LEARNING MEDIA DESIGN 2017 FALL

QVFOLIO

Making Student Thinking Visible with E-Portfolios

HUMAN COMPUTER INTERACTION INSTITUTE
CARNEGIE MELLON UNIVERSITY

OUR CLIENT

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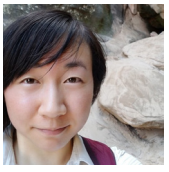

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ABSTRACT

Students often leave school with little more than memories, grades, and some products of their coursework (such as essays and completed projects) to refer to later on. Quaker Valley Middle School (QVMS) wants to change this by helping students create e-portfolios that make their thinking visible, so students, parents, and teachers alike can refer to and reflect upon students' learning over the years.

This project first drew on initial user research with college students with portfolios as well as with the teachers and students at QVMS to develop and evaluate a set of guiding design principles for our e-portfolio design. We then synthesized our partner QVMS teachers' needs and sketched out an experience map in a hypothetical general QVMS classroom with our proposed e-portfolio solution. This helped to clarify and confirm our understanding of our two partner teachers' shared needs and our initial ideas to meet these needs. From there, we designed two prototypes to test out different implementations of these guiding design principles. Using our insights from prototyping, we came up with a final design that met the needs of our partner QVMS teachers and followed our guiding design principles: QVfolio, an emerging e-portfolio system that provides a seamless and engaging experience to make students' thinking visible (for students, teachers, & parents alike) with a user-friendly platform and insightful prompt system to support students as needed. We have also included a concept video which demonstrates our proposed implementation of this final design.

BEST REGARDS

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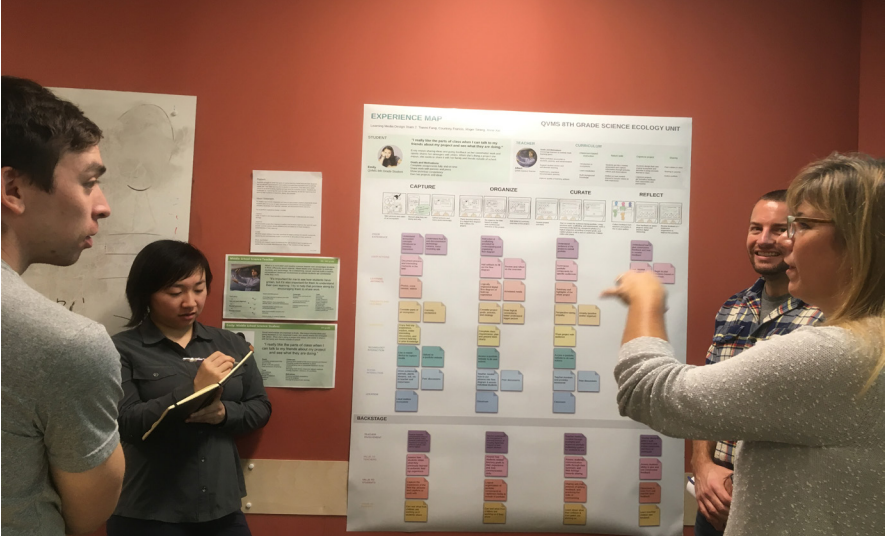
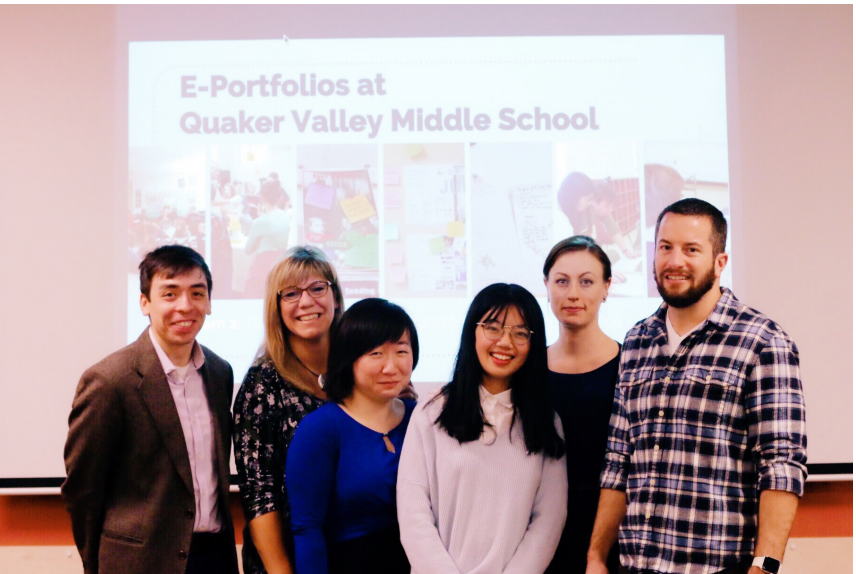


IDEATION

PROTOTYPING

FINAL DESIGN: QVFOLIO



FINAL REFLECTIONS

APPENDIX

INTRODUCTION

Open Portfolios at Quaker Valley Middle School

Helping Students and Teachers use Open Portfolios for Lifelong Learning

CONTEXT

Project Zero at Quaker Valley School District

Since early 2015, Quaker Valley School District (QVSD) has been actively implementing Harvard Graduate School of Education's Project Zero pedagogical framework to improve the school's educational practices ("Quaker Valley School District: Project Zero at QV"). Jeff Evancho, Quaker Valley Middle School (QVMS) art teacher and QVSD Project Zero Programming Specialist, elaborates, "If you can build a culture in your classroom that embraces deep, individualized thinking, then you've created a place where learning can thrive" (McGee, 2015). Project Zero's mission is to understand and enhance learning and thinking in the arts, as well as in the humanistic and scientific disciplines at both the individual and institutional levels.

What is Project Zero? An overview linked on the QVSD Project Zero website describes: "Project Zero has been committed to helping create communities of reflective, independent learners; enhancing deep understanding within disciplines; and promoting critical and creative thinking. Project Zero's mission is to understand and enhance learning and thinking in the arts, as well as in the humanistic and scientific disciplines at both the individual and institutional levels.

At the core of this pursuit are the following questions:

What is understanding and how does it develop?
What do thinking and learning look like?
What is worth Learning today and tomorrow?
How and where do thinking, learning, and understanding thrive?" ("Project Zero Overview: Quaker Valley School District")

"If you can build a culture in your classroom that embraces deep, individualized thinking, then you've created a place where learning can thrive." - Jeff Evancho, QVSD

The concept at the heart of Project Zero that stood out in our observations with Quaker Valley was visible thinking, or "making [students'] thinking visible," as teachers call it.

Agency by Design is a research initiative under the Project Zero umbrella that investigates the promises, practices, and pedagogies of maker-centered learning. Agency by Design's work is "built on the project concepts of maker empowerment, sensitivity to design, and the three maker capacities of looking closely, exploring complexity, and finding opportunity. These concepts acted as touchstones for us throughout our design process.

How can learners make visible their ability to look closely, explore complexity, and find opportunity? How can teachers qualitatively measure students' performance within the realm of these three core maker capacities? and
How can we collaborate with students and teachers to design a suite of practical documentation and assessment tools best suited to the development of maker empowerment?" (Harvard Graduate School of Education)

An Agency by Design blog post co-written by Evancho emphasizes appropriately prioritizing teachers' values for learning. For example, although content-related values were most frequently mentioned by Pittsburgh area teachers when asked to identify values that "defined [the individual teacher's] instructional practice," reasoning, creativity, perception of self, agency, perseverance, and collaboration were considered to be the most important learning values by these same teachers (Evancho & Wardrip, 2017).

At QVMS, teachers have heard about Steven Covey's metaphor (mentioned in the above blog post) of fitting rocks (our values) into a jar (the capacity of our lives). The key is to "focus on the large rocks first," and the small rocks naturally fill in the empty space between the large rocks. If we do not prioritize our most important values first, there will be no more space in our "jar" to fit them in.

The MakerEd Open Portfolio Project

The MakerEd Open Portfolio Project heavily influenced our design solution. MakerEd portfolios focus on documenting the maker-centered process of creation. MakerEd describes open portfolios as an "openly networked, decentralized, and distributed system in which the maker maintains control of the content and curation process." Additionally, the long-term goal of open portfolios is to document and showcase lifelong learning.

The use of open portfolios aligns with those of Project Zero and the Quaker Valley School District, as do the challenges. Through a Q&A session with Stephanie Chang from MakerEd, and our analysis of the MakerEd Research Brief, we became acclimated to the challenges of using open portfolios. Those that resonated with us throughout this project include challenges to the technical ease and timing of

documentation, motivating and guiding students through the documentation process, and helping stakeholders - students, parents, and teachers - find value in capturing and sharing their learning process.

PROBLEM

Thus, our team set out to identify the needs and values (the "large rocks") of the two Quaker Valley Middle School teachers we are working with (see "Emerging Patterns" under "Research Synthesis" of this document for more details). Although our 8th grade English Language Arts teacher and 6th-8th grade Technology Education teacher have their unique classroom cultures and cover very different subject areas, they shared similar needs and challenges related to the student e-portfolio.

The teachers we worked with are motivated and forward-thinking, and have a clear grasp on the goals for their classroom. But with this new initiative, they are challenged to help students make their learning visible, because their students lack an efficient

documentation and organization process that empowers them to "own" their learning and to build and share their process with others. Our teacher's needs and values focus on: making thinking visible, student autonomy and ownership of the portfolio, and a simple, seamless, and student-friendly portfolio experience.

However, our teachers currently struggle to:

Manage the plethora of technologies (digital and physical) being used within the classroom and across the school

Learn the capabilities of each classroom technology and then optimally implement their classroom learning goals/ values using these technologies and

Organize various sources of documentation to tell the bigger story of student learning over the school year.

Problem Statement

Using Maker Ed's definition of an open portfolio (Maker Ed: "About Maker Ed's Open Portfolio Project") as a guide-line, we developed this problem statement based on the values, needs, and challenges of the two Quaker Valley Middle School teachers we are working with:

“ QVMS is looking to create a seamlessly integrated & easy-to-use portfolio experience that encourages students take ownership of the process of documentation, curation, and sharing; and facilitates self-reflection; showcasing learning, interests, and accomplishments over time.”

USER RESEARCH

RESEARCH STRATEGY

Our research process began with reading existing research about portfolios and the maker movement. Next, as a group, we looked at four existing portfolio platforms, and analyzed them in terms of features and learning goals. Then, we interviewed four experts who created and used sophisticated portfolios for a variety of purposes. We created user insight boards for each of these experts (see Appendix), and a model that described their portfolio creation process.

We were matched with Joe Prosdocimo (Pre-Engineering Technology), and Schuyler Kidd (English Language Arts) from Quaker Valley Middle School, who were looking for a portfolio solution for their classes. To better understand their needs, we conducted semi-structured interviews with them and traveled to Quaker Valley Middle School, and observed Joe and Schuyler teach. Our notes were used in affinity diagramming sessions to generate insights about their needs. We created proto-personas for each teacher, crafted a problem statement and presented our findings to the teachers. At the same time, we created a student survey that enquired about sharing projects, feedback and saving work. Schuyler and Joe ensured that their students, 188 in total, completed the survey.

ESTABLISHING A BASELINE

What are the goals and challenges of an open portfolio?

How can we conduct user research?

How should we synthesize and interpret this and future data?

Literature Review

We reviewed papers and books focusing on open portfolio research and user experience design, which helped us understand e-portfolio goals and challenges, and design principles and techniques.

Type of Data: Qualitative data about understanding of open portfolio, as well as principle and principles and methods of user study

Artifacts: Reading reflections

What values do they create based on Maker Ed OPP qualities?

What instructional methods are used to promote the development of expert practices?

What are social characteristics of the learning environment?

What are motivational strategies?

Competitive Analysis

We analysed four open portfolio platforms based on learning heuristics: Seesaw, Fresh Grade, Portfolium, and Build in Progress. Through analysis, we described features, functionalities, language, media and social interaction affordances of each online learning system.

Type of Data: Qualitative data about characteristics of each online learning system

Artifacts: “Best practice” presentation document, comparative matrix

What are goals and motivations in making a portfolio?

What is the process of creating a portfolio? (Both general ideas & specific projects)

What are available resources and tools?

How are portfolios managed and used long-term?

Contextual Inquiry: Expert Interviews

We interviewed four experts from different domains (product design, fashion design, human computer interaction and entertainment technology). Our contextual inquiry aimed to gather information about the motivations behind using portfolios and the processes people engage to build portfolios efficiently. We wanted to uncover best practices in creating and maintaining portfolios, and examine the short-and long-term motivations people have for starting and maintaining portfolios.

Type of Data: Qualitative data about motivations, goals, resources, process, curation, feedback and tools in portfolio creation

Artifacts: Planned question list, transcribed interview data, video and audio files, user profile insight boards, a synthesized portfolio model

See Appendix for Expert Personas

Secondary Research Insights

Readings for class affected our research methods, and an analysis of existing portfolio platforms prepared us to discuss the merits of SeeSaw with Joe Prosdocimo.

At the beginning of the semester, we read the first chapter of E-Portfolios for Lifelong Learning and Assessment by Darren Cambridge. He analyzed a personalized portfolio that a senior undergraduate student made, and concludes that the student "has clearly learned something about how he thinks, learns, and makes ethical choices through the reflective writing … that went into his portfolio" (Cambridge,17). When one of our clients, Schuyler Kidd, mentioned that she wants her students to reflect on their works, and to select a fraction of their writing for the portfolio, we recognized that this would help the students understand themselves.

When we were preparing to conduct ethnographic interviews with expert portfolio makers, we read the first chapter of About Face, which suggested basic techniques to use. First, they suggested that two designers conduct each interview, and to designate one designer a moderator and the other a facilitator. While the moderator conducts the interview, the facilitator notices gaps in questioning. The roles are helpful, but the designers also support each other. We used this technique for the expert as well as user interviews. The second recommendation was to approach early interviews in an exploratory nature (Cooper, 11-14). Although we went into interviews with prepared questions, we also explored what interviewees said in depth. Show and tell was an interview method we used extensively in our expert interviews, as well as during our observation at Quaker Valley Middle School. The expert portfolio makers show-and-told us about their projects. Students showed us how they use Schoology and Google Drive, and one young woman served as a tour guide in her ELA classroom.

Prior to meeting our clients, we researched several portfolio platforms. Our research on SeeSaw helped us understand Joe's experience with the app. Through our research, we found the app to be user friendly because of its simple interface. A teacher can take a picture or video on a device, and post it to a student's account. As a result of the design, uploads of media to individual accounts requires few steps. We also found that teachers can create skills and tag media with those skills, which Joe mentioned in his interview. Finally, captioning media is an additional feature we read about, and a feature of SeeSaw that Joe's students used to "make their thinking visible."

Prior to constructing our proto-personas for our clients, we read chapter three in About Face about personas. The chapter impressed upon us that one important purpose of a persona is to put the users' goals front and center. It also encouraged us to infer goals from behavior, and to be open to clues as to user goals throughout interviews.

In order to develop an ideal portfolio solution, we wanted to understand the benefits, challenges, and processes engaged by expert users. We performed a contextual interview with four people who used their portfolios before, during, and after their college experience, examining best practices in areas that include: goal formation, resource management, process management, content curation, feedback, and tools. We also looked at intrinsic and extrinsic motivational factors. From these interviews, we found distinct patterns in the portfolio creation process - which are reflected in the e-portfolio model:

Experts relied almost entirely on external motivation to organize and create portfolios (all). This was likely because the portfolios were developed for academic purposes.

The project drives both the process of the project and the portfolio-making process.

Documentation is more project-focused and aides the portfolio creator to think through and successfully complete the project.

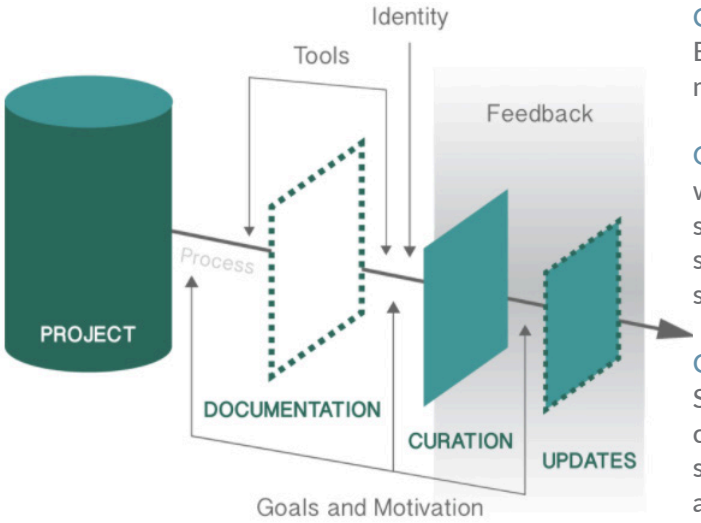
All experts got feedback while curating their portfolios. Some from peers, some paid.

Experts were challenged to balance their self-representation with the external needs (Joan). This seems to be related to the goals of the portfolio. Those applying to academic programs (Shan) had more success in representing themselves.

None of our experts created the portfolios in real-time. Some weren't sure what the complete "story" was until the end of a project, and selected evidence to support their narrative after the fact.

For the portfolio, the creator curates existing documentation to reflect the creator's work and identity in the way they would like their audience to perceive them. Feedback drives this iterative cycle of curation and updates (to update curation of the portfolio, to create new documentation, or both).

Our initial e-portfolio experience design includes the following stages, which were developed from our expert research and continuously refined by our research and materials from our classroom instruction. Each component offers a touchstone for evaluating the portfolio process, and the model was continuously refined by our research and materials from our classroom instruction.



Our initial portfolio model was based on expert interviews, and was updated throughout our design process.

Capture

Ease of capture and documentation is improved through mobile devices and cloud storage

Organize

wCustomizable project flow diagrams scaffold how students organize their work for each project, and the system allows artifacts to be annotated to increase student's understanding of their learning.

Curate

Students select artifacts from their workflow to create portfolios for specific audiences, captioning and summarizing project components to tell a story to their audience

Share and Reflect

Students can present custom portfolios to the right audience and reorganize and update them to include reflections and notes on the evolution of their learning.

Identifying User Needs

What are the classroom culture and attitude?

What is the expectation of portfolio from teachers?

What techniques/tools are employed in class?

Who will be the audience and what are benefits for them?

Semi-structured interview

We interviewed Joe and Schuyler remotely using Zoom, so we could get a feel for their vision. This gave us an opportunity to learn how teachers fulfill Quaker Valley's mission and values before going on-site. It also helped us structure our goals for the site visit.

Type of Data: Qualitative data about priorities, processes, and classroom and school initiatives. History and context.

Artifacts: Planned question list, transcribed interview data, video and audio files.

Reference: Contextual inquiry techniques from Contextual Design (Beyer, & Holtzblatt, 1999)
Reveals the details and motivations implicit in people's work
Makes the customer and their work needs real to the designers
Introduces user data as the basis for making decisions
Creates a shared understanding of the data throughout the team

Interview Insights

JOE
Technology Education

Interviewing Joe gave us an opportunity to learn about his needs and pedagogy. The beginning of the interview centered on his success with SeeSaw. Using its tagging, sharing, captioning and commenting features on pictures of student work helped him document his students' progress towards his learning objectives.

Using SeeSaw presented Joe with more than just a way to document growth. SeeSaw was a tool that allowed him to expand his pedagogy. It all began by sharing his pictures with the students. At the end of class, they would caption pictures with explanations of what they were doing and why, as well as comment on each other's work.

This **peer feedback** undoubtedly caused students to see their work in new ways, and to learn how to use feedback for improvement. Additionally, commenting presented an opportunity to teach students about digital citizenship. He also took advantage of the students' commenting to teach how to write constructive feedback.

"My "look fors" - the big rocks in my class - are perseverance, collaboration and empathy. I need examples. That's what I'm looking for as the kids go through the project."

- Joe

While SeeSaw was good for helping Joe meet his goals, he decided to stop using it after the school implemented Schoology because he didn't want technology use to dominate what his students were learning. He tried to use Schoology in the same way as SeeSaw, but could not do so in a time-efficient way, "I took 45 mins to upload pictures of class one day in Schoology." He also expressed his desire to give students a seamless experience several more times, explaining, "I hate the fact that I'm going to make them do a second thing," which made us realize that this was one of his needs.

"We talk about building each other up, finding right things to see, ways to critique student's work rather than be negative. We never want to be hurtful."
"Some kids will just say "that's cool", and I always encourage them to go further to say why you think it is cool."

- Joe

We learned that Joe wanted students to be more **active creators** of their portfolios. Other findings included: the Launch Notebooks students use to record their design process, along with reflections the students make at the end of each project, are things Joe thinks would be good to digitize and share.

"I would like kids to kind of take ownership of their own documentation process, their own portfolio."

- Joe

We learned that Joe really valued students **sharing their work with each other,** them making their thinking visible by writing captions, and giving **feedback** to each other, because he said that he planned on going back to SeeSaw, in spite of his concerns about a seamless student experience.

Interviewing Schuyler gave us valuable information about her goals and motivations. She thinks it's important for students to see how much they've grown, so naturally she sees portfolios being mainly for the individual student, with families as another audience. Currently, they have one chance at the end of the year to look at all of their work, and it "surprises them" how they've matured over the year. This packet of writing is passed on to the high school, not them. They don't have ownership over it.

SCHUYLER
English Language Arts

We also learned about Schuyler's pedagogy; of particular relevance is that she lets students choose much of what they write about, as long as they're writing in the genre being taught. Over the course of the year, they write major pieces that inform, argue a point, tell a narrative and analyze literature; they also reflect on their experiences in class in a writer's notebook. She adapts the amount of choice to her students' ability levels, because with research, which is hard, comes with choice. For her struggling students, she lets them pick among three choices that come with research already done.

"It's important for kids to see, even when they look through their portfolio the end of the year, what they did at the beginning of the year, they see how much they've grown, but that's the only time they're able to do that, at the end of the year. And they're surprised by what they've done, so I think it's important for them to have a place to keep that moving forward."

- Schuyler

Schuyler's students use Schoology to access assignments, Google Drive to record their writing, and NoRedInk to learn grammar. Schoology has been implemented school-wide by most teachers, but they are not aware of all of its features yet. Schuyler gives her students feedback on their writing digitally, which is new for her

One of Schuyler's goals is to have students reflect on their writing. We found that she focuses more on student learning than grades. About a year ago, she tried to move to an entirely gradeless system, but the administration didn't let her. Currently, she returns writing pieces to students with feedback, without grades; later on, in individual meetings, she shares the grade and why they got it.

Not surprisingly, Schuyler envisions that students select some of the writing, including smaller pieces, to go into their digital portfolios. She also would like them to reflect on the process for each piece of work. In summary, Schuyler's priorities are to increase student autonomy, reflection and awareness of their growth, particularly in writing.

"I don't give them the rubric right away. I'm going to give them the writing with all the feedback on it [and give them the rubric later]... so they have a little time to think... as opposed to just being irritated or happy, whatever the case may be, about their grade."

- Schuyler

Onsite Observations

Quaker Valley Middle School Site Visit

At the middle school, we observed students working in order to understand social patterns, and then engaged them with questions about how they worked, what they were working on at the moment, and how they received feedback. We documented classroom activity with audio and visuals, paying particular attention to decor / signage, instructions, and other elements of "classroom culture."

What are common social behaviors?

How do "leader" students emerge?

How do students prioritize class time?

Do students make choices that prioritize learning?

Ethnographic Method (informal interviews)

Our main research method on-site was an ethnographic method, informal interviews of students in their classroom environment. It was observational, but the students were aware of our presence so it wasn't a true "fly on the wall" scenario. We approached convenience samples around the classrooms, engaging students in their classroom environment.

Type of Data: Qualitative data about student behaviors, tool interactions, preferences for student autonomy.

Artifacts: Photographs, audio recordings, field notes, links to websites, tools list.

What are the classroom culture and attitude (compared with teachers' ideas)

What are activities in class and how do students perform?

What are interactions between teachers and students, and among students?

Narration (IDEO Method Cards, p17)

We asked the teachers and/ or students to describe their process while they engage it. We can gain insight into user priorities, challenges, and "work-arounds" they commonly use.

Type of Data: Qualitative data about student behaviors, tool interactions, preferences for student autonomy.

Artifacts: Photographs, audio recordings, field notes, links to websites, tools list.

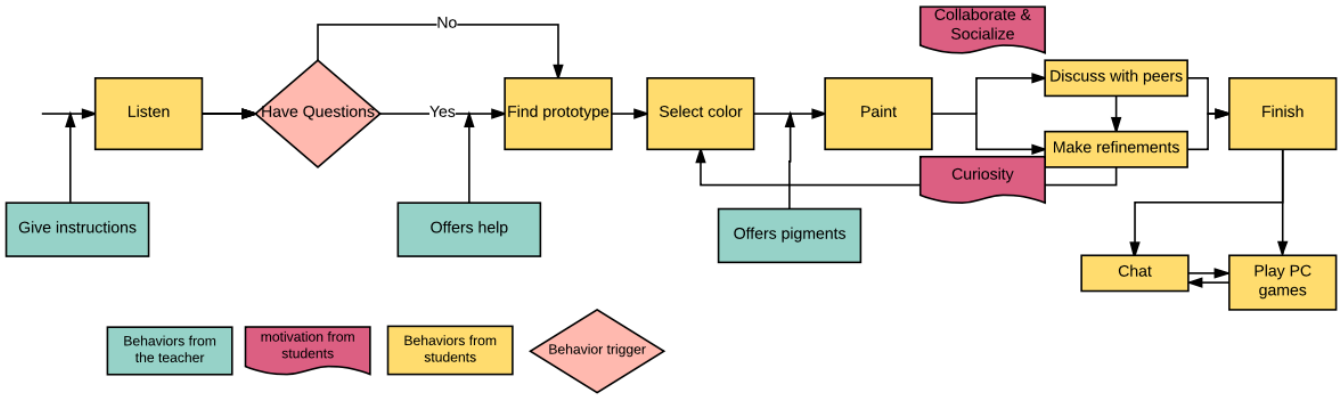
Technology Education Class

Classroom Insights

Classroom Environment: Technology Education

At the middle school, we observed students and teachers in both two class: Education Technology and English language Arts.

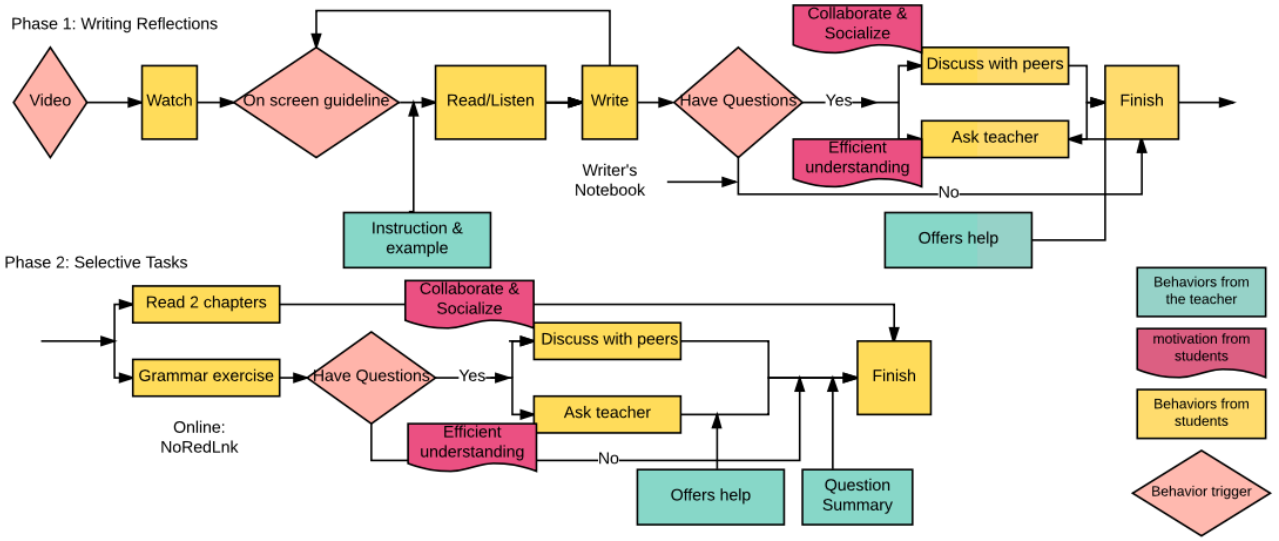
In Technology Education class, students were required to paint their “CO2 Car” in different colors. After finishing projects, they could use computers in the lab and play games. In this classroom, students were very active and willing to share their projects with peers. They discussed color selections and made refinements based on feedbacks or self-evaluations. However, no documentation behaviors were observed. They did have a LAUNCH Notebook as a documentation tool but did not use it in this section. No one took pictures as well. The documentation process is inadequate.



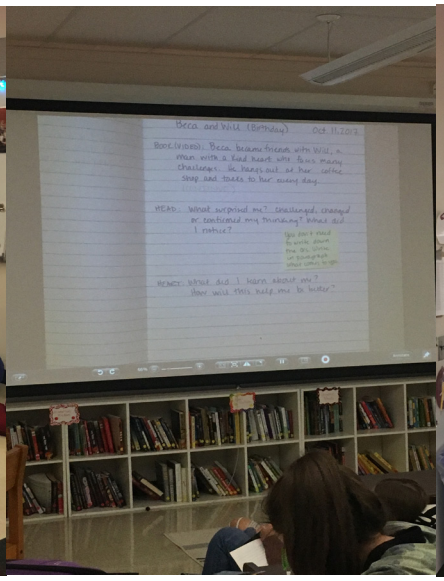
Behaviors in the Technology Education Class

Classroom Environment: English Language Arts

In English Language Arts class, students were required to finish one required task and one selective task: writing down reflections about the video they watched, and finishing grammar exercise on NoRedInk (posted on Schoology) or reading two chapters of a book chosen by themselves. They used ‘writer’s notebooks’ as a low-level documentation tool: Reflections on notebooks were personal and low-organized, and most of students would not share their notebooks with others. Besides, although they would discuss grammar questions and reflections sometimes, cooperation is not strong in class.



Behaviors in the English Language Art Class



Tools

Digital Tools

There are multiple technologies being used for learning within classroom and across the school. Schuyler uses many digital tools while Joe only uses Schoology currently. They are both worried about the disruptive switches among different technology throughout the school day.

School Environment

- QVMS is the only middle school in district: decisions can just be made in there
- Carry out using Schoology this year. Teachers can choose how they use it, and some people uses it more heavily than others.
- Switched over to Common Core State Standards recently around this time
- 17-25 students per class

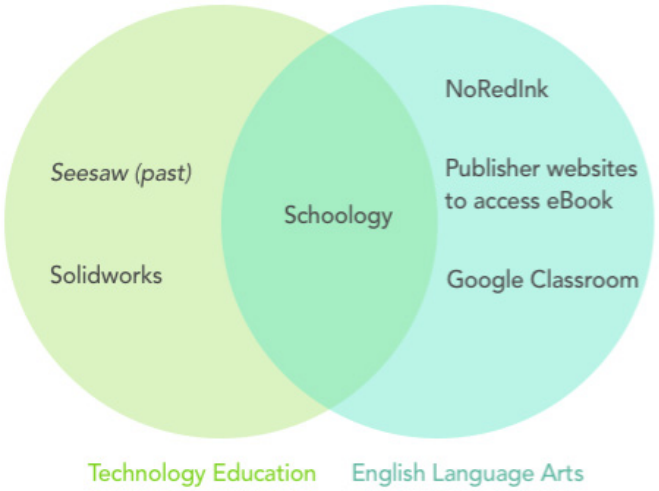
Technology Education Classroom: Physical Tools

- LAUNCH notebook (not used in our observations but is a part of curriculum): a scaffolding to help students document their design process based on LAUNCH Cycle.
- Model paper: some students would print their 3D models and bring home (not required)
- Posters about how to use Seesaw
- Posters about LAUNCH Cycle
- Computers
- Tools for making prototypes

English Language Arts Classroom

- Writer's Notebook
- Paper handouts
- Posters about "Signposts to notice"

Both teachers want the seamless experience in information acquisition, documenting, sharing, and optimizing physical and digital tools.

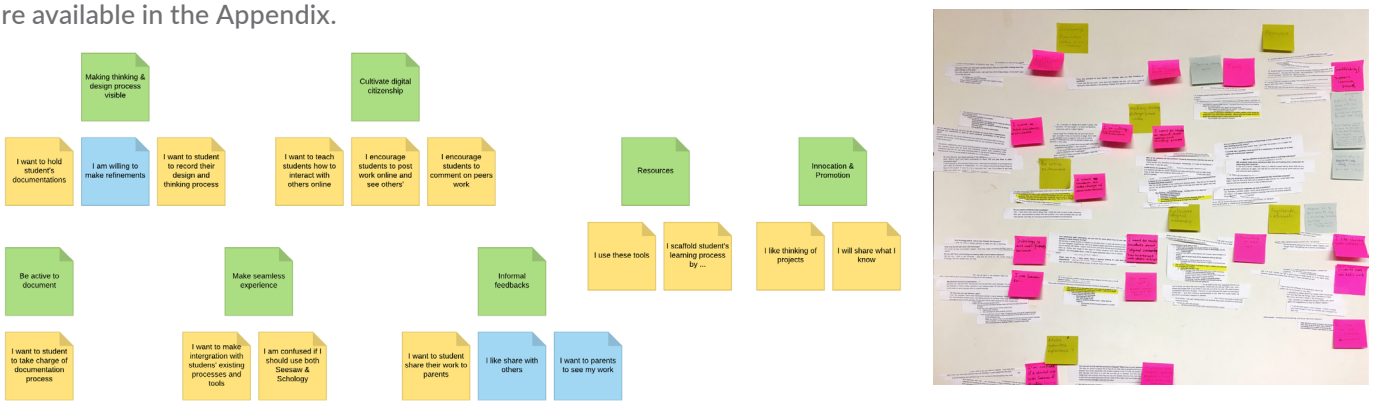


Digital Tools used in classrooms

SYNTHESIS

Persona Development

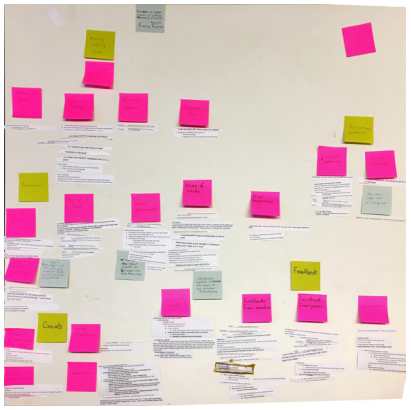
After conducting interviews with Joe and Schuyler and observing them and their students at Quaker Valley Middle School, we had gathered a lot of data. Through affinity diagramming, we were able to discover connections among what they said and did. Like in all affinity diagramming, finding natural relationships among data led to groups. Naming these groups, and then grouping them, led to higher level goals. Thus, synthesis of the raw data helped us realize their goals that they had not explicitly stated. Larger versions of the affinity diagrams are available in the Appendix.

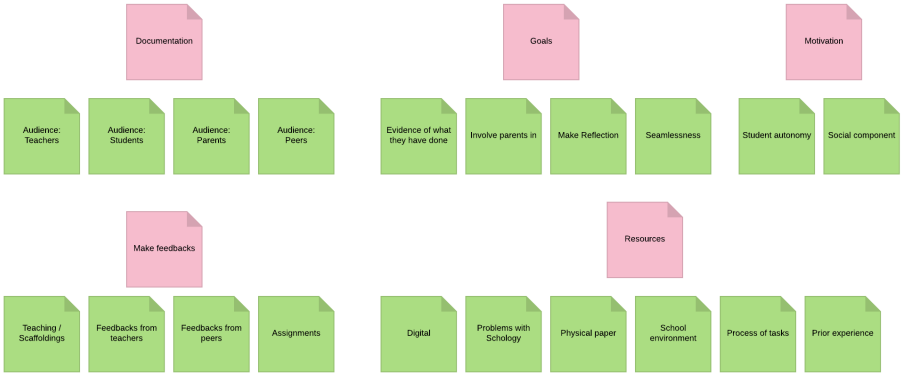


Full affinity diagram for Joe
Yellow post-its summarize raw data from Joe. Blue post-ites summarize data from Joe's students. Green post-ites group together yellow and blue post-ites, and represent goals.

We found Schuyler's goals to be focused on the individual student: tracking writing, encouraging reflection, supporting their autonomy and sharing their work with parents. For Joe, we found his goals to be: making student thinking visible, empowering students to take charge of their own documentation, encouraging feedback, teaching digital citizenship, leaving space for informal feedback and giving students a "seamless" technology experience.

These goals became a key part of our proto-personas of Joe and Schuyler, which we used to build our problem statement.





Full affinity diagram for Schuyler.
Green post-ites summarize raw data from Schuyler's interview and observation. Pink post-ites group together green post-its.

After conducting interviews with Joe and Schuyler and observing them and their students at Quaker Valley Middle School, we had gathered a lot of data. Through affinity diagramming, we were able to discover connections among what they said and did. Affinity diagramming led us to two personas. We combined them into a fictional persona so we could more comprehensively manage needs.

JOE | Technology Education Teacher

6th - 8th grade

Joe has a positive attitude and is process-focused. He's motivated to make students' process visible in the classroom, in order to ensure understanding. He's focused on modeling behavior for his students in the makerspace, so course expectations are clear.

Joe is always looking to improve his own processes and help his colleagues do the same.

Goals and Motivations
Making student thinking visible

Empowering students to take charge of their own documentation

Encouraging feedback

Teaching digital citizenship

Leaving space for informal feedback

Looking for a "seamless" tech experience for students

Challenges
Streamlining documentation

Tools
SolidWorks 3D modeling
Schoology (briefly)
Seesaw (formerly)
LAUNCH Design Framework
Maker space / PC lab

"I always encourage them to tell me *why* they think something is cool. If you have a thought we want you to have a conversation about it."

Tech savvy
low — high

Tech and goal alignment
Low — high

Student autonomy
low — high

Process-oriented
low — high

Technology Education Student
mini-persona

Social relationships are important to maker education students. They enjoy sharing ideas and contributing to one another's work, and openly share mistakes and strategies with others.

Goals
Meeting project goals

Motivations
Showing technical competency

Challenges
Technical challenges
Workshop challenges

SCHUYLER | English Language Arts Teacher

8th grade

Schuyler is a thoughtful and accepting teacher who encourages her students to be creative and think differently. She is welcoming, casual, and has designed a creative, personalized classroom environment to ensure her students are comfortable while they work.

She considers herself a rebel in her school for giving students a lot of autonomy.

Goals and Motivations

Track writing (reading and presentations are secondary)

Encourage reflection

Strong focus on the individual student (less on the sharing and collaboration)

Wants to share student work with parents

Supports student autonomy

Challenges
Documenting comments and feedback
Increasing opportunities for self-directed learning
Opportunities for reflection

Tools
Chromebook
Schoology
Google Classroom
Overhead projector
"Writer's Notebook"
NoRedInk.com
My HRW site

"It's important for kids to see how they've grown; what they've done, what they've learned from it, and how their thinking changed along the way."

Tech savvy
low — high

Tech and goal alignment
low — high

Student autonomy
low — high

Process-oriented
low — high

English Language Arts Student
mini-persona

Social relationships are important to English students. They want to help each other, and often seek collaborative support for their work.

Goals
Complete assignments fully and on time

Motivations
Enjoys when work is engaging

Challenges
Managing work across tools / delivery methods

STUDENTS NEEDS AND MOTIVATION

How do students document their work?

How do students get feedback? Is this feedback useful?

Where is the gap between the current reality and the ideal regarding documentation, feedback, and sharing?

Post Visit Student Survey

We analyzed our site data prior to sharing a student survey with QVMS.The 23 questions included classroom demographics, Likert scales on attitude, and open-ended questions following principles from Muratovski (2015). We wanted to incorporate as much of our learning as possible into the survey so we weren't duplicating efforts or wasting time soliciting information we might already know.

Type of Data: 188 student responses, both quantitative data and qualitative data on these topics:

Sharing, interest in sharing, pride in work
Finished class projects
Works-in-progress

Feedback
Who, when
Value to student

Documentation
Importance to student
How and why students save work

Artifacts: Results summary

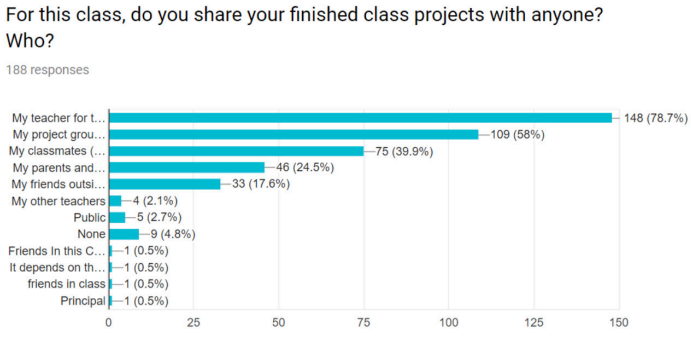
Post Visit Student Survey

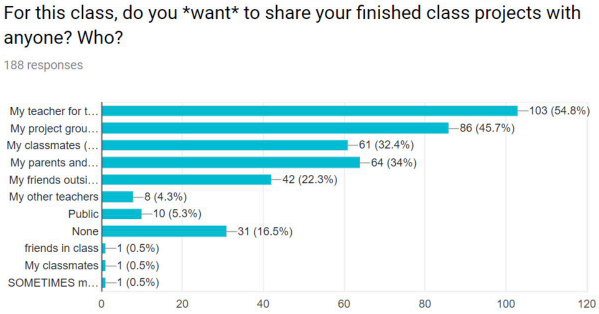
Who students share with vs. who students want to share with:

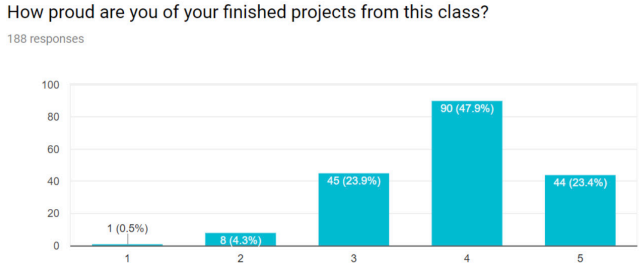
Students would generally like to **share with their parents/family & friends** more than they currently do.

A sizeable minority (15-20%) of students **would rather share their work with no one** (and notably, not with their teacher for the class).

How proud students are of their work does not seem directly related to their desire to share.







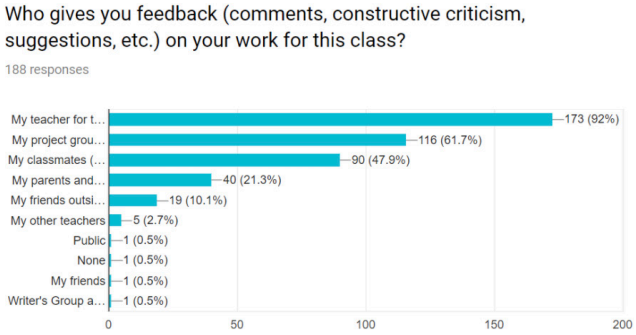
Most students seem to be proud of their work.

Feedback

Feedback is **generally limited to the classroom**, although some will also get feedback from **parents** (20%) and **friends outside of class** (10%).

Students generally find **seeing and commenting on peers' work as helpful for their own work.**

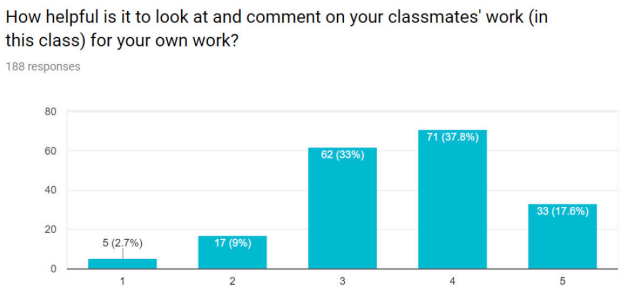
Students do **not seem to have trouble getting feedback** (i.e. rated it as pretty easy to get feedback).

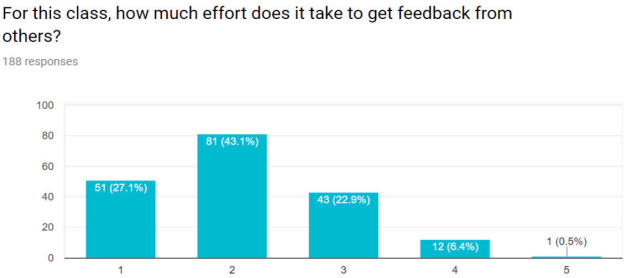


Documentation

Why students save their work: memory/souvenir/ decoration, pride in work ("cool"), spent a lot of time/ effort, help complete their project, may be useful for future class activities.

Why students don't save their work: no longer needed, useless after class year.





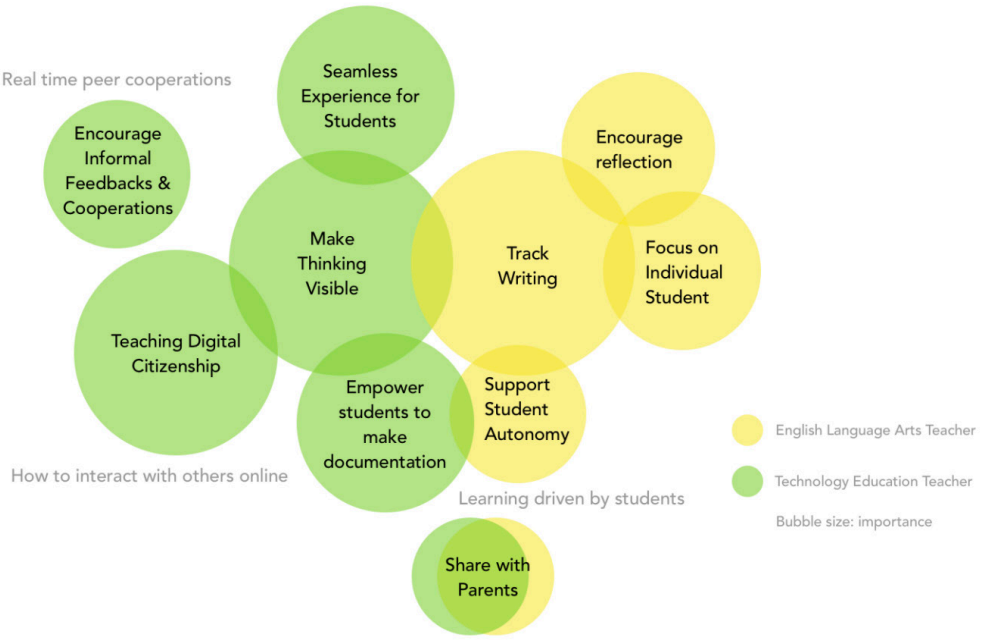
See Appendix for detailed survey results.

RESEARCH SYNTHESIS

SWOT ANALYSIS: CLASSROOM

In order to clearly define the needs of our two classrooms, we engaged an analysis of Strengths, Weaknesses, Opportunities, and Threats for each classroom using data from our initial research initiatives with teachers and students, and our classroom observations. We also wanted to understand where needs overlap, so that we might create a solution that benefits multiple classrooms.

	Technology class		English class
Strengths	Prior portfolio experience Process-focused class	**Collaborative classroom environment** **Focus on feedback / reflection**	Student autonomy and ownership of work
Weaknesses	Numerous technologies	**No current e-portfolio solution** **Lack of process supporting documentation**	Multiple digital tools No way to capture feedback
Opportunities	Cultivate digital citizenship	**Select more appropriate software** **Streamline documentation process** **Make use of physical space**	Facilitate reflection at a later date
Threats	Dynamic projects	**Limited class time** **Student motivation for documentation**	

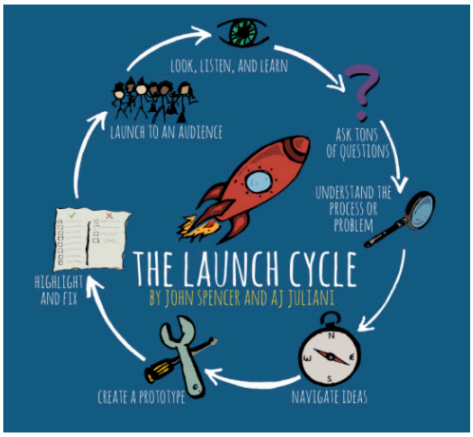


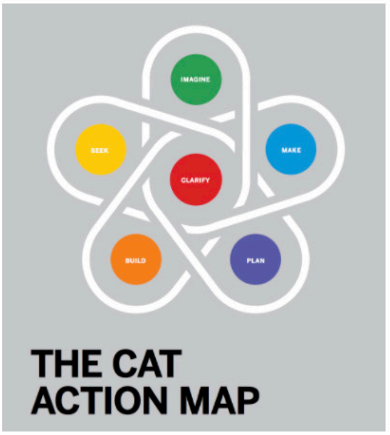
Identify overlapped needs

DESIGN INSIGHTS

Because we have a number of stakeholders, including two distinct classrooms, we need to ensure we are considering the portfolio as a system with needs extending beyond the student. Since we don't currently have access to example classrooms with portfolio usage, we need to look to secondary research done on similar classrooms. *The Open Portfolio Project's Research Brief Series (Keune)* is a great resource for better understanding existing portfolio systems. Since we're working with middle school students, the research brief on Lighthouse Community Charter School (p27) offers insight into a useful demographic of 7th - 12th graders involved in maker education. Aaron Vanderwerff, the robotics teacher mentioned in the brief, developed **a year-long plan**; for the first few months students choose simple skill and confidence building projects, followed by larger self-directed projects guided by student interests. Lighthouse teachers work with Maker Ed's AmeriCorps VISTA program on **professional development initiatives** that help them build portfolio projects that enable student choice while meeting learning and documentation goals. Lighthouse also provides a potential model for portfolio use for the duration of a student's learning career. Students continue building portfolios from K-12, with a **regular portfolio review** every two years, to give parents, teachers, and other students an opportunity to view and participate in student work.

Further inspiration can be drawn from a portfolio framework already in use in Joe Joseph Prosdocimo's class is the LAUNCH Cycle and Frog Design's Collective Action Toolkit.





EMERGING PATTERNS

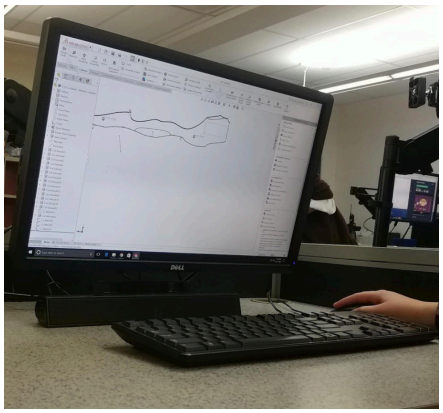
Goals and Motivations

Making Thinking Visible

Both classrooms facilitate interpretation, reflection, and sharing. Students are encouraged to explain their decision-making process to each other and offer feedback. Students generally find seeing and commenting on peers' work as helpful for their own work and felt they had a relatively easy time seeking and receiving feedback. Students do not seem to have trouble getting feedback (i.e. rated it as pretty easy to get feedback). Feedback is generally limited to the classroom, although some will also get feedback from parents (20%) and friends outside of class (10%).

Student Autonomy

Both classrooms handle student autonomy a bit differently, but the teachers value it highly. Schuyler's class allows students to choose from different variations of exercises to complete assignments, and she also allows students to make their own priorities during class time. For the most part, students decide who sees their work and who gives them feedback, but are encouraged through tools like NoRedInk.com. Students indicated an interest in this tool because they can customize the content.



"This one I went all out, trying to make it as light as I could. It's not very aerodynamic but it's light."
- Joe's student

It's important to students to exhibit pride & personal achievement when presenting their work online. Students should be empowered by their e-portfolio process to take charge of their own documentation. Because the content is more technical, Joe's students follow a very defined process, but they have the freedom to be creative within each step. For example, students had to use certain software to create a car that had the potential to win the CO2 race, but the students determine how important style and function are to their project. Some students knowingly made sacrifices according to their preferences.

System Usability

Though both teachers have classroom cultures that support documentation and reflection, neither are presently using any sort of documentation process. This is, in part, because there are no readily available systems that support the process in the way these teachers can build into their workflow. Though he found success with Seesaw, Joe had to abandon the platform because of a lack of integration with the new LMS, Schoology. Schuyler's process of documentation is less developed but all the components of documentation are present in her lessons. Both classrooms would benefit from a simple, seamless, student-friendly experience that integrates with the rest of the students' schoolwork.

Engaged parents

Parents are not really engaged currently, and both teachers are looking for ways to engage parents in the classroom. Neither has really found a process to engage parents meaningfully. Students describe parents as less engaged, interested only in final grades and digging into projects only when they are seeking clarification for student's failures.

Needs

Teachers control visibility

Teachers need to control who can see student work and group students within their classrooms.

Students own their work

Sometimes students want to share their work with parents, friends, and family. This sharing satisfies a social need and is unrelated to academic needs to submit The 188 students we interviewed indicated that they would like to share more among these groups.

There are also limited ways for students to share their portfolio beyond the website. Some students are interested in documenting, printing, and sharing certain parts of their process but don't currently have a way to share it.

"My parents usually only check our grades and stuff... if I don't get such a good grade they'll ask me if I tried and studied and I'll say 'yes' and they'll say 'you'll do better next time'."
- ELA student

Smooth technical process

Students and teachers can sour on a system pretty quickly when the process is perceived as irrelevant or cumbersome. If a process doesn't immediately demonstrate alignment with the needs of the user, they waste time and energy on a process that doesn't produce the result they need. In Joe's class, for example, Seesaw was abandoned because the technical process is too cumbersome with the school's new LMS. Although Joe was interested in solving this technology problem, the solution proved too time consuming and was abandoned (to be picked up by this team).

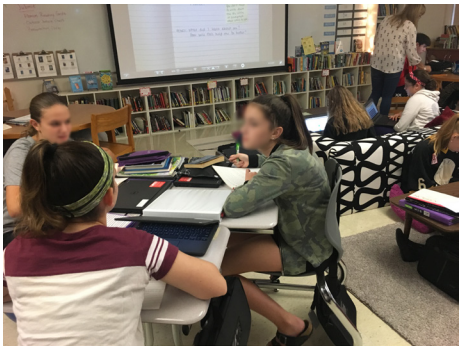
Essentially, schools suffer from too many systems and too little time to engage them. After some success with Seesaw's portfolio system, Joe couldn't find the same functionality once Schoology was introduced.

An engraving machine in Joe's classroom.

Challenges

Documentation process

Neither classroom has a documentation process in place, but they are reinforcing a culture of documentation in their classroom cultures. Each class nurtures a learning environment that is curious, conversational, and supportive, and offers students ample time to collaborate and discuss their work. The challenge for our team will be to connect the work that's already happening in the classroom to documentation processes that suit the existing workflow.



Technology Integration

Both classrooms use a variety of technology to do their work. There is a projection system in Joe's computer lab, and students have access to high quality software and internet (QVMS uses a filter to block certain content). The workshop includes a variety of hand tools, saws, an engraving machine, paint, safety equipment, and cleaning supplies.

Schuyler's English classroom includes an overhead projector, video projector, laptops, as well as posters, books, couches, and other physical items that help create the classroom culture.

Schoology is focal for QVMS, but doesn't need to be central to our solution. A proper process also may be able to obscure the use of multiple systems, as long as the results are useful.

Our solution will rely on opportunities to streamline and integrate technology into this process. Certain components can likely be streamlined (by using the same tech solution for multiple purposes), and others can be made more efficient by examining the process around technology use.

Integrating storytelling

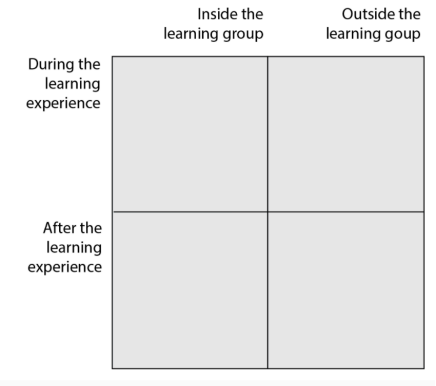
Presently, portfolios are only used for single classes at a time. This results in a series of related projects that tell the story of a course, but not necessarily of a student. Enhancing coursework in the manner described above will hopefully make room for students to develop their own "story" with the content. This also aligns with the teachers' objectives to support student ownership and identity development.

Increasing the presence of documentation throughout the classroom will give students ample opportunity to reflect on their work and select narratives and learning experiences that speak to them. These experiences can be curated by students to tell the story of their learning in a way that reaches out of the classroom.

Opportunities

Alignment of documentation and project processes

We have the opportunity to pay close attention to the processes already occurring in the classroom, and exploit them as opportunities for documentation and sharing. The process detailed on p75 in Krechevsky's reading offers a helpful breakdown of where and why documentation should occur.



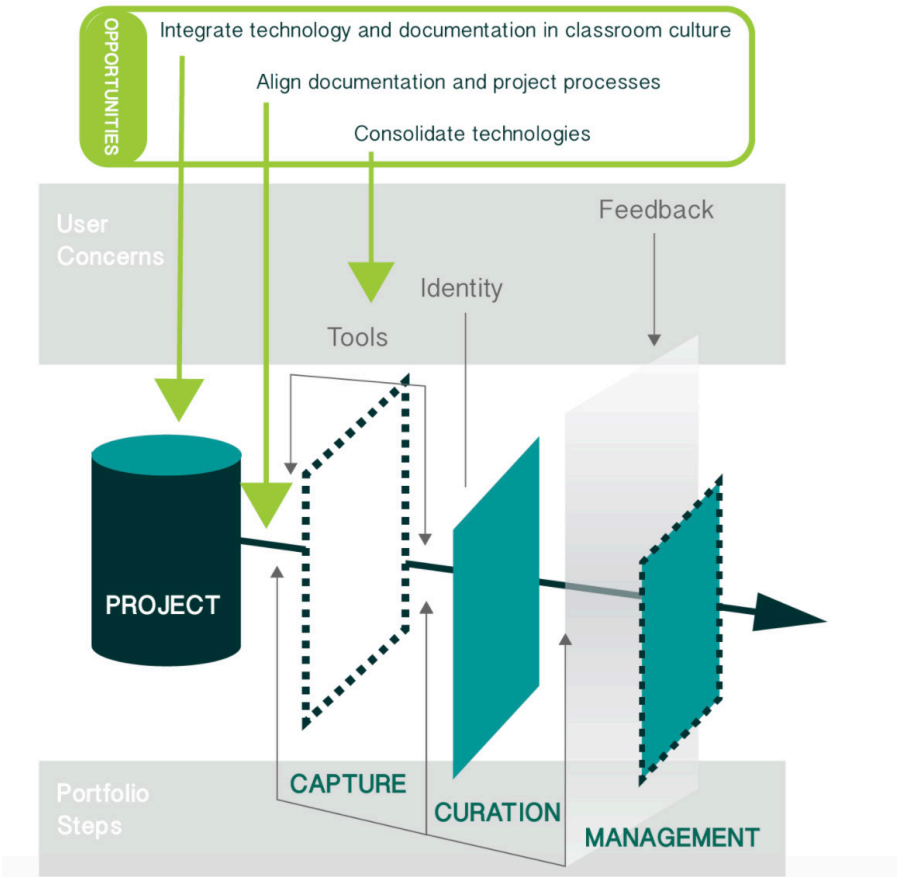
Documentation in 4 Contexts (Krechevsky)

Consolidation of technologies

Each classroom uses a number of different technologies for instruction and assessment. Although both teachers have indicated interest in streamlining students' technology, neither mentioned adjusting their own. We believe this is an important step in addressing challenges in the overall process in the classroom.

Integration of technology and documentation in classroom culture

This component helps students and teachers build a narrative around learning. By making documentation a core component of the classroom, students can more easily reflect and build on their work. Both classrooms have a culture that makes space for self-directed learning, iteration, and documentation; for our team it is a matter of designing an e-portfolio process that aligns with existing practices.



A modified portfolio process diagram that accounts for on-site research, with indications for user concerns, portfolio steps, and where in the process our opportunities lie.

VISION STATEMENT

In preparation to move forward in our design process, we return to our original problem statement based on the values, needs, and challenges of the two Quaker Valley Middle School teachers we are working with.

The guiding design principles that will drive our design moving forward are represented in this problem statement: usability and visibility ("seamlessly integrated & easy-to-use," "sharing," "showcase," "over time"), identity development and student autonomy ("students take ownership of… their work to ultimately showcase their learning, interests, and accomplishments over time"), simplicity of design solution ("seamlessly integrated & easy-to-use portfolio experience"), as well as generalizability and flexibility ("QVMS is looking to"). In the next section, we describe these guiding design principles in more detail.

"QVMS is looking to create a seamlessly integrated & easy-to-use portfolio experience that encourages students take ownership of the process of documentation, curation, and sharing; and facilitates self-reflection; showcasing learning, interests, and accomplishments over time."

GUIDING DESIGN PRINCIPLES

Based on our partner teachers' goals, motivations, needs, challenges, we identified the design opportunities for a student e-portfolio solution - as shown on the preceding page. To focus our future design work and assess our future prototypes and final solution, we want to keep the following guiding design principles front and center:

Usability and visibility

Hosting an e-portfolio online offers the broadest access to content and allows portfolio creators to update their portfolios from a multitude of devices.

An e-portfolio solution has to be easy to update and easy to view, or else fewer students will engage fully with the system.

Our QVMS teachers often highlight the importance of "making thinking visible," with a focus on the interpretation and sharing aspects of documentation (Krechevsky, Mardell, Rivard, & Wilson, 2013).

Sharing: students can share with whomever they wish. Joe emphasizes this sharing and feedback piece in his technology education classroom. Students also generally would like to share with their parents/family and friends more than they currently do *(Appendix: Student Survey Results).*

Design Implications

It is important for the students to be able to bring their work home and literally own their e-portfolio: both for the students themselves (for now and later on) as well as to share with their family and friends. Additionally, students' e-portfolios should be visible to an appropriate audience - which may be smaller for the English Language Arts class than in the Technology Education class. The e-portfolio platform should be easy for students to navigate, view, and update. Our solution should also support more and better curated content online, e.g. a curated selection of the Writer's Notebook, or more detailed reflection.

Identity development and student autonomy

This principle focuses on students' feelings, dispositions, and the classroom/school culture related to e-portfolios. This includes teaching **digital citizenship:** the norms of appropriate and responsible behavior regarding technology use. Students begin to build their own identity and take ownership of learning content and experiences.

Ideally, this design principle helps students take ownership of the documentation, curation, sharing, and self-reflection of their work to ultimately showcase their learning, interests, and accomplishments over time. This is an important area of focus from our research, and a large component of our problem statement.more than they currently do *(Appendix: Student Survey Results).*

Design Implications

Students select documentation tools and execute a plan of their own design. Consider the cultural implications of each of our e-portfolio design decisions moving forward to cultivate a positive and motivational culture around students' e-portfolios. This culture and climate is imperative for sustainability. Also consider the culture of each individual classroom and how this affects the e-portfolio experience. Moving forward, we plan to explore how students act after receiving feedback, as this relates to students' autonomy and ownership of their portfolio.

Technology should enhance learning

Simplicity of design solution

Technology should not distract from the primary classroom focus on students' learning and thinking. Students should be putting more time and energy towards thinking and learning rather than on technical process of documentation. Generally, students pick up on the technical aspects of a process easily; they know which tools to use and can build a workflow. Classroom resources should scaffold this process so students can direct more of their attention to learning.

Design Implications

Students are able to focus their energy on the process of learning and documenting, rather than spending too much time learning the technical aspects of documentation and sharing. We have identified some opportunities to reduce switching between technologies in the classroom workflow and plan to streamline this process.

Generalizability and flexibility

It allows the solution to be used for both classrooms. The ideal solution can be customized by teachers for their individual classroom needs. Although we focus on teachers' needs in our design process, students' needs directly influence their teachers' needs.

Design Implications

A flexible framework can provide a sufficient number of options to offer variation within learning environments. Giving teachers a choice in which components they adopt allows for a greater level of customization to work towards achieving their specific needs.

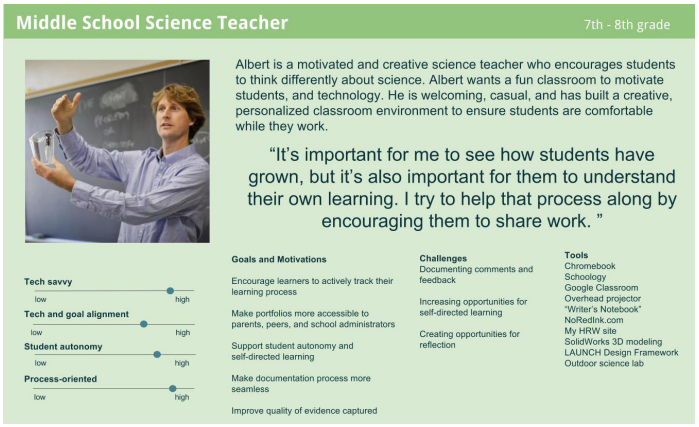
Assumption: Two unique classroom cultures can be served by the same technology framework.

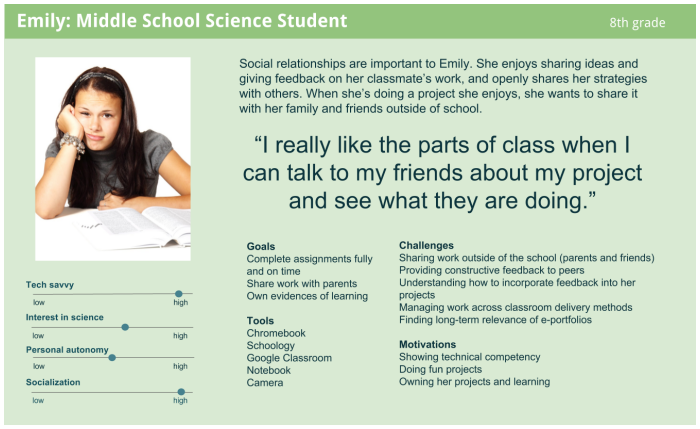
IDEATION

SYNTHESIZED PERSONA

We assembled rich data from individual classrooms, but in order to begin the design process we needed to find commonalities that could be addressed across classrooms. It was apparent that the classrooms had similar cultures, focused on students' learning process, reflection, collaboration and sharing, so we were optimistic that the design features we would select could be supported by these teachers.

Additionally, we constructed a hybrid student persona from discussions and observations we had made in the classroom.





We chose to create a fictional hybrid persona based on a science teacher who instructs seventh and eighth graders. We selected a science classroom because that environment includes both reading and writing exercises as well as lab time. This would enable us to account for needs that reflected both the Technology Education maker lab, as well as the English Language Arts class. Details of the synthesized persona include

Goals and Motivations

- Encourage learners to actively track their learning process
- Make portfolios more accessible to parents, peers, and school administrators
- Support student autonomy and self-directed learning
- Make documentation process more seamless

Improve quality of evidence captured

Challenges

- Documenting comments and feedback

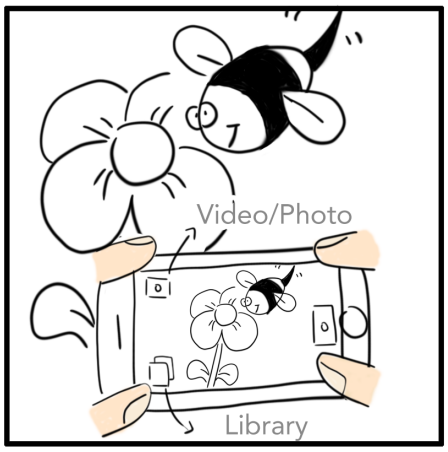
Increasing opportunities for self-directed learning

- Creating opportunities for reflection

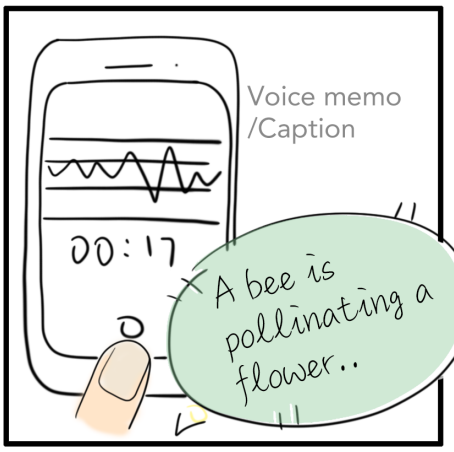
EXPERIENCE MAP

We had already created our own portfolio model, which was validated by a classroom activity that broke portfolio creation down into similar stages. We developed a set of storyboards and a user experience map that reflects the **Capture, Organize, Curate, and Share** steps of the portfolio process. We elected not to make Feedback a specific stage because we knew it had to be a throughline in our design. We want students to give and receive feedback at each stage of the process, rather than just on the final product.

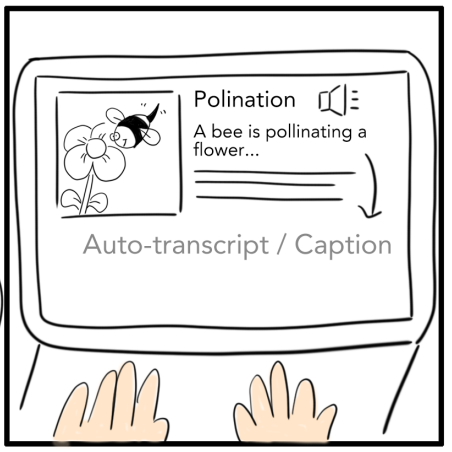
Capture



Take pictures or video of a real ecosystem.



Record what is captured and why (relevant descriptions).

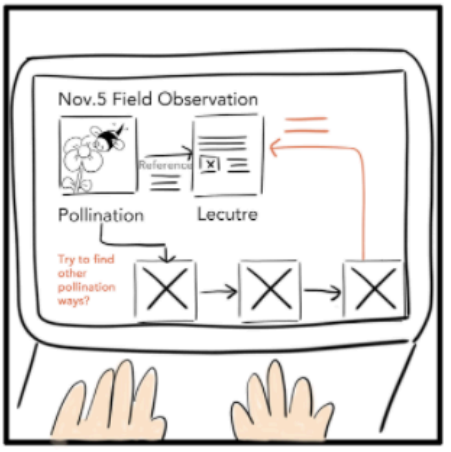


Upload pictures and enter personal notes (auto-transcript).

Organize

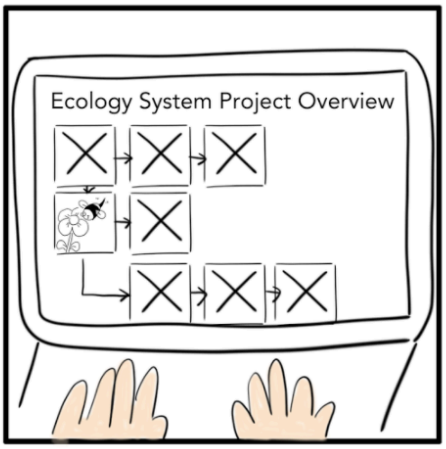
Learners tell a story about their learning experience by placing artifacts in a visual diagram.

Teachers support learners with prompts and provide them with examples.

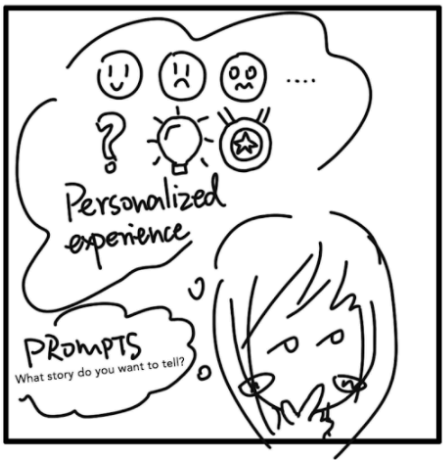


Based on prompts and examples, learners organize their learning evidence and make graphic organizers

Curate



Create and review project overview.

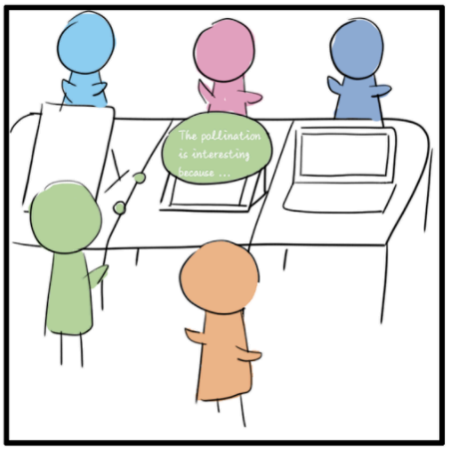


Think about their personal experience in the project and choose their own focus.

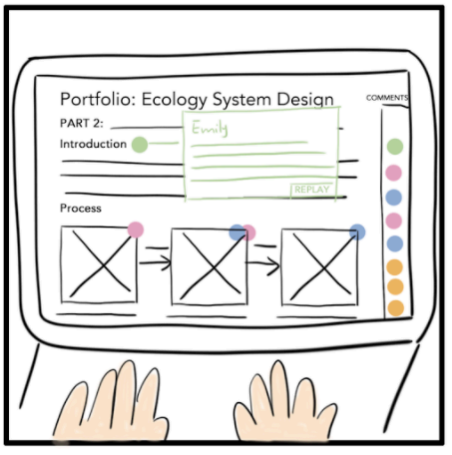
Create the audience-facing portfolio. Using previous work, scaffolding, and requirements, write a summary of the field trip, re-organize photos according to project goals, and caption artifacts to tell a story to audience. Every learner will have a different view.

Share and Reflect

Teachers provide prompts about how to practice digital citizenship (critique others' projects online appropriately).



Students publish their portfolios online and share. Collect feedback from teachers and peers in the in-class gallery.

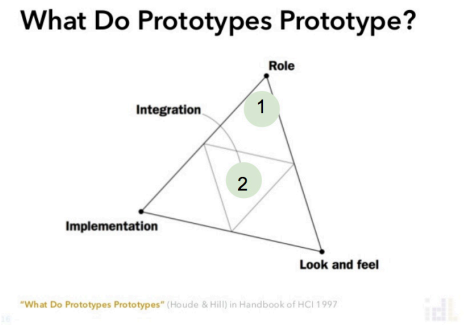


Students give feedback on peers' projects online and practice digital citizenship. They also review feedback and implement suggestions received to improve the portfolio.

PROTOTYPING

Our initial prototype was designed to help us better understand the way students think about portfolio creation, and the processes they readily engage in the classroom. In order to determine how our portfolio system could meet students' needs, we needed to understand their behaviors and identify opportunities for them to engage the portfolio naturally in their class work. We engaged a simplified paper portfolio to this end.

We knew that once we understood the user's goals, perspective, and workflow, we would be able to provide a more targeted digital solution in the second prototyping session. The second prototype used a series of digital tools to synthesize what we had observed from prototype 1 with our prior research into the needs of teachers at QVMS, getting us closer to the seamless design solution we were aiming for.



USER TEST 1

Our main goals for the first prototype were to understand how students capture and annotate evidence in the classroom, and how they organize their work to tell the story of their learning. In addition to better understanding their process, we wanted to identify areas where students might benefit from prompts that would scaffold their portfolio creation process to result in a way that would satisfy the goals of their teachers and QVMS - without too much interruption to the student's workflow. To do this, we tested a paper prototype of an e-portfolio system for capturing and organizing pieces of a project with 6th grade Technology Education students.

Questions we wanted to address included

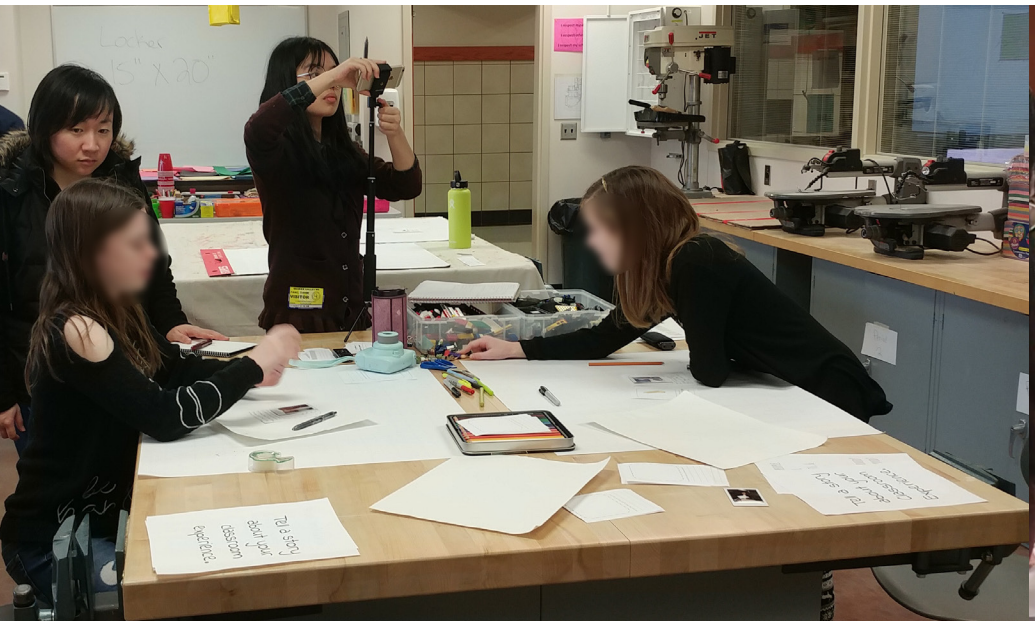
How will students organize their story?

Do they think strategically? Can they explain their

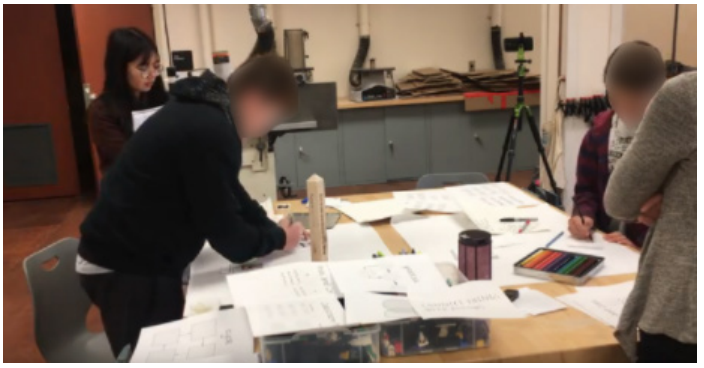
Are students willing / able to organize w/ scaffolding?

What level of scaffold should we provide?(ex. no scaffold, example models, pre-built model)

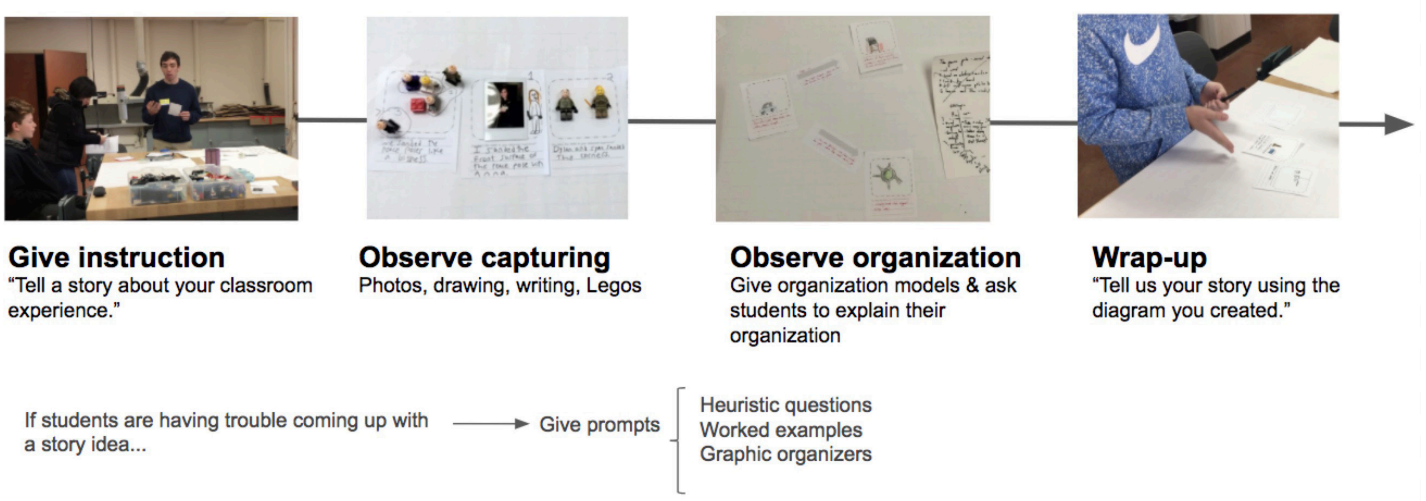
Will the capture interrupt their workflow?



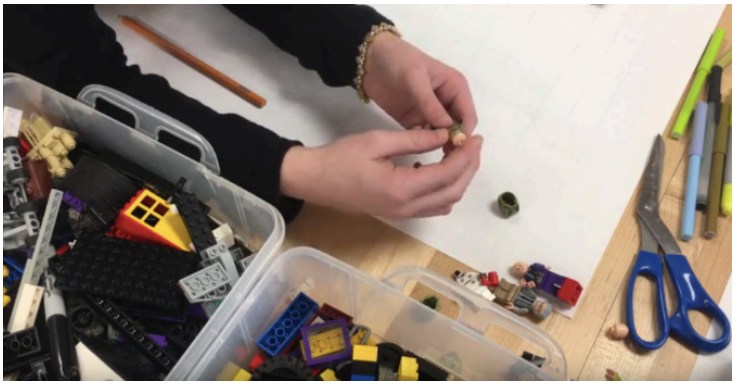
We set up in a quiet area in the technology teacher's classroom. After our two volunteer students were seated, we gave them an open-ended prompt: "Tell a story about an experience in this technology education classroom." We asked the students if they had any ideas for stories. After they started brainstorming, we showed them cards (see below) they could show evidence of learning on. They had the choice of writing, drawing or taking a photo and attaching it to the card.



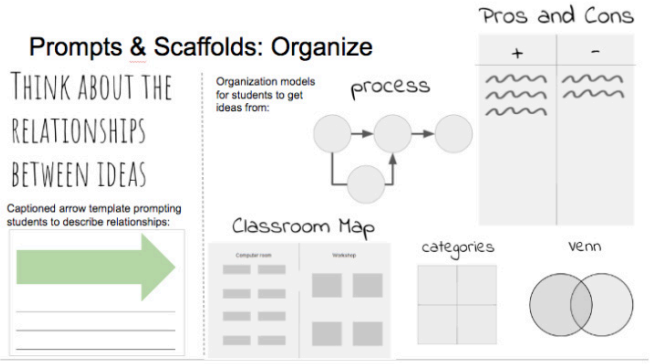
Two students capturing an experience in the Technology Education class



Process Overview



Students could use lego pieces to set a scene



When students appeared to struggle, we provided graphic organizers as scaffolds

""I really enjoyed it because I don't really talk about stuff like this to other people. So this was kind of relaxing for me to write it down."

- Joe's student

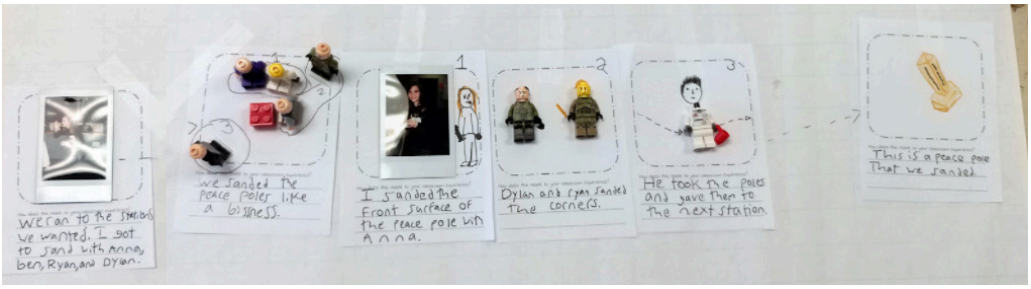
Our team showed the students examples of completed cards. We told the students they would be breaking their stories into parts, one part per card, and then organizing those parts. We gave them some graphic organizers for inspiration and arrows for connections. They worked on their stories for 15-20 minutes and then shared them with us.

FINDINGS

Guiding Question 1: How do students organize their story?

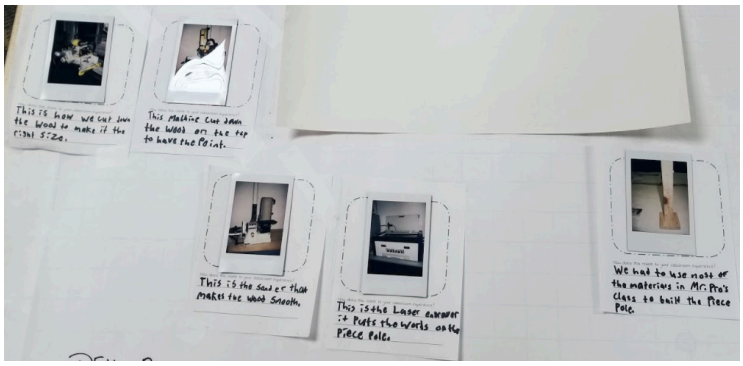
Four out of five students organized their stories linearly. The remaining student made a story that was composed of three interdependent parts. A subtlety in one of the linear stories was grouping evidence cards that were related, as opposed to spacing them out evenly (no grouping).

This story is about efficiency and collaboration during the Peace Pole project. Small groups of students worked together to operate a



"We sanded the peace poles like a business."

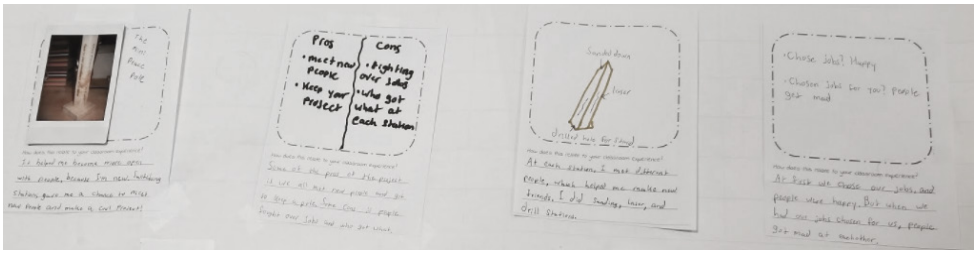
machine and do one part of the manufacturing process. There were even runners who took the peace pole to the next station. And there is a subtle difference in the organization of this story. A distinct group of evidence cards are grouped together!



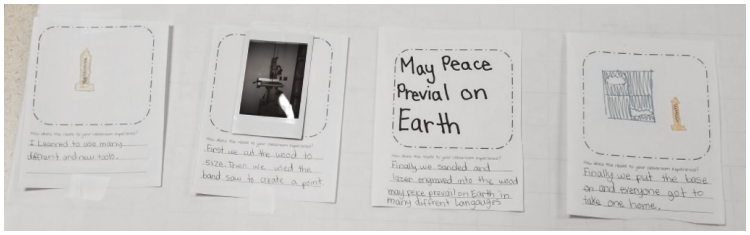
"This machine cut down on the wood to have the point."

This is a story about the Peace Pole manufacturing process from end to end. The photographs are of machines. Each evidence card details what the machine did to the peace pole. Although this picture does not show it, the original organization was linear.

"it helped me become more open with people, because I'm new."

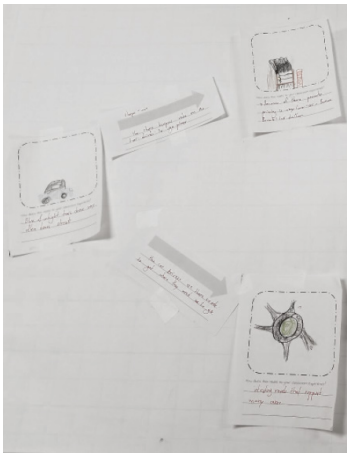


A story of a girl's experience with the Project. The main idea was the student meeting her classmates for the first time. Although the linear is organization, the cards do not logically come together to make a story.



"I learned to use many different and new tools."

A linear story about the process of making a Peace Pole. It begins with a statement of what the student learned, and then goes through the process all the way until the students took their projects home.



This student told a story about a recent trip to Ethiopia. The organization is a triangle of three interdependent elements.

> "For example, take the cars out, and the shop won't be able to get anything to sell. Take the shops out, and the drivers wouldn't have a way to make money. Take the roads out, and the cars would have a difficult time on the dirt."

Guiding Question 2: What prompts and scaffolds successfully give structure while supporting student autonomy?

Scaffolds

anything extra that helps students to accomplish a task

- Planning a story out on paper helped students think of how to tell it.

> "[the organizers] gave me a head start."

- The student who did the story about Ethiopia did not know how to tell a story. After looking through the graphic organizers, he had a framework for organizing his disconnected memories.

- The students figured out how to describe the process of making the Peace Pole together.

Verbal prompts

a question or statement that let the student think more clearly or deeply

> "Do these parts relate?"

When one of our team members asked this, the student made a new connection in his diagram.

> "That's a fine story to tell"

When one of the students asked if she could tell a story about the process of creating a Peace Pole, our team member reassured her that that was fine.

> "Can you tell me your story?"

When students felt as though they had completed their story, we asked them to tell it to us. We noticed that they sometimes added information in the verbal re-telling. Suggestion to teachers: prompt for students to explain their story to a peer and then write a summary

Guiding Question 3: How do the processes of documenting the story and organizing it interact with each other?

Students occasionally realized that their stories were missing a part, and then did a quick documentation. One student was basing his story on photos, so he took additional pictures. Another student was basing her story on lego-people, but when she realized that she wanted to add a piece, she switched to photography. None of the students got carried away with taking pictures, drawing, or building with Legos.

ADDITIONAL FINDINGS

In all of the stories, there was no mention of challenges or setbacks the students faced while making the Peace Pole. Perhaps this is because students were telling their stories retrospectively in a limited time frame. Also, they were not required to include this kind of content. Sometimes we asked questions about it, but this was not consistent.

The open-endedness of the initial prompt "Tell us a story…" led students to tell unique stories about the same event, that reflected their perspectives. For example, one girl focused on the Peace Pole project from an efficiency point of view. She repeatedly described the process being akin to a business. Another student talked about how the Peace Pole project helped her to meet people, and another described what the machines did to the raw wood.

For some students, this kind of activity is both unusual and satisfying. One student said "I really enjoyed it because I don't really talk about stuff like this to other people. So this was kind of relaxing for me to write it down."

Several pairs of students helped each other remember what they did during the Peace Pole project.

USER TEST 2

Testing a digital prototype of an e-portfolio system for capturing and organizing pieces of a project with 8th grade ELA students. Though the classroom culture was similar to that of the first prototype test, the students had different content and approaches to the material. We wanted to move our prototype closer to our ideal digital solution, so for the second prototype we supported students in using a cell phone to capture artifacts, and Google slides to organize their evidence.

We were also curious how the process differed moving from the Technology Education class to the more traditional English Language Arts classroom.

Questions we wanted to address included

Does a technology-based prototype affect student's understanding or performance of the task?

Does our approach to scaffolding work on a new task?

Is the revised capture process disruptive?

CHANGES MADE BASED ON FINDINGS FROM USER TEST 1

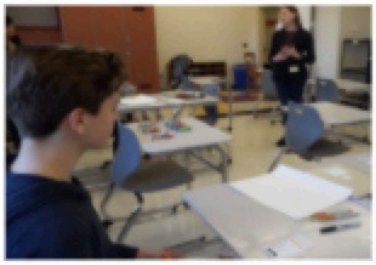
The biggest change to our prototype for User Test 2 was **going from a physical to a digital prototype**. We went digital for two main reasons:

One, lifelong learning is a goal of Quaker Valley and e-portfolios potentially can last forever. An e-portfolio can also keep projects from different classes, grade-levels and contexts in one central location.

Two, e-portfolios can be easily shared, which would allow anyone to comment on what is in the portfolio. This functionality also aligned with the technology teacher's interest in teaching digital citizenship.

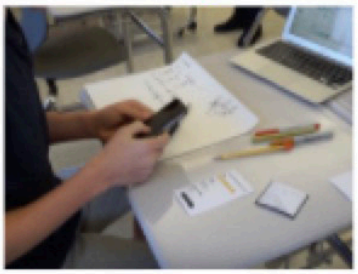
We tweaked the wording we used for user study 2, from user study 1. We referred to documentation as pieces or parts of the story. We also changed the prompt ever so slightly to be more concrete: "Tell us a story about something that you did or that happened to you."

Going into user study 2, we expected our findings to be slightly different from user study 1. The students we worked with before had been in the engineering class for only the last couple of weeks. They also had just completed a project. In contrast, we knew going into User Test 2 that the students had been in their English Language Arts classroom for several months. Therefore, they had more experiences to draw upon. We wondered if students would document projects, such as essays.

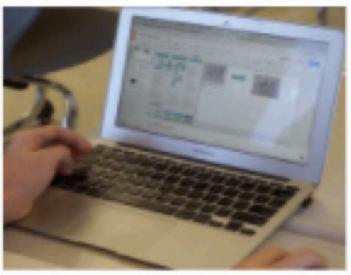


Give instruction
"Tell us a story about something that you did or that happened to you.."

Student brainstorm
Ask students to plan a story on paper. Then show students an example and encourage them to start documenting.



Observe capturing
Students use mobile phone to capture pictures and tag.



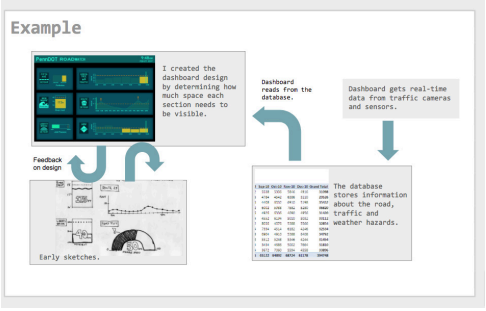
Observe organization
Students use Google Slides to create their graphic organizers and recap their story at the end

PROCEDURE

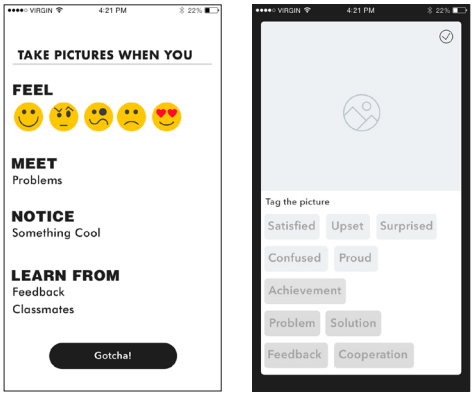
We met with students in a separate room, two at a time. They sat a few meters apart. We gave them blank paper, a laptop and a cell phone, and asked them to "Tell us a story about something that you did or that happened to you." After a few minutes of brainstorming, we showed them an example and encouraged

"You can use the phones to take pictures of here, or anything in your classroom, or in your teacher's class" - Anne (team member)

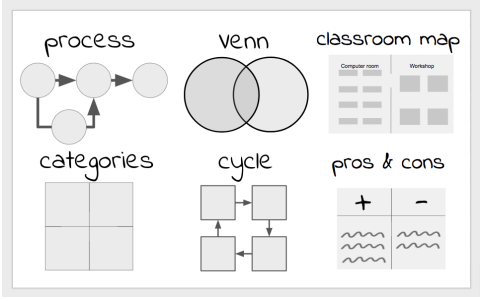
them to start documenting. The two students who had the most time with us documented their stories two ways. One learner took pictures of drawings. The other relied more on text (although she might have found or created an image if she had more time), but also took a picture of a screen. They wrapped up by telling us their stories.



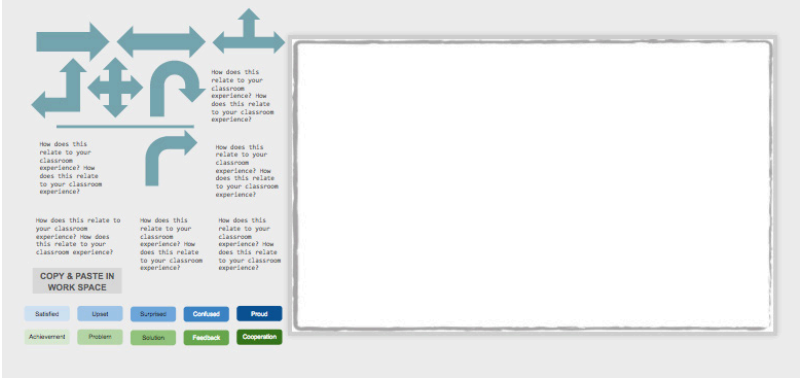
Example slide



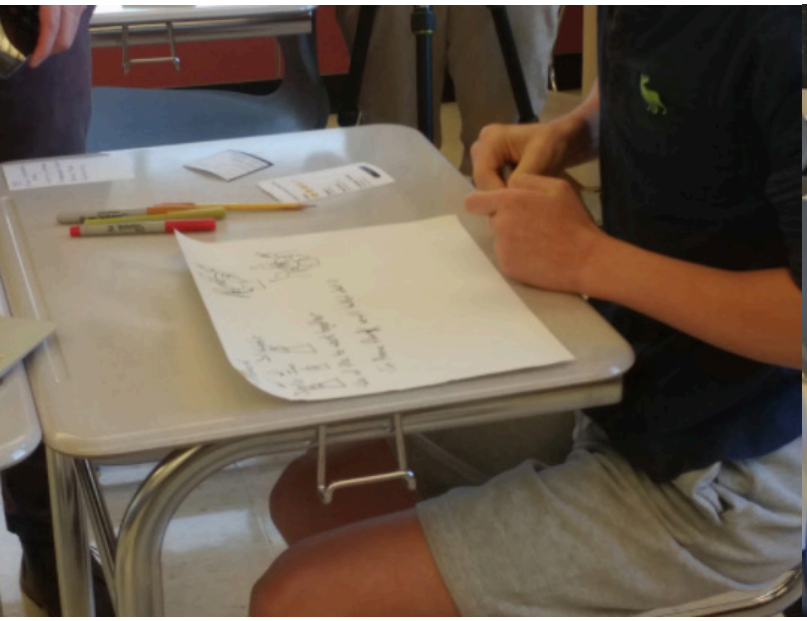
Mobile application prototype



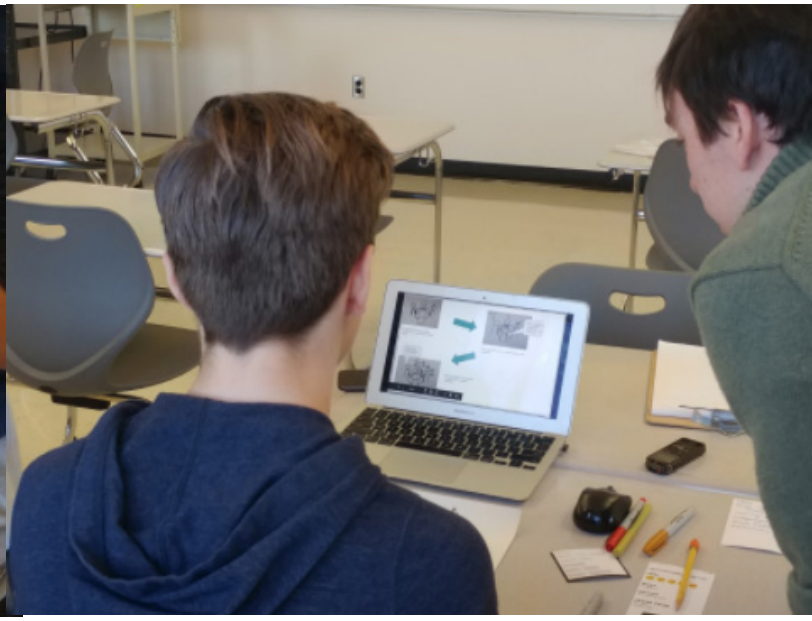
Digram prompt slide



Canvas slide where students create their graphic organizers



Planning a story on paper



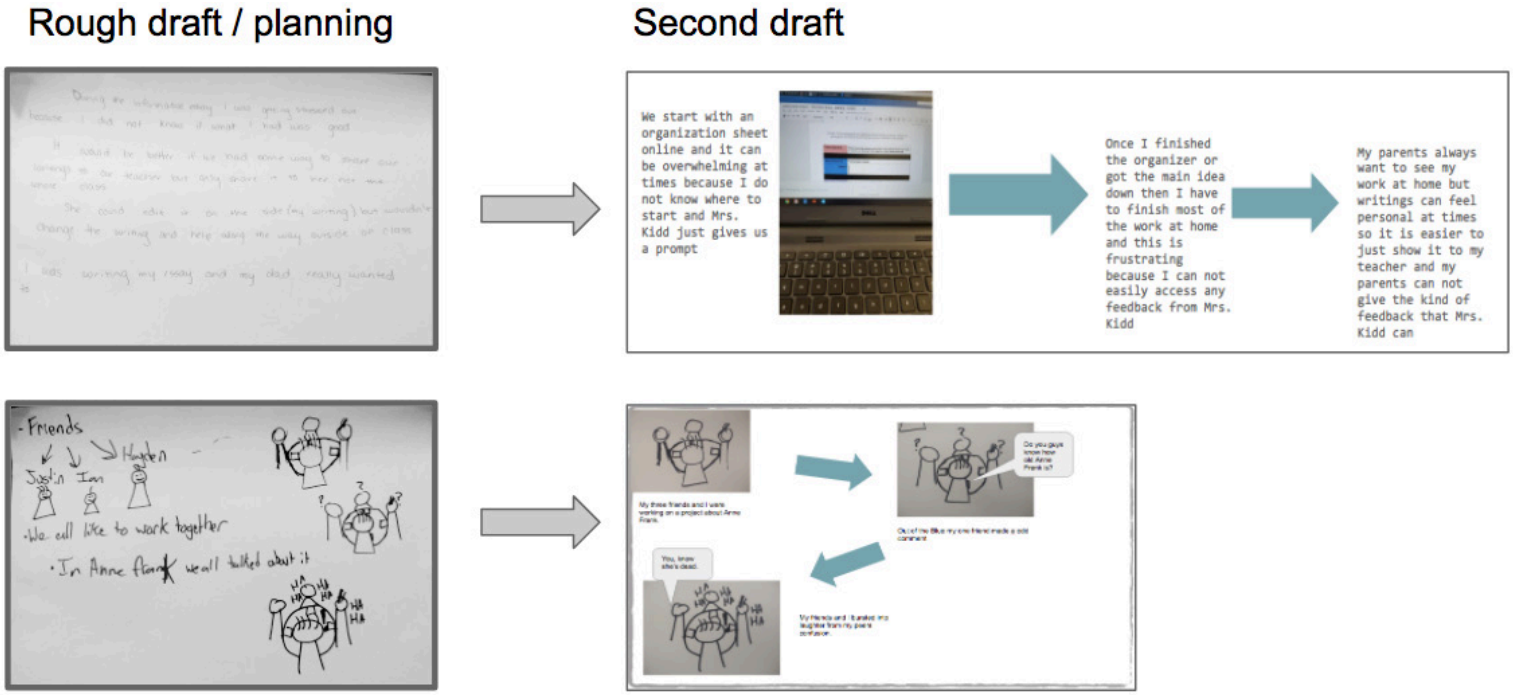
A student gives an overview of his story, including descriptions of evidence and relationships.

FINDINGS

Guiding Question 1:Does a technology-based prototype affect student's understanding or performance on the task?

There were two students who used the technology. We observed that one student had no problems getting his documentation onto google slides. In fact, this student made use of google slides in an unexpected way - he used the speech bubble option in Google Slides to make his story look more like a comic book.

The other student used a photo of a worksheet as her documentation. This required that she get her laptop from the classroom. From this, we gather that teachers should prepare their students for the portfolio creation process by suggesting they make a list and then get the materials they think they will need.



Students planned on paper and then created a story on Google Slides


8th grade students capturing and organizing their stories

FINDINGS

Guiding Question 2 : What questions do students ask about the task?

The word 'story' is well used in ELA, which led to some confusion over what the task meant exactly. For example, one student asked if his story was acceptable even if "this doesn't have a conflict." On a separate note, the open-ended question led students to ask for clarification and to ask whether their story was valid.

> "So… we're just writing a story?"
> "So we're just writing down stuff that we did during the process? And what we would do differently and stuff?"
> "And it has to be something that happened, right? Like not fiction."

Additional Findings

Students did was talk to each other and used their collective memory. Two students worked together to recap a book that one of them wanted to use for the task.

The students told very different stories, as we expected. They range from a group of friends talking about a book outside of class and laughing at a silly comment to educational technology helping a student improve her grammar.

"I was thinking through writing about how when learn grammar. We go on the website call NoRedInk and I just think it is helpful."

The technology students and the ELA students often wrote instead of drew in preparation for documentation.

INSIGHTS FROM BOTH USER STUDIES

Open-ended prompts encourage students to tell personalized stories

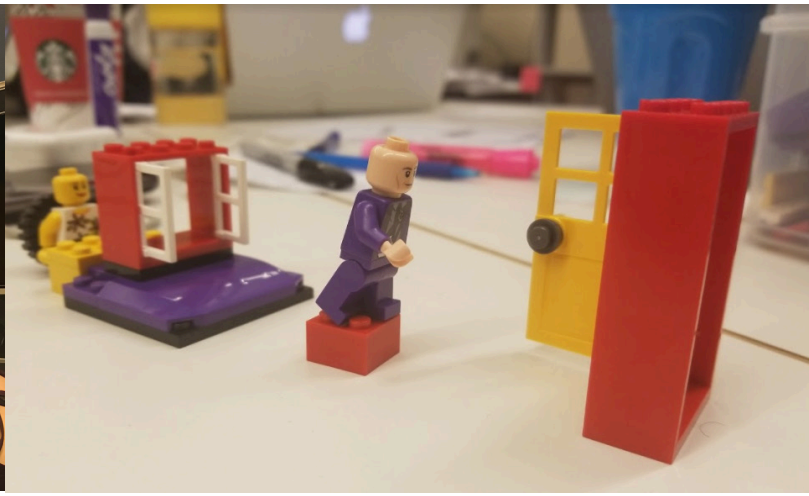
• Students in the technology class had different takes on the same project
• Students in the English class had completely different stories they wanted to tell

When students verbally told their stories, they were slightly different from the stories they had created.
• After documenting their portfolio project, it may be useful for revision purposes to talk about it to a friend.
• The friend can note any discrepancies between the documented portfolio project and the verbal story. The student can use this feedback to clarify or expand their visual version.

Retrospective storytelling may need teamwork
• Students in both classes talked with each other in order to remember a project or a story. They would collaborate naturally, whether they were sitting across from each other or a few meters apart.

Graphic organizers help
• Two students made use of the pros and cons graphic organizer.

This is a new way to tell stories. Some students need support
• This finding combines several of the other points. While most students were able to complete the task without any support, others benefited from graphic organizers or other people helped them remember. The opportunity to clarify the task was also key.



FINAL DESIGN: QVFOLIO

CONCEPT VIDEO

We recommend that you view our QVfolio concept video that demonstrates our final design features to get a feel for how we envision QVfolio would be used by QVMS students:

https://youtu.be/qswguBGtSig

FINAL DESIGN FEATURES

Using the insights that resulted from our prototyping sessions, we decided on several key features our final design would include. These design features are categorized by the stage in the e-portfolio process that they appear in. We focused on the Capture and Organize phases, since students drive the rest of their e-portfolio with their thinking in these phases - particularly when coming up with their own mental organization of their project. Since our prototypes focused on the Capture and Organize stages of the e-portfolio process, we have included final design features for three stages: Prepare, Capture, and Organize. Prepare refers to the preparation and context-setting that occurs in the classroom before students start Capturing evidence for their e-portfolios with our QVfolio camera app. Finally, Organize refers to the graphic organizer that students create to start synthesizing the evidence they have captured to reflect their own mental organization about the project. Although this design feature falls outside of the range of our three phases, it is important to note that **all of QVfolio is designed to be accessible to students throughout their time in the Quaker Valley School District.** If the district ever plans to delete this data or discontinue online access, students and parents will be notified several months in advance so they can export their data to keep for personal use. Our partner QVMS teachers, Joe and Schuyler, also provided feedback on these final design features and suggested some ideas for supporting features that would be helpful to their current processes.

PREPARE

Preparation and context-setting must be done in the classroom to prepare students to build their e-portfolios.

Supportive classroom culture that values student autonomy and identity
Since we envision an e-portfolio that celebrates student autonomy and reflects each individual student's identity, we believe a district, school, and class culture that foster these values are best suited to our QVfolio system. Since QVfolio is designed to be flexible to accommodate for the needs of different teachers and projects and to allow students to express their ideas in different ways.

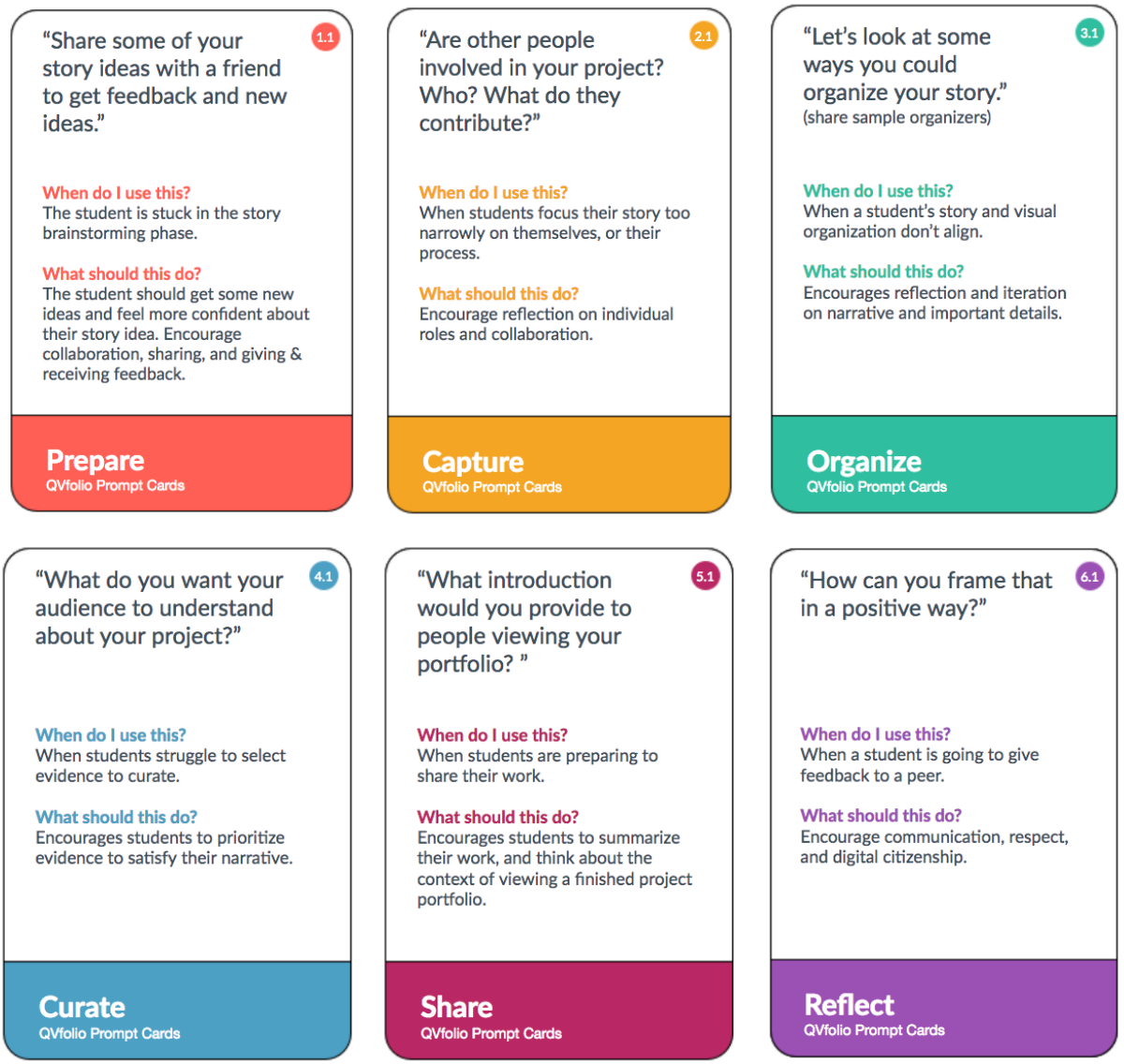
Project task design: balance guiding structure and creative freedom
As we learned from our user testing sessions, trying to solicit individual interpretations and perspectives on a project is related to the nature of the project and the context it is situated in - as well as the nature of the e-portfolio task students are assigned. In our prototypes, we gave students a very open-ended task to get a sense for the range of ideas students came up with: "Tell a story about your class experience." The nature of students' most recent project affects their mental organization of the experience. For example, in the more process-focused Peace Pole project in Joe's technology education class, many students told a story of the process of the machines they worked at, since students practiced an assembly-line process to create the peace poles. Some students needed more support and structure with our open-ended task, so we offered more clarifying information, examples, and prompts to help them approach the task with more confidence. Teachers need to find a balance between providing structure that guides students in the right direction and providing room for creative interpretation.

Prompt cards
Prompt cards offer teachers questions and phrases that can support students at each stage of the e-portfolio creation process. These cards prepare teachers to handle common challenges students encounter and are organized by stages of the e-portfolio process: prepare, capture, organize, curate, and share. Teachers can also add their own prompts to their deck using our easy-to-copy Google Slides template.

PREPARE

Communicate big-picture goals of e-portfolio and specific goals of the project and its phases
We learned that students have a better understanding of how to approach the e-portfolio task they are asked to do when they understand the big picture goals of the e-portfolio and the e-portfolio task - as well as the goals of each specific phase (e.g. capture, organize) of the e-portfolio process.

Time dedicated to student brainstorming
During our prototyping sessions, we learned that allotting time for students to brainstorm, think about the story they would tell, and plan what evidence they would capture helped students confidently proceed with the rest of the e-portfolio creation process.



Prompt cards offer teachers questions and phrases that can support students at each stage of the e-portfolio creation process. These cards prepare teachers to handle common challenges students encounter.

CAPTURE

Capturing photo evidence with the QVfolio app is designed to be quick and easy, so students can focus on core learning activities.

Smartphone/tablet QVfolio app to take photos
Ideally, students should be the ones to capture evidence of their learning and document their work. This way, students have control over the content and creation of their e-portfolio and can truly take ownership over their e-portfolio process. A student can speak to and relate better to photos and other evidence they personally captured. To make this capture process easier in a large classroom setting, we designed an app to be compatible with common smartphones and tablets, so students can use technology they are familiar with to streamline the process and also take advantage of existing resources available to students.

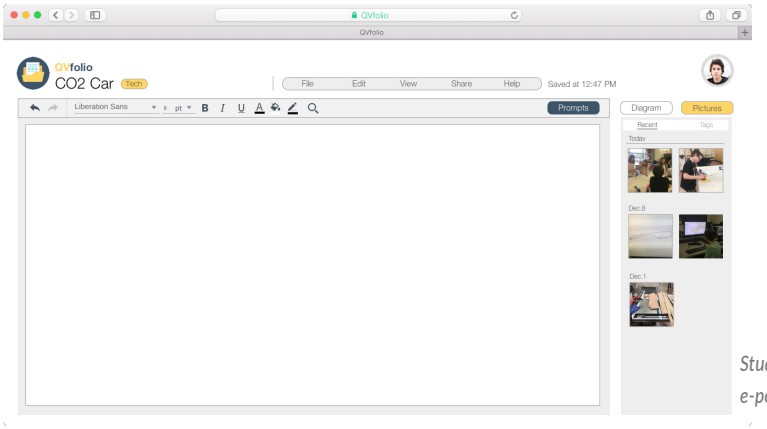
Prompts to caption and/or tag photos as they are taken
These captions and tags are then visible for students to think about and consider when they continue their work with their e-portfolio. These captions and tags should reflect student thinking during the moment of capture and save students some mental effort and factual accuracy of trying to remember their thoughts when they captured these photos after the fact.

In-the-moment reflection prompts
Teachers can also add additional reflection prompts with text-response fields that display when students are using the QVfolio app to take pictures. This helps to make students' thinking visible during the moment of capture - which offers valuable detail and insights to students as they organize and synthesize their captured evidence.

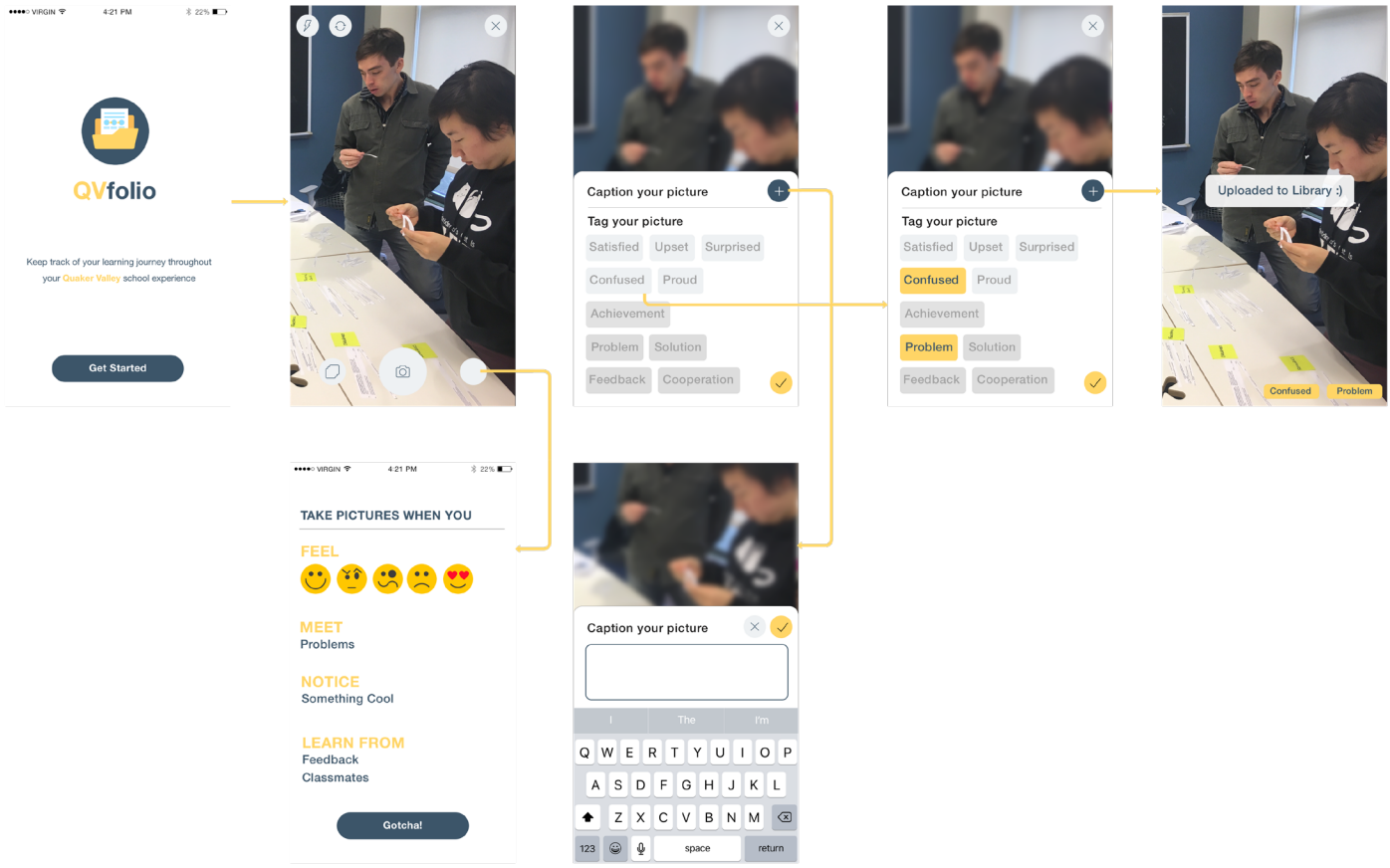
Project-specific families of tags and reflection prompts
Since the content of the pre-set photo tags depends heavily on project-specific evidence features that teachers want their students to focus on, we gave teachers control over the tagging options that students are offered. Teachers can easily re-use and/or modify tags from a previous project for a new one, as these project-specific tag families are saved in a database that teachers can also choose to share with their peers.

Teachers can push prompts to the entire class as well as to individual students via the QVfolio app
This allows teachers to communicate with the class via another medium - primarily for situations when making a classwide announcement would be less effective, such as on a field trip.

Seamlessly upload photos to student's e-portfolio library
Photos taken with the QVfolio app will upload to the student's e-portfolio library once the smartphone/tablet is connected to Wi-Fi. This simplifies file and photo management, as students can easily access their photos in a "Pictures" tab, as seen highlighted in yellow on the right side of the QVfolio web interface below.



Students' photos taken with the QVfolio app are automatically uploaded to the students' e-portfolio library for easy access.



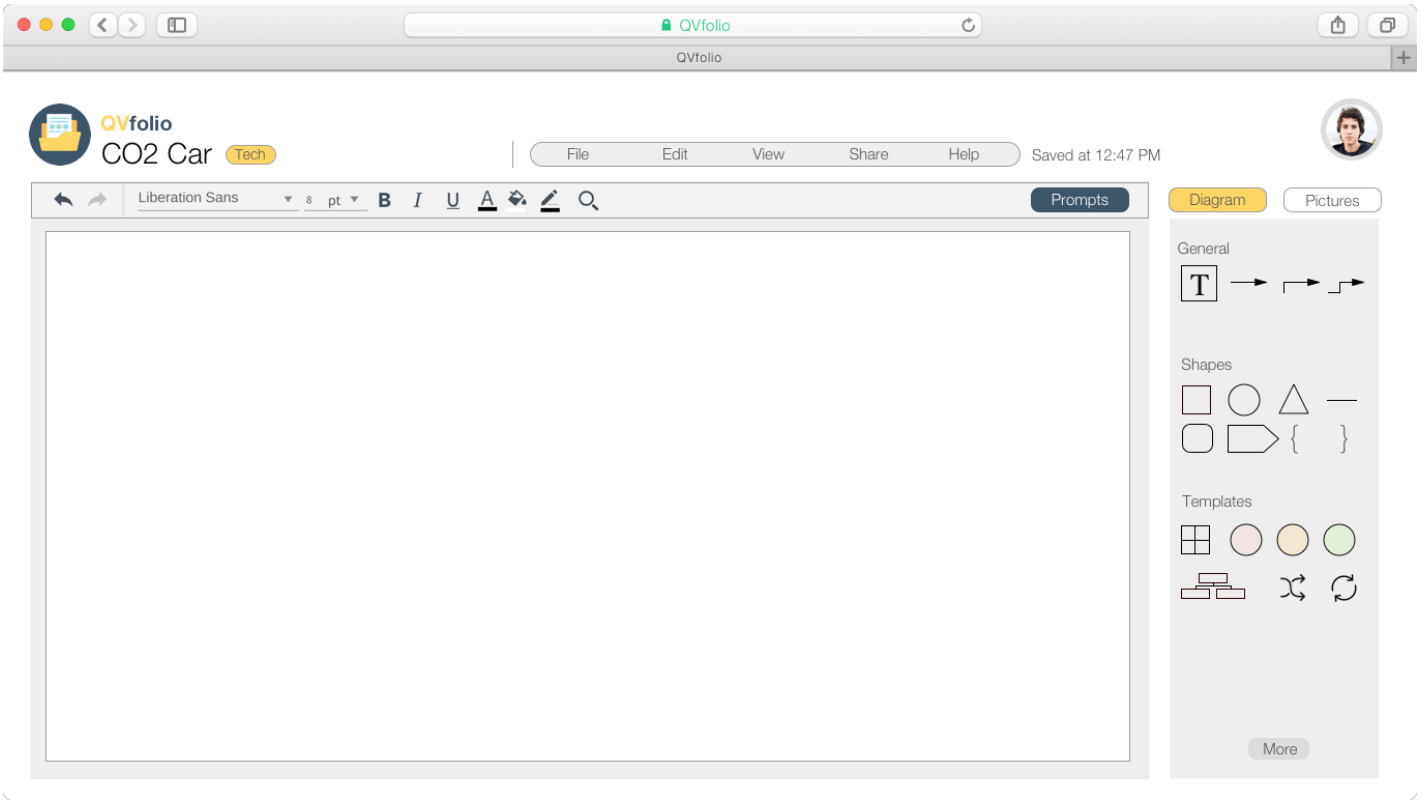
These images represent the interface flow a student would see on a smartphone when taking photos with the QVfolio app.

ORGANIZE

Learners can use the QVfolio website to organize the elements they captured to tell a story about their learning.

Visual prompts to caption evidence (e.g. pictures, writing, screenshots, online research)
When students upload pictures or write text in their graphic organizer, there is a caption box just underneath their evidence that prompts students to caption their evidence. Photos that are uploaded from the QVfolio app will display the caption students wrote during the capture process, although students can make edits to this caption. This prompt to caption evidence is designed to make student thinking visible.

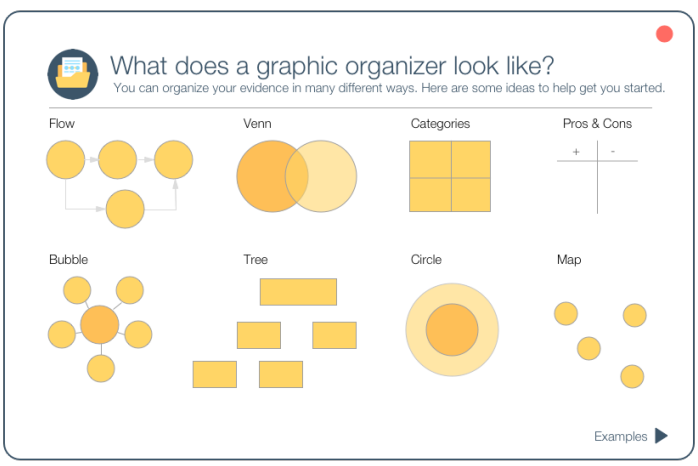
Pre-made shapes for students to easily drag & drop
Students can easily drag & drop the shapes, pictures, and other objects they need to create their graphic organizer. This is designed to give students a simpler, faster, and more seamless experience and avoid disrupting their mental organization process.

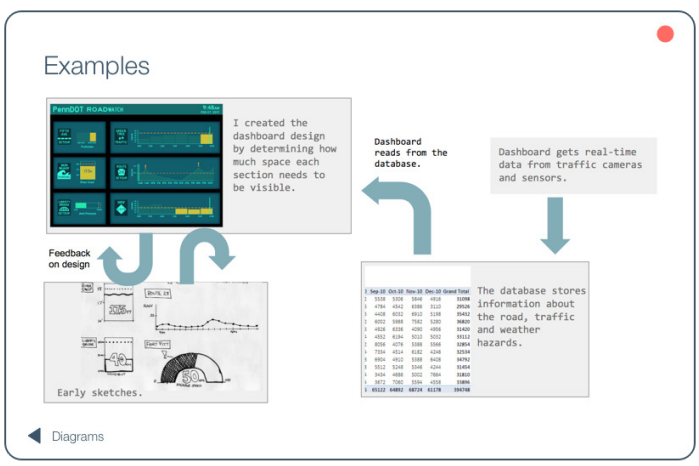


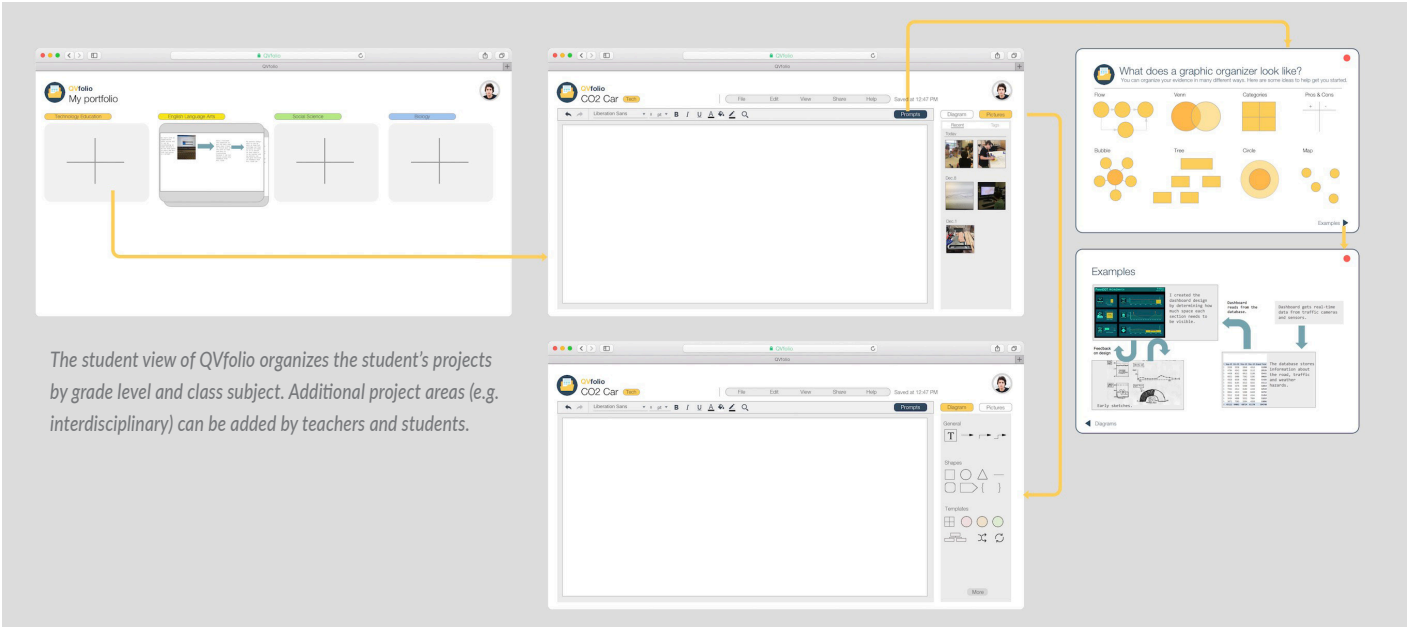
The graphic organizer interface provides an array of pre-populated shapes and objects for students to drag and drop onto their canvas.

Optional scaffolding: graphic organizer templates
To offer support to students who do not know where to start with their graphic organizers, we have included a few example templates of organization models students can start to use or get some ideas from. In our user tests, graphic organizer templates were helpful for students struggling to understand the task, so we included a reference page with these templates. This is accessible via the “Help” button.

Teacher-selected example that represents key features students should include
Students can see examples of portfolio projects curated by their teacher which model key features students should include in their own graphic organizers (which teachers will have gone over with students when introducing the graphic organizer task), for example: annotated relationships, captions, spatial organization that represents student thinking, and so on. These examples are also accessible via the “Help” button, so students are not all primed with the same example organization model and end up replicating it - unless they explicitly request this extra support to orient their work.







The student view of QVfolio organizes the student's projects by grade level and class subject. Additional project areas (e.g. interdisciplinary) can be added by teachers and students.

These images represent the interface flow a student would see on the computer when creating a graphic organizer with the QVfolio web app

FINAL REFLECTIONS

FEEDBACK AND REVISIONS

After sharing the initial version of our experience map at a critique session with stakeholders and the CMU community, we revised our storyboards to focus more on the user experience rather than our proposed user interface. Also, in response to feedback about how many students would leave their graphic organizer unchanged if their initial model was computer-generated, we removed the initial default computer-suggested organization scaffold from our final design so students could start from a blank canvas.

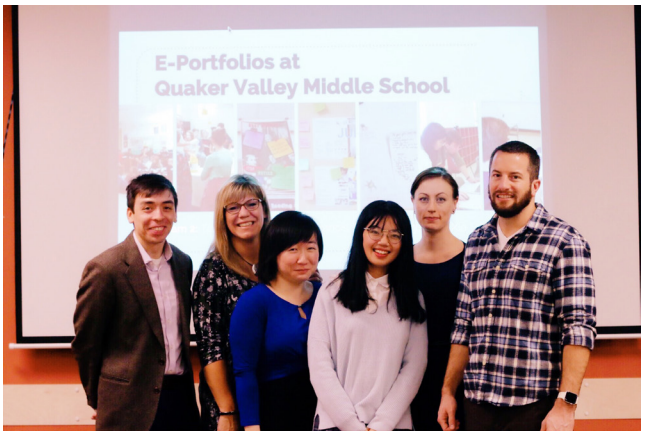
As mentioned in the previous section, we incorporated member checks with our partner teachers at QVMS, Joe and Schuyler, to seek feedback on our final design features. Their feedback and suggestions were invaluable and helped us confirm the needs met by our design.

We were asked about the potential for teachers to take control for the capture process by taking pictures of students' work-in-progress during our final presentation critique session. Although this would be possible by means of a traditional picture upload to the student's e-portfolio library, we envisioned the capture process to be more student-driven so as to best take advantage of in-the-moment captions, tags, and reflection upon their captured evidence and give students control over the content of the stories they tell using their e-portfolios.

REFLECTION

What went right? Brief analysis of what went well for the project through the semester.

Partnership with QVMS teachers and students: Throughout our design process, our two partner teachers, Schuyler and Joe, were very accommodating to our inquiries about their processes and our classroom visits. As mentioned above, they provided helpful feedback that allowed us to finetune our design moving forward in each stage of the design process.



Design features: Our prototyping sessions gave us great insights that we used in our final design. Although we did not have a functional software solution for QVMS at the end of the semester, our design features were well received by our teachers who were particularly interesting in the tagging feature we developed. They reaffirmed our hypothesis that students may need to revisit the context and reasons for capturing their work later when organizing it for themselves and others.

What needs more work? A look at challenges faced that could have been better solved, or needed more time.

Students' perspectives: Although we observed students' interactions with our e-portfolio design prototypes, we were only able to work with a handful of students during each session. For example, our final user testing session was rushed with a fire drill and the initial setup time required to connect to the school Wi-Fi network. It would help to spend some more time with students to get a better understanding of students' perspectives.

User testing in context: Due to the constraints of the course and limited time at QVMS, the task we designed was simple and retrospective - "Tell us a story about your experience in this class." We asked students to share a story of their learning because we knew they could generate ideas for us to work with, based on memory. To truly test the design of our solution, we would have students creating e-portfolios throughout the school year, during their project process. This would enable us to know more fully whether the process we designed was disruptive to their project process.

Quantity of user test data: Our schedules permitted us to visit QVMS twice, for a total of four hours. We met with approximately 14 students, with a subset of those using the entire prototype. That is, fewer students thought of a story, captured it and organized it. We would like to test a prototype with more students, and have a teacher facilitate the process with a whole class, so that we can gain more insights, and create additional prompt cards.

Appendix

User Research

1. User Study 1 Personas
2. Portfolio Models
3. Research Protocol
4. Affinity Diagrams
5. Workflow Models
6. Teacher Proto-personas
7. Student Survey Results

Ideation

1. Synthesized Personas (student and teacher)
2. Experience Map

Design

1. Prompt Cards
2. Graphic Organizers

References

Julia

Parsons New School (2016)
BFA in Product Design / BA in Sociology

Portfolio Focus: social impact, education, aesthetic

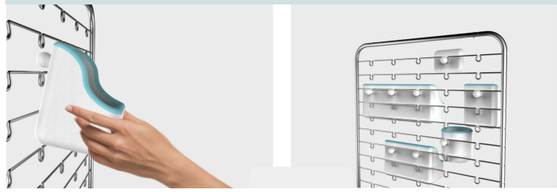
Chinese American; has lived in Hong Kong, Shanghai and New York.

Fluent in Mandarin Chinese, English

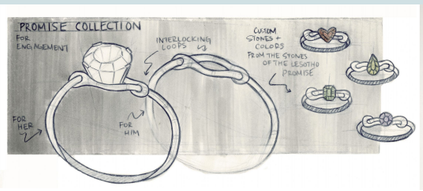
Interests outside of design are traveling, museum/gallery hopping, and learning Japanese

“The website is not your entire process - that's important… The website is only 20% [of the book].”

modular bathroom storage design - 3D rendering

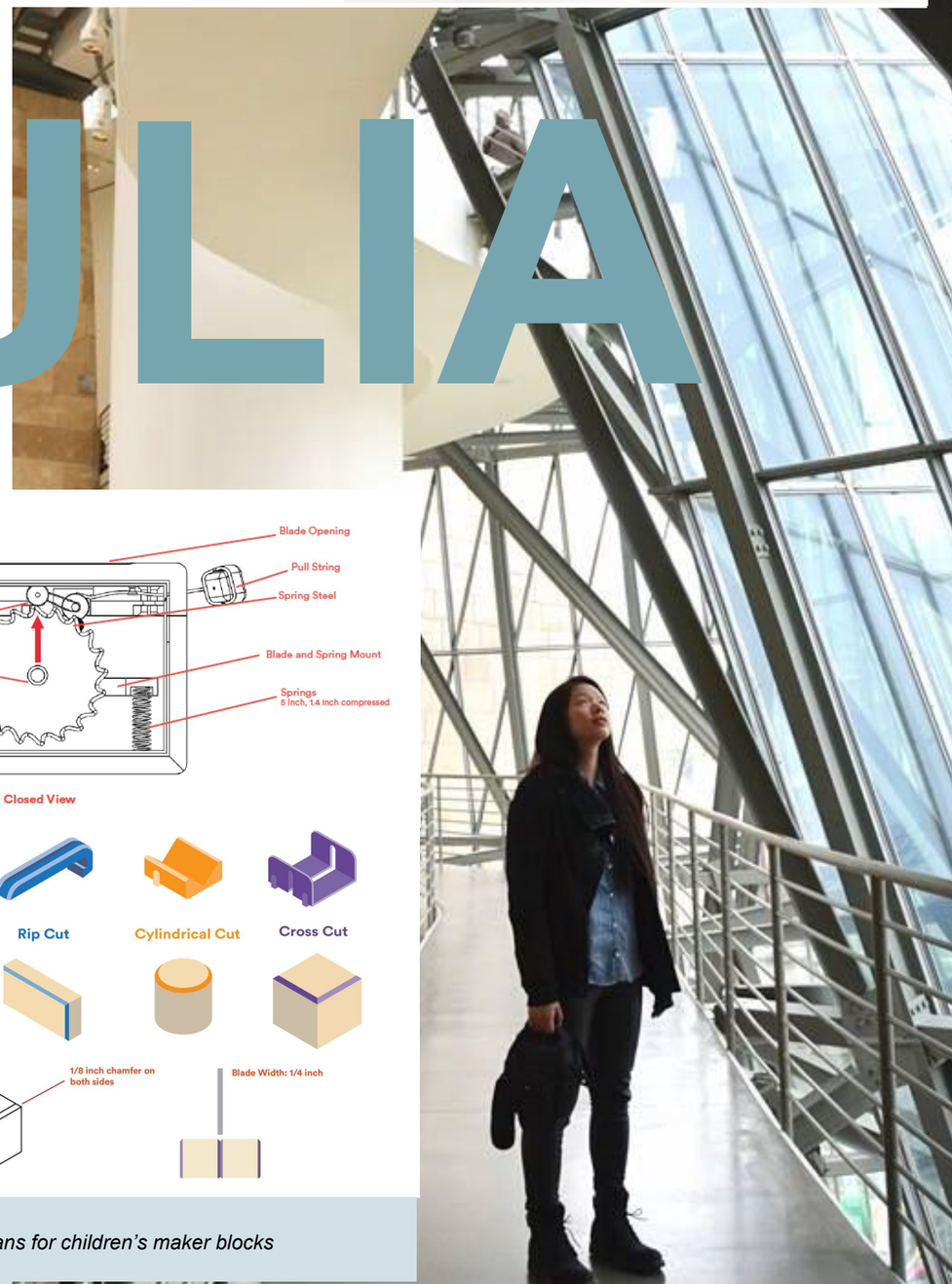


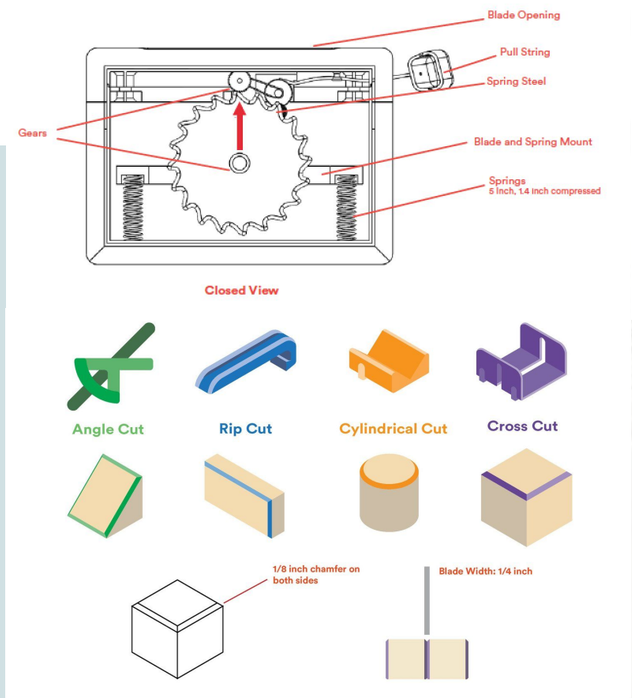
anniversary jewelry design



metro card swiping system for

JULIA





Plans for children’s maker blocks

Portfolio Expertise

Communication of process

low — high

Personal identity

low — high

Portfolio projects
5

Priorities

Meeting academic objectives
Reusable content
Clarity
Easy to update

Goals

Represent contributions to teams
Clear process explanation
Encourage social responsibility

Challenges

Accuracy
Academic deadlines
Prioritizing material

Tools

Adobe creative suite: Illustrator, InDesign, Photoshop, Solidworks, Squarespace

www.julialiao.design

Joan

Parsons New School (2016)
BFA in Fashion Design from Parsons School of Design

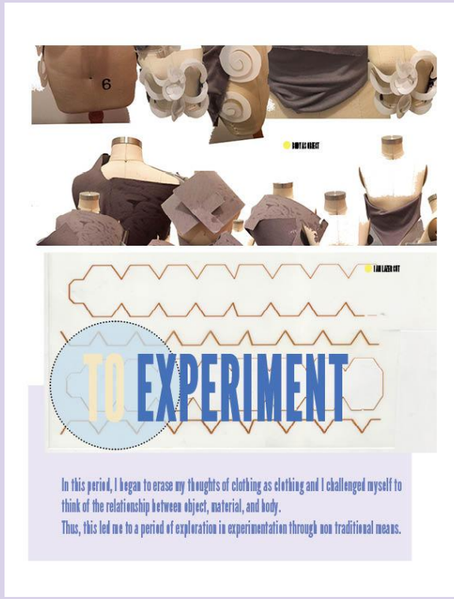
Portfolio Experience: Only for fashion portfolio class

Chinese-American; has lived in Tianjin, China, New Jersey, and NYC

Fluent in English, Mandarin

Playful, whimsical design values - culminating in her thesis project/collection: A Toy Story

"A Toy Story" thesis process: Toy research (left) and a thesis editorial (center), Joan's photo (right, facebook)



"I think the difference [in portfolio quality] is between when someone is proud of the work versus someone who's not… What's on [my] website is heavily edited."

Portfolio Expertise

Communication of process
low — high

Personal identity
low — high

Portfolio projects
1 (thesis)

Priorities/Goals of Portfolio
Meeting academic objectives
Following norms of fashion industry, e.g. editorial, collection, no text

Challenges
Creative freedom vs. mentor feedback
Hard to come up with own process for self-driven project

Tools
Sketchbooks, Adobe Creative Suite: Illustrator, InDesign, Photoshop, Squarespace (website)

http://www.joankaodesign.com/

Shan

CMU (2018)
Master in Entertainment Technology CMU
BEng. In Digital Media Zhejiang University

Chinese, Fluent in English, Mandarin

Shan, photo (left)

Chinese Style
3D Modeling (right)

Portfolio Experience Game Design, Character Design

- Prioritizing content depends on the aim
- Sharing the process of struggling and how problems were solved
- Creating his website as a portfolio scaffold for the pdf format

“Feedbacks from peers and experts are crucial, but some students do not have these resources...when you do projects in your 3rd year, you don’t know what you'll need for the 4th year portfolio.”

Portfolio Expertise

Clarity of process

low — high

Reflects personal identity

low — high

Portfolio projects
7

Goals
Master program application

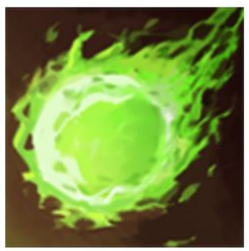
Challenges
The gap between the project-focused documentation process and the audience-focused curation
Privacy and copyright issues about portfolio shown publicly

Tools
Website template, Cloud storage

http://shanjiang.portfoliobox.net

SHAN

Character and level designs for game.



Tab

CMU Student (2018)
Master in HCI
Industrial Design, Shang Hai Jiao Tong University

Portfolio Experience
- Carefully curated content of each project page
- Heavily personalized his portfolio, using a template to start
- Separated UX and Industrial Design work, showing awareness of audience
- Created aesthetic style that pervades entire portfolio

Goal
- Graduate school applications
- Job applications (bonus)

Challenges
- Maintaining portfolio, bc he wants his project pages to be thorough
- Documenting projects while working on them

Tools
- Programming languages
- Website template

“I visualize the important parts of projects, to make the project readable.”

Portfolio Expertise

Clarity of process
low — high

Reflects personal identity
low — high

Portfolio projects
6

Advice to portfolio users
- Use images instead of text whenever you can
- Don’t spend too much time choosing a template. The content is more important.
- Separate different kinds of experience (e.g. UX vs. indust. design)
- Get other people to review your e-portfolio.
- Sometimes you have to create documentation after the fact.

Tab’s logo

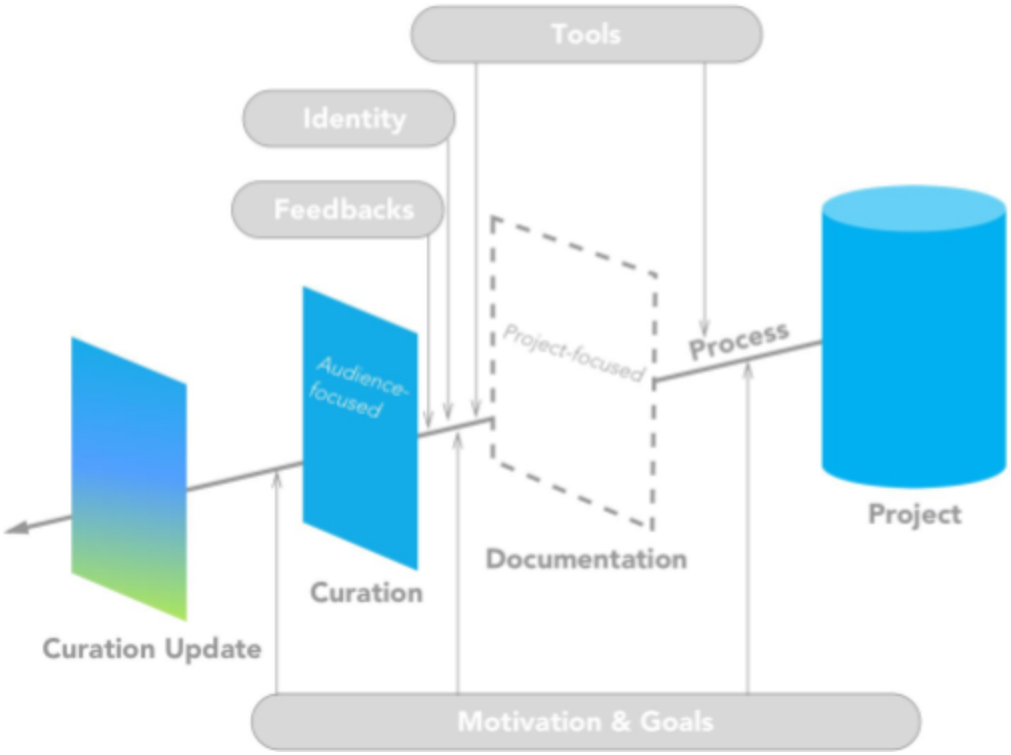
Cell phone interface

Screen preview

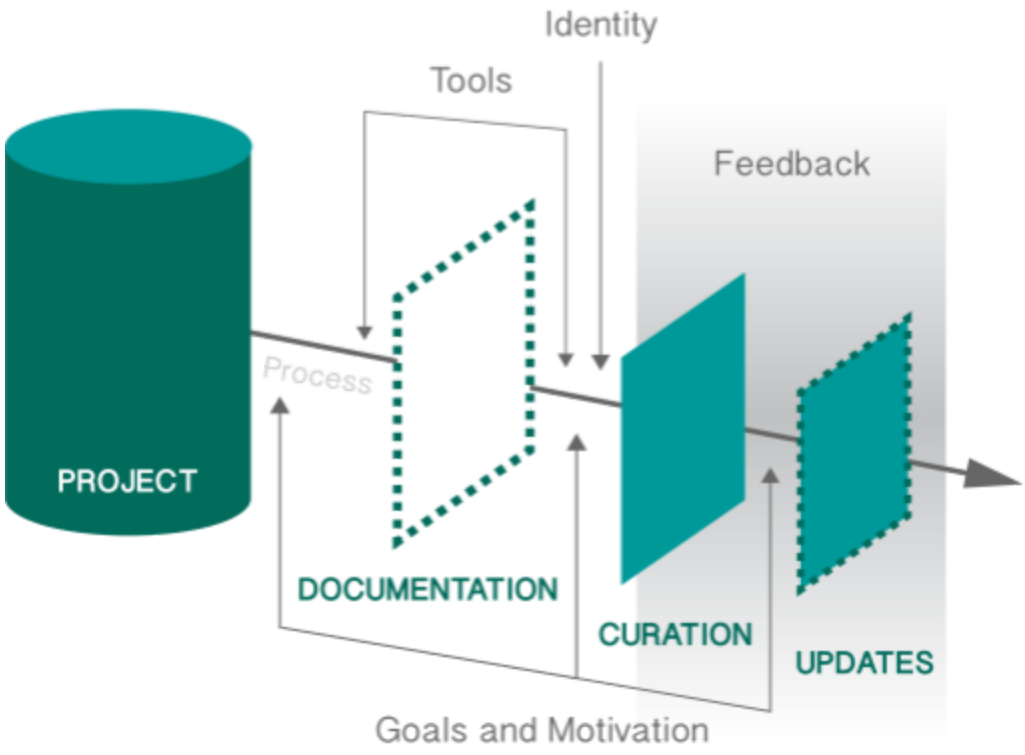
3D toothbrush design

Portfolio Graphics

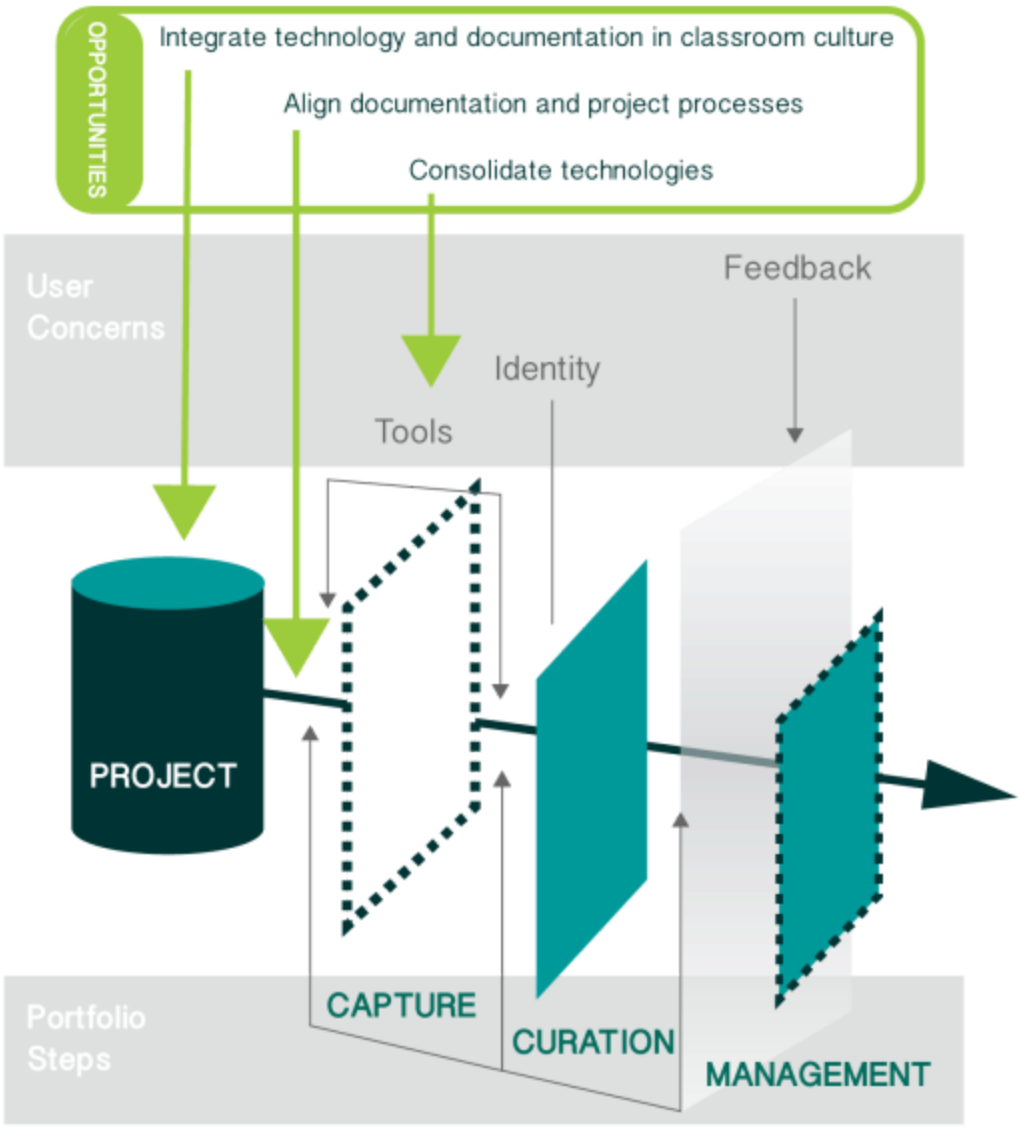
Initial portfolio model our team developed from expert interviews.



Second revision of portfolio model.



The third version includes revisions based on feedback and our own research, and indicates the areas where our opportunities reside.



Research Protocol

Study Purpose

We are designing a portfolio model to serve two classrooms at Quaker Valley Middle school. The first is an English Language Arts classroom and the second, a technology education classroom. This study will be designed around finding commonalities among portfolio needs among students and teachers, and designing a system to solve challenges across classrooms.

Our main goal is to uncover commonalities that point to a solution; we need to determine if our solution will serve students or teacher professional development. We have a portfolio model based on expert portfolio user interviews, and we plan to use that as a starting point for the Quaker Valley project.

Study Design

Step 1: Interviews

Conducting a **semi-structured interview** (via Zoom, 1 to lead, 1 to record) will give us an opportunity to learn how teachers fulfill Quaker Valley's mission and values through their programs.

We can consider the **5 Whys technique** (IDEO Method Cards, p9) when drilling down into a topic.

Question Pool

Personal

- Do you (or any of your students) have a portfolio?
    - If so, how is it used?
    - If you don't, what might be included?
- Where are you struggling the most with the current student portfolio/documentation process?

Classroom

- Which grades do you work with?
- Do projects span multiple classrooms? grades?

- What is the typical class size?
- What kinds of documentation or portfolio technology, if any, do you use in your classroom today?
- What does documentation mean to you. Why is important in your classroom?
- What does successful documentation looks like in your classroom? What is hard about documentation?
- How self-directed is student learning?
- Who is the primary audience for the proposed student portfolios? Secondary audience(s)?
    - Stakeholders
- How do you prepare for each class? What purpose(s) does the lesson plan serve?
- How do you conduct your class?

School

- Do you have a technology budget?
- What's the role of your supervisor in classroom decision-making?
- What other stakeholders are involved in making your classroom run smoothly?
- Does your curriculum accommodate portfolios?
- How is Schoology currently used across the school - and within your classroom? Are you aware of how other teachers are using this platform?
    - If you have used Seesaw or another similar e-portfolio/LMS platform before, what did you like about it? What could have been improved?

Logistics for Classroom Visit

- What is the process for setting up a visit? (addressed via email)
- Are we able to take pictures (without faces) or audio in the classroom?
- Do we need to provide any forms or documentation? (addressed via email)
- Any special paperwork to send surveys to students (and possibly guardians/parents)?
    - Digital would be easier for data collection/analysis, but is paper preferred?

Focused questions for Schuyler

Current documentation process

- Walk us through:
    - the Google Doc tracking students' reading,
    - how the paper portfolio is used to document students' writing,
    - how speaking and capstone projects fit in this picture, and
- Any other thoughts on how you envision the students' digital portfolio experience.

Focused questions for Joe

What do we want to know after the initial interview with Joe?

- Objectives for 6th, 7th, 8th grade s's in the 9 weeks he sees them.
- How he evaluates s's.
- More details about his "problem of practice."
- Why he stopped using Seesaw.
- Why he feels s's should document their projects.
    - Is it more for him, for them, or both?

- It seems as though the Launch Notebook has a documentation role. Would you agree? Can we see examples?
- How does it happen? Do s's choose when to document, or are they told when to document?

Classroom

- What do you want students to do
    - You are currently working on 7th and 8th grades, both employing a Launch cycle in a project-based learning. Will you work with 6th students and is there a different curriculum for them?
        - If any, what technology or methods are currently employed to document?
        - Do you think LAUNCH notebooks is a some kind of documentation?
        - How do you utilize it, for example, how do you evaluate student's LAUNCH notebooks? Is there any showcase for notebooks? (Could you please show us some examples of LAUNCH notebooks after interview?)
            - Is LAUNCH notebook used as raw data record, or students will make some refinement or elaboration later?
            - Why do you want students to document their learning and make an online portfolio?
                - Five whys
            - Why do you think e-portfolio is beneficial for middle school students

              Are goals different between three grade students?
                - What do you think is a good working process for student's online portfolio? Some people we interviewed before said they would refine and re-create documentations after finishing design, while others may preferred to designing projects and making portfolio in real time.
            - What do you think is good documentations for your student's two project, coaster roller and pinball?

Step 1.5 - Audience

At the start of this project, we are unable to know if our primary users are students or teachers. After we do the preliminary interviews, we plan to narrow down the scope of a solution that would have the most impact.

Define Your Audience (IDEO, Field Guide, p 44)

- Stakeholder mapping will help us identify stakeholders and relationship between them, if it's not immediately obvious.

Step 2 - in the Classroom

We plan to engage observational methods in groups of two, then to switch classrooms. This way we can gain a more complete picture of the classroom experience.

- **Fly on the Wall** (IDEO Method Cards, p12) - observe the classroom without influencing teacher or student behavior
- **Ethnography** (somewhat like Fly on the Wall, but with opportunity to ask questions and participate as researchers)
    - Focus on students' social interactions
- **Narration** (IDEO Method Cards, p17) - Asking the teachers and/ or students to describe their process while they engage it. We can gain insight into user priorities, challenges, and "work-arounds" they commonly use.
- **Error analysis** (IDEO Method Cards, p6) - list the challenges that teachers face in assigning a quarter's grade and writing about their student's progress
- **Informal interviews** of students in classroom (ask what they are doing, what is going on, how they feel, etc.)
- **Student survey** about their interest in having access to their classwork after the class is over & what they think the purpose of their e-portfolio is.
    - Is digital better than paper?
    - We need an unbiased,
    - Also: interest level in class, reason(s) for why they're taking this class, what students are looking forward to the most in this class
    - Busy work? Is this prominent in their classes?

What roles will team members play? How many users will you recruit to participate on what dates?

- Courtney and Anne to interview Schuyler (10.9.17)
- Roger and Tianmi to interview Joe (10.9.17)

We will break into teams of 2 to observe the classrooms and switch for the second period.

Schuyler Wednesday morning
Wednesday 8:00 - 8:50: Working on grammar (independently) and reading a novel (independently)
Wednesday 8:55 - 9:41: finish reading story together; work independently

Joe Wednesday morning
Wednesday 8:00 - 8:50:
Wednesday 8:55 - 9:41:

Are you planning to observe youth, involve them in interviews, focus groups, survey or self-report activities?

- Yes - ethnography, informal interviews, and/or surveys about their interest and pre-existing ideas

Analysis Plan

Revised Portfolio model: “exploded” visual that describes composition and process

Affinity diagram (LUMA, p40): cluster observation/interview data to find common issues among teachers

Student survey data - Analyze 1-5 likert scale and mean scores for each question, include any relevant student comments that explain their rating

Flow analysis: (IDEO Method Cards, p11) Represent/ diagram the flow of a process to help identify opportunities for alternative paths / processes

Qualitative research analysis: Users, stakeholders, customers

Needs, goals, experiences, challenges/problems, opportunities, tasks, behaviors, lifestyles, attitudes, aptitudes

Appendix

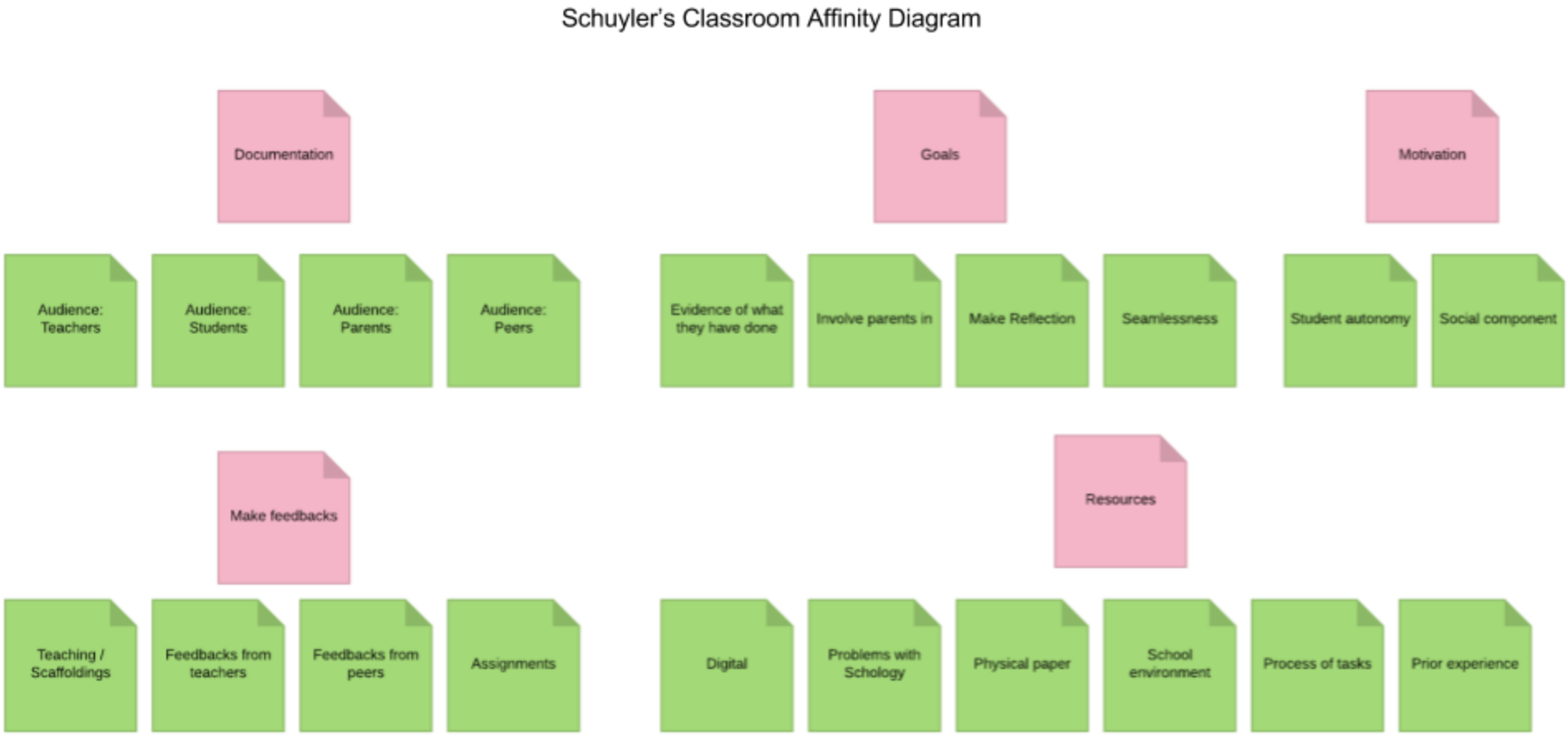
Prepare before classroom visit:

- Audio recorder / Camera / phones
- Survey

Shot list

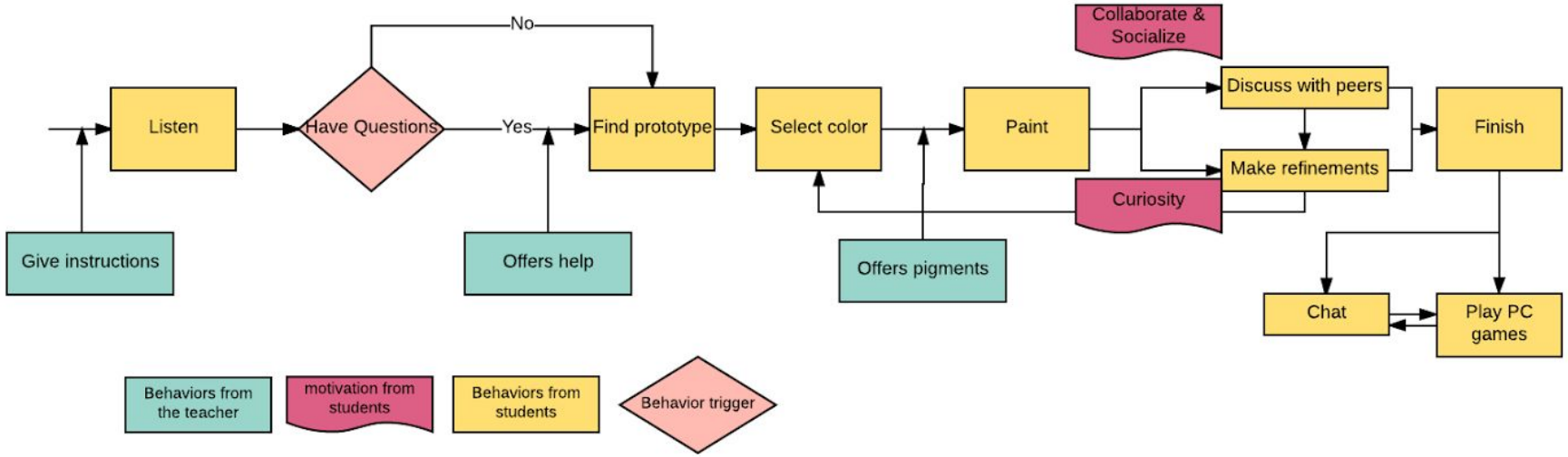
- Students’ use of
  - Tools for
    - Documentation
    - Project work
  - Writing process (individual)
  - Collaborative activities
- Best practices
  - Capture students from behind, or zoom in on hands & avoid photos that reveal student identity
  - No names or faces
- Classroom(s)
  - Joe - Roger (try to do before Period 1)
  - Schuyler -
- Individual student workspace
- Collaborative spaces
- Technology spaces / teacher’s space
- Technology hardware
- Classroom learning tools
- Classroom communication methods (teacher to student / teacher etc)
- Common spaces

Affinity Diagrams

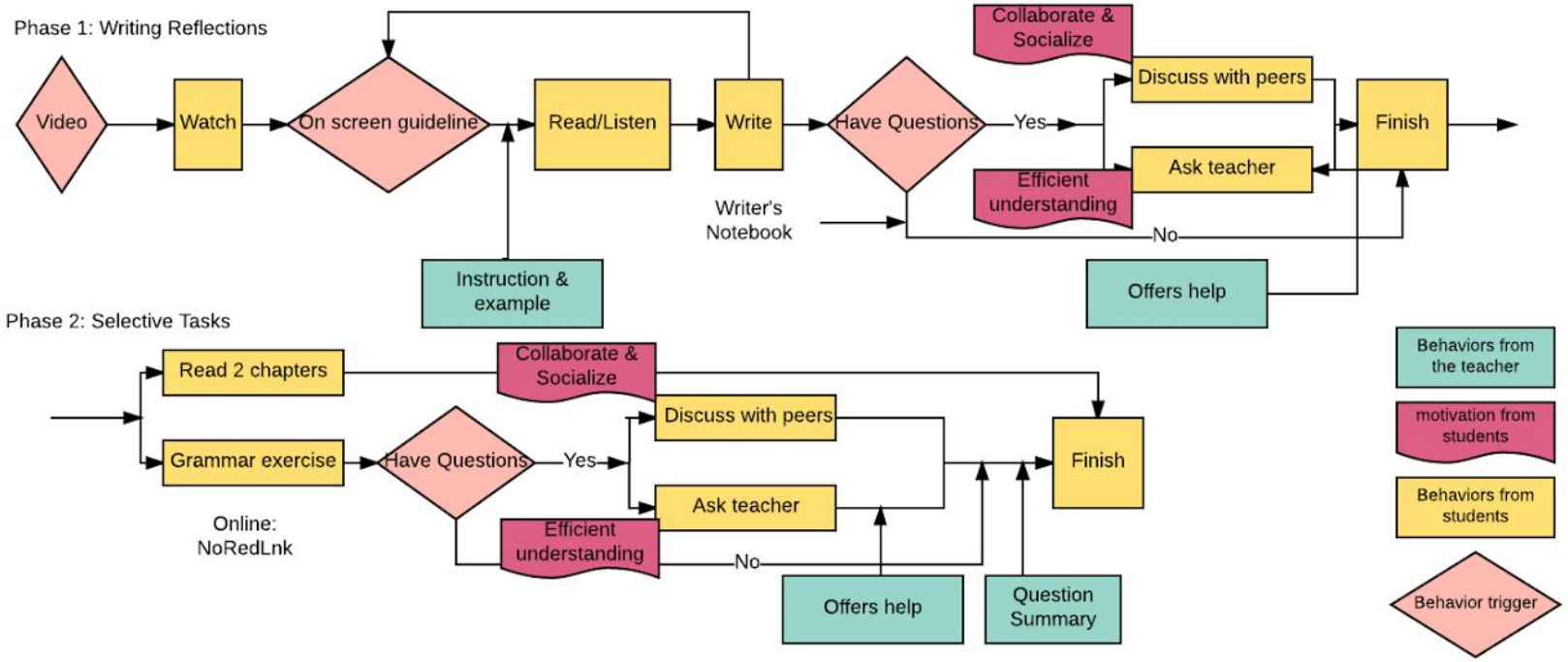


Joe's Classroom Affinity Diagram

Workflow Models



Behaviors in the Technology Education Class



Behaviors in the English Language Arts Class

JOE | Technology Education Teacher

6th - 8th grade

Joe has a positive attitude and is process-focused. He's motivated to make students' process visible in the classroom, in order to ensure understanding. He's focused on modeling behavior for his students in the makerspace, so course expectations are clear.

Joe is always looking to improve his own processes and help his colleagues do the same.

Goals and Motivations
Making student thinking visible

Empowering students to take charge of their own documentation

Encouraging feedback

Teaching digital citizenship

Leaving space for informal feedback

Looking for a "seamless" tech experience for students

Challenges
Streamlining documentation

Tools
SolidWorks 3D modeling
Schoology (briefly)
Seesaw (formerly)
LAUNCH Design Framework
Maker space / PC lab

Tech savvy
low — high

Tech and goal alignment
Low — high

Student autonomy
low — high

Process-oriented
low — high

"I always encourage them to tell me *why* they think something is cool. If you have a thought we want you to have a conversation about it."

Technology Education Student
mini-persona

Social relationships are important to maker education students. They enjoy sharing ideas and contributing to one another's work, and openly share mistakes and strategies with others.

Goals
Meeting project goals

Motivations
Showing technical competency

Challenges
Technical challenges
Workshop challenges

SCHUYLER | English Language Arts Teacher

8th grade

Schuyler is a thoughtful and accepting teacher who encourages her students to be creative and think differently. She is welcoming, casual, and has designed a creative, personalized classroom environment to ensure her students are comfortable while they work.

She considers herself a rebel in her school for giving students a lot of autonomy.

Goals and Motivations

Track writing (reading and presentations are secondary)

Encourage reflection

Strong focus on the individual student (less on the sharing and collaboration)

Wants to share student work with parents

Supports student autonomy

Challenges
Documenting comments and feedback
Increasing opportunities for self-directed learning
Opportunities for reflection

Tools
Chromebook
Schoology
Google Classroom
Overhead projector
“Writer’s Notebook”
NoRedInk.com
My HRW site

Tech savvy

low — high

Tech and goal alignment

low — high

Student autonomy

low — high

Process-oriented

low — high

“It’s important for kids to see how they’ve grown; what they’ve done, what they’ve learned from it, and how their thinking changed along the way.”

English Language Arts Student
mini-persona

Social relationships are important to English students. They want to help each other, and often seek collaborative support for their work. These students

Goals
Complete assignments fully and on time

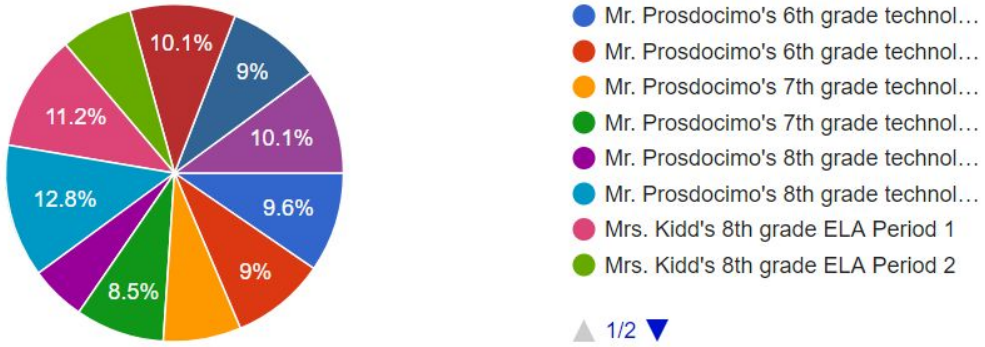
Motivations
Enjoys when work is engaging

Challenges
Managing work across tools / delivery methods

Student Survey Results (10.18.17)

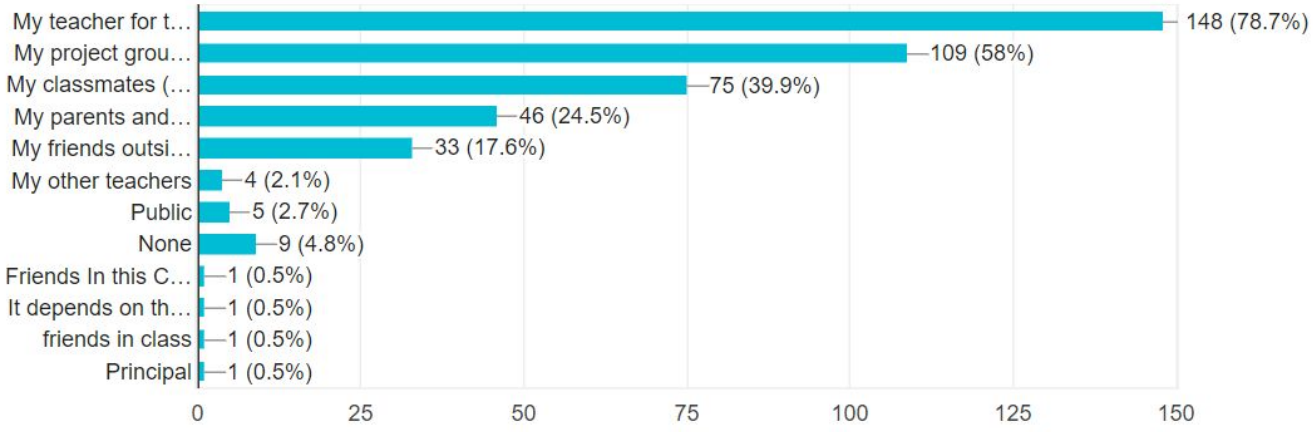
Which class are you taking this survey for?

188 responses



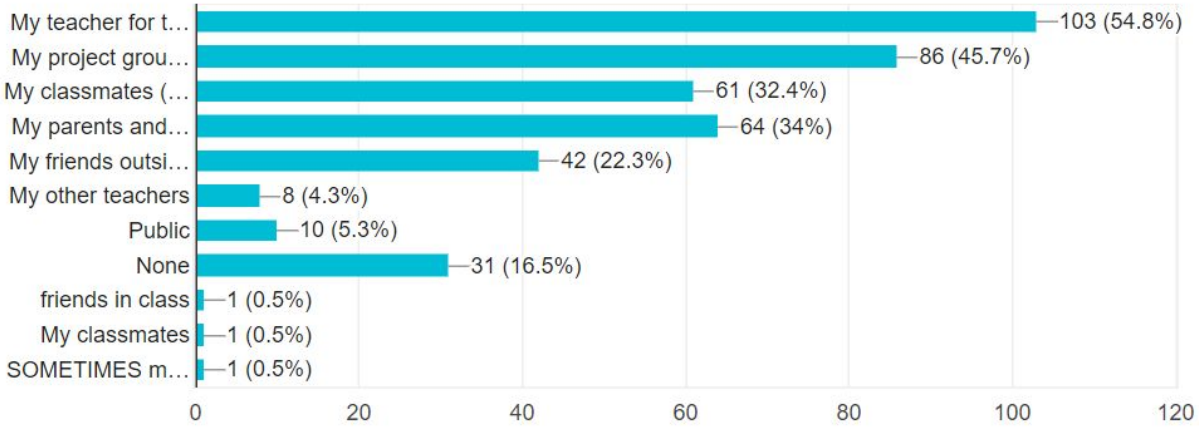
For this class, do you share your finished class projects with anyone? Who?

188 responses



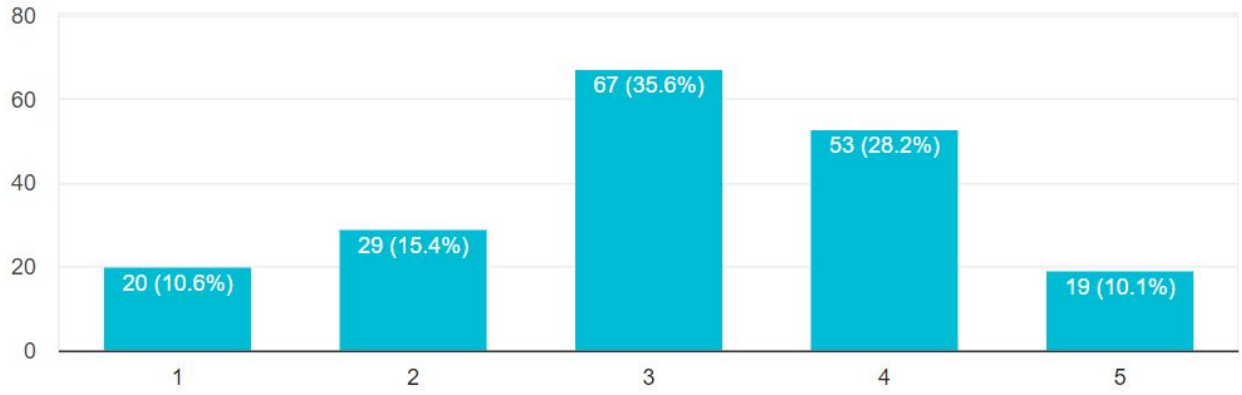
For this class, do you *want* to share your finished class projects with anyone? Who?

188 responses



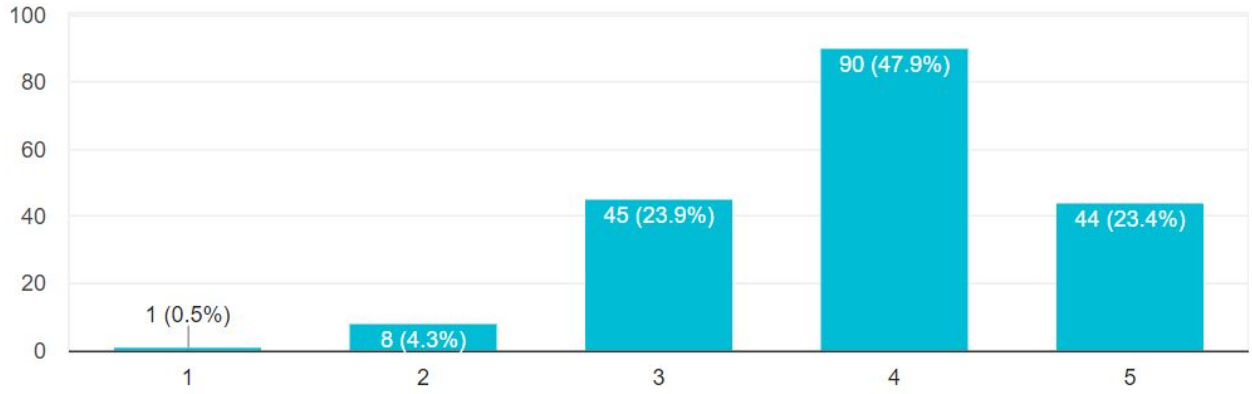
For this class, how interested are you in sharing your finished projects with others?

188 responses



How proud are you of your finished projects from this class?

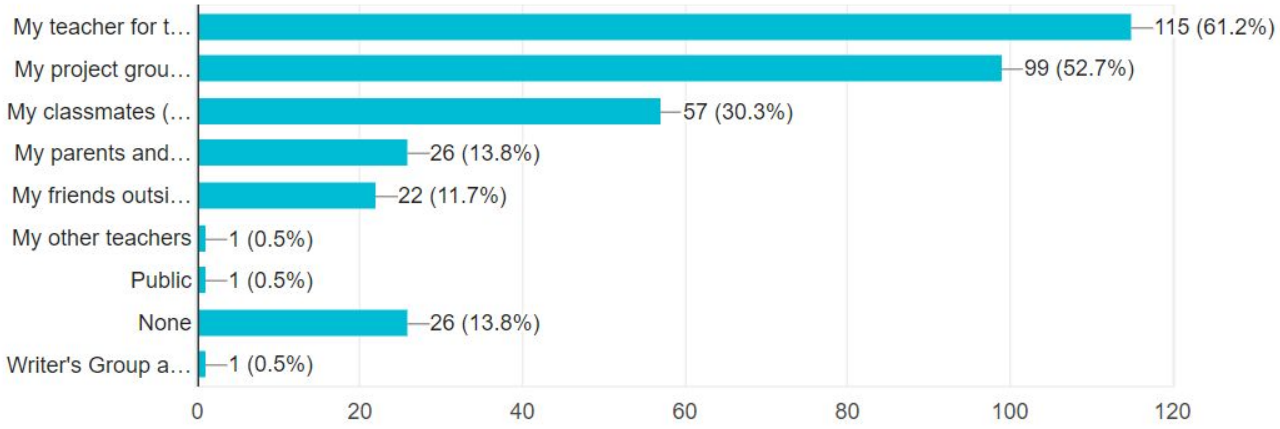
188 responses



Section 2: Works-in-progress

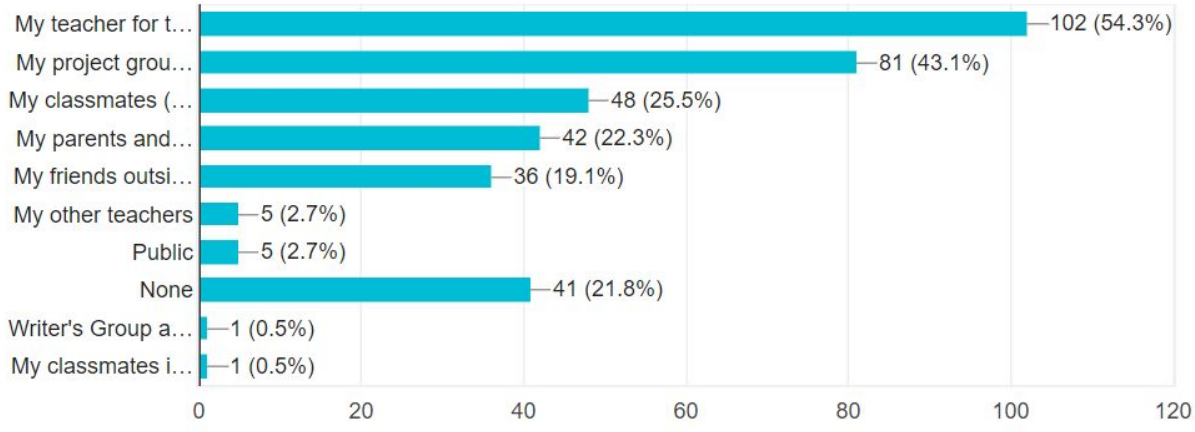
For this class, do you share your works-in-progress with anyone? Who?

188 responses



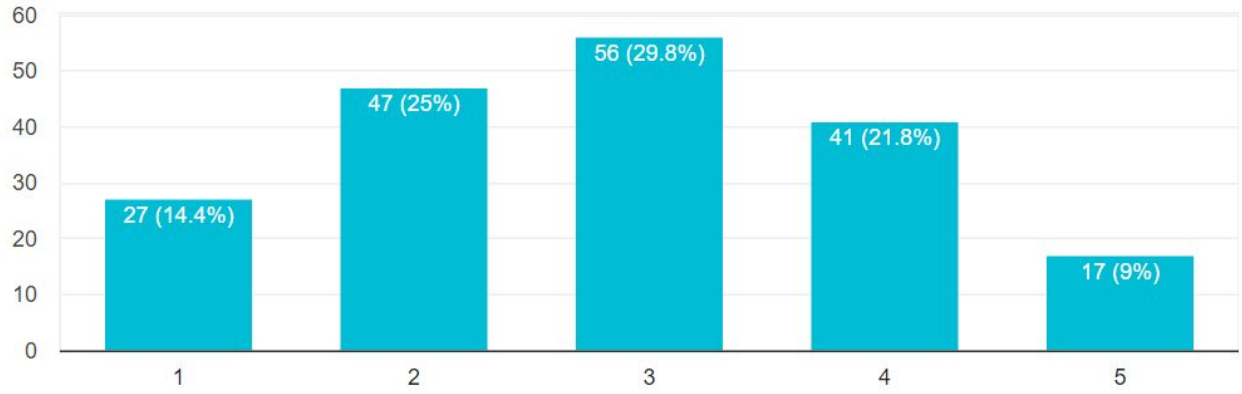
For this class, do you *want* to share your works-in-progress with anyone? Who?

188 responses



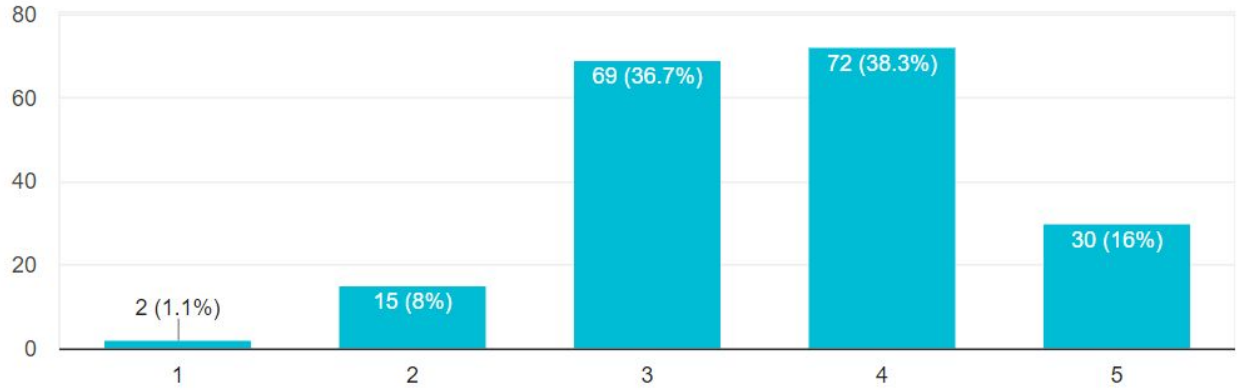
For this class, how interested are you in sharing your works-in-progress with others?

188 responses



How proud are you of your works-in-progress from this class?

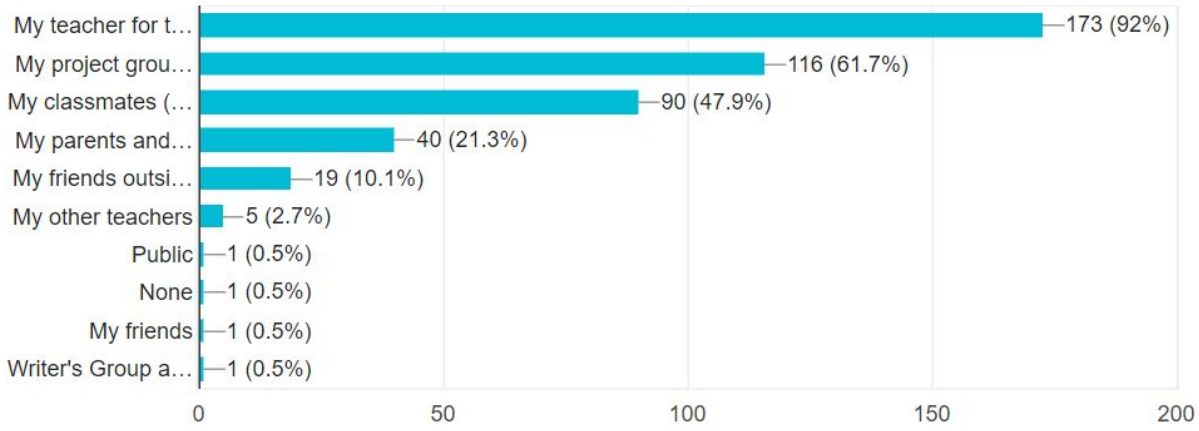
188 responses



Section 3: Feedback

Who gives you feedback (comments, constructive criticism, suggestions, etc.) on your work for this class?

188 responses



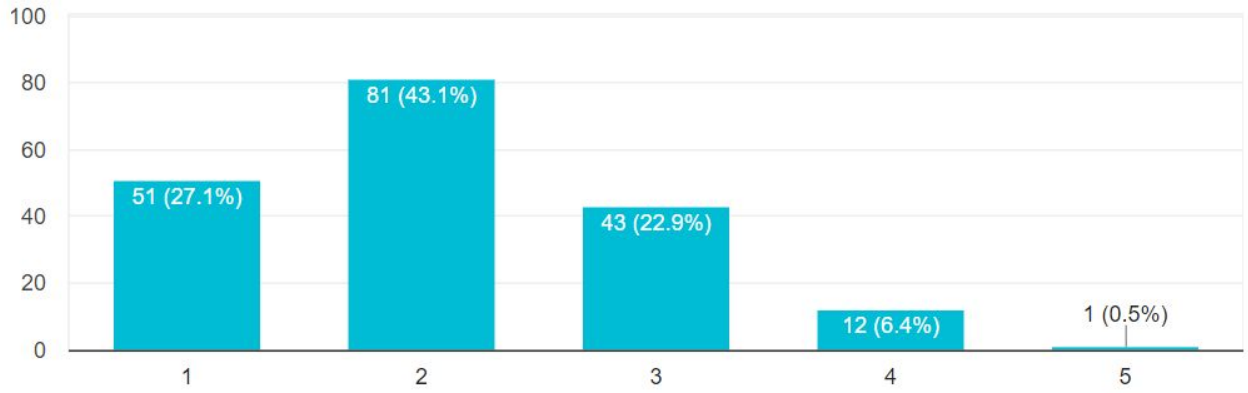
When do you receive this feedback? If you receive feedback at different times from different people, please describe how that looks like. For example: "My teacher gives suggestions in the middle of class while I'm working. My parents comment on my homework when I'm working on homework after school and say what they like about my project when I bring my graded final project home."

188 responses

during class (2)
in class (2)
when people tell me. thats when i get feedback
I receive feedback from my teacher in class. I always ask if she likes what i'm doing, what I should do better, etc.
I get feedback when i'm working on it at school.
My teacher goes around asking people how they are doing and sometimes people will show her what we have done.
My teacher calls students up to her desk and helps them and gives them feedback
If it is a google document, Mrs. Kidd would typically leave a comment on it. If it is on paper, she will write on it, or tell me. I'd just show my parents and siblings, and they'd tell me what they think about it. (Same for my friends.)
" My teachers give me feedback when I ask or if they walk around and see my work. My family gives me feedback and ideas when I show them what I have been working on."
My teacher will comment on them and talk about what i'm doing.

For this class, how much effort does it take to get feedback from others?

188 responses

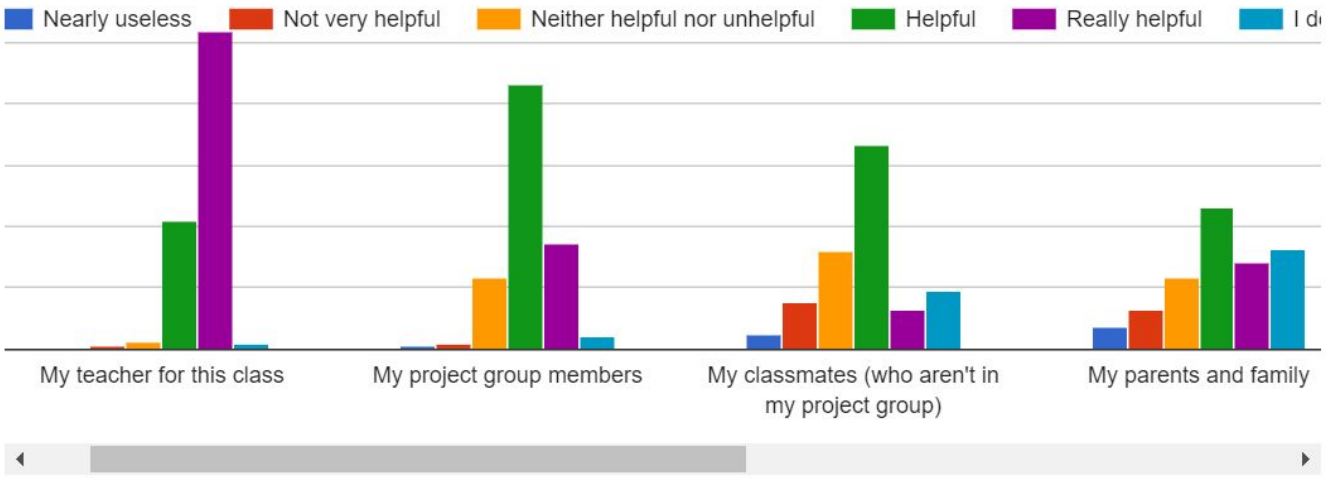


Why did you pick this rating for effort needed to get feedback? Please write a sentence or two describing your thoughts on who you try to get feedback from, and why this is easy or difficult for each person.

188 responses

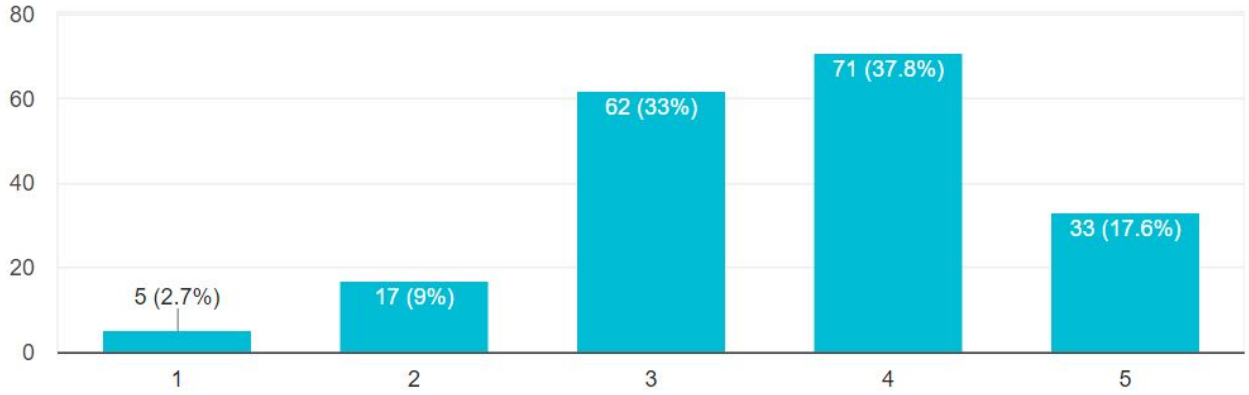
because its kinda easy but a little bit hard
I try to get feedback from Mrs. Kidd and she's always there to help me.
I try to get feedback from my teacher and students, sometimes parents.
Because our teacher is very helpful.
Because people would offer to help you and want to give you constructive criticism
It's not very hard to get feedback, all you really have to do is ask for it.
Because most people don't know what to say or they have a lot of ideas.
Because are teacher wants us to give feedback or she wants to.
I don't have to put much effort in I just got to my teacher or parent and ask them for feedback
I don't like getting feedback from anybody except teachers
it's kind of easy to get feedback from someone because they are working on the same thing that I am, and they could help me answer the question
I asked for feedback from my friends and other classmates, it was decently easy but sometimes friends didn't

When looking for feedback on your work in this class, how valuable is feedback from the people below to you?



How helpful is it to look at and comment on your classmates' work (in this class) for your own work?

188 responses



Why did you pick this rating? Please write a sentence or two describing if/how seeing and commenting on your classmates' work affects your own work.

188 responses

because it is not that helpful to me

Because it's very helpful to know what you're doing right or wrong.

It makes me think how I can make my work better.

Because it's their project they do what they want.

It helps get ideas for what you are going to do

It is pretty helpful to see how someone else sees your work, but I tend to judge my own work.

Because it gives you ideas on what to write.

This can affect my owns work because I can get ideas about my work.

It helps me understand what I am supposed to do more

sometimes my classmates work isn't correct so i always get suggestions from the teacher

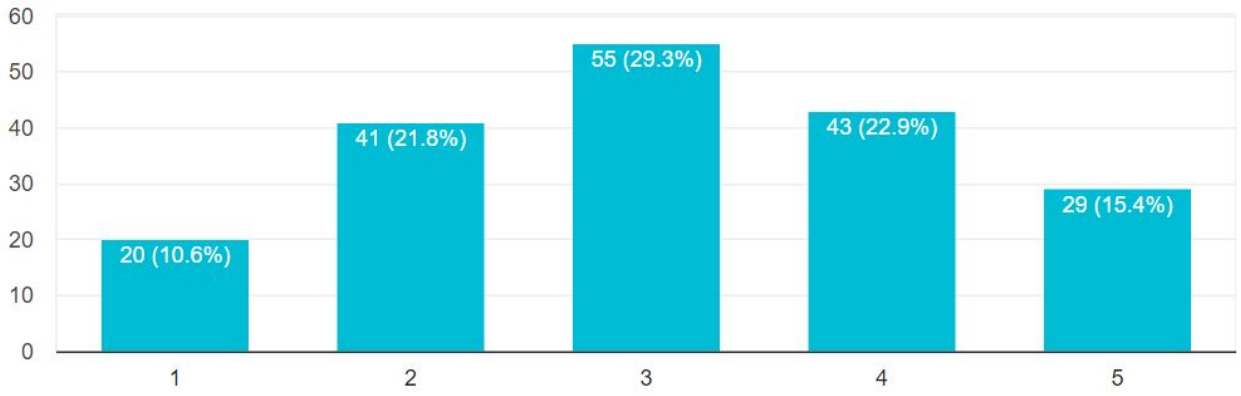
it's in the middle because It's easy to comment on some ones work, but it's hard to think about what your going to say

It can inspire me to make edits to my design or make a change that could be crucial to my project and how my

Section 4: Record-keeping

When doing a class project (in this class), how important is record-keeping to you? Some examples of project record-keeping include: your notes, your first draft, pictures of your project at different stages as you work on it, and a sketch or picture of your original design.

188 responses



Please write a sentence or two describing why you chose this rating on the importance of record-keeping for this class.

188 responses

so you can have all your stuff at the end if you have a test
It can always be used as study material.
I really don't need to record for this class.
Because if you are very organized you should be fine.
I think it is helpful because it helps you to stay organized
It doesn't really help me personally, but i'm sure that it could help others that need to remember a certain idea, or something like that.
gives you more ideas and more information to write.
I can look back and improve off of what I had.
It is really important to me to use my notes so if I dont understand something I can do it.
i don't like looking back in my record keeping because sometimes it's useless
it's important for me to have some note when i'm doing this project, so it can be easier to do my work.
I choose a 5 because keeping the sketches of the models are important in case we need them again, or

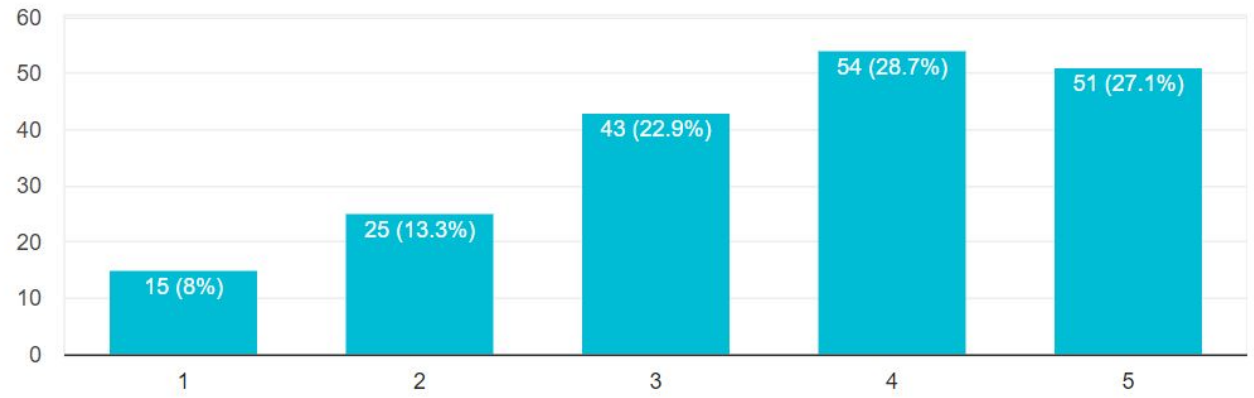
After finishing longer projects (longer than 3 weeks) in this class (or your LA or Technology Education class last year), how do you save your work? Please include the class and project(s) you are describing.

188 responses

it automaticly saves in google drive
I don't usually they go to the teachers very often.
I save my work in classroom, docs, and in my folder.
Put in my locker or if it's on computer save it to drive.
I usually would take a project home such as a poster board or the teacher would want to keep them and if it were a powerpoint, then it would automatically stay on my computer
I'd keep the google document, or i'd keep the poster/paper somewhere i'll remeber it is.
I sometimes keep it in my binders, It is on my computer so it stays there, or i don't save it.
We usually keep everything we did in a file.
If it is on computer I can access it anytime I want but if its paper I would give it to my teacher and whenever I need it I will just go to her for it.
i use google docs to save work for Tech Ed.
In LA how I save my work it's to keep safe with a teacher .

How much of your work do you save?

188 responses



Describe the types of work you have saved for a longer project you have recently done in this class (or your LA or Technology Education class last year). Please include the class and project you are describing.

188 responses

documnets presentations slide shows

study guides. Important worksheets.

My grammer on red ink I have to save.

The outsiders notes.

I saved the CO2 cars that I made in Technology education in 6th grade, but I didn't keep any of the work that I did to make the final car

I've done a poster on Edgar Allan Poe last year (at Avonworth), and I keep it in storage. I don't really save small projects though.

my CO2 car from Mr. P's class last year

For La I always keep everything unless it's something I already improved on I will get rid off that first draft.

We had to read a book then make a design out of cardboard or go to the makers space and create a theme from the book

the car project for Tech Ed.

In LA i saved many work with the teacher or if it's on the computer i just save on that

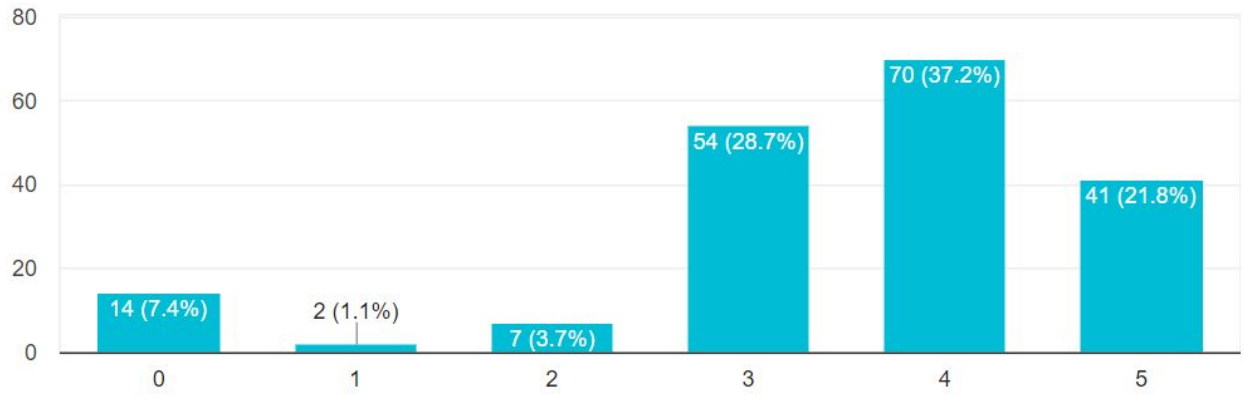
Why did you choose to save the work that you ended up saving? Alternatively, why did you choose not to save the work that you did not save?

188 responses

so i can have it if i ever need it
It's whether or not we'll be using it again and if it's useful for me to have.
I chose it because I need to use it to study for a test coming up.
Because it's important,
I decided to save this because i thought it was cool and I liked the way that it looked
I kept it because it could help me on other posters, and it has good facts on Edgar Allan Poe. I don't really get any benefits from keeping small projects.
Because it was cool and I was proud of it.
Because it could be helpful later on or if i recreate something and lose it I can find it again.
I figured I would need them later on in life or just give it to my sister to help her when she gets to this project
it would be useless in the future
because it can be useful to me for later on.
I liked what I made and I was proud of myself for making what I made

How proud are you of the work you have saved for this project? (0 = N/A: I didn't keep any of my work, 1 = Not proud at all, 2 = Somewhat ashamed, 3 = Neutral, 4 = Proud, 5 = Extremely proud)

188 responses



Middle School Science Teacher

7th - 8th grade

Albert is a motivated and creative science teacher who encourages students to think differently about science. Albert wants a fun classroom to motivate students, and technology. He is welcoming, casual, and has built a creative, personalized classroom environment to ensure students are comfortable while they work.

> “It’s important for me to see how students have grown, but it’s also important for them to understand their own learning. I try to help that process along by encouraging them to share work. ”

Tech savvy

low — high

Tech and goal alignment

low — high

Student autonomy

low — high

Process-oriented

low — high

Goals and Motivations

Encourage learners to actively track their learning process

Make portfolios more accessible to parents, peers, and school administrators

Support student autonomy and self-directed learning

Make documentation process more seamless

Improve quality of evidence captured

Challenges

Documenting comments and feedback

Increasing opportunities for self-directed learning

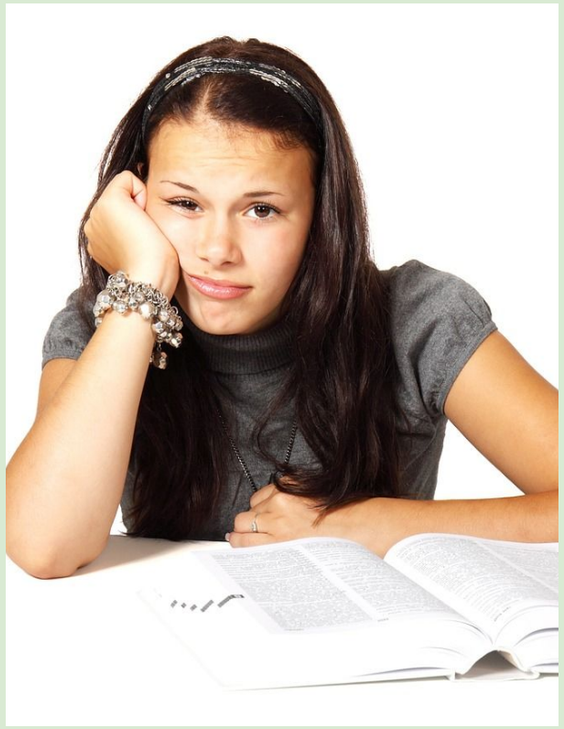
Creating opportunities for reflection

Tools

Chromebook
Schoology
Google Classroom
Overhead projector
“Writer’s Notebook”
NoRedInk.com
My HRW site
SolidWorks 3D modeling
LAUNCH Design Framework
Outdoor science lab

Emily: Middle School Science Student

8th grade



Tech savvy
low — high

Interest in science
low — high

Personal autonomy
low — high

Socialization
low — high

Social relationships are important to Emily. She enjoys sharing ideas and giving feedback on her classmate's work, and openly shares her strategies with others. When she's doing a project she enjoys, she wants to share it with her family and friends outside of school.

"I really like the parts of class when I can talk to my friends about my project and see what they are doing."

Goals
Complete assignments fully and on time
Share work with parents
Own evidences of learning

Tools
Chromebook
Schoology
Google Classroom
Notebook
Camera

Challenges
Sharing work outside of the school (parents and friends)
Providing constructive feedback to peers
Understanding how to incorporate feedback into her projects
Managing work across classroom delivery methods
Finding long-term relevance of e-portfolios

Motivations
Showing technical competency
Doing fun projects
Owning her projects and learning

EXPERIENCE MAP

QVMS 8TH GRADE SCIENCE ECOLOGY UNIT

Learning Media Design Team 2: Tianmi Fang, Courtney Francis, Roger Strang, Anne Xie

STUDENT

Emily
QVMS 8th Grade Student

“I really like the parts of class when I can talk to my friends about my project and see what they are doing.”

Emily enjoys sharing ideas and giving feedback on her classmates' work and openly shares her strategies with others. When she’s doing a project she enjoys, she wants to share it with her family and friends outside of school.

Goals and Motivations
Complete assignments fully and on time
Share work with parents and peers
Show technical competency
Own her projects and ideas

TEACHER

Albert
QVMS Science Teacher

Goals and Motivations
Encourage learners to actively track learning gains

Make portfolios accessible to students, parents, and administrators

Support student choice and self-directed learning

Implement a seamless documentation process

Improve quality of learning artifacts

CURRICULUM

Classroom-based instruction	Nature walk	Capstone project	Sharing
· Introduction to ecosystems · Learn vocabulary · Build background knowledge	· Students go into a nearby ecosystem and capture information through pictures, videos and observations. · Reflect on how content learned in lecture relates to field experience	· Students design their own original ecosystem and describe it using concepts learned in class. · Capstone projects get formative feedback from classmates and and teacher.	· Peer critique in class · Sharing to parents · Online portfolio

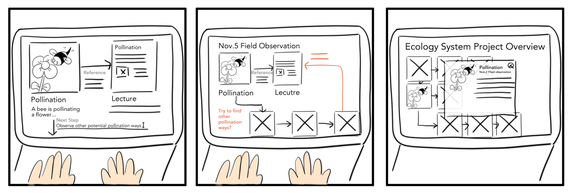
CAPTURE

Take pictures and video of an ecosystem.

Record what they are doing and why.

Upload pictures and notes (auto-transcript).

ORGANIZE

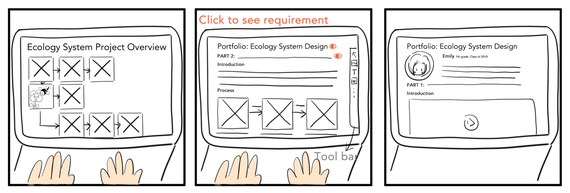


Place learning artifacts in a digital flow diagram that outlines the project.

Re-organize the flow based on initial auto-synthesized overview of the project.

Add detail to summary overview of the project.

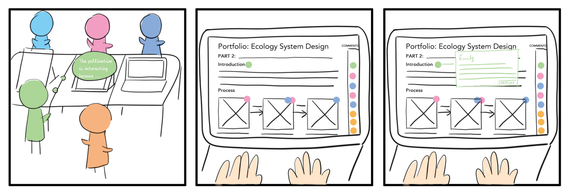
CURATE



Review project overview.

Start to create the audience-facing portfolio. Using previous work, scaffolding, and requirements, write a summary of the field trip, reorganize photos in a logical sequence according to project goals, and caption photos to tell a story to audiences. Publish online and share.

REFLECT



Collect feedback from teachers and peers in the in-class gallery.

Give feedback on peers' projects online and practice digital citizenship.

Review feedback and implement suggestions to improve the portfolio.

PRIOR EXPERIENCE

- Understand ecosystem concepts introduced in previous instruction
- Understand how to use documentation technology: camera, voice-recording app
- Instruction & scaffolding provided for understanding and organizing flow diagram
- Understand audience of the project & overall portfolio
- Understand how to give constructive feedback and how to receive feedback

USER ACTIONS

- Document process and interesting moments in the field
- Add artifacts to fill out the flow diagram
- Review and reflect on the overview
- Summarize portfolio components for specific audiences
- Give, receive and respond to feedback
- Begin to plan revisions based on feedback

LEARNING ARTIFACTS

- Photos, voice memos, videos
- Logically organized digital flow diagram of field trip experience
- Annotated media
- Summary and highlights of the whole project
- Feedback given, received and responded to

THOUGHTS AND FEELINGS

- Consider parts of an ecosystem
- Curiosity, excitement
- Consider project goals, process, and strategy
- Draw logical connections; better understand bigger picture
- Perspective-taking, empathy
- Anxiety (positive and/or negative)
- Curiosity & interest in peers' work, optimism, anxiety

MOTIVATION

- Enjoy field trip experience, explore, make interesting discoveries, and connect field trip to prior knowledge
- Complete class requirements: plan and present work clearly
- Share project with audience
- See classmates' work; Improve projects based on constructive criticism

TECHNOLOGY INTERACTION

- Use a mobile device to capture media
- Upload to e-portfolio website
- Access e-portfolio website to do user actions
- Access e-portfolio website to do user actions
- Give and receive feedback, and respond to feedback digitally

SOCIAL INTERACTION

- Show evidence of animals, plants, streams, soil, etc. to teacher and classmates
- Peer discussions
- Teacher models how to put pictures into flow diagram & assists individual students
- Peer discussions
- Teacher monitors and provides assistance
- Peer discussions
- Give feedback to peers and receive feedback from peers & teacher during in-person gallery walk
- Give feedback to peers and receive feedback from peers, teachers, and public online

LOCATION

- Local outdoor ecosystem
- Classroom
- Classroom
- Classroom
- Out of Classroom

BACKSTAGE

TEACHER INVOLVEMENT

- Teacher facilitates documentation process prior to activity: helps students understand the importance of capture, when to capture, and how to capture
- Teacher understands the conceptual & technical process of creating digital flow diagram to best support students
- Teacher models curation through examples and organizes portfolio publishing system for students to use
- Teacher designs gallery walk experience and invites community members to participate

VALUE TO TEACHERS

- Assess how students relate what they previously learned to authentic field trip experience
- Assess how students related learning goals to their experience and their communication skills
- Assess students' communication skills through their summary, and their feelings towards sharing
- Assess students' ability to give and use constructive feedback

VALUE TO STUDENTS

- Capture the experience of the field trip: pictures and captions to work with
- Logical organization of portfolio components & captioned media to include in portfolio
- Sharing with the purpose of getting feedback, and practicing the skills of summarizing
- Opportunity to learn from and improve upon feedback

VALUE TO PARENTS

- Can see what their children are working on if students share
- Can see what their children are working on if they share
- Learn about what their children & their peers are working on
- Learn how their children take feedback

EXPERIENCE MAP

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Emily
QVMS 8th Grade Student

“I really like the parts of class when I can talk to my friends about my project and see what they are doing.”

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Goals and Motivations
Complete assignments fully and on time
Share work with parents and peers
Show technical competency
Own her projects and ideas

TEACHER

Albert
QVMS Science Teacher

Goals and Motivations
Encourage learners to actively track learning gains

Make portfolios accessible to students, parents, and administrators

Support student choice and self-directed learning

Implement a seamless documentation process

Improve quality of learning artifacts

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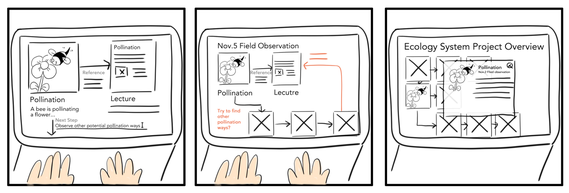
CAPTURE

Take pictures and video of a real ecosystem.

Record what they capture and why.

Upload pictures and enter personal notes (auto-transcript).

ORGANIZE

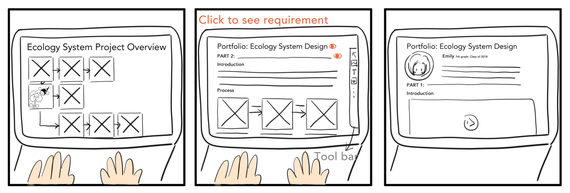


Place artifacts in digital flow diagram to tell a story about the project.

Re-organize flow based on initial scaffolded overview of the project.

Add detail to summary overview of the project.

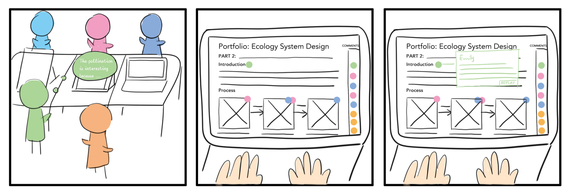
CURATE



Review project overview.

Create the audience-facing portfolio. Using previous work, scaffolding, and requirements, write a summary of the field trip, reorganize photos according to project goals, and caption artifacts to tell a story to audience.

SHARE



Publish online and share. Collect feedback from teachers and peers in the in-class gallery.

Give feedback on peers' projects online and practice digital citizenship.

Review feedback and implement suggestions to improve the portfolio.

FOREGROUND

	CAPTURE	ORGANIZE	CURATE	SHARE
PRIOR EXPERIENCE	Understand ecosystem concepts introduced in previous instruction Understand how to use documentation technology: camera, voice-recording app	Instruction & scaffolding provided for understanding and organizing flow diagram	Understand audience of the project & overall portfolio	Understand how to give constructive feedback and how to receive feedback
USER ACTIONS	Document process and interesting moments in the field	Add artifacts to fill out the flow diagram Review and reflect on the overview	Summarize portfolio components for specific audiences	Give, receive and respond to feedback Begin to plan revisions based on feedback
LEARNING ARTIFACTS	Photos, voice memos, videos	Logically organized digital flow diagram of field trip experience Annotated media	Summary and highlights of the whole project	Feedback given, received and responded to
SCAFFOLDING	Teacher facilitates documentation process prior to activity: helps students understand the importance of capture, when to capture, and how to capture Teacher prompts students to recognize "A-Ha" moments where thinking shifts and document them in real-time Prompt: What is important or unique about the artifact? What are the reasons for documenting it?	Teacher understands the conceptual & technical process of creating digital flow diagram to best support students Teacher explains rationale for flow diagrams they provide, facilitates increasing learner control as year progresses. Prompt: How does each collection of artifacts contribute to the ecosystem? What is their relationship to each other?	Teacher models curation through examples and organizes portfolio publishing system for students to use Prompt: Who is the audience for this portfolio? List the things they want to know about your ecosystem.	Teacher designs gallery walk experience and invites community members to participate Prompt: How should you phrase your feedback? Suggest words to use and words to avoid.
THOUGHTS AND FEELINGS	Consider parts of an ecosystem Curiosity, excitement	Consider project goals, process, and strategy Draw logical connections; better understand bigger picture	Perspective-taking, empathy Anxiety (positive and/or negative)	Curiosity & interest in peers' work, optimism, anxiety
MOTIVATION	Enjoy field trip experience, explore, make interesting discoveries, and connect field trip to prior knowledge	Complete class requirements: plan and present work clearly	Share project with audience	See classmates' work; Improve projects based on constructive criticism
TECHNOLOGY INTERACTION	Use a mobile device to capture media Upload to e-portfolio website	Access e-portfolio website to do user actions	Access e-portfolio website to do user actions	Give and receive feedback, and respond to feedback digitally
SOCIAL INTERACTION	Show evidence of animals, plants, streams, soil, etc. to teacher and classmates Face to face peer discussions	Teacher models how to put pictures into flow diagram & assists individual students. Teacher monitors and gives feedback Face to face peer discussions	Teacher monitors and provides assistance Face to face peer discussions	Give feedback to peers and receive feedback from peers & teacher during in-person gallery walk Give feedback to peers and receive feedback from peers, teachers, and public online
LOCATION	Local outdoor ecosystem	Classroom Anywhere with access to e-portfolio website	Classroom Anywhere with access to e-portfolio website	Classroom Anywhere with access to e-portfolio website

BACKGROUND

VALUE TO TEACHERS	Assess how students relate what they previously learned to authentic field trip experience	Assess how students related learning goals to their experience and their communication skills	Assess students' communication skills through their summary, and their feelings towards sharing	Assess students' ability to give and use constructive feedback
VALUE TO STUDENTS	Capture the experience of the field trip: pictures and captions to work with	Logical organization of portfolio components & captioned media to include in portfolio	Sharing with the purpose of getting feedback, and practicing the skills of summarizing	Opportunity to learn from and improve upon feedback
VALUE TO PARENTS	Can see what their children are working on if students share	Can see what their children are working on if they share	Learn about what their children & their peers are working on	Learn how their children take feedback

QVfolio Prompt Cards

"Share some of your story ideas with a friend to get feedback and new ideas."

1.1

When do I use this?
The student is stuck in the story brainstorming phase.

What should this do?
The student should get some new ideas and feel more confident about their story idea. Encourage collaboration, sharing, and giving & receiving feedback.

Prepare
QVfolio Prompt Cards

"List the materials you need to tell your story and where you can find them."

1.2

When do I use this?
After students have started considering their narrative.

What should this do?
Helps students organize their process and evaluate resources, preparing them to focus on the capture stage.

Prepare
QVfolio Prompt Cards

2.1

"Are other people involved in your project? Who? What do they contribute?"

When do I use this?
When students focus their story too narrowly on themselves, or their process.

What should this do?
Encourage reflection on individual roles and collaboration.

Capture
QVfolio Prompt Cards

2.2

"Did you beat any challenges? What were they?"

When do I use this?
The student's story is very straightforward and does not include any challenges or setbacks.

What should this do?
Encourage reflection on their learning and skills.

Capture
QVfolio Prompt Cards

3.1

"Let's look at some ways you could organize your story."
(share sample organizers)

When do I use this?
When a student's story and visual organization don't align.

What should this do?
Encourages reflection and iteration on narrative and important details.

Organize
QVfolio Prompt Cards

3.2

"Would someone else understand your story based on your graphic organizer?"

When do I use this?
When students have assembled parts of the story and are beginning to form a narrative.

What should this do?
Encourage students to think about communication and describe their experience explicitly.

Organize
QVfolio Prompt Cards

4.1

"What do you want your audience to understand about your project?"

When do I use this?
When students struggle to select evidence to curate.

What should this do?
Encourages students to prioritize evidence to satisfy their narrative.

Curate
QVfolio Prompt Cards

5.1

"What introduction would you provide to people viewing your portfolio? "

When do I use this?
When students are preparing to share their work.

What should this do?
Encourages students to summarize their work, and think about the context of viewing a finished project portfolio.

Share
QVfolio Prompt Cards

“How can you frame that in a positive way?”

6.1

When do I use this?
When a student is going to give feedback to a peer.

What should this do?
Encourage communication, respect, and digital citizenship.

Reflect

QVfolio Prompt Cards

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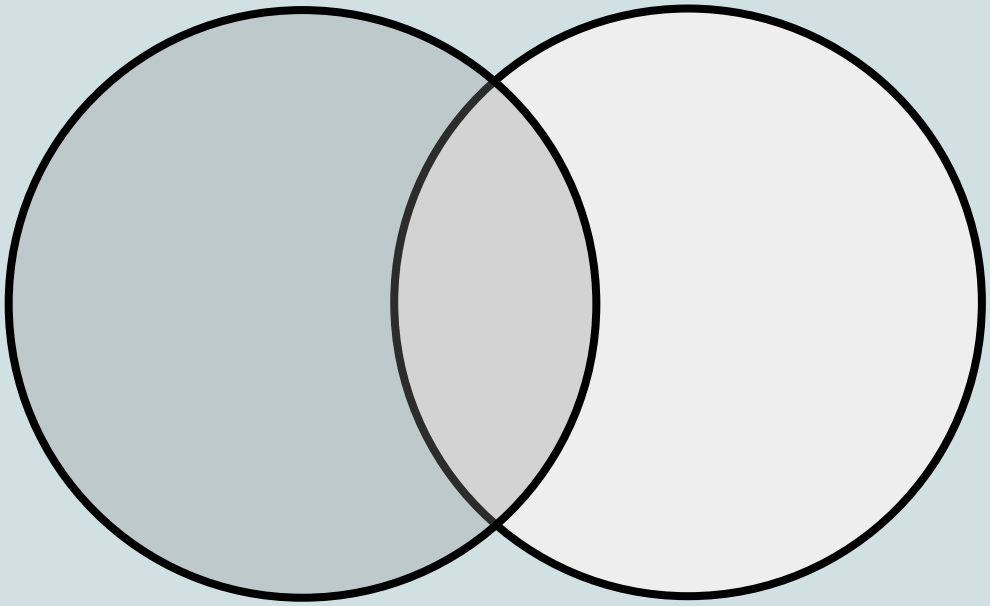
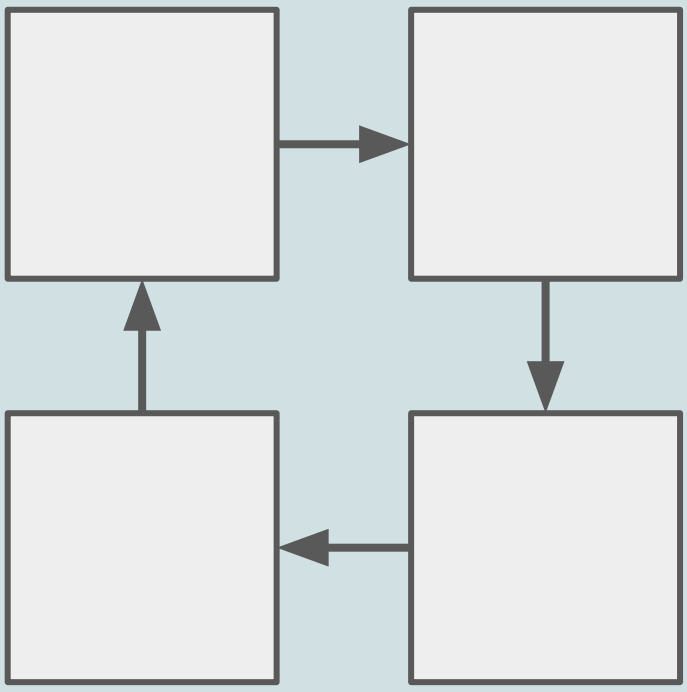
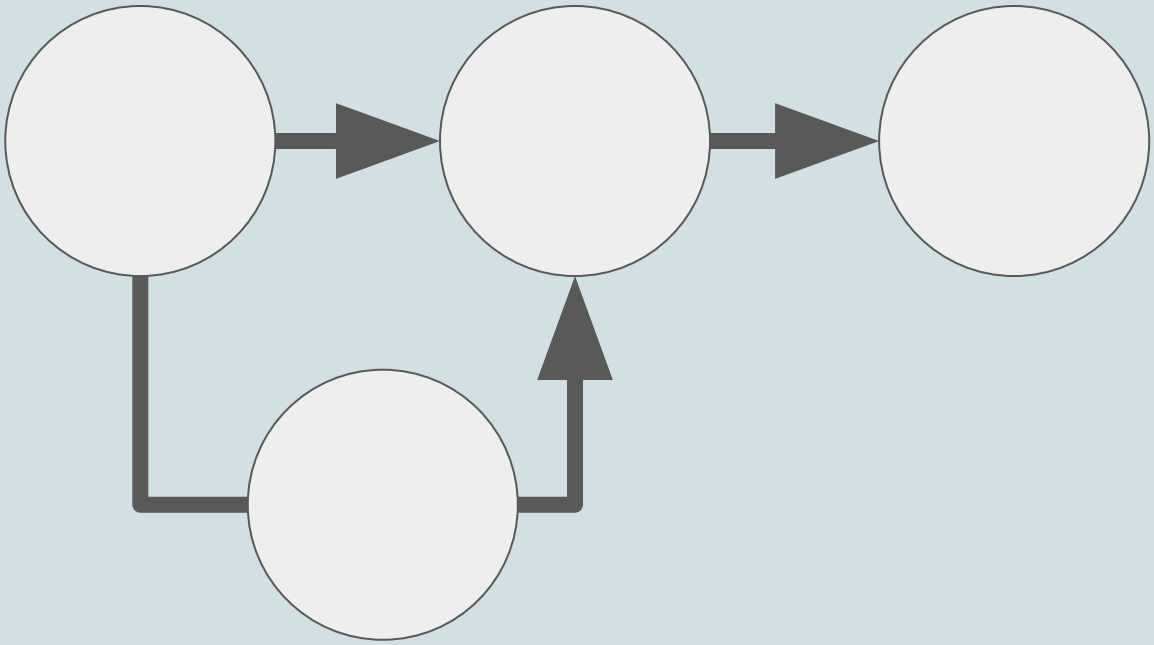


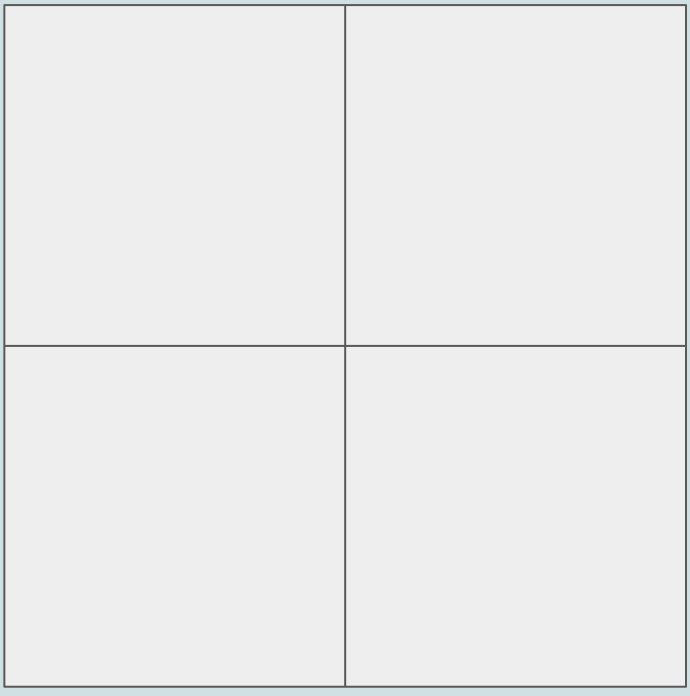
cycle



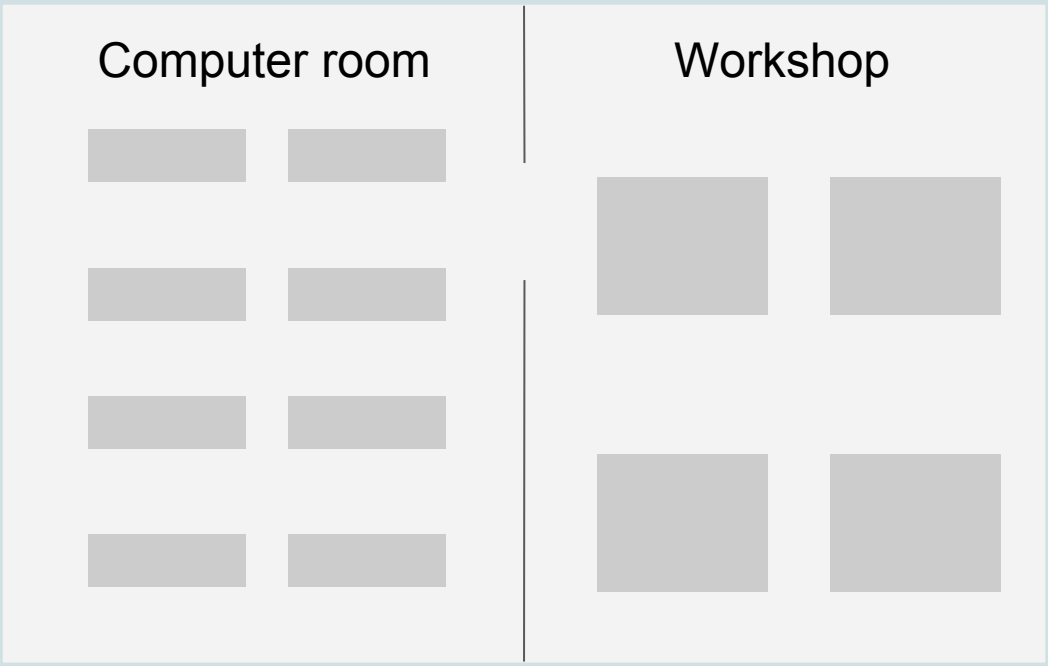
process



categories



classroom map



pros & cons

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