, A. M., Pintrich, P. R., Vekiri, I., & Harrison, D. (2004). Changes in epistemological beliefs in elementary science students. *Contemporary Educational Psychology, 29*, 186-204. doi: 10.1016/j.cedpsych.2004.01.004

[5] As cited in Conley, A. M., Pintrich, P. R., Vekiri, I., & Harrison, D. (2004). Changes in epistemological beliefs in elementary science students. *Contemporary Educational Psychology, 29*, 186-204. doi: 10.1016/j.cedpsych.2004.01.004

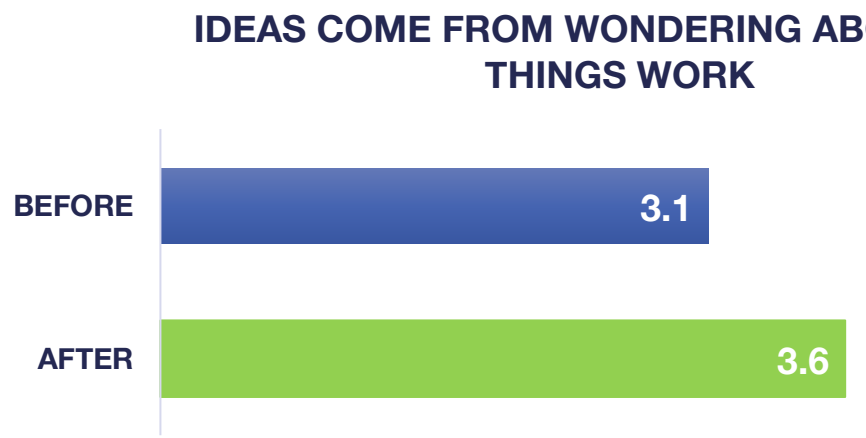
[6] According to Conley et al., the Justification subscale measures how experiments can justify knowledge and was found to have moderate reliability (α = .65, .76). The reliability of this scale with the sample used for this evaluation was also found to have moderate reliability (α = .74).

The specific items from the critical thinking portion of the survey that were reviewed for this evaluation were:

1. Ideas come from wondering about how things work.
2. It is good to ask questions and wonder.
3. Good ideas can come from my questions.

The results for each item are explained further below.

IDEAS COME FROM WONDERING ABOUT HOW THINGS WORK



**one-tailed paired t-test analysis indicates a significant difference between before versus after ratings ($p < .001$).*

The first item on the survey asked students to reflect on the belief that "ideas come from wondering about how things work" before and after they participated in SHARP workshops. Of the students who answered this item (102), the average response before workshops was 3.1, or *neither agree or disagree*. The average response for after workshops was 3.6, or approaching *agree*. This difference was found to be statistically significant.

Thus, it appears that students overall believed that they significantly increased in their agreement with the statement that ideas can come from wondering as a result of the workshops, which is an important aspect of critical thinking.

IT IS GOOD TO ASK QUESTIONS AND WONDER

IT IS GOOD TO ASK QUESTIONS AND WONDER

**one-tailed paired t-test analysis indicates a significant difference between before versus after ratings (p < .001).*

The third item on the survey asked students to reflect on the belief that "it is good to ask questions and wonder" before and after they participated in SHARP workshops. Of the students who answered this item (105), the average response before workshops was 3.9, or approaching *agree*. The average response for after workshops was 4.4, or *agree*. This difference was found to be statistically significant.

Questioning could be considered another important aspect of critical thinking. It appears that students overall believed that they significantly increased in their agreement with the statement that it is good to ask questions and wonder, as a result of the workshops.

GOOD IDEAS CAN COME FROM MY QUESTIONS

GOOD IDEAS CAN COME FROM MY QUESTIONS

**one-tailed paired t-test analysis indicates a significant difference between before versus after ratings (p < .001).*

The eighth item on the survey asked students to reflect on the belief that "good ideas can come from my questions" before and after they participated in SHARP workshops.

Of the students who answered this item (105), the average response before workshops was 3.4, or *neither agree or disagree*. The average response for after workshops was 3.9, or approaching *agree*. This difference was found to be statistically significant.

Students overall appeared to believe that they significantly increased in their agreement that good ideas could come from their questions as a result of the workshops. This belief arguably supports students to engage in critical thinking.

SELF-EFFICACY

The self-efficacy[7] survey was also developed based on research in the area of self-regulated learning and the building blocks for a motivation to learn in children. Research on motivation has long connected one's confidence in learning to their motivation to learn and their value of taking on a learning task.[8] In fact, it has been shown that children do not engage in learning if they do not feel they will be successful or that it will be enjoyable.[9] Considering the mission of SHARP being to inspire the love of learning in children, the team felt strongly that the concept of self-efficacy should be evaluated.

The self-efficacy survey was adapted from Usher, Li, Butz, and Rojas (2018)[10] to fit the specific context for SHARP workshops and ensure that they were at the appropriate reading level.[11] Items on the survey were revised so that they were no higher than a 5th grade reading level according to Flesch-Kincaid. The survey is also divided into three subscales: confidence in reading, confidence in math, and confidence in science. To complete each subscale, students were asked to rate their confidence in completing work in each specific subject area using a 6-point Likert scale (1 = *not at all;* 2 = *a little bit*; 3 = *sometimes*; 4 = *mostly*; 5 = *usually*; 6 = *a lot*). To complete the scale, students were provided with dots that increased in size commensurate with their level of confidence. Using a post-reflective method, students were asked to rate their confidence for each subject *before* and now, *after*, SHARP workshops.

It is important to note that although 107 students completed this survey not all items were answered in some cases, resulting in missing data. The number of responses will be indicated for each item in this report.

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[7] As previously mentioned, self-efficacy is one's belief that they are capable of completing a specific task.

[8] Hofer, B. K. & Sinatra, G. M. (2010). Epistemology, metacognition, and self-regulation: musings on an emerging field. *Metacognition Learning, 5*, 113-120. doi: 10.1007/s11409-009-9051-7

[9] Usher, E.L. & Pajares, F. (2008). Self-efficacy for self-regulated learning: A validation study. *Educational and Psychological Measurement, 68*, 443-463. doi: 10.1177/0013164407308475

[10] Usher, E. L., Li, C. R., Butz, A. R., & Rojas, J. P. (2018). Perseverant grit and self-efficacy: Are both essential for children's academic success*? Journal of Educational Psychology. Advance online publication.* doi: 10.1037/edu0000324

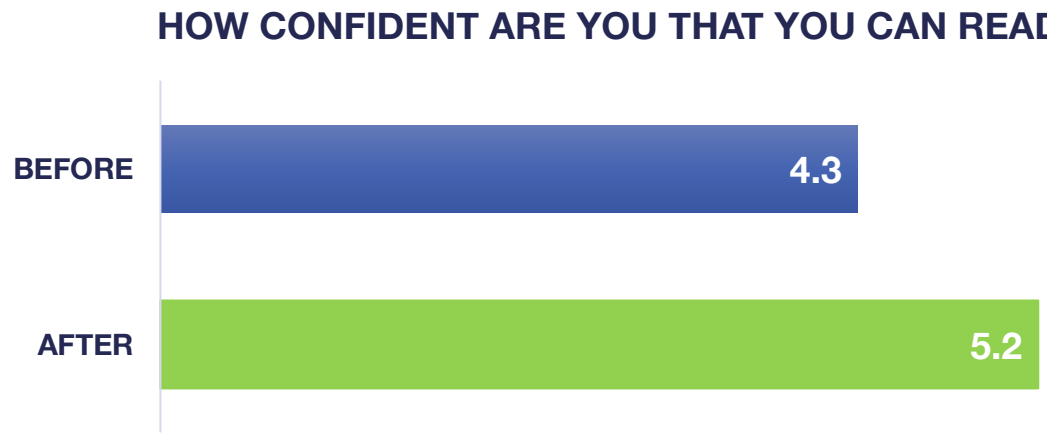
[11] The reliability for each subscale of the self-efficacy scale with the sample used for this evaluation are considered high (reading α = .91; math α = .93; science α = .93).

The specific items from the self-efficacy portion of the survey that were reviewed for this evaluation were:

1. How confident are you that you can read?
2. How confident are you that you can do math?
3. How confident are you in science?
4. How confident are you that you could do science work?

The results for each item are explained further below.

CONFIDENCE IN READING



**one-tailed paired t-test analysis indicates a significant difference between before versus after ratings ($p < .001$).*

The first item on the self-efficacy scale asked students to share how their confidence for reading has changed since they participated in SHARP workshops. Of the students who answered this item (104), the average response before workshops was 4.3, or *mostly*. The average response for after workshops was 5.2, or *usually*. This difference was found to be statistically significant. Students overall appeared to increase in their confidence in reading, which they attribute to be a result of their participation in workshops.

CONFIDENCE IN MATH

HOW CONFIDENT ARE YOU THAT YOU CAN DO MATH?

**one-tailed paired t-test analysis indicates a significant difference between before versus after ratings ($p < .001$).*

Students were asked to share how their confidence for math has changed after participating in SHARP workshops. Of the students who answered this item (105), the average response before workshops was 4.5, or *mostly*. The average response for after workshops was 5.1, or *usually*. This difference was found to be statistically significant. Students overall appeared to increase in their confidence in math, which they attribute to be a result of their participation in workshops.

CONFIDENCE IN SCIENCE

Although science is not directly taught in SHARP workshops, the team wanted to consider if there was a "spillover effect" in that confidence gained from the workshops generalized to other subject areas that require more critical thinking skills, such as science. Therefore, impact on confidence for science was also explored.

HOW CONFIDENT ARE YOU IN SCIENCE?

**one-tailed paired t-test analysis indicates a significant difference between before versus after ratings ($p < .001$).*

Students were asked to share how their confidence for science has changed since they participated in SHARP workshops. Of the students who answered this item (100), the average response before workshops was 4.3, or *mostly*. The average response for after workshops was 4.9, or approaching *usually*. This difference was found to be statistically significant. It appears that students felt that the workshops also had an impact on their ability in the area of science.

**one-tailed paired t-test analysis indicates a significant difference between before versus after ratings ($p < .05$).*

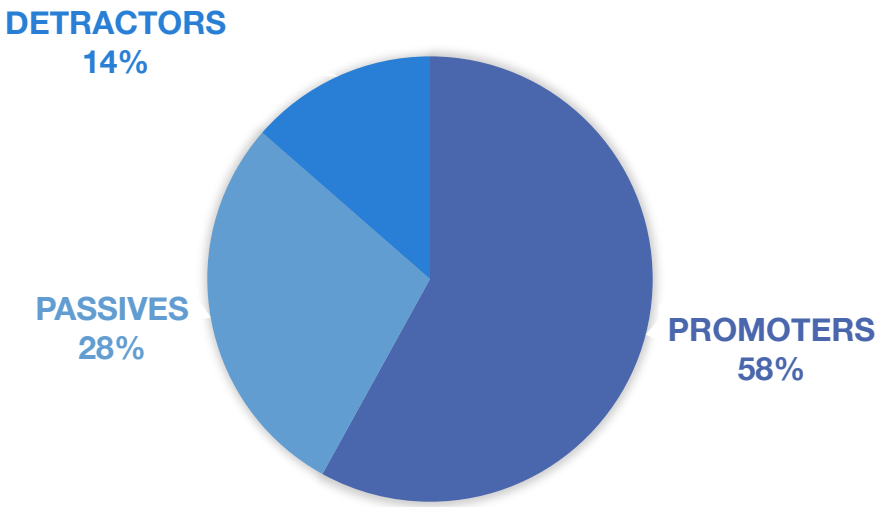
Finally, students were asked to share how their confidence for completing science work has changed. Of the students who answered this item (105), the average response before workshops was 4.4, or *mostly*. The average response for after workshops was 4.6, or *mostly* as well. This difference was found to be statistically significant; however, it's important to note that this difference was not as significant as it was in other areas explored above. It appears that students felt that the workshops also had an impact on their ability to complete work in the area of science.

TEACHER FEEDBACK SURVEY

Teachers were asked to rate the likelihood that they would recommend SHARP workshops to other teachers on a scale of 0 (*not at all*) to 10 (*extremely likely*). Teachers were also asked to share the reason for their rating. A Net Promoter Score (NPS) was calculated using the recommendation ratings and the comments were analyzed for themes. To calculate the NPS, the number of respondents who gave a rating of 0 to 6 (detractors) were subtracted from the number of respondents who gave a rating of 9 or 10 (promoters). This number was then multiplied by 100 to obtain an overall NPS. To analyze responses for themes, an open coding process was used that allowed for themes to evolve based on the responses provided.

Overall, 162 teachers completed the survey for a response rate of 50%.[12] Not all teachers provided a reason for their rating. The results of the teacher survey are described below.

NET PROMOTER SCORE



The overall NPS based on the recommendations of teachers in this sample was 44.[13] Over half (58%) of the teachers provided a rating of 9 or 10, 28% provided a rating of 7 or 8, and 14% provided a rating of 0 through 6. This sample of teachers was overwhelmingly positive regarding their experience with the SHARP workshops.

TEACHER FEEDBACK

As previously stated, not all teachers who completed the survey provided a reason for their rating. Of the teachers who completed the survey, 118 (73%) provided specific comments. Below is a thematic summary of the responses from teachers to explain their ratings. The number of responses per theme are indicated in parentheses.

Curriculum and structure of workshops. The wide majority of teachers provided feedback that their rating was based on the curriculum or workshop experience. Teachers reported that they valued the hands-on nature of workshops and curriculum that made learning very engaging (42). Teachers also valued a curriculum that was integrated or multi-faceted that combined multiple disciplines or incorporated real life applications (18). Other teachers valued that the curriculum was aligned to their

[12] There were 322 teachers who were invited to take the survey because their classrooms had received a workshop over the 2019-20 school year.
[13] Since it is unclear what the NPS is for SHARP competitors, the context for this rating is not available.

school's curriculum or the Next Generation Science Standards (9).[14] Teachers also appreciated the field trips and believed that it added to the workshop experience (5). A few teachers provided feedback that they believed the curriculum needed to be streamlined because the workshops were too long or not age appropriate (4) while other teachers felt as though the workshops were too few (2). A couple teachers reported that the curriculum could be more aligned to standards (2).

Quality of the guide. The next most common reason provided by teachers for their rating was the quality of their guide (31). Regardless of rating, teachers appeared to attribute their experience to how well the guide engaged students and was organized in setting up the workshops. A few teachers also commented that they believed that the program was better in previous years and attributed this to their experience with multiple guides (4).

Generally positive experience. A significant number of teachers commented that they thought SHARP was "fantastic" or that they would "highly recommend" the program without specific reasons for their rating (17). One teacher stated that their rating was based on what they heard from other teachers (1).

Increased opportunities for students. Many teachers reported basing their rating on their belief that the workshops provided opportunities to students (11). Teachers stated that they believed the workshops increased access to the arts or literacy for their students. Some commented that the field trips were to places that most of their students typically are not able to visit.

Teacher professional development and support. Some teachers reported feeling as though they learned from SHARP. The resources provided and observing the guides during workshops inspired teachers in their own professional development (6). Some teachers also believed that the professional development session at the beginning of the year was a positive experience (3).

Logistics and organization. Some teachers provided lower ratings of SHARP (0-6) because they had a negative experience related to the logistics of the workshop. The common issue was that scheduling was difficult for the workshops (4). Another reason was that the resources for them to prepare for field trips or workshops were not provided in time (3). One teacher attributed her rating to the workshops being free to schools (1).

SUMMARY AND CONCLUSIONS

STUDENT POST-REFLECTIVE SURVEY

[14] More information about the Next Generation Science Standards (NGSS) can be found at this website: https://www.nextgenscience.org/.

Students in grades 4 and 5 across three schools were surveyed at the end of the 2019-20 school year to better understand the impact of the SHARP core programming aligned to SHARP's mission. The two areas targeted for the survey were critical thinking and self-efficacy. Due to a global pandemic forcing schools to close in March 2020, only 10% of students were surveyed (107).

Overall, it appears that students who participated in SHARP workshops believed that their experiences inspired confidence and an ability to think critically. Students expressed an increase in their beliefs related to questioning and wondering and their experiences made them more confident in reading, math, and science. Considering that this survey was a pilot, it will be important to compare these findings to the results of surveys for subsequent school years to further validate the results.

TEACHER FEEDBACK SURVEY

Teachers report that their experiences with SHARP as a company are generally positive with the wide majority of teachers surveyed providing a rating of 7 or higher (86%). Their ratings were mainly attributed to the curriculum or workshop experience and the quality of the guide that worked with their students. Other reasons for the ratings provided were attributed to a generally positive non-specific experience, increased opportunities to students related to art and literacy, or professional development and growth. Some teachers provided reasons for lower ratings (0-6) being attributed to logistical issues with scheduling or the timing of resources provided.

CONSIDERATIONS

Improve training for guides. Based on teacher feedback, it appears that a large part of the SHARP workshop experience hinges on how well the guides are able to engage students and are organized when scheduling visits. Current training and coaching may need to be revisited to ensure that the guides are able to provide a positive experience for teachers.

Furthermore, missing data in the survey was a result of guide error, where guides did not follow the protocol or training. If using guides to survey students moving forward, further training and coaching will need to be provided to ensure that they are supporting the collection of valid and reliable data.

Provide more training on arts-integrated instruction to partners. Considering the impact that arts-integrated instruction seems to have on students' beliefs in their ability in the areas of reading, math, and science and their beliefs in the value of critical thinking skills, such as questioning, SHARP should consider how they can increase the amount of professional development they provide to teachers and their school-based partners. Teachers reported that they deeply appreciated the curriculum and felt inspired by observing workshops and the hands-on arts-integrated approach. Some also reported enjoying the professional development opportunities that have already

been provided. There seems to be an opportunity to inspire teachers to use similar instructional approaches to increase student engagement across schools in the communities served by SHARP. This aligns to one of SHARP's objectives to be a valuable partner. Sharing their approach more widely appears to be a possible value to teachers.

More training for teachers at partner schools could also fortify the impact that SHARP has through their workshops. If teachers integrate instructional practices they are trained to use and observe from the workshops, the impact on student self-efficacy and critical thinking will be compounded and, based on research, this would translate into higher academic performance for students served.

Continue to communicate the impact of SHARP core programming. To ensure that SHARP maintains clarity on the impact that their workshops have on students, it is important that SHARP consider how they can communicate their impact to partners, funders, and the community. The academic nature of the core programming may mislead outsiders to expect that SHARP programs will directly improve literacy or performance in other academic areas. It is important to make clear what SHARP workshops can and cannot do in order to manage expectations and support partners' understanding of what it takes to raise student achievement.

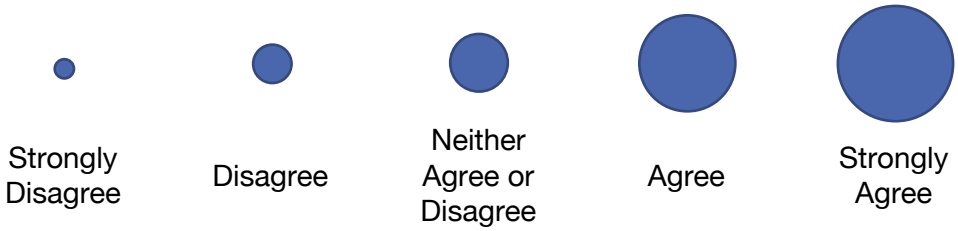
Doing so could also increase engagement from partnering schools. If school partners are going to leverage SHARP workshops in order to improve student achievement, they are going to have to work to integrate the instructional strategies used by SHARP in order to see those gains.

Create workshop observation tools. Due to limitations in using children as reliable responders, it is not advised to survey all students served by SHARP. Only children in 4th and 5th grades were surveyed as their cognitive skills are mature enough to complete psychosocial surveys. In order to capture the impact of workshops in younger grades, it is recommended that SHARP consider creating a rubric to track the quality of student engagement during workshops. This rubric could clearly define what engagement looks like. It could also be used as a coaching tool to improve the quality of instruction for guides, that therefore improves the experience for teachers.

APPENDIX A: STUDENT SURVEY

EXAMPLE:

I only like to eat ice cream in the summer.



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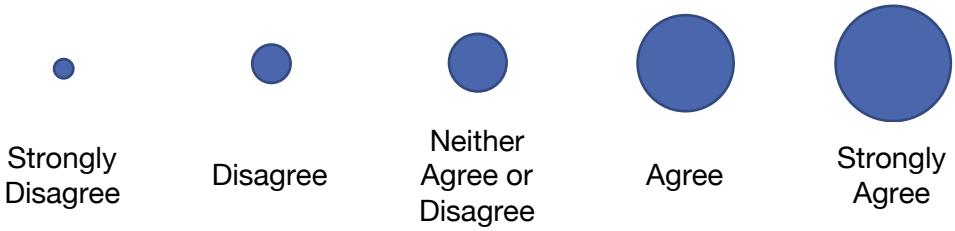
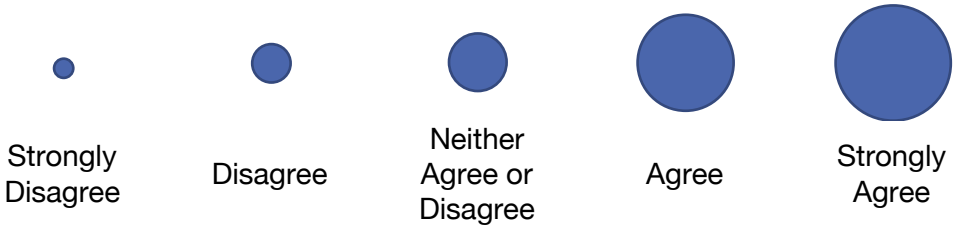
1. Ideas come from wondering about how things work.

I used to think…

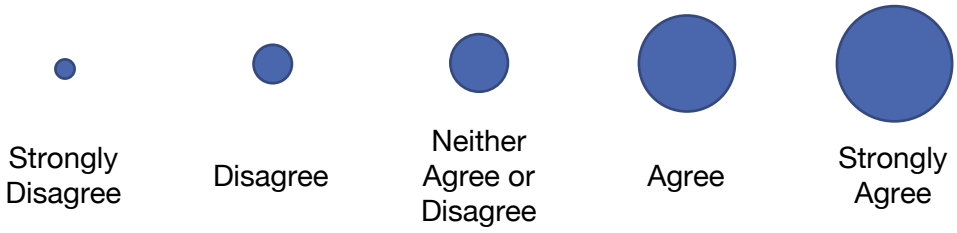


Now I think…



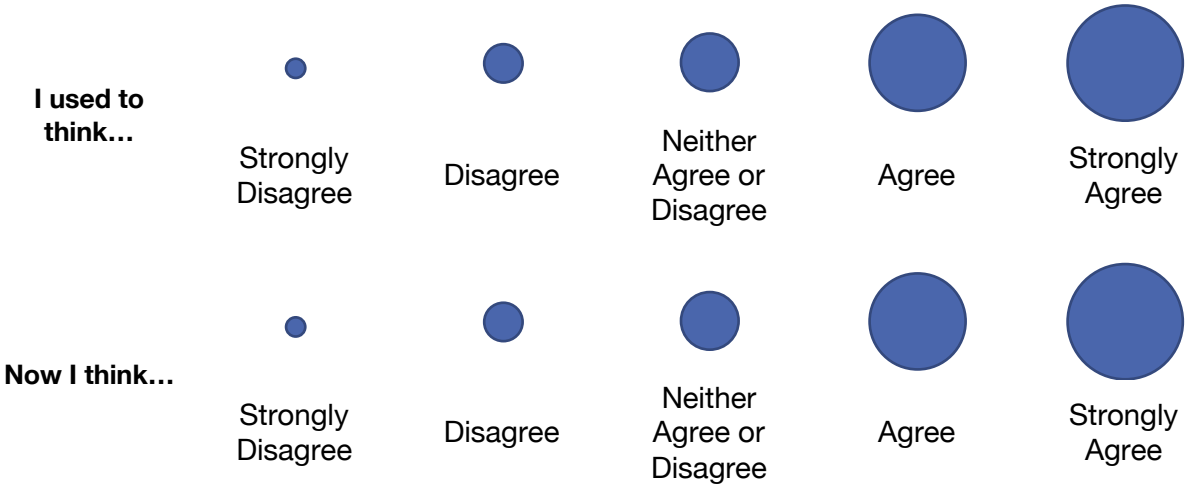
2. There can be more than one way to learn about ideas.

I used to think…

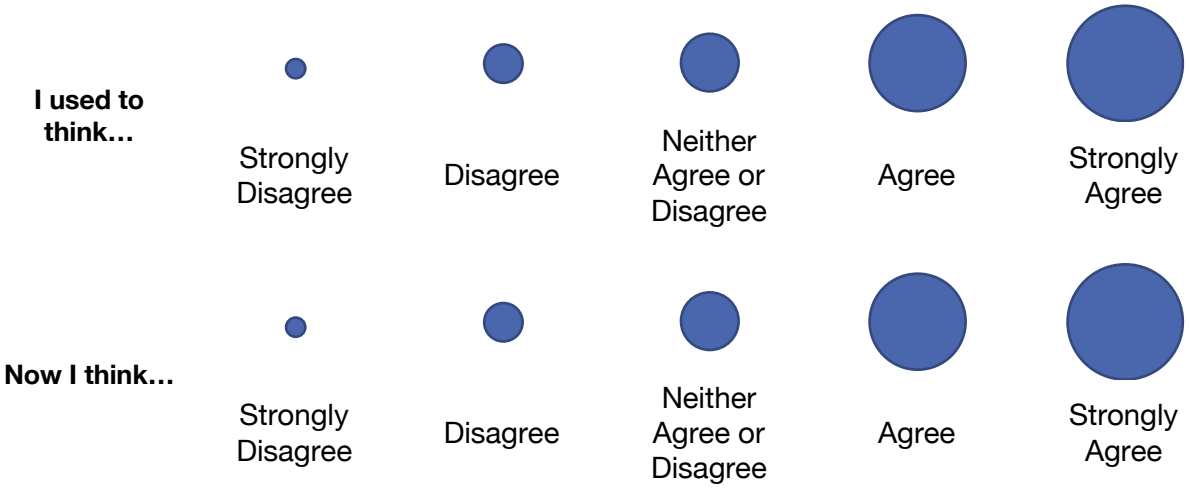


Now I think…

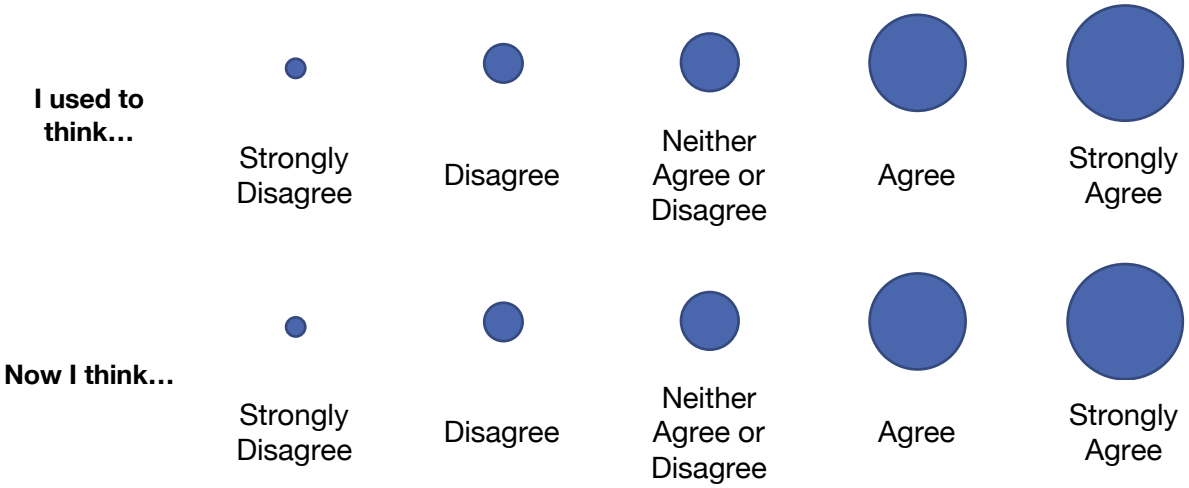
3. It is good to ask questions and wonder.



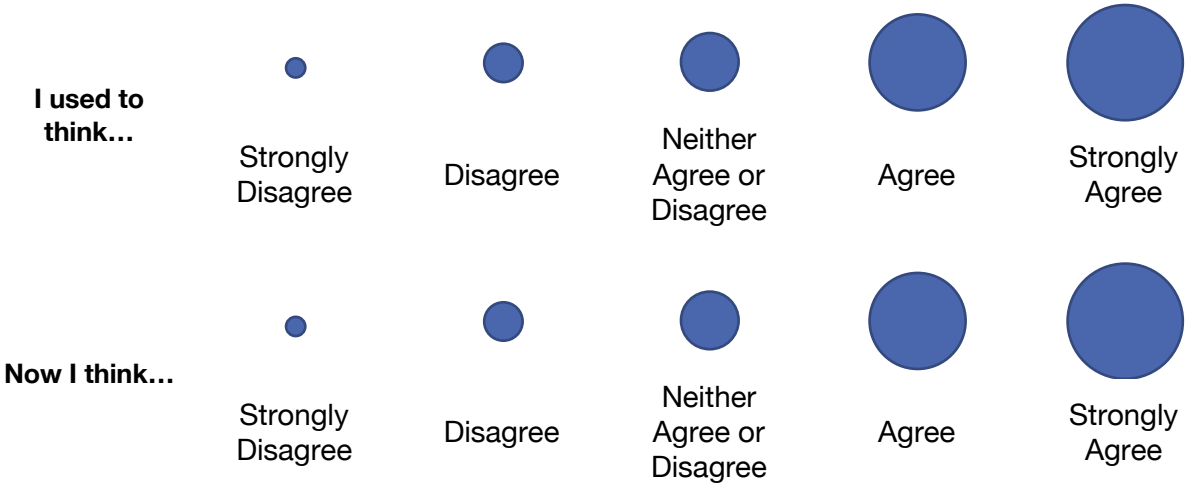
4. It is good to look for information in many places.



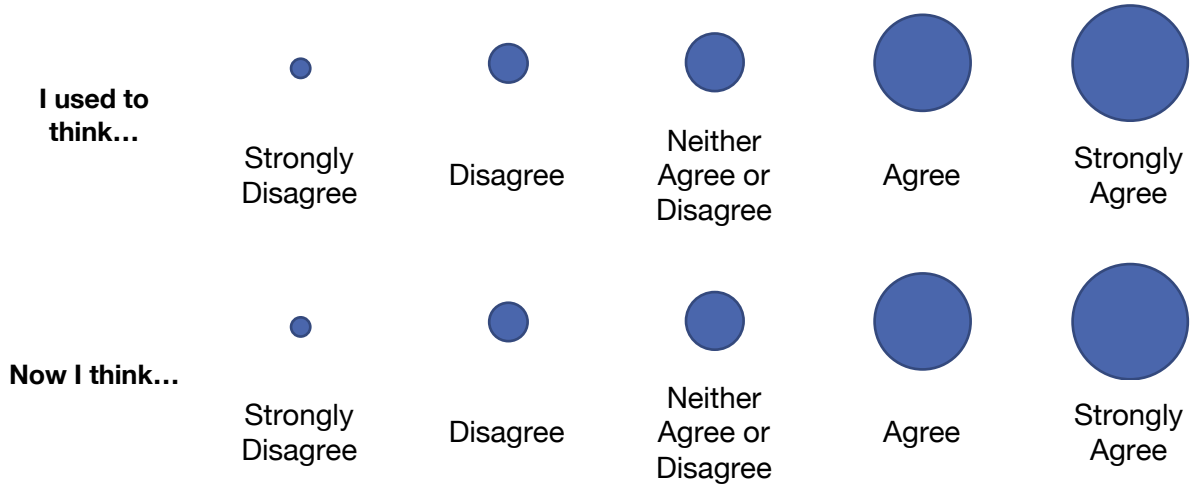
5. I can find information about things.



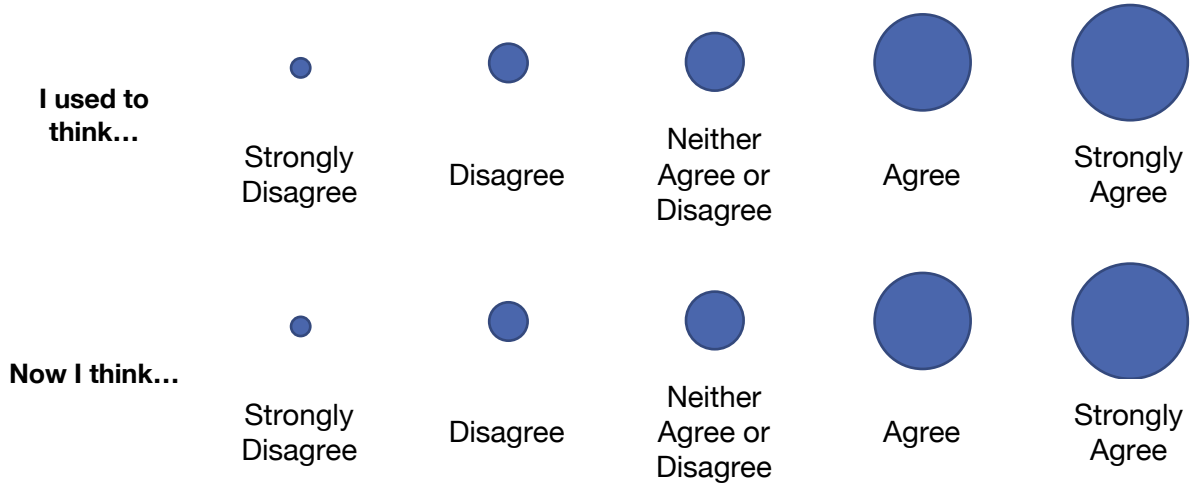
6. Books are a great source for information.



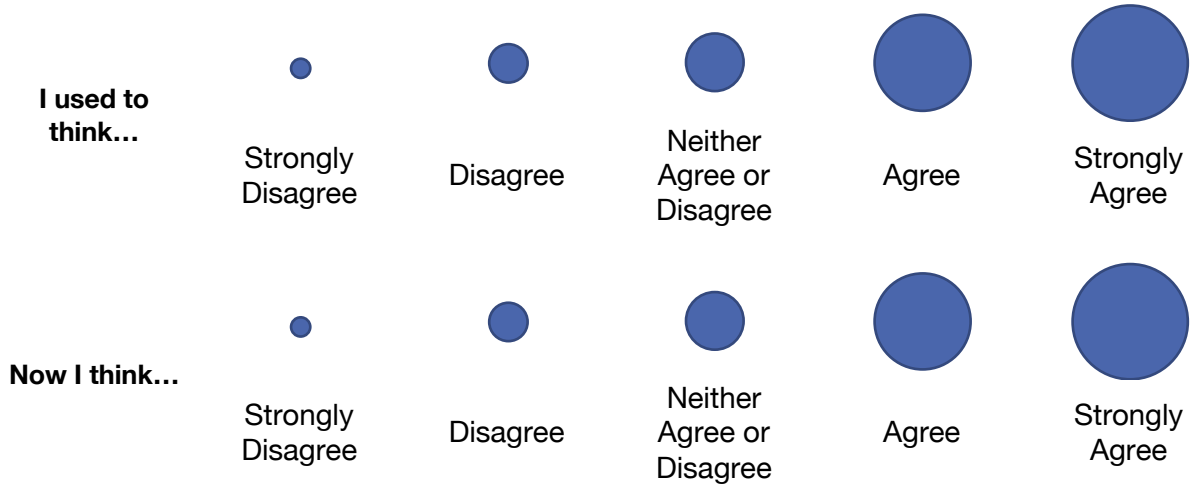
7. I look for information in many places.



8. Good ideas can come from my questions.

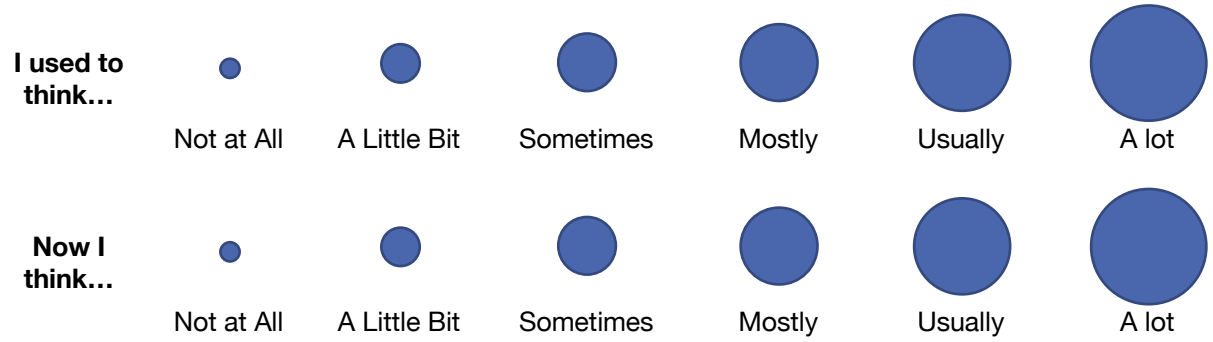


9. I can create new ways of doing things.

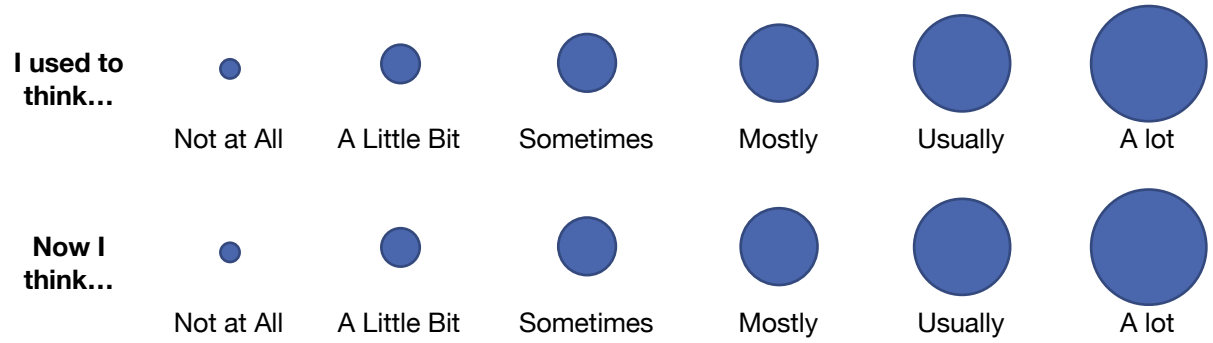


PLEASE STOP HERE AND WAIT FOR FURTHER INSTRUCTIONS.

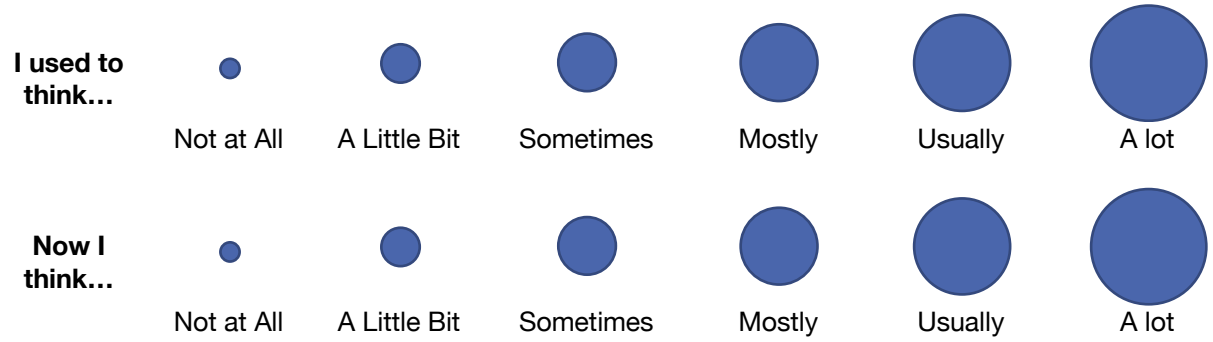
10. How confident are you that you can read?



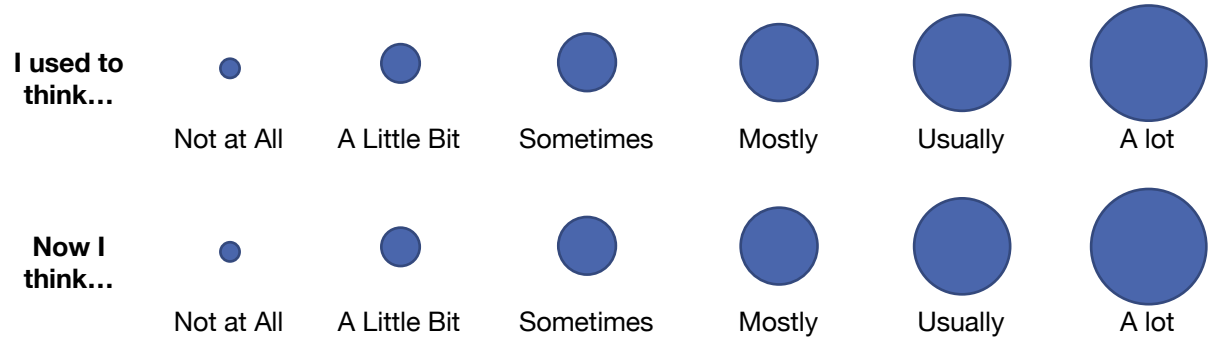
11. How confident are you that you will do well in reading class?



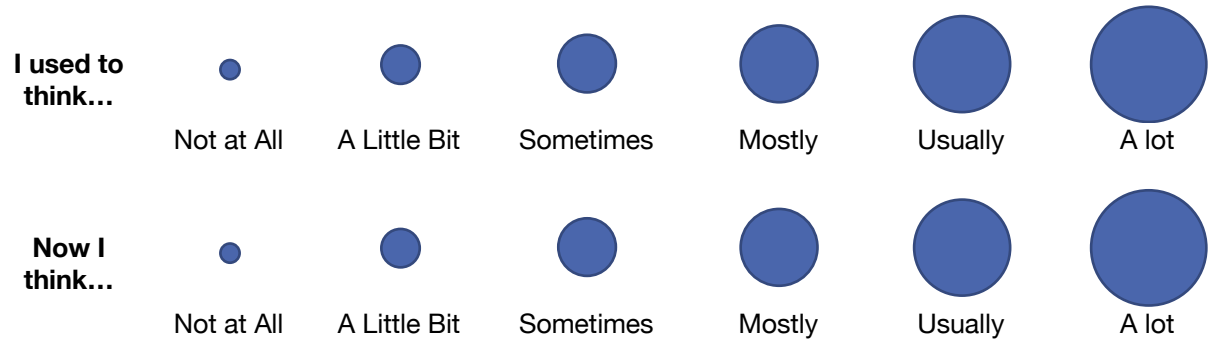
12. How confident are you that you can do well on reading tests?



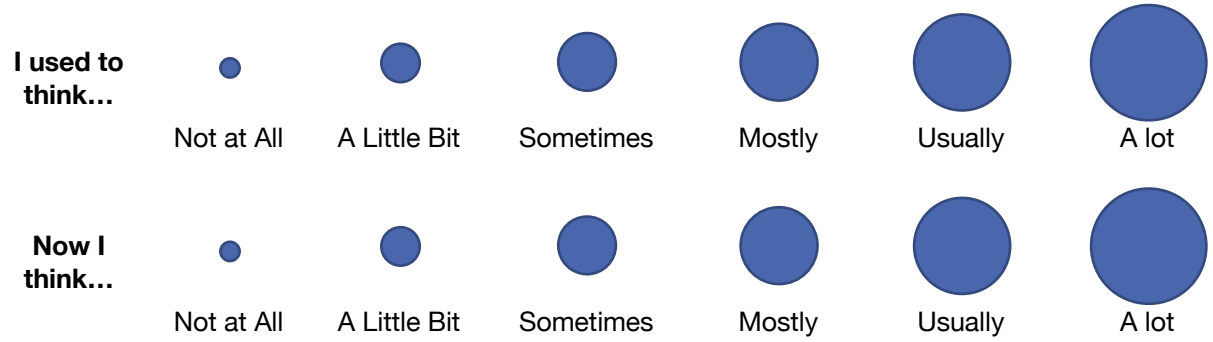
13. How confident are you that you can do a good job on reading work?



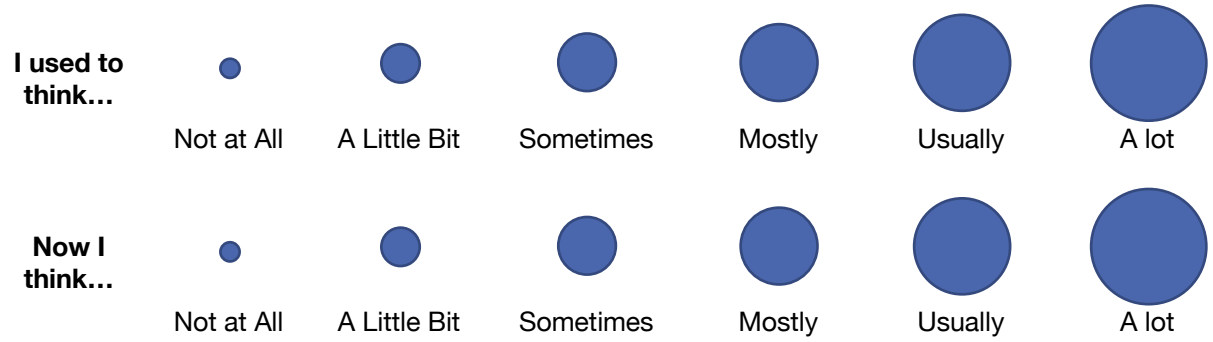
14. How confident are you that you can do math?



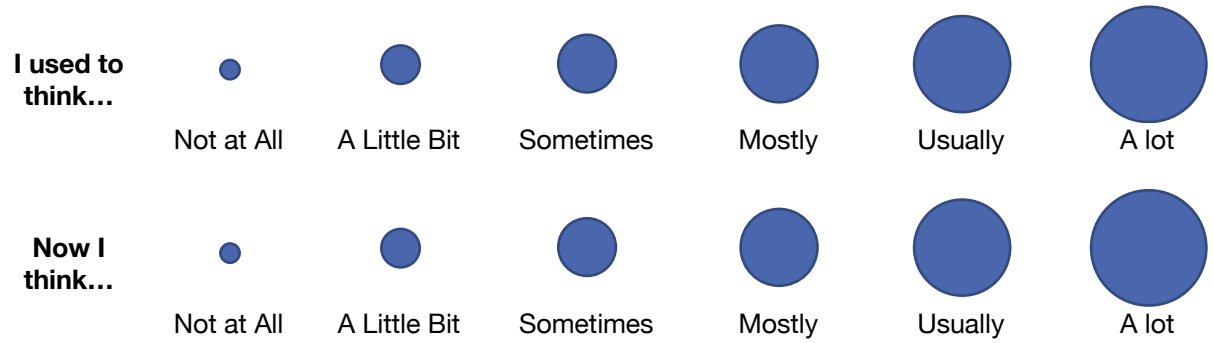
15. How confident are you that you will do well in math class?



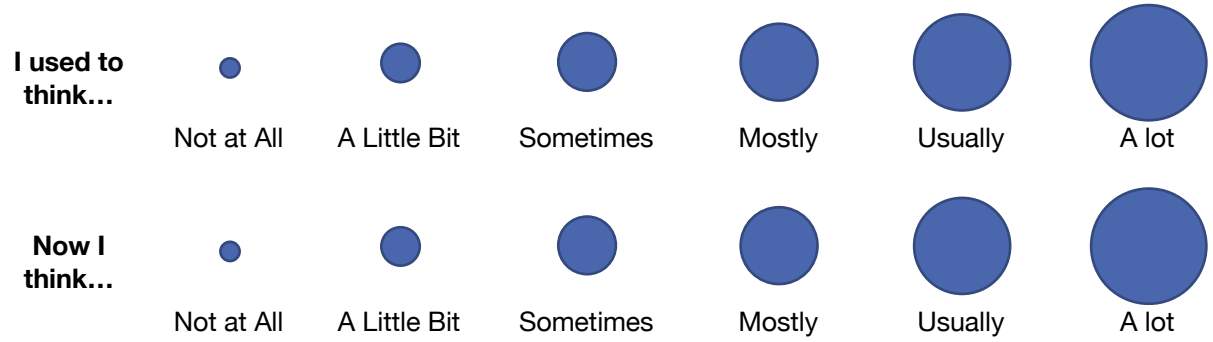
16. How confident are you that you can do well on math tests?



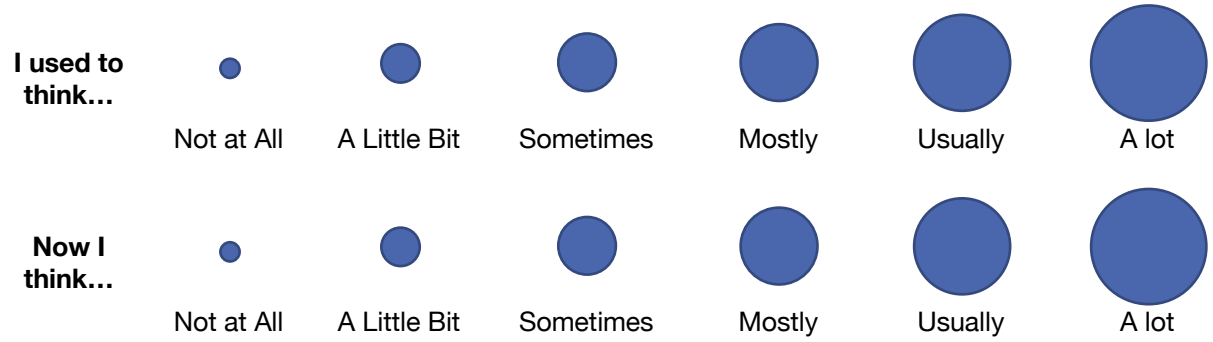
17. How confident are you that you can do well on math work?



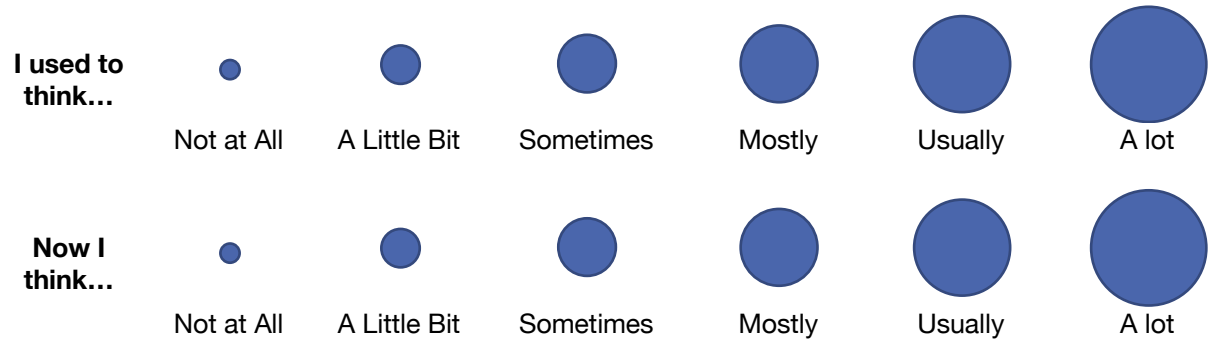
18. How confident are you in science?



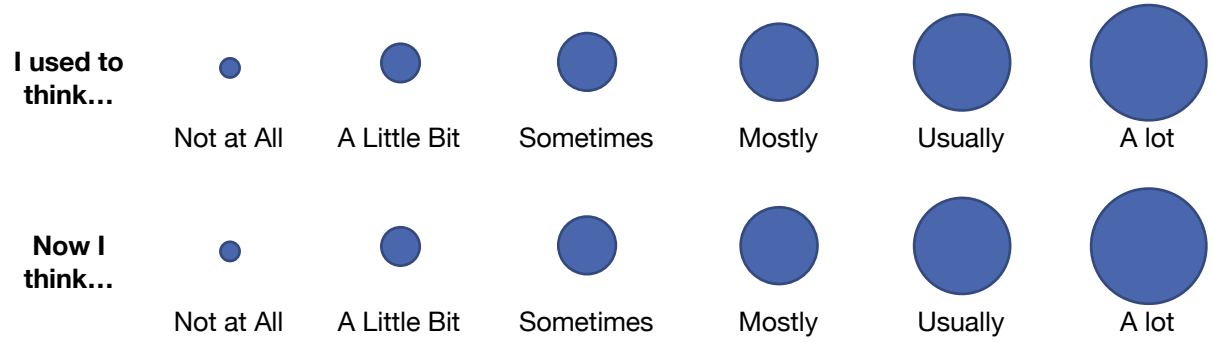
19. How confident are you that you will do well in science class?



20. How confident are you that you can do well on science tests?



21. How confident are you that you could do science work?



APPENDIX B: SUMMARY TABLE OF STUDENT SURVEY RESULTS

Critical Thinking Survey Items

Item	Before (Mean)	After (Mean)	*n*	Sig.
Ideas come from wondering about how things work.	3.1	3.6	102	$p > .001$
There can be more than one way to learn about ideas.	4.0	4.3	101	$p > .001$
It is good to ask questions and wonder.	3.9	4.4	105	$p > .001$
It is good to look for information in many places.	3.7	4.2	104	$p > .001$
I can find information about things.	3.9	4.2	104	$p > .05$
Books are a great source for information.	3.5	4.3	106	$p > .001$
I look for information in many places.	3.3	3.7	105	$p > .001$
Good ideas can come from my questions.	3.4	3.9	105	$p > .001$
I can create new ways of doing things.	3.8	4.2	104	$p > .001$

Note: results were for the epistemic cognition justification subscale adapted from Conley et al. (2004) with a Likert scale from 1 (strongly disagree) to 5 (strongly agree).

Self-efficacy Survey Items

Item	Before (Mean)	After (Mean)	*n*	Sig.
How confident are you that you can read?	4.3	5.2	104	$p > .001$
How confident are you that you will do well in reading class?	4.3	4.9	104	$p > .001$
How confident are you that you can do well on reading tests?	4.0	4.8	104	$p > .001$
How confident are you that you can do a good job on reading work?	4.4	4.9	105	$p > .001$
How confident are you that you can do math?	4.5	5.1	105	$p > .001$
How confident are you that you will do well in math class?	4.7	5.0	105	$p > .001$
How confident are you that you can do well on math tests?	4.4	4.9	102	$p > .001$
How confident are you that you can do well on math work?	4.6	4.9	102	$p > .05$
How confident are you in science?	4.3	4.9	100	$p > .001$
How confident are you that you will do well in science class?	4.1	4.6	103	$p > .001$
How confident are you that you can do well on science tests?	3.9	4.3	103	$p > .05$
How confident are you that you can do science work?	4.4	4.6	105	$p > .05$

Note: results are for the self-efficacy scale adapted from Usher et al. (2018) with a Likert scale from 1 (not at all) to 6 (a lot).