i.e.: inquiry in education

Volume 14 | Issue 2 Article 10

2022

Impact of a Free-Choice ('Genius Time') Inquiry Project on Student Skill-Building, Agency, and Motivation

Sam Woolford
Saint David's School, swoolford@gmail.com

Impact of a Free-Choice ('Genius Time') Inquiry Project on Student Skill-Building, Agency, and Motivation

Cover Page Footnote

I am grateful for the support and trust of the administration team to try something new and untested, and for my community of colleagues that gave their time and expertise to help me design and complete this research project. Major props to my sixth and seventh grade students as well - without their effort and creativity, there would be no research.

Impact of a Free-Choice ("Genius Time") Inquiry Project on Student Skill-Building, Agency, and Motivation

Sam Woolford
Saint David's School

Abstract

Student investment in learning is often stronger when learning incorporates student choice, "real-world" authenticity, and creativity. This action research study investigated the impact of a particular tool for emphasizing these elements in learning: a free-choice, or "Genius Time," project in which middle school students in an independent all-boys school were asked to develop and carry out an individual project to investigate anything of their choosing as part of their regular science class. This study aimed to determine how a project like this could impact student skill-building, self-efficacy, motivation, and student learning through the practice of inquiry. Through surveys, student self-assessment, student interviews, and teacher journaling, the results showed that this project was successful in building essential 21st-century skills, such as initiative, risk-taking, persistence, and resilience. In addition, students were engaged in meaningful inquiry learning because they were required to exercise and grow their own agency for learning, including their self-efficacy. Finally, this project may have facilitated a shift in participant personal motivation toward more intrinsic (rather than extrinsic) factors. These findings support a larger body of research and reporting about the effectiveness of project-based learning, and free-choice or passion projects in particular, to engage students with inquiry in meaningful ways.

Keywords: Project-based learning, choice, skill-building, agency, self-efficacy, motivation

Introduction

In the middle school science classroom, experiential learning can be a potent tool for engaging students with inquiry, facilitating understanding, and assessing comprehension. John Dewey wrote in 1916, "Give the pupils something to do, not something to learn; and the doing is of such a nature as to demand thinking…; learning naturally results" (Dewey, 1916, ch. 12). These deep pedagogical roots are seen today in models like problem-based learning, inquiry-based learning, project-based learning, and reflective inquiry. All of these tools can facilitate meaningful learning through concrete experience

(visiting a location, conducting an experiment, designing a solution to a problem, etc.) and subsequent reflection, abstraction, application, and further inquiry (Itin, 1999).

In an experiential education setting, teachers often strive to be facilitators of student-led learning. When students drive their own learning through inquiry, discussion, collaboration, and action, the learning is more meaningful and their reflection fosters deeper connections and applications to prior knowledge (Barron & Darling-Hammond, 2008; Dunlosky et al., 2013; Marsick et al., 2015). In addition, student-driven inquiry allows students to exercise agency in their learning, which consists of students setting individual goals, taking action to achieve them, reflecting on their progress and adapting their methods, and in turn developing confidence in their own ability to learn and grow (self-efficacy) (Code, 2020; Poon, 2018).

A large and growing body of research indicates that a project-based approach can succeed in providing structured autonomy, personal motivation, and meaningful inquiry learning (Barron & Darling-Hammond, 2008; Condliffe et al., 2016; Juliani, 2015). After rigorous evaluation of hundreds of studies reporting the effects of project-based learning, in which a long-term and authentic or "real-world" project serves as a vehicle for student learning, Condliffe et al. concluded that there is promising evidence that project-based learning correlates with growth in positive student attitudes toward learning (including motivation, engagement, and self-efficacy), quantitative performance outcomes around knowledge retention and academic achievement, and so-called 21st-century skills such as communication, creativity, resilience, self-reflection or meta-cognition, and critical thinking.

Furthermore, research about best practices in teaching boys (this study took place at an all-boys school) dovetails significantly with learning projects that emphasize choice, inquiry, and self-direction. Hawley and Reichert (2009) assert that boys are more engaged with in-school learning and have higher motivation when they can create and express themselves freely, and that boys' confidence and self-efficacy increases when learning makes use of open inquiry in combination with the encouragement of risk-taking and learning from failure. According to best practice strategies for teaching boys and fostering engagement, self-efficacy, and deep learning, a high-quality project should involve a great deal of choice, autonomy, and student-directed or "active" learning (Barron & Darling-Hammond, 2008; Munns et al., 2006).

As a teacher, it is clear in my classroom that student-driven, project-based learning is often the most exciting and rewarding form of inquiry for my students. The action research reported in this study aimed to evaluate the outcomes of a particular type of learning tool, a free-choice or "Genius Time" project, which combines both student choice and project-based learning.

A significant number of educators have led free-choice projects with students of all ages, and while the student project work has various names depending on the classroom (Genius Time, 20% Time, Passion

Projects), many practitioners report anecdotally that inquiry-based personal choice projects can be powerful learning tools (Juliani, 2015; McNair, 2017). There has been little rigorous research focused on the learning outcomes of these specific types of projects, but Reuer (2017) found that ninth-grade science students participating in "Genius Hour" projects reported increases in motivation, enjoyment, and self-reliance, and she found a significant increase in student perception of "science ability," measured by self-ranking on the NGSS Science and Engineering Practices.

The study conducted for this research required sixth and seventh grade students to complete a self-directed, free-choice project over the course of a semester. The project was ungraded, and the topic entirely up to the student, with only the following requirements:

- It must begin with an investigative question
- They must set realistic but challenging goals for themselves
- They must "pitch" their idea and goals to the rest of the class
- There must be some final "product'
- They must present their work in a short presentation after completion

While participants were provided tools and support to accomplish these requirements, the nature of the project required students to exercise and develop agency for learning, prioritized student choice, and focused on skill development rather than graded assessment. The aims of this research were to investigate student response to the project and evaluate how such a project could contribute to student learning and inquiry, help students grow so-called 21st-century skills, and increase student self-efficacy and intrinsic motivation for learning and doing science.

Results indicated that participants built on essential skills, such as initiative, risk-taking, persistence, and resilience, and developed their own agency for learning, including their self-efficacy. The findings support a larger body of research and reporting about the effectiveness of project-based learning, and free-choice or passion projects in particular, to engage students with inquiry in meaningful ways.

Methodology

This action research study was carried out in an urban all-boys independent school in New York, in two middle school science classrooms (one sixth grade and one seventh grade class) each with about 13 students (total N = 27). From late September until mid-December, at least 30 minutes (usually longer) of class time was reserved each week for students to work on their Genius Time Project, in addition to choice time (time when students could choose to work on their project). Students were also expected to spend about 45 minutes of homework time each week working on some aspect of their project.

This action research aimed to determine how a project like this could impact student skill-building, self-efficacy, motivation, and student learning through the practice of inquiry. To assess these questions, the teacher-researcher used four sources of data: teacher journaling, student interviews, a student self-assessment of their personal growth, and pre/post participant surveys measuring self-efficacy and motivation for learning and doing science. The data sources were selected to overlap in scope to support methodological triangulation and better understand and interpret the results of the quantitative analysis. The methods for collecting this data are discussed in detail below.

Teacher Journaling

Once per week at regular intervals during the study period, the teacher-researcher recorded observations in a running journal, including major events or changes, progress and obstacles, and anything else noteworthy. Additional journal entries were made as necessary, for a total of 14 journal entries. An effort was made to record teacher notes about the progress of at least one third of the students every week, or every student every three weeks, especially when an individual faced a major challenge, experienced significant personal growth, or encountered some other notable occurrence.

Journal entries were analyzed after the study period for consistent themes regarding student growth, common challenges faced, learning environment, and opportunities for improving project delivery and implementation. Examples of journal entries and coding (discussed further in “Results”) can be found in Appendix A.

Student Interviews

Student interviewing took several forms in this project. During the week following the students’ presentations of their projects, the teacher-researcher led a group interview in both classrooms to elicit responses to broad prompts about the project: “What did you like or enjoy? What would you change? How is this project different from your regular school experience?” Student responses during the approximately 25-minute interview were collected as data, and about 60% of students participated.

Four students from each classroom were chosen as “representative” to participate in a more in-depth interview study. These students were purposefully chosen by the teacher-researcher to represent a spectrum of achievement, interests, and engagement with the Genius Time Project. In the two weeks following the completion of the project, each of these eight students was interviewed individually outside of class time, and their responses were recorded through teacher notes and digital recordings. Initial interview questions may be found in Appendix B.

Student responses in all formats were recorded, compiled, and analyzed for themes that were consistent and relevant to research questions about student personal or academic growth, motivation, self-efficacy, and engagement with inquiry. In order to seek opportunities for improvement in future iterations of the Genius Time project, particular attention was also paid to where there was little consistency or major disagreement within a question or thematic category. Examples of interview excerpts and coding (discussed further in "Results") can be found in Appendix A.

Student Self-Assessment Rubric

The ultimate student goal for this Genius Time project, which was made explicit for student participants before and throughout the project, was personal growth in a number of "21st-century skills," or skills necessary for succeeding in a modern career, such as creativity, communication, flexibility, resilience, problem-solving, and others. A project that is student-directed and led by student choice provides inherent practice in many of these skills, but students often lack the language and tools to reflect on or assess their growth in these areas (which achievement grades do not generally target).

To this end, a rubric was developed for students (Appendix C) to self-assess their competency in these core skills, based on rubrics published by Juliani (2015) and College Track (2014). This rubric was also created as a "slide" rubric with an expanded slide scale (1–7 rather than 1–5) in order to emphasize growth and for students to more precisely measure personal growth (Aguire, 2012).

The rubric was first used during week 1 of the project in late September, when students were introduced to the idea and format of Genius Time. Each class spent at least 20 minutes in small group and whole group discussion about the 13 items on the self-assessment rubric in order to establish a common understanding of the characteristics being measured and how to use the rubric. Emphasis was placed on the importance of growth over mastery multiple times. Students self-assessed using the rubric on paper with the opportunity to ask questions as they proceeded. To assess student answer validity, the teacher-researcher conducted discussions with at least one third of the students about their personal self-assessment in order to elicit individual examples that supported their choice in ranking their own competency.

Students repeated the self-assessment using the rubric in the week following the project completion (mid-December, 11 weeks after the initial assessment). A comparison between the initial and post-project assessments was used for student growth analysis. Primary analysis measured the average "overall" growth (all rubric items combined) and the average growth on individual characteristics/rubric items. Individual student data (rather than average change) was examined when narratives from teacher journaling and student interview data called for it.

Student Self-Efficacy and Motivation Survey

While there are a number of instruments that may be useful in measuring student self-efficacy (students' belief in their own ability or competency), this project is specifically related to science class and the practices of science explicitly taught there (and possibly even the science content, depending on the student project). Because of this, it was best practice to use a survey instrument that narrowly targets "domain-specific" characteristics (specific to science), rather than more generally (Peterman et al., 2018). The DEVISE (Developing, Validating, and Implementing Situated Evaluation Instruments) Project at the Cornell Lab of Ornithology has developed survey instruments with funding from the National Science Foundation that were originally for use with citizen science projects but are applicable to participants of projects with free-choice, informal science learning components such as this one (Phillips et al., 2014).

One scale created by the DEVISE Project that was used, called "Self-Efficacy in Learning and Doing Science," "measures an individual's confidence in learning science topics and engaging in scientific activities" (Porticella et al., 2017b, p. 1). The scale was validated by Peterman et al. (2018) to be reliably consistent within age cohorts (including middle school) and across education projects, as well as correlated to other valid measures, in informal, free-choice, hands-on health science education settings with 360 participants. These settings were judged to be similar to the Genius Time Project, even though this project took place in a classroom, because the student-led, novel, ungraded, and experimental approaches used here are all hallmarks of non-formal education experiences. Peterman et al. (2018) found that item 7 on the "Doing science" subscale ("It takes me a long time to understand how to do scientific activities.") was not reliably internally correlated with the other seven items on the scale and suggested that removing that item offers more confidence in analysis, so this study used a modified 7-item instrument.

In addition, students also responded to a similar survey instrument created by the DEVISE Project to measure "Motivation for Learning and Doing Science." This 16-item instrument "provides information about the type of psychological motivation that participants have for engaging in science, i.e., either intrinsic or extrinsic" (Porticella et al., 2017a, p. 1). This was deemed an appropriate measure for this study, as one goal of a Genius Time project is to harness or tap into student intrinsic motivation, and this study aimed to understand how the project impacted motivation for student inquiry.

Students responded to both instruments in science class in a pre- and post-test format: once in the week before being introduced to the Genius Time Project (in September), and once in the week following the project completion (in January). Responses to the two instruments (Self-Efficacy and Motivation) were analyzed separately, and internal subscales within the Self-Efficacy instrument ("Learning Science" and "Doing Science") were also analyzed for disagreement or reinforcement of overall results. Pre- and post-

project responses were compared for average change in self-efficacy and motivation type overall, as well as for only those students who rated their self-efficacy or intrinsic motivation lower (on average 1–3.6 out of 5) in the initial survey (while students who score highly on the initial scale have less room to grow, these responses were also analyzed to see if high ratings were maintained).

Results

Twenty-First Century Skills Student Self-Assessment

Personal growth, particularly in 21st century skills, was made explicit to the students as the primary goal of the Genius Time Project (rather than content mastery or achievement on an assessment, for instance). On average, students rated themselves significantly higher on 13 21st-century skills after completing the Genius Time Project than before the project (N = 27). Overall average self-assessment scores increased from 4.97 to 5.43 out of 7 (+0.47). This was a statistically significant increase in a paired value t-test with a p-value of 0.01.

Among individual items on the self-assessment rubric, the most notable increases were in four skills: risk-taking (+0.98, defined as “trying things when you know you might fail, in order to learn or grow”), persistence (+0.83, defined as “sticking with a project or task, even when it gets much harder than expected”), flexibility and resilience (+0.72, defined as “the ability to change your plans, ideas, or process when needed, and to recover quickly from setbacks, challenges, or failure”), and initiative (+0.56, “the ability to see what needs to be done, and figure out how to do it independently”). Table 1 provides the results for all items included in the rubric defined in Appendix C.

Students supported this finding in interviews, reflection, and whole-group discussions as they spoke and wrote about their experiences, and many individuals gave examples of their personal growth in these skills and/or how utilizing these skills made their project successful.

Table 1. *Change in Average Self-Assessment Scores (Scored 1–7) of 13 21st-Century Skills Comparing Pre-Project Self-Assessment to Post-Project Self-Assessment (N = 27)*

**The overall average change was evaluated to be statistically significant with a paired value t-test (p = 0.01).

21st-Century Skill	Average change (post-test difference)
Overall	+0.47**
Risk-Taking	+0.98
Persistence	+0.83
Flexibility & Resilience	+0.72
Initiative	+0.56
Self-Belief	+0.5
Originality & Creativity	+0.44
Forward Thinking	+0.31
Communicating Expertise	+0.3
Productivity	+0.26
Problem Solving	+0.2
Leadership	+0.19
Inquisitiveness	+0.11
Self-Reflection	-0.08

Self-Efficacy Survey

Across all students (N = 26), there was a slight increase in reported self-efficacy for learning and doing science, but this change was not significant (+0.15 out of 5). Analysis of the sub-scales ("learning science" versus "doing science") did not differ meaningfully from this result. For individual items on the survey, the largest change was in item 3, "It takes me a long time to understand new science topics," with disagreement increasing by 0.38 on average from the pre-project to the post-project survey.

Most notable was the increase in reported self-efficacy among those who initially scored lower on the scale. There were 12 students whose overall average self-efficacy score was greater than 3.6 out of 5 on the initial survey (pre-test). When removing these students with high initial self-efficacy and analyzing only the remaining 14, the average overall score increased 0.44, a significant increase using a paired value t-test with a p-value of 0.01. This increase for initial low scorers was even greater when just analyzing self-efficacy for "learning and understanding science topics" (rather than "doing science"). When removing students with high initial self-efficacy for learning science and analyzing only the remaining students, the average "Learning Science" self-efficacy score increased 0.49; comparatively, scores among these students on the "Doing Science" sub-scale only increased 0.39. These results are presented in Table 2.

Table 2. *Change in Average Scores (Scored 1–5) on Instrument Measuring Self-Efficacy for Learning and Doing Science Comparing Pre-Project to Post-Project Scores*

Those with "low initial scores" were those who scored on average lower than 3.6 out of 5 on the instrument prior to the project.

**The average change was evaluated to be statistically significant with a paired value t-test (p = 0.01).

Instrument and Population	Pre-project average	Post-project average	Average change
Self-Efficacy for Learning and Doing Science; All students (N = 26)	3.6	3.76	+0.15
Learning Science Sub-Scale	3.46	3.64	+0.18
Doing Science Sub-Scale	3.79	3.91	+0.12
Self-Efficacy for Learning and Doing Science; Low initial scores (N = 14)	3.18	3.62	+0.44**

Learning Science Sub-Scale	3.0	3.49	+0.49
Doing Science Sub-Scale	3.26	3.65	+0.39

Motivation Survey

This survey was meant to assess a student's type of motivation for learning and doing science activities (intrinsic versus extrinsic). Across all students (N = 26), there was a slight increase in reported intrinsic motivation for learning and doing science, but this change was not significant (+0.05 out of 5). Interestingly, students on average indicated being far more intrinsically than extrinsically motivated for learning and doing science activities before the project began, a trend that continued to be seen following the project.

Similar analysis to the self-efficacy survey was performed, and scores for those with lower *initial* intrinsic motivation were analyzed separately. There were 14 students whose average score on the intrinsic motivation subscale was greater than 3.6 out of 5 on the initial survey (pre-test). When removing these students with high initial intrinsic motivation and analyzing only the remaining 12, the average intrinsic motivation score increased 0.47, a significant increase using a paired value t-test with a p-value of 0.04. There was no significant increase on the extrinsic motivation subscale using the same method. These results are presented in Table 3.

Table 3. *Change in Average Scores (Scored 1–5) on Instrument Sub-Scales Measuring a Student's Type of Motivation for Learning and Doing Science, Comparing Pre-Project to Post-Project Scores*

Those with "low initial scores" were those who scored on average lower than 3.6 out of 5 on the intrinsic motivation sub-scale prior to the project.

**The average change was evaluated to be statistically significant with a paired value t-test (p = 0.04).

Motivation Type and Population	Pre-Project Average	Post-Project Average	Average Change
Intrinsic Motivation Sub-Scale; All students (N = 26)	3.83	3.88	+0.05
Extrinsic Motivation Sub-Scale; All students (N = 26)	2.63	2.69	+0.06
Intrinsic Motivation Sub-Scale; Low initial scores (N = 12)	3.03	3.51	+0.47**

Extrinsic Motivation Sub-Scale; Low initial scores (N = 12)	2.53	2.71	+0.18

Student Interviews and Journaling

Using a constant comparative method within the Grounded Theory approach (Glaser & Strauss, 1967; Strauss & Corbin, 1990) to analyze transcripts of student interviews and the teacher's journal, an open coding strategy was used first to identify and categorize common themes. In discussing what contributed to project success, common themes included "Independence and Initiative," "Overcoming Challenges," and "Positive Risk-Taking." Students also often made statements about their "Engagement and Enjoyment" of the project, "Planning and Goal-Setting," and their "Motivation" for continuing and completing the project. Each of these subjects was used as an open code to categorize the data (Appendix A).

Following two initial rounds of open coding and comparison to other data sources, it was found that many of these categories closely aligned with skills that students reported (via self-assessment) to have grown over the course of the project. In addition, using an axial coding strategy, thematic categories such as "Independence and Initiative," "Planning and Goal Setting," "Reflection," and "Self-Belief and Personal Growth" were grouped into the category of student "Agency for Learning." This grouping was in the spirit of student agency theorized and defined by Poon (2018) and Code (2020), in which student agency consists of several components: setting advantageous goals; taking action to achieve goals; reflecting on progress and self-regulating subsequent action; and developing self-efficacy.

Statements and quoted work in these coded categories were then sorted and linked to other data sources to support conclusions and provide evidence for both numerical and qualitative findings. Categorical coding results are reported in Table 4.

Table 4. *Categorical Results of Coding Student Interviews, Discussions, and Teacher Journaling*

Read left to right, some open codes were grouped into axial codes, which were then used to support the findings of this action research. Colors in the right-most column indicate where certain codes support more than one finding.

Open Coding Categories	Axial Coding Groupings	Correlation to Action Research Findings
Positive Risk-Taking	Positive Risk-Taking	Success in Building 21st-Century Skills
Persistence	Persistence	

Overcoming Challenges	Flexibility and Resilience	
Independence & Initiative	Student Agency for Learning	
Planning & Goal Setting		Engagement in Inquiry Through Developing Agency
Reflection		
Self-Belief (Efficacy) & Growth		
Engagement and Enjoyment	Engagement and Enjoyment	
Motivation	Motivation	Shifting Personal Motivation for Learning

Discussion

Juliani (2015), McNair (2017), Reuer (2017), and others have shown through anecdotes, examples, and data that a free-choice project ("Passion Project," "Genius Hour," "Genius Time") is an empowering, motivating, and engaging educational tool that can be used successfully in diverse classroom settings. This study found that in a middle school science classroom where students had support to carry out and complete a Genius Time Project, this type of project can be an effective tool for building essential 21st-century skills needed for modern careers, particularly specific skills that are emphasized explicitly as project goals. In addition, the project provided a platform that fostered student engagement and a classroom culture of independent inquiry, primarily by providing students the tools to practice and grow their own agency for learning in a low-risk environment, when they were required to. Finally, this study showed that the Genius Time Project may have played a role in shifting personal motivation for learning and doing science toward intrinsic (rather than extrinsic) factors, particularly among those students with lower initial intrinsic motivation.

Success in Building 21st-Century Skills

Twenty-first-century skills are those skills needed to succeed in a modern workforce. Due to technological advancement and an increasingly global and connected economy, jobs of the future are likely to be less algorithmic or rote, more likely to evolve rapidly over time, and more likely to be self-directed or contract based. Personal-choice projects inherently develop and emphasize skills that will be

needed for success in future careers (Juliani, 2015; McNair, 2017), and in this study, development of these skills was made an explicit goal for students participating in the Genius Time Project.

Student proficiency in these skills showed clear improvement over the course of the project (as represented by their scores on the self-assessment rubric), and students indicated in interview responses that the project required them to use and develop these skills. These included several skills in particular that showed significant increase in scores and that students spoke of as being essential for success in completing the project and achieving their goals.

With regard to how he developed "persistence," or "sticking with a project or task, even when it gets much harder than expected," one sixth grade student said:

> *"I think I also grew in just, if something doesn't go your way, it's the internet, there's billions and millions of different answers and things. If there's a problem or there's something that doesn't seem right, you can always double-check and go to a different website and compare and contrast and then find a middle and then move on as you finish it. So, [I improved in] not exploding if I got stuck."*

Several others spoke of how they also made progress toward their goals, even as they were more challenging or took longer than expected, by pushing themselves, trying new strategies, or surprising themselves with their own capabilities.

Students taking part in the project rated their own "risk-taking" ("trying things when you know you might fail, in order to learn or grow") nearly one full point (out of 7) higher after the project than prior to it. Positive risk-taking and learning through failure is often seen as an essential tool for fostering self-reflection, strengthening critical thinking, and deepening understanding (Miller, 2015). Several students spoke of trying and learning new skills as a particular area of growth in this project, including one seventh grader, who researched hypnotism and completed his project by hypnotizing a classmate and had this to say:

> *"The biggest takeaway for me was about taking risks. I learned a lot through my research and practiced at home, but I still wasn't sure if I wanted to try to hypnotize someone in class for my final presentation, even though that was my goal from the start. But when class happened, everyone was asking me if I was going to do it, so I decided to try … I had been studying my classmates to see which ones could be the most vulnerable to hypnotism, and everyone volunteered so I picked the one I wanted … after about two minutes I knew he was in a hypnotic trance because he forgot to follow my finger with his eyes and was shrugging a little bit. And yeah, I was really happy that I was able to do it, and that I took the risk, because I felt like it paid off. Now I know I'll be ok with taking more risks, because I saw what can happen."*

Other students needed to change their plans and overcome challenges to meet their goals and spoke of how this process helped them to grow their "flexibility and resilience" ("the ability to change your plans,

ideas, or process when needed, and to recover quickly from setbacks, challenges, or failure"). The following is from one seventh grader who investigated the best steak in his city:

> *"I wish I knew that when I picked my topic I would actually have to study, research a lot because it's hard to find good, decent steaks, because I only knew about like half of them, so I had to research a lot, and I did not know how much steak that was and how expensive it was. In the end it changed my project, but I know way more now."*

Engagement in Inquiry Through Developing "Agency"

The Genius Time Project, as enacted in this study, is a learning tool that requires students to develop agency for their own learning in order to succeed, as it is a student-directed project. Student agency has no exact definition, but it typically means students taking responsibility for their own thinking and learning, and is often cited as a key element to engagement, motivation, and investment in learning (Hawley & Reichert, 2009; Vaughn, 2020)**.**

One compelling explanation of student agency by Poon (2018) posits that agency consists of four student components: Goal Setting, Initiating Action, Reflecting and Redirecting, and Self-Efficacy. Multiple sources of data collected in this study point to the power of the Genius Time Project to engage students with inquiry through connection with the four components of student agency. Students were required to exercise agency throughout the project when setting goals, making plans, reflecting on progress, and adapting or shifting their goals and were provided with tools to support each of these steps. Evidence from self-assessment, survey instruments, interviews, and journaling suggests that it is this focus on agency, and student growth within the key components of exercising agency, that drove student engagement with independent inquiry.

Students completed their projects with nearly total independence and very little input and direction from the teacher. Following are excerpts from the teacher journal:

> *"One thing I wonder is how much work anyone has done? I can't give feedback or know, and I will not be able to try to step in and redirect anyone." (Nov. 18)*

> *"It is VERY independent work, so I am a bit out of the loop on some (or even most) projects." (Dec. 2)*

> *"Some students are concerned about the 'requirements' of the final presentation, but most have done their own thing, very independently, and I have yet to see much of it and have only heard about their experiences in their own words." (Dec. 2)*

Nevertheless, when they presented the results of their independent inquiry, the vast majority of students showed detailed, impressive, high-level work. Teacher journaling indicated that, in at least one case, student work was at a higher level (more in-depth research, more fluent and clear writing) than on any previous class assignments.

With regard to the "Goal Setting" and "Initiating Action" components of agency for learning, students on average self-assessed their skills for "forward thinking" ("the ability to realistically plan and set goals for the future") and "initiative" ("the ability to see what needs to be done, and figure out how to do it independently") higher after the project and spoke in interviews about how the self-directed nature of the project helped them to develop these skills. One seventh grader spoke about how personal agency helped his inquiry into dreams:

> *"[Compared to other projects] I managed my time way better. Because I worked on the Genius Time project I'd say every single day for about 10 minutes, and yeah, it was really time management. I actually improved my research skills because I learned how to focus on one topic and what to type into that Google search. Since there was not a lot of pressure, I was more open to experiment on all that stuff, and since I had so much time, which I really liked, yeah, I experimented so much. I wrote a dream journal that I thought was really intricate."*

In interviews, different students spoke of developing all aspects of agency during this project: needing to take initiative to solve problems, learning new things independently, and reflecting on goals in order to change them.

Finally, progress and success in achieving their goals helped students to develop self-efficacy, an important component of student agency. Not only did students self-assess their capacity for "self-belief" ("belief that you have the power and the ability to get things done, with or without help") higher after the project, students who scored lower initially on an independent tool to measure "self-efficacy for learning and doing science" scored significantly higher after completing the project. In other words, those students with lower self-efficacy prior to undertaking and completing the Genius Time Project were most likely to benefit by developing their self-belief, a key component of student agency.

Shifting Personal Motivation for Learning

For many students in school, motivation comes from external sources, in particular the goal of achievement (good grades), and encouragement or expectations set by teachers and parents. Development of a reliance on these extrinsic motivators may not be good preparation for life beyond school, however, as Self-Determination Theory posits that effort and persistence on a particular task are typically higher when a person is more intrinsically motivated (Ryan & Deci, 2000). This study measured the effect of the Genius Time Project on student intrinsic motivation for learning and doing science. For those students whose intrinsic motivation was lower prior to the project, their scores on the survey instrument used indicated a significant positive shift in their intrinsic motivation, which suggests that the experience of a free-choice inquiry project may play a positive role in shifting student attitudes toward learning.

It was consistently clear from student interviews that motivation for engaging in inquiry in this particular project was almost entirely intrinsic: most spoke of wanting to complete it because they chose the topic and because they were interested in learning more. Grades were not a motivating factor, as this project played no role in their achievement grade in class. In addition, several spoke of continuing this type of inquiry beyond science class, into other classes or parts of their personal lives. Many students were also explicitly motivated by the opportunity to share this part of their life or personality with their classmates, which is not a typical motivator in school projects. One sixth grader said:

> *"I worked pretty hard on it, a bit harder than maybe some assignments that I had no control over because I could choose what I wanted to do to work on it. So, that was fun, and it made it more enjoyable to put time into."*

Another shared:

> *"I guess probably one of my interests was the fact that I just love YouTube so much, and it just kind of hooked onto my mind and I thought, 'Oh, maybe this would be a good thing to study.' Now I'm even more interested, and now whenever I watch videos I occasionally see if I can search up the analytics for that video and see the data."*

While students may have different sources of motivation in different facets of their life, different subjects in school, or even different days of the week, the experience of planning and executing a personal project in science class may provide a window for some into intrinsically motivated learning, opening students to possibilities they did not know of, or igniting curiosity that was previously latent.

Conclusion

When I first introduced this project to my students, there was a mix of confusion, excitement, bewilderment, and skepticism. "We can pick *anything* we want?" (yes) and "It doesn't count toward our grade?" (no) and "Does it have to be something to do with what we are learning about in science?" (no) were common questions I heard again and again. The only requirements were that each project must start with a question and that students must pitch their idea to the class, set goals for themselves, create some final product, and present their work. Students did incredible and creative projects about creating and sampling foods; researched new topics like dreams, evolution, sports, YouTube, military aircraft, hypnotism, and the Bermuda Triangle; built models of planes and cars; created photography portfolios; wrote poems; created a survival guide; and even created a working basketball from scratch.

While I knew that a project that required a great deal of student agency in a low-risk (ungraded) environment would match some of my students' skills, I was surprised by how many of my students responded with high effort, investment in their own learning, and meaningful engagement with inquiry beyond my expectations. This study showed that a free-choice inquiry project was truly an effective tool for student growth in 21st-century skills, particularly when this growth is emphasized as the primary goal for the project. My students were also clearly driven to pursue their inquiry goals in part because of

the autonomy they had, and they developed agency for learning and self-efficacy through progress in the project. Finally, more students were motivated strongly by the internal satisfaction of learning and doing science (intrinsically) following completion of this project than prior to it, suggesting that a free-choice inquiry project can be a powerful tool for motivating learners.

Teachers across grade levels, subjects, and student types have achieved success engaging their students with inquiry in similar free-choice "Passion Projects" or "Genius Projects" (see Juliani, 2015; McNair, 2017; Reuer, 2017). This study contributes to a growing pool of meaningful data that reinforces the success reported by teacher practitioners, provides evidence to support the power of emphasizing agency in inquiry, and contributes to the development of tools to support holistic student growth in both knowledge acquisition and skill building.

Sam Woolford is an educator and ecologist who has taught science for over a decade in muddy salt marshes, on rocky shores, wading in streams, aboard boats, and in aquariums, museums, planetariums, and classrooms. He currently teaches elementary and middle school science at an independent school in New York City.

References

Aguire, B. (2012). Rubrics for teachers: Differentiation & the slide rubric. *Owlcation*. https://owlcation.com/academia/Student-Success-via-Effective-Differentiation-The-Slide-Rubric

Barron, B., & Darling-Hammond, L. (2008). *Teaching for meaningful learning: A review of research on inquiry-based and cooperative learning*. Powerful learning: What we know about teaching for understanding. Jossey-Bass.

Code, J. (2020). Agency for learning: Intention, motivation, self-efficacy and self-regulation. *Frontiers in Education, 5*. https://doi.org/10.3389/feduc.2020.00019

College Track. (2014). *College Track student GRIT rubric* [Table]. http://www.kriegerland.net/http:/www.kriegerland.net/wp-content/uploads/2016/03/CT_GritRubric.pdf

Condliffe, B., Visher, M. G., Bangser, M. R., Drohojowska, S., & Saco, L. (2016). *Project-based learning: A literature review*. MDRC.

Dewey, J. (1916). Democracy and education: An introduction to the philosophy of education. The Free Press.

Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. *Psychological Science in the Public Interest*, 14(1), 4–58.

Glaser, B. G. & Strauss, A. L. (1967). The discovery of grounded theory: Strategies for qualitative research. Aldine.

Hawley, R., & Reichert, M. (2009). *Teaching boys: A global study of effective practices.* International Boys School Coalition. http://circle-education.wdfiles.com/local--files/start/Teaching-Boys?ukey=f866f260633dff3d2d45442ff0688222c6eb0aed#page=90%7C

Itin, C. M. (1999). Reasserting the philosophy of experiential education as a vehicle for change in the 21st century. *Journal of Experiential Education*, *22*(2), 91–98. https://doi.org/10.1177%2F105382599902200206

Juliani, A. (2015). Inquiry and innovation in the classroom. Routledge.

Marsick, V., O'Toole, P., & Adams, B. (2015). *Mastery practice in teaching boys.* International Boys School Coalition. http://circle-education.wdfiles.com/local--files/start/Mastery-Practice-in-Teaching-Boys?ukey=094c8a41a9c59182af852b508d475742a40c2ac7#page=63%7C

McNair, A. (2017). Genius hour: Passion projects that ignite innovation and student inquiry. Prufrock Press.

Miller, A. K. (2015). Freedom to fail: How do I foster risk-taking and innovation in my classroom? (ASCD Arias). ASCD.

Munns, G., Arthur, L., Downs, T., Gregson, R., Power, A., & Sawyer, W. (2006). *Motivation and engagement of boys: Evidence-based teaching practices (Appendices).* Australian Government Quality Teaching Program.

Peterman, K., Withy, K., & Boulay, R. (2018). Validating common measures of self-efficacy and career attitudes within informal health education for middle and high school students. *CBE—Life Sciences Education, 17*(2). https://dx.doi.org/10.1187%2Fcbe.17-07-0122

Phillips, T. B., Ferguson, M., Minarchek, M., Porticella, N., & Bonney, R. (2014). *User's guide for evaluating learning outcomes in citizen science*. Cornell Lab of Ornithology, Ithaca, NY.

Poon, J. D. (2018). Part 1: What do you mean when you say "Student Agency"? *Pioneering, 57*. https://education-reimagined.org/what-do-you-mean-when-you-say-student-agency/

Porticella, N., Phillips, T., & Bonney, R. (2017a). Motivation for doing and learning science scale (Generic). Technical Brief Series. Cornell Lab of Ornithology, Ithaca, NY.

Porticella, N., Phillips, T., & Bonney, R. (2017b). Self-efficacy for learning and doing science scale (SELDS, Generic). Technical Brief Series. Cornell Lab of Ornithology, Ithaca, NY.

Reuer, M. D. (2017). Cultivating genius: An exploratory case study of the genius hour instructional technique and its effect on the identity and self-efficacy of high school science students [Unpublished doctoral dissertation]. Montana State University. https://scholarworks.montana.edu/xmlui/bitstream/handle/1/14914/ReuerM0517.pdf?sequence=4&isAllowed=y

Ryan, R. M. & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1): 68–78.

Strauss, A. & Corbin, J. M. (1990). Basics of qualitative research: Grounded theory procedures and techniques. Sage Publications, Inc.

Vaughn, M. (2020). What is student agency and why is it needed now more than ever? *Theory Into Practice, 59*(2), 109–118. https://doi.org/10.1080/00405841.2019.1702393

Appendix A

Color Codes

Overcoming Challenges

Motivation

Independence and Initiative (became Agency)

Engagement and Enjoyment

Persistence

Risk taking

Planning and Goal-setting (became Agency)

Self-Belief (Efficacy) & Growth (became Agency)

Reflection (became Agency)

Sample Teacher Journal Entries

Thurs 10/7

6th grade boys did their initial planning sheets on Tuesday, and 7th grade will do them on Friday. It was a struggle for some 6th graders to come up with a question and a product, and some were even reconsidering their interests. For others, like student 13, it was very easy and he could not wait to get started researching and creating a golf club. Student 3 is dead set on learning to cook meat, and his question is what is the best way to cook different meats. He seems excited, I am concerned about narrowing his focus. Student 7 was having trouble figuring out his idea, as was Student 8 - 8 was the only person not to get their sheet done in class time, but he did complete it for HW: He wants to learn to cast a fishing rod farther and make a guide for others. Student 7 decided on something to do with baking cookies, I think. Student 5 is interested in fishing as well, and we worked to narrow his question to How can I make a fishing rod that will catch fish no matter where I am? Finally, Student 9 was being very quiet and I was concerned he was checked out, but it turned out he had a good idea for a project about photography: How can I take the perfect picture? I want to connect him to [a teacher] to interview/learn about some resources.

Thurs 12/2

We are closing in on the end of this project. On Tuesday I gave my 6th graders time in class to begin planning and writing their final presentations, using the presentation planning checklist. Five boys are planning to present their projects next week, and then the remaining eight the week following. It has been fun to hear from them about their progress: Student 2 is excited that he is almost done making his basketball! Student 4 keeps telling me that he has not caught any fish with his lures, but he has continued trying. Students 3 and 7 are telling me about their cooking escapades, and 3 is excited to learn to film and edit a video of himself cooking a steak to show his process. Student 7 has been telling me about his "failures," like a cookie that was misshapen and spread-out, and his successes (like adding an extra bit of flour to solve that problem), and been equally excited about both. Some students are concerned about the "requirements" of the final presentation, but most have done their own thing, very independently, and I have yet to see much of it and have only heard about their experiences in their own words. Student 9 was using the timeline planning doc very effectively: I think I need to incorporate that one more next time.

In seventh grade, we have so much going on that I needed to push most of the presentations back a week. Two or Three of them will present in several weeks, and the others will work on planning their presentations. I recently gave Student 14 some feedback about his writing about military aircraft: it is so cool to see the information he found and was interested in, and his very good writing about the aircraft and their capabilities. His writing fluency on the topic is very high, seemingly much more clear than writing I have seen in class. I have heard from many of them about their progress - for some, it feels a bit stalled in the midst of a heavy work load and cumulative assessments. For others, they continue to plug away when they can. Just like in 6th grade, it is VERY independent work, so I am a bit out of the loop on some (or even most).

Excerpt from Interview with Student 11

Teacher: Okay. [Laughs] Okay. Was there anything about this project that felt different to you than other projects that you've done?

Student 11: Yeah.

Teacher: It's more like how…your approach to it.

Student 11: The fact that I was able to choose my own thing and I was basically by myself to do my own research, I liked that on this project because normally, let's say, "Oh, you're assigned to do this," and you just don't really want to do that, but then you just have to do it for the entire project. It gets a

little annoying, and then at the end when the project's finally over, you just feel like, "Okay, now finally this is done. Hopefully the next one's not going to be like this."

Teacher: Okay. [Laughs] Is there anything that you wish that you knew at the beginning of the project that you figured out along the way or close to the end?

Student 11: Yeah. I definitely should've figured out that I was not going to do a recorded video of my findings that… I should've just started with slides and then thought about if I was going to do a video or not, and yeah, that kind of messed me up in the final weeks.

Teacher: So, you had a plan to do one thing and then you realized that you needed to do a different thing?

Student 11: Yeah.

Teacher: Got you. At the end of that process or after making that decision, were you happy with how you changed it?

Student 11: Yeah. I was pretty happy because I realized if I had to film a video, I'd have to make it sound good for it to…yeah, to be interesting.

Teacher: Got you. So, you realized the challenges actually made it so that it would be better for you to do it a different way.

Student 11: Yeah.

Teacher: Interesting. What personality traits or interests of yours can we see in your Genius Time project?

Student 11: I guess probably one of my interests was the fact that I just love YouTube so much, and it just kind of hooked onto my mind and I thought, "Oh, maybe this would be a good thing to study."

Teacher: Yeah. Do you think that the Genius Time project helped you grow or develop that interest in YouTube? Are you more [Laughs] interested now than you were, or…?

Student 11: Yes, because now whenever I watch videos I occasionally see if I can search up the analytics for that video.

Teacher: [Laughs] You're curious in finding out more of the data about that video?

Student 11: Yeah.

Teacher: That's cool. What skills or talents did you use and/or improve during the time you were working on the project?

Student 11: I actually don't think I improved on many talents besides my finding information better, because I found more information than I find on my normal nine-week project for this. So, yeah.

Teacher: Was there anything that you did that you would be able to do on other projects that would help you find more information?

Student 11: Yeah, like doing the research first. I would just do the research first, then do the project later by jotting down notes. That's what I did for the Genius Time, and for my other projects I would just continuously… I'd do a little bit of research then copy it down. I found out that took way longer than just doing all the research first.

Teacher: So, you learned a bunch and then you were able to take that knowledge…

Student 11: Yeah.

Teacher…and apply it, sort of thing. It's a good skill. Did you use any other skills or anything that you want to…?

Student 11: Not really. I just got better at researching, I guess.

Excerpt from Interview with Student 22

Teacher: Okay, so the first one is: Describe your personal level of investment in the Genius Time project versus other projects at school.

Student 22: I was a little more invested in the Genius Time project because it was something that I was actually interested in and I wasn't being forced to do any specific topic. So, it made it a lot easier for me to actually want to do the project and be inspired to do different things in the project. So I was a lot more invested in it.

Teacher: Do you think that that meant that you spent more time doing it or more time thinking about it? Or was it about the same amount of time versus other projects?

Student 22: I would spend the same amount of time. I would do a different restaurant a Tuesday or a Thursday but I would spend more time researching it because I enjoy researching. It wasn't like a task to research it, so...

Teacher: Yeah. Is there anything that you wish you knew at the beginning of the project that you figured out along the way? Can be either about...

Student 22: Or what you think?

Teacher: ...your project or about the project, like the format, too.

Student 22: I would probably start not doing Google Slide presentation because I feel like there are better ways to get our ideas up and maybe it would be a Google Sheet or a chart or some way to make it more statistic and more educational. But other than that, I feel like I stayed pretty similar to my main goal from the beginning and nothing really changed for me.

Teacher: Was there anything that you didn't know about the project at the beginning, like what you would have to do or what, I guess, the requirements would be or anything?

Student 22: I guess, I think making the due date clearer would be a little better at the beginning, because it was kind of weird how different people had different due dates. I think it would be there would be a set due date at the beginning would be good. But other than that, I think everything else was good and everything else was clear.

Teacher: What personality traits or interests of yours can we see in your Genius Time project?

Student 22: I don't know. Probably the fact that I like geography a lot, so you could see that in my Genius Time project because, I guess, I did go to every...a lot of countries" food that I hadn't been before. And I like traveling a lot, too. so traveling around the city was fun. So, yeah, you could see those two things.

Teacher: And do you feel like working on this project helped you to develop or grow those interests?

Student 22: Yeah, definitely. Me and my mom have been doing stuff like this for a while. We went to different cuisines before this and we would try new things. But this was definitely better because we got back on track and we started doing new things, so this helped us a little bit.

Teacher: Do you think you guys will continue to visit different cuisines of the world, even after this?

Student 22: Yeah. Yeah, definitely. We've already done a couple since the project ended.\

Appendix B

Sample Interview Questions

[some adapted from Reuer 2017]

Describe your personal level of investment in Genius Time vs. other projects at school

1. What do you wish you knew at the beginning of the project that you figured out along the way?
2. What personality traits or interests of yours are evident in your Genius Time work? How did GT help you develop those?
3. What skills or talents did you use and grow during GT? How did GT help you develop those?
4. What major obstacles did you face, and how did you overcome them?
5. What were the keys to success in the GT project?
6. How did your classmates and teacher(s) help you achieve your goals? What do you wish they could have done more?
7. The ultimate goal of GT is personal growth for each student - do you feel that goal was achieved? Why or why not?
8. What are your thoughts on sharing your GT project with peers and giving/receiving feedback? How was collaboration different than in other projects you have worked on?
9. Were you proud of your work? Why or why not?

Starting points for whole class discussion:

What did you like or enjoy? What would you change? How is this project different than your regular school experience?

Appendix C

Genius Time Project Personal Growth Rubric				
Skill	Not yet (1)	Proficient (4)	Expert Level (7)	My score
Initiative: The ability to see what needs to be done and figure out how to do it independently.	I have to be told exactly how to do every job. There is only one right way to do the job.	I usually need a little guidance, but I can figure out most things once I get started. It's sometimes confusing when other people do things differently than I do.	I don't need to ask the teacher a lot of questions. I can think for myself and get the job done. Other people usually ask me how to do things.	1 2 3 4 5 6 7
Originality and Creativity: Creating unique ideas, projects, or products.	I can only think of ideas that others have already thought of. I don't like finding new ways of doing things, I just want to stick to the old way.	I have bursts of inspiration and creative ideas. From time to time I do get stuck and need some more time or help. It's sometimes easier to reuse an old idea.	I can think outside the box and I have a great imagination. I think of ideas others have never considered.	1 2 3 4 5 6 7
Inquisitiveness: Being curious about the world around you, how things work, and how to make things better.	I don't really care about how or why things happen. I don't have any questions about the world around me.	I'm usually curious about the world around me, and want to know what's happening and why. I don't always go out of my way to ask the questions I have or find out the answers.	I ask a lot of questions about why things are the way they are. I try to find out how to do things, and how things work.	1 2 3 4 5 6 7

Flexibility and Resilience: The ability to change your plans, ideas, or process when needed, and to recover quickly from setbacks, challenges, or failure.	Once I start something, I'm not willing to change my ideas or think of better ones. When I don't succeed, it takes me a long time to want to try again; If I get a second chance, I sometimes think "What's the point?"	If I hit an obstacle or things don't go to plan, it usually makes me think of another way to accomplish my task. Sometimes if I get stuck, I get frustrated or down on myself. I like to learn from what I did wrong and improve.	When I don't succeed or I face a challenge, I can think of new ways to do things. I can recognize other people's great ideas. If I have a second chance, I always take it and improve. I learn from my mistakes, but I don't dwell on them.	1 2 3 4 5 6 7
Risk-Taking: Trying things when you know you might fail, in order to learn or grow.	I don't try new things because I hate not succeeding. Sometimes I try something once or twice, and then give up altogether.	I like getting better at things, and I don't mind that I may not succeed the first time that I try something. When something is scary or seems too hard, I can usually keep going until I get comfortable or better.	I'm not afraid to try anything, even if I don't do well at first. I sometimes fail over and over, but I keep trying until I find a way that works. I try out new techniques, ideas, or arguments all the time.	1 2 3 4 5 6 7
Persistence: Sticking with a project or task, even when it gets much harder than expected.	I usually quit when I run into a snag; When I face a hard challenge, I usually don't believe I can overcome it.	When a project gets more difficult, I usually find a way to give my best effort. I can think of many times that I have worked hard to overcome challenges. If I get bored or things get tough, I sometimes try to	When the going gets tough, I work harder. I am determined to finish things that I start and I always follow through, especially when there are challenges.	1 2 3 4 5 6 7

		find a shortcut or an easier way.		
Problem Solving: Finding solutions to hard issues.	If I can't Google it, I usually ask someone else. If I don't know how to solve a problem at first, I won't go any further.	If I have faced a similar problem before, I can use my experience to plan and overcome. Sometimes it's hard to creatively solve a problem that I've never seen before without help.	When I face a challenge, I make a plan for how to overcome it. I try lots of different ways to solve a problem, and keep thinking if I don't know how	1 2 3 4 5 6 7
Communicating my expertise: Being able to share and teach others what I know, proudly and effectively.	I don't try to be an expert about anything. I sometimes pretend not to know about something so I don't have to share.	Sometimes I teach my friends or classmates things that I know. Sometimes it's hard for me to put what I am trying to say into the right words.	I know I am an expert about some things, and I am not afraid to share my knowledge with others.	1 2 3 4 5 6 7
Self-Reflection: Honestly evaluating yourself and your work, in order to grow.	I lie about my work or my grades. I can't or won't look honestly at the things that need more work or effort.	I usually know what I did well, and what I could have improved. Sometimes I am not honest with myself because it's hard, or I feel bad.	I can go through my work or my process critically (but fairly) and always know what I did well, and what needs improvement or more effort.	1 2 3 4 5 6 7
Self-Belief: Belief that you have the power and the ability to get things done, with or without help.	I start things knowing I can't do them. I set easy goals for myself, or I don't take goals seriously because	I like having a mix of easy and hard tasks or goals, so I know I can accomplish them. I believe that I can usually accomplish	I set challenging goals for myself. I believe that I can accomplish all my goals, either on my own or because I can find the	1 2 3 4 5 6 7

	I won't accomplish them anyway.	my goals, even when I challenge myself.	right people and resources to help.	
Productivity: The ability to work efficiently and diligently to achieve a goal, find a solution, or create a product.	It's hard for me to get started, and I have a hard time staying on task. I procrastinate a lot. I usually rush my work, can't wait to finish, or put in less effort than I should.	If I'm interested or know what I'm doing, staying on-task and focused is not a problem for me. Sometimes I procrastinate, rush, or put in less effort when things are hard or boring.	I can easily move from one step to the next in a project without losing focus or concentration. I sometimes lose track of time when I'm working. I finish things early.	1 2 3 4 5 6 7
Leadership: Motivating, encouraging, and setting an example for others.	I usually only care about myself or my success. Sometimes I put people down or criticize their work. I enjoy telling people they are wrong.	I am usually a good example for others to follow. I sometimes help encourage my classmates and teammates	I am always a good example for others to follow. I help encourage my classmates and teammates. I offer help and feedback so others can succeed.	1 2 3 4 5 6 7
Forward-Thinking: The ability to realistically plan and set goals for the future	I don't plan more than a few hours ahead. I usually let things go until the last minute. I often make things harder for myself by being less productive than I could be.	I can usually make a plan to get things done, but things don't always go to plan. If I procrastinate or am not productive, I make a plan to accomplish that work in the future.	I set academic and personal goals for myself that are ambitious but realistic. I often make sacrifices now so that I can get what I want later.	1 2 3 4 5 6 7