Kelly Babcock & Alex Visconti

TRUSS

A DESIGN & EDUCATION PARTNERSHIP

Published by:

MiD | MASTER OF INDUSTRIAL DESIGN
THE UNIVERSITY OF THE ARTS

320 South Broad Street
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Truss: A Design and Education Partnership

By: Kelly Babcock and Alex Visconti

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree Master of Industrial Design in the College of Art, Media, and Design.

The University of the Arts
Philadelphia, Pennsylvania

May, 2013

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Much appreciation to our committee members, Dr. Rose and Dr. Burnette for being outside voices of reason and clarity in confusing and complex times.

Thank you to our faculty advisors, Jeremy Beaudry, Jonas Milder, Sherry Leferve and Neil Kleinman for their support and guidance, and our fellow classmates for making the studio a wonderful place to work.

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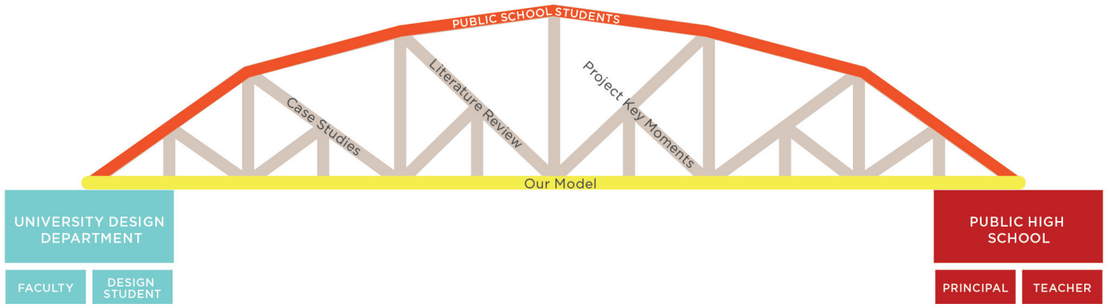
DEDICATION

To Alex, for defining what it means to be a great partner, and for always finishing my sentences (sometimes literally)–I know I didn't make it easy. To my husband for all of his support and encouraging words, even when he was under an equal amount of stress. And to all of my family and friends for being the loudest cheerleaders throughout this entire experience. Thank you!

–Kelly

To Kelly, for her unending support and friendship, even in "hangry" (hungry + angry) times. To my mother and father for being the continual pragmatists that they are and encouraging me to find my passion. To younger brother and older sister for being strong individuals whom I look up to and who understand the value of a creative way of life. To the formal and informal teachers throughout my life who helped foster a desire to learn from all situations. And to my friends who have stuck with me throughout this time in my life.

–Alex



What does "truss" mean?

In the field of architecture, a truss is a "framework, typically consisting of rafters, posts, and struts, supporting a roof, bridge, or other structure."

When it came time to name the model we had built through this project, we searched for a term to act as a metaphor and to allude to a mental image of support and framework. We feel that "truss" embodies the exact concept of what we had hoped to accomplish through our project–to provide a framework to support teachers in teaching 21st century skills. Our work has been in the pursuit of this goal and realized in the form of a model that outlines a partnership* between universities and public schools.

*We also enjoy how "truss" is close in sound to "trust"–a key element in the partnership

ABSTRACT

Truss is a model for partnership between university design students and public high school teachers to use design thinking and design process as a framework for teaching 21st Century skills (what we will refer to as design-based learning).

The question we asked ourselves when beginning this thesis was how can we, as designers, support forward thinking teachers who want to engage in an alternative way of teaching. Can classroom instruction be improved without extensive re-education and re-tooling of teachers? Our goal was to employ design in lesson-plan building for teachers interested in 21st Century skill development. We did this through collaborating with a teacher to use design methods and skills in planning lessons. In order to examine the relationships and effectiveness of the roles, we had to implement a design-based learning project with the class. The result of this collaboration, design-based learning project and research is an informed model for the development of a partnership between design students at a university level and public school teachers.

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DESIGN-BASED LEARNING AND 21ST CENTURY SKILLS

DESIGN-BASED LEARNING AND 21ST CENTURY SKILLS

Exploring a growing movement in public education reform

Design based learning has been a part of education for many years. It has many names: project based learning, problem based learning, service learning, etc. Each of the names holds a different connotation and has a slightly different slant to the type of learning it promotes, but they all aim at teaching 21st Century skills. As David Kelley, one of the founders of the design firm, IDEO and the Stanford University d.school, states in an interview about Stanford's REDlab, "The funny thing is that now in the K-12 literature I read all this stuff about 21st-century skills. And it's amazing because I could just cross out '21st-century skills' and put in 'design thinking.' It's basically what we mean, which is a new way of thinking that adds to, but doesn't replace, the way we normally think." Just as Kelley states, design thinking embodies the thought process and method by which designers innovate. It emphasizes creative thinking, visual communication, trial and error, synthesis, and other competencies that make it conducive for integrating with the 21st Century skills of: communication, collaboration, critical thinking and creativity.

What is the background of the movement to 21st Century skills?

The discussion of 21st Century skills began in 1991 when the US economy started a transition from an Industrial Age to the "Knowledge Age". That year was the beginning of a switch in the market place from industrial employment to an economy based on services and information, expertise and technological innovation, such as medical care or cell phone coverage.

As Trilling and Fadel illustrate in their book: *21st Century Skills: Learning for Life in Our Times*, the industrial age focused on a value chain of extraction > manufacturing > assembly > marketing > distribution > products (and services). The Knowledge Age value chain looks a bit different, beginning with data > information > knowledge > expertise > marketing > services (and products). The modern school day is structured around previous "ages".

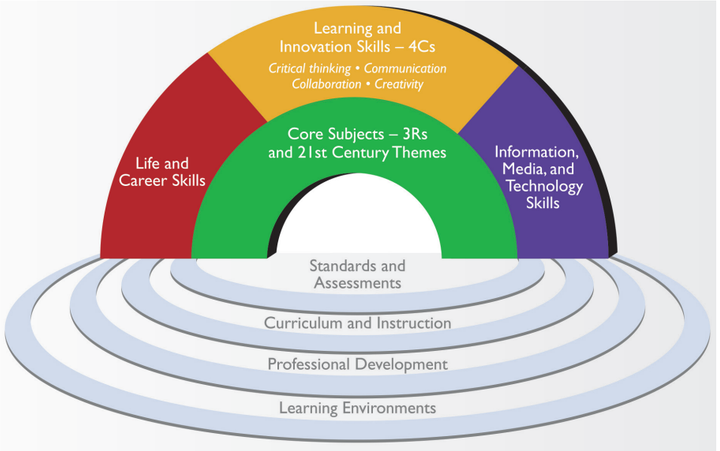
Each time a new century, and a new economy comes into play, a little bit of the old ones remain in the school structure. For example, schools are not in session during the summer because in the agrarian age, children were needed to harvest the fields in the summer time. It is no longer necessary for children to harvest fields, but they still have that time off. The industrial age shows its relics in the form of a day compartmentalized into smaller 40 or 50 min periods with a bell to signal a time to switch rooms to get the students used to a factory work day model that they would be in once they left school.

Students no longer need to be prepared for factory work, yet the bell and the short periods remain a staple of the school day. The original reasons for this school structure no longer exist, yet they remain an integral part of public schooling.

What are 21st Century skills?

The skills that the Partnership for 21st Century Skills (P21) have identified as the most important skills for the workplace of the 21st century are centered around three main areas: Learning and Innovation, Digital Literacy, and Career and Life Skills. *Please see the Appendix for a detailed description of the 21st Century skills.*

Learning and innovation skills are based around the principles that students should know how to use their knowledge in the core areas by thinking critically, applying it to new situations, analyzing information, comprehending new ideas, communicating, collaborating, solving problems and making decisions.



Graphic: Partnership for 21st Century Skills

How are 21st Century skills best taught?

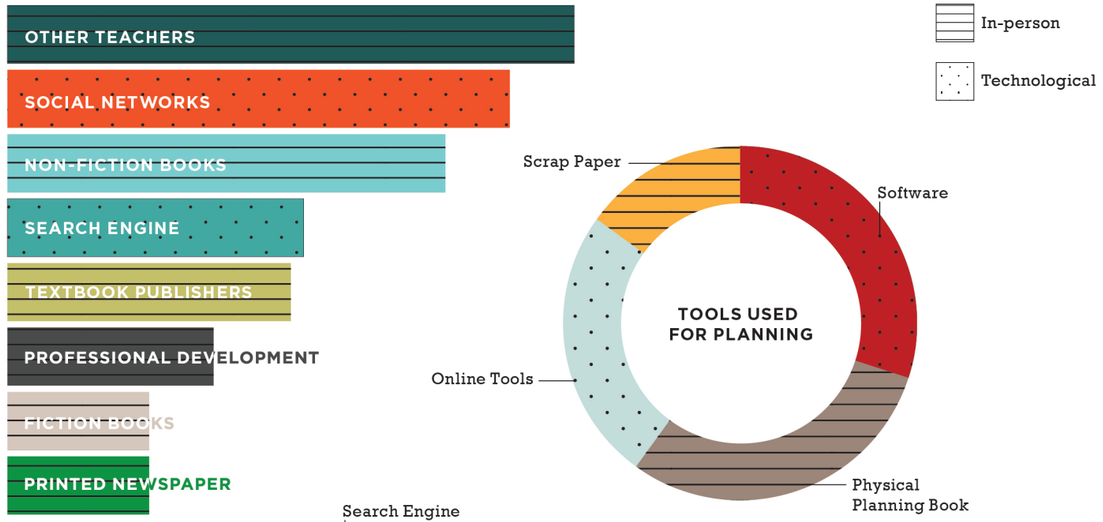
P21 names critical thinking and problem solving as the basics of 21st Century learning. Trilling and Fadel express that these skills are both taught through project based, real world applied methods of teaching. By sitting in rows and being dictated to, students will not learn the skills or understand the situations in which they need to apply critical thinking and problem solving strategies. Students must be equipped with these strategies and processes ahead of being confronted with the problem. The student has to have a solid grasp of the process and concepts before heading into the 21st Century workplace. Without that process at the ready or the knowledge of when to apply it, he/she will flounder.

There are many ways in which "21st Century Skills: Learning for Life in Our Times" outlines that these skills can be taught, all of which are inquiry based. The learning and teaching of these skills should be done through a series of P's (problems) and Q's (questions). The scientific method of questioning, and the engineering and design process of identifying problems, allow students the opportunity to become fluent in a process that is applicable throughout their lives. He/she will be able to work through the process of problem solving to gain the skills that will be able to be applied again. The project will serve with two layers, the content or area of interest to the student, and the development of the skills necessary to complete that project. That process of inquiry and discovery, with the addition of developing a solution, is design-based learning, or just design. Through design-based learning, the student is being taught the core 21st Century skills from those three areas of focus.

How teachers currently plan and teach new lessons and activities

To gain an understanding of how teachers currently plan and teach new lessons and activities, we conducted an email survey with twenty teachers. The teachers spanned grades K-12, and a breadth of subjects. They taught across public and private schools throughout the United States.

TOOLS USED FOR INSPIRATION



"But there is a problem. When you talk to teachers, they tell you, 'I love your ideas and it was a great workshop, but I don't have a minute to put this in my curriculum.' It just breaks your heart. So I think that the thing to do in K-12 to get design thinking in the curriculum is to find little ways, little cracks in the system to put it in."

–David Kelley, Founder of the D.School

How does design-based thinking fit with teaching 21st Century skills?

Design based thinking in education is defined by Swee Kwek as "an approach to learning that focuses on developing children's creative confidence through hands-on projects that focus on empathy, promoting a bias toward action, encouraging ideation and fostering active problem solving." He goes on to say that these are the "competencies that align with the five core assumptions outlined by Zhao." Dr. Yong Zhao is a professor at the University of Oregon, author and expert in creative, global and entrepreneurial 21st century education.

Trilling and Fadel assert that design-based learning, is one of the many ways proven to teach 21st Century skills in classrooms. Kwek also agrees but expands on why design-based learning is a good way to teach 21st Century skills by relating it to expectancy theory. Expectancy theory is the theory that "people are purposeful beings who behave in accordance with their expectations that their efforts will result in outcomes they value." Design based thinking has many different names, but Dr. Charles Burnette describes it as the process of intentional or purposeful thinking with an added layer of problem solving. He uses the example of crossing the street:

"Imagine the task of crossing a street. When we feel a need or desire to cross a street we form goals about doing it. Then we gather information about the layout of the street, the state of the traffic light, the flow of traffic, our relative location, etc. to help us decide the best way to cross the street. We organize this information into different ideas about crossing the street and analyze which best serve our goals. We may consider running across between moving cars if we are in a hurry. Whatever option we choose we think of it as a plan of what to do to cross the street and we think about what the experience will be like. As we cross the street we evaluate our progress and risk and adjust our actions as required. Once across, we think about the experience and add what we learn to our knowledge about crossing streets. Such thought is so familiar that we don't realize that different ways of thinking are involved and that we are designing when we think this purposeful way. We don't realize that we can think this way about other things and how to do or make them better."

This way of thinking becomes innate and habitual to those who use the design process and mind set regularly. Other people may cross the street with intention, but never evaluate their performance or think about how they can do it better unless something went terribly wrong. This is a new way of thinking that seems to align with the 21st Century skills overall purpose.

In their book, Bernie Trilling and Charles Fadel draw attention to the fact that design-based learning has been proven to teach creativity and innovation, responsibility and leadership, as well as collaboration, communication and cross-cultural understanding. Through a studio model, design-based learning offers a rich community for exploration. Students are constrained by certain project and studio limitations, but are able to explore a wide variety of options and encounter different types of people in their quest for a potential solution, expanding their cross cultural skills.

What are the obstacles and challenges of teaching 21st Century skills in a design-based way?

The design-based learning method of teaching requires a new skill set that is difficult to teach systematically. This makes it hard for teachers to devote the time and resources necessary to developing the lessons and plans associated with running a project in a class of 33 students. Teachers want to be creative, but it can be time consuming for them to think about all the students involved while planning those lessons. It is often hard for teachers to find the time to learn the skills themselves before teaching them to students. Today's teachers were most likely taught in the 20th century model of schooling, and have not developed the 21st Century skills themselves. Without an understanding and personal experience with those skills, it is hard to explain and develop lessons that teach those skills to a new class of 21st Century learners.

Trilling and Fadel explain and outline the obstacles to inquiry and design-based learning as:

- An unfamiliarity of students to the way of thinking required to create and justify logical arguments
- The role of teachers must change from the "sage on stage" to a facilitator and coach of the process
- Curriculum changes and assessment practices

These are in concert with the findings of Swee Kwek's thesis paper, "Innovation in the Classroom: Design Thinking for 21st Century Learning". Mr. Kwek describes his thesis as a case study of a school that has employed and indoctrinated design thinking with the help of the leadership administration. He chronicles three different teachers and their classes of students as well as the principal herself. He sites the main obstacles to design thinking integration as: resource allocation of time and space in schools, teacher expertise and support, and beliefs and assumptions about students, teachers, schools and community.

What are teacher specific obstacles and challenges of teaching 21st Century skills in a design-based way?

When implementing this new way of teaching, teachers will first have to be aware and have a solid understanding of the skills they will be teaching. When they aren't sure they grasp certain skills, they lose confidence and revert back to the old methods they know and understand, which are ineffective when teaching 21st Century skills. As Kwek describes, every teachers has his/her own way of teaching that becomes habit. When they are introduced to this new way of working, it can be difficult for teachers to break those habits and alter their methods.

Kwek ties this to cognitive science in that teachers may "understand the conceptual underpinnings of design thinking but reject the premises that support it." This shows the need for teacher support in terms of a guiding leader who will help him/her through the trials and tribulations of learning a new way of thinking. Kwek describes those positive attributes that appear in the leadership style of the principal at the school he researched. He says she offers support in the form of allowing a "no pressure" use of design thinking. She sets up professional development workshops, and asks teachers to use an agreed upon set of terms for teaching design-based learning. Other than that, she gives a framework and lets the teachers appropriate what they want from the framework.

Kwek highlights the importance of this by saying, "in adopting design thinking, schools therefore need to help these educators re-learn and even unlearn old habits – and school leaders must remove the fear of failure as a barrier to trying." This lowered pressure sets the teachers up for success and allows them the agency required to integrate design thinking into their classroom activities. Once these parameters are in place, they are equipped with enough tools and knowledge to begin integrating design-based learning into the day-to-day classroom.

Expert Interview

Dr. Kristin Swoszowski-Tran is a Learning Specialist at the Lower School at William Penn Charter School in Philadelphia, PA.

Our talk with Dr. Swoszowski-Tran provided great first-hand insight into working with teachers from a support staff perspective. For our work, we focused on how she supports teachers in the change cycle as they adopt new ways of working.

In particular, we incorporated the concept of co-creating solutions at a low fidelity scale when collaborating with our teacher-partner, Mr. Geyette. Initially, we approached our meetings with pre-fabricated, higher-fidelity ideas, but found that it stifled our relationship and hindered the collaborative process that we were striving for. After realizing this, we transitioned to a more co-creative process providing low-fidelity and more verbal tools that invited customization and adaptation.

"[...] in adopting design thinking, schools therefore need to help these educators re-learn and even unlearn old habits–and school leaders must remove the fear of failure as a barrier to trying."

–Swee Hong Kwek

Where are the opportunities in the obstacles that teacher face?

The importance of official policy, leadership, and teacher learning are reinforced in Trilling and Fadel's book in the section titled "Retooling Schooling". They outline a number of other factors that contribute to a school's success when adopting 21st Century learning as a priority. The official policy and leadership are linked because the leader must indoctrinate and communicate the priority of 21st Century skills in the school. Kwek states "teachers can try to introduce innovative practices in their classes, but it is a job only half done without the support and clear vision of the school leadership."

With that type of leadership and direction everyone in the school is working toward the same goal for all the students, even if each teacher is taking a different approach to teaching it. The second job of the leader is to create a network in which teachers feel supported and able to teach in this way, either through an online system or a physical meeting. Kwek agrees with this idea and found that teachers need this support network to generate a best practices list and share the ways in which this type of teaching works or doesn't work.

This is not a new idea. In a paper from 1997, Davis, Hawley, McMullan and Spilka highlight this idea in saying "if supported by strategic investments in networking, pre-service training, resource dissemination and further research – will lead to a quantum leap in the integration of design methods across the spectrum on U.S. education."

The other main obstacles that teachers face is that of time and money resources. There is a large time investment when changing the way that teaching and learning happen. Trilling and Fadel say that "to make project approaches work well, teachers must carve out the time to design and plan project activities that match the interests and needs for their students and the school's curriculum as well as time for extended project work that doesn't easily fit in the standard 50-minute period." It can be difficult to manage a classroom full of diverse learners and at the same time teach a new way of thinking. There is a lot of pressure on teachers and until some of that is relieved, and the fear of failure is taken away, they might be reluctant to teach in project or design-based ways.

Conclusion

While design based learning is proven to offer a way to teach 21st Century Skills, we needed to implement it in a classroom by running a project in order to watch the variables and obstacles react under certain circumstances. There are a number of frameworks and toolkits that allow teachers to access the information needed to implement this way of teaching, but we wanted to experience and observe the way those toolkits act in a real classroom. By understanding those variables and the effects they have on the teacher, we could better inform the model.

Quotes
These quotes are pulled from contextual interviews done with two teachers at the Franklin Learning Center relating to the obstacles that are found when trying to implement design or project-based learning. The colors relate to the obstacle that it addresses in the text opposite this page.

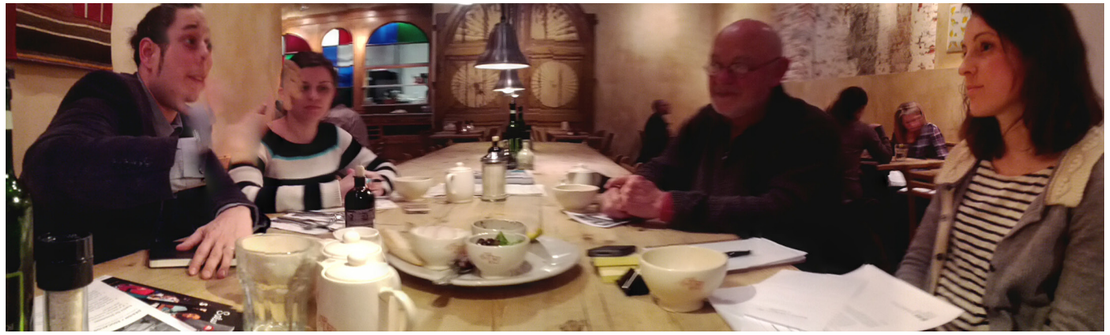
"Not about the tools, it's about the time you have to actually use the tools."

"Teachers are fearful of project-based learning because it means they have to change their mindset."

"Teachers will not be able to sustain it unless you 'sell the DNA'."

"If the Principal has the vision in an autonomous school within the Philly School District, they can change the culture."

"The District's time and content schedule is the driving force of my curriculum."



"Coffee Talk" with Mr. Geyette, Dr. Dan Rose, and Dr. Charles Burnette *Photo credit: Dr. Dan Rose*

02

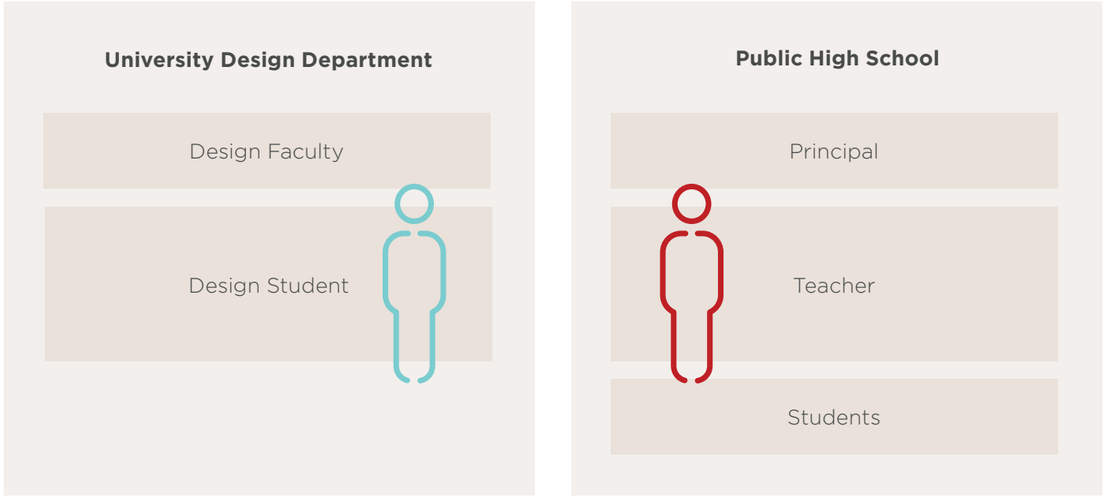
TRUSS: A MODEL FOR THE FUTURE

TRUSS: A MODEL FOR THE FUTURE

How we envision the partnership between universities and public schools, based on what we learned through our research

This is a model for a partnership between a university design program and a public high school to teach 21st century skills. It is intended for public schools who believe there is more to student learning than just "teaching to the test" and does not address the teaching of specific content. This model is a preliminary frameworkbased solely on our experience with one teacher, at one school, and with one class of students; it is not meant to be a stand-alone. Although our project could be duplicated as is, we recommend that this framework be tested in a variety of circumstances as it is fleshed out and scaled to other universities and public schools.

The roles involved in the model



The process used in the model

The aspects of the model that were informed by "Key Moments" from our research
Use these numbers to find out how the "Key Moments" in the development of our project informed the decisions we made about the model.

1. Lesson & Activity Planning with the Teacher, see page 75 for more detailed information
2. Direct Instruction & Facilitation of Design-Based Learning, see page 79 for more detailed information
3. Building Creative Confidence in the Students, see page 83 for more detailed information
4. Assessment of Student Understanding, see page 87 for more detailed information

HOW WE BUILT THE MODEL

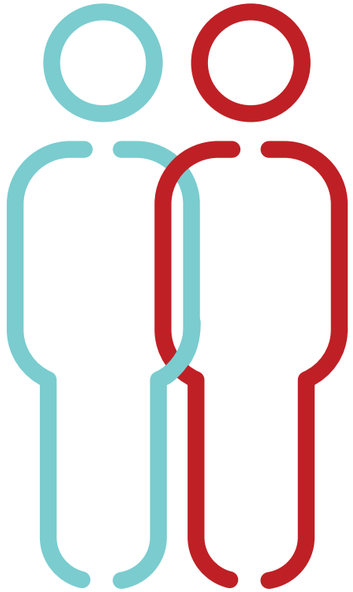
The model is the product of our experience when working with a teacher at a public high school in Philadelphia. This first hand experience really paved the way for the section about the relationship between the teacher and the design student. Throughout the process we employed during this partnership, we focused on the day-to-day instruction relationship between the design students (ourselves) and the teacher (Mr. Geyette) in the classroom. We understand that in order to sustain this model, the principal must lead a greater shift in the culture of the school.

Secondary literature research was looked to when informing the first section (in reference to setting up the partnership) and the last section (reflection practices). One significant piece of data we learned through our project development and secondary research was that teacher support is necessary from all levels. That information inspired the amount of professional development and the hands-on nature of the principal and leadership found throughout our model. We do not directly address the specifics of each professional development session, as we believe that should be determined through a collaboration between the designers and the public school principal.

Our hope is that it will serve as the basis for principals looking to integrate design-based learning into their school culture with the support of a university design program.

prepare > meet > plan > make > do > reflect

The "prepare. meet. plan." step is about creating a school-wide culture–built through collective understanding and intentional design of the new structure. This step is meant for the design students and teachers to work together to establish that understanding.



1. The school principal will lead a session to develop the new vision for the school, and discuss guiding principles for the change in school culture as well as the collaboration in the classroom.
2. The design student will apply to Truss–if accepted, they will receive training in building empathy, emotional intelligence, basic education theory, the ethos of the school.
3. The design students and design faculty will guide the teachers through a one-week professional development session, where they will personally experience design-based learning, as it applies to their schools' specific needs. The principal will participate and provide input.
4. Teachers will have the opportunity to volunteer as part of a leadership team responsible for planning extra, school-wide, design-based activities throughout the year, as well as act as a mediation committee for any problems that may arise.
5. Design students and teachers will meet and get to know one another at an event before deciding on pairings[2a].
6. In the first week of the partnership, the design student will learn about the teacher's needs and challenges of teaching their course's content.

[2a] We believe our collaboration with Mr. Geyette benefited greatly by how well our personalities worked together.

Suggested Guiding Principles for Culture Change

- All participants are willing to collaborate
- 21st Century skills and design-based learning are emphasized as complements to and support of analytical thinking
- All decisions are student-centered
- Students are supported in building personal agency and connecting themselves to a larger context outside of the classroom
- Teachers, students, design students, the principal, and design faculty work co-creatively and are transparent in their practices[1a]

Suggested Criteria for University Design Student Applicants

- An empathic attitude
- An interest and knowledge-base in design *and* education, as well as an outside subject area–preferably pertaining to a specific high school content area
- Communication skills (verbal, written, and visual)[1b]
- Facilitation skills–especially experience with non-designers[3a]
- Ability to be self-directed and take initiative
- An understanding and capacity to manage the design process and corresponding methods and tools[1c,2b]

[1a] Although we did preliminary lesson planning with Mr. Geyette in-person, we could have also included him in the process of fleshing out the details, and fabricating the materials

[1b] We found that it was most effective to alternate between communication styles as we explained different design-based lessons/activities

[1c] Suggesting the sequence and type of design-based activity required a knowledge of all the possibilities, and which one would be most appropriate to the situation

[2b] In order to facilitate the activities, we needed previous personal experience using the methods and tools and ideally experience using them with non-designers

[3a] We used facilitation skills we had learned in the MiD program to build confidence in the students as we asked them to work in new and unfamiliar ways

prepare > meet > **plan > make > do** > reflect

The "plan. make. do." step is about defining the relationship between the design student and teacher. It outlines how the day-to-day operations in the classroom are managed.

Design Student

- Set up the shared planning materials and tools (i.e. Google Doc) and After Action Report (AAR).[1a]
- Understand how to apply the design methods and tools to the teacher and students' needs[3a]
- Design and fabricate the design-based activities used in the classroom

Teacher

- Co-facilitate the classroom activities[2a]
- Co-create, review and sign an agreement between the design student and teacher
- Complete the AAR following each lesson[1a]
- Lead the day-to-day direct instruction and classroom management[2b]
- Formatively assess and revise day-to-day activities according to student needs[4a]
- Print materials to be used in class
- Participate in weekly sessions with the teacher designed-based learning leadership team

[1a] *Although we conducted a formal AAR following each lesson/ activity, we did not do it together with Mr. Geyette–it would have been more effective to include him in our practice*

[2a] *We found that the students needed more support from us and Mr. Geyette than we had expected*

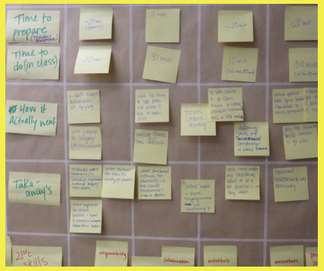
[2b] *Mr. Geyette was more knowledgable and experienced in delivering new content to the students and managing the classroom dynamics*

[3a] *We considered which methods and tools would be best for building confidence at different stages of the design process*

[4a] *Mr. Geyette had a strong sense of how well the students were grasping the new concepts and if they needed more support*

After Action Report

This is an example of the After Action Report we used to assess how each lesson went. We kept track of key moments and ideas for improving future lessons. *For a more detailed view, please refer to the Appendix.*

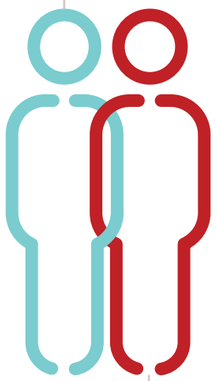


Suggestions for the Designer-Teacher agreement

This document should outline the roles and responsibilities for each teacher-design student pair. The discussion should also involve sharing what success means to each individual, and the establishing of a class goal.

prepare > meet > plan > make > do > reflect

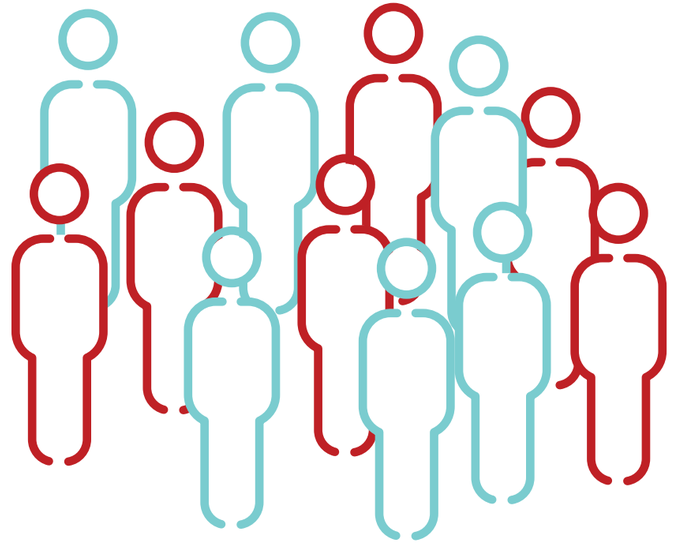
The "do. reflect. prepare." step is about bringing the day-to-day operations out of the classroom to affect the school culture. It enables teachers and design students to reflect and iterate on the process for next year's collaboration.



Design student and teacher pairs meet to discuss how the collaboration went–creating an After Action Report (AAR) to assess successes and failures, if the goals were met, and outline what they would change for next time.

Design students meet with university design faculty to reflect on the effectiveness of the partnership with respect to bringing design-based learning into the classroom.

Teachers meet with the principal to reflect on the effectiveness of the partnership with respect to bringing design-based learning into the classroom.



Design students and teachers meet as a group to share the overall experience and the outcomes from their individual sessions.

AREAS FOR FUTURE RESEARCH

We acknowledge that there are aspects of this model that are not fully researched or complete. We invite future designers and educators to explore those areas–including, but not limited to the following:

- How the process of pairing the design student and teacher would work
- How university design students would be selected to participate, including the format of the application
- How the agreement contract between the design student and teacher would be structured
- Who would manage Truss at the university
- How the university design faculty and the principal of the public school create channels for communication and collaboration

03

TESTING OUR ASSUMPTIONS THROUGH A SPECIFIC PARTNERSHIP

TESTING OUR ASSUMPTIONS

Testing how the co-creative, teacher–design student partnership functions when introducing design-based learning in a public school classroom

This section explains the details of our partnership with a public school teacher and his students. It outlines how the roles, relationships, and responsibilities developed over the course of a four-month design-based learning project.

ESTABLISHING A PARTNER

Building a partnership with a public high school teacher and his 13 junior American History students

Dr. Dan Rose, our thesis committee co-lead, connected us with Mr. Neil Geyette, a Principal Intern and American History teacher at the Franklin Learning Center. We met with Mr. Geyette to explain the goals of our thesis project, and we were excited to learn that they aligned well with his teaching philosophy. He agreed to the partnership we were proposing, and to engaging in a design-based learning project with his American History class. We were grateful and excited about this opportunity, and believed it would be a mutually beneficial experience for all involved.

Here are some of the parameters we set-up for the project:

- Mr. Geyette was our sole partner
- The American History content was covered in class periods we did not attend
- We accepted design-based learning as a proven method to teach 21st Century skills and tailored the lessons and activities to Mr. Geyette's teaching style
- We would be in the classroom two to three days a week to work with the students on the design-based project
- We would meet with Mr. Geyette for a half hour, following each class period, to reflect on the day and plan for the next class
- The project content would focus on opportunities for innovation in the Franklin Learning Center community, and teach the students design process, methods, and tools

A short narrative about Mr. Geyette

This is Mr. Geyette. He is currently a high school American History teacher at the Franklin Learning Center. And the following is a brief story that he relayed to us and was detailed in an article on "The Notebook," a website covering current news in the education network in Philadelphia.

Mr. Geyette graduated from college with a history degree. He always knew that he wanted to be a teacher through alternative means–developing his own philosophy along the way. He feels it is important for a teacher to come up with his/her own philosophy and perspective on teaching. While he was in Mongolia teaching for a year after college, he was able to develop his own philosophy about teaching.

He brought that with him back to the U.S. and received a teaching fellowship in Philadelphia. The plan he developed outlines the type of classroom environment and students he wants to cultivate though teaching. He believes that "teachers must give students some agency in their education. Students are not passive vessels waiting to have knowledge poured into them, they are complex beings with the desire to feel they are in control of their lives." He references Howard Gardner's Theory of Multiple Intelligences–which differentiates intelligences into different modalities–and proposes ways in which teachers can foster the different abilities.

After getting a permanent position at West Philadelphia High School (WPHS), he won two awards: one for being the 'Most Promising High School Teacher" in the district, and the other for "Distinguished Teacher." He was on track to become a change-maker at WPHS.

During Mr. Geyette's first year, there were 2 fires and 25 assaults on teachers and staff. In a high school of approximately 700 students, the extreme disruption took a toll on the culture at the school. Mr. Geyette personally extinguished two major fires, one in the girls bathroom and the other in a locker.

Two years after starting at WPHS, Mr. Geyette was appointed Director of The Urban Leadership Academy within WPHS. He was able to use "community action based learning" to teach 21st Century skills to 400 public high school students. With the amount of vacant land in West Philadelphia, and the help of the University of Pennsylvania he was able to craft a curriculum that got the students out of the classroom and into the community. They went door-to-door and conducted ethnographic research to uncover what the community wanted to see in those currently empty spaces. He also had the students re-brand the academy by designing a new logo.

After the first year of Mr. Geyette being in charge of the academy, the culture of the school had changed for the better. The amount of fires were reduced from 2 to 0 and the number of assaults dropped from 25 to one. Students were being more respectful of each other, the staff, and the community in which they operated.

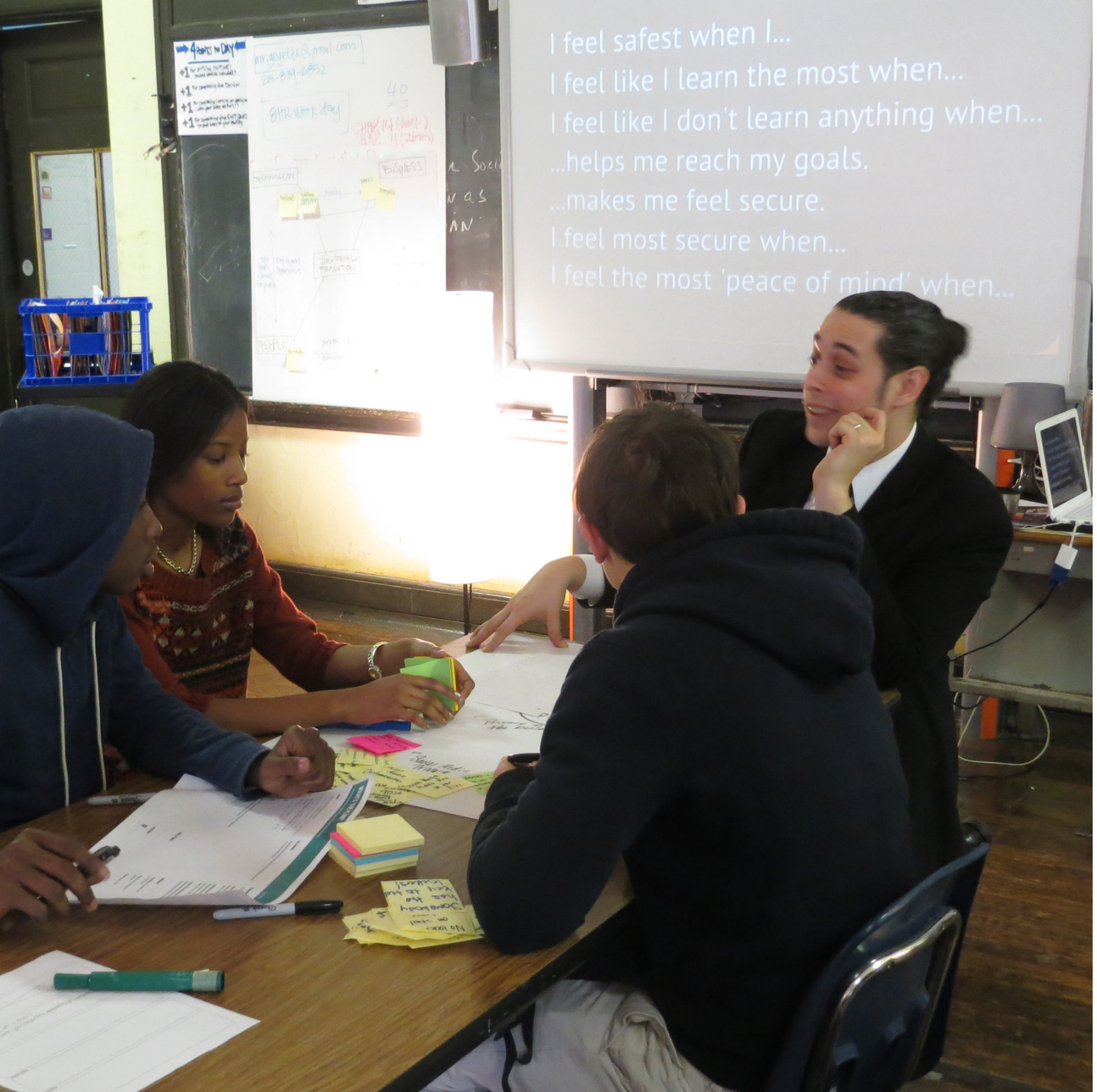
The academy was highly supported by the principal. She and Mr. Geyette saw eye-to-eye on the philosophy through which students were learning 21st Century skills. However, this method was not improving test scores or increasing the students' success on traditional modes of assessment as drastically as the district would have liked.

By the end of the 2009–2010 school year the Superintendent removed the Principal from her position. Mr. Geyette, along with other teachers, submitted a plan to the district to keep some of the previous modes of teaching (like community based projects) and integrate a more rigorous curriculum that focused on reading, writing and math. The district was quick to dismiss it.

With the principal gone, Mr. Geyette tried to convince the incoming administration to allow integrated project-based community learning back into the curriculum at West Philadelphia High School because the culture of the school had returned back to its original state. The rates of assaults were back up from 6 to 23 and there were 3 weapons related incidents.

The superintendent was under pressure to make the school perform better on the Pennsylvania System of School Assessment (PSSA) standardized tests and turned the High School over to a "Promise Academy." This meant that all the teachers and administration were forced to relocate to another school and a new staff was brought in to replace them. Mr. Geyette lost his position as a teacher.

The media got wind of this story and published articles about the state of the school and the implications of turning the school into a Promise Academy. The new principal had success at another high schools in Philadelphia and wanted to implement the same exact plan at WPHS, without regard for the previous community and any cultural practices in place.



Mr. Geyette was resilient, and set his sights on becoming an administrator to have more control over the type of skills and how they were being taught to students.

Because of his understanding that in order to operate in the system, he has to be in control of it, Mr. Geyette was able to apply for and receive another fellowship. This one allowed him to pursue his Master's degree, while also serving as Principal Intern at the Franklin Learning Center to learn about the administrative side of the education system. He also doubles as a teacher for one American History class made up of Juniors and Seniors. He hopes to become a principal after graduating this May.

This is where we met him. We were excited to form a partnership with him and work within his classroom a few days a week to implement design-based learning strategies.

Franklin Learning Center (FLC)

Public Magnet School, Grades 9–12

Mission Statement

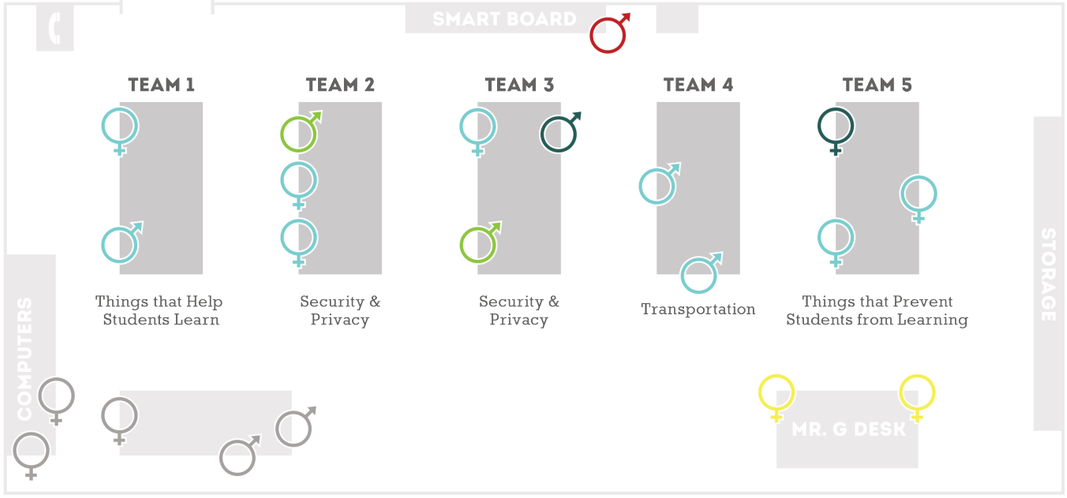
"We believe that all students can succeed with appropriate supports from school and home. All students will leave Franklin Learning Center with a skill set that enables successful competition with graduates from the best schools in the country. All students will have a 21st century skill set that enables success in college and/or career."

The Franklin Learning Center is located at 15th and Spring Garden street in Philadelphia, PA. The student body is made up of about 750 students ranging from 9th to 12th grades. It was founded in 1974. The school was awarded the title of National Blue Ribbon School of Excellence as well as a School of Excellence at the state level. Each student is required to enter one of three mini schools within the Franklin Learning Center; Health Science, the Arts and Humanities, or Technology.

It is the first high school in the Philadelphia School district that operates entirely on a competency based system. That means that "each student receives credit for units completed in a class. When they have completed the required credits for that class, they can move on to the next class". Each teacher creates a system of LAP's (learning activity packets) for their students to obtain the required credits.

The people in the classroom

After observing for a couple months, we mapped out how the people were situated within the classroom. We placed the students according to their project group seats, by gender, and by tendencies in learning and group work. We also noted the topics that each team focused on throughout the project. Because of the Franklin Learning Center's competency-based system, there were senior students who did their own individual work in the back of the classroom.



Junior Student
Fully focused, natural leader, comfortable with risk, independent

Junior Student
Semi-focused, follower, not comfortable with risk, dependent

Junior Student
Not focused, counter-dependent leader, fight or flight with risk, resistant

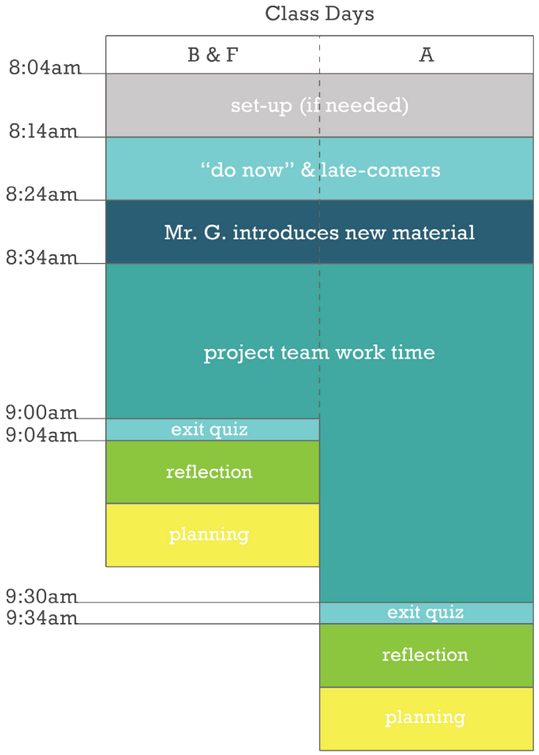
Neil

Alex & Kelly

Senior Student

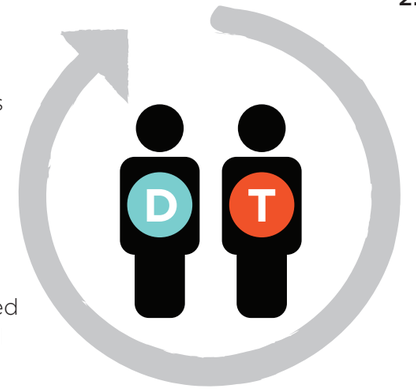
The class time structure
The Franklin Learning Center schedule operates on a 6-day cycle, using letters A-F to denote the different class days. We alternated between A, B and F days. B and F days are a 50 minute class period, and A days are an 80 minute class period.

We found that structuring time immediately after the class period to reflect with Mr. Geyette was crucial. It provided space to discuss what had worked or not in that day's lesson/activity, as well as iterate and plan for doing it a different way the next time. This also allowed for great flexibility and meant we were able to change the project's course easily.



How we intended the roles to play out for the process of planning, implementing, and evaluating a specific lesson/activity:

1. **Teacher** shares details of upcoming lesson plan with **Designer**
2. **Designer** brainstorms ideas for methods/tools to use, and storyboards how they might work in the lesson
3. **Designer** brings examples of the design methods/tools to meeting with **Teacher** and discuss which is best to implement
4. **Designer** and **Teacher** co-create a method of evaluation for the particular method/tool
5. **Designer** designs and produces the artifacts that will be implemented
6. **Designer** delivers the finished artifacts to the **Teacher**, and he/she implements them in the lesson
7. **Designer** observes the class and evaluates the method/tool, artifact, and the **Teacher**
8. **Designer** discusses the evaluation findings with the **Teacher** and recommends iterations for future implementation



DESIGN-BASED LEARNING IN THE CLASSROOM

How we structured and implemented the design-based lessons and activities in the classroom

We worked out a plan with Mr. Geyette to lead the students through a design process for about 10 weeks. The project was introduced to the students as a process by which they would be able to innovate. This tie to American History was enough for Mr. Geyette to make it a full semester project. We began by listening to his needs for teaching the class and the objectives he had in teaching 21st century skills. Then we were able to use our knowledge of design tools and methods to create and facilitate activities in the classroom to help the students through the project.

INTRODUCTION

Goal
The goal of the introduction phase of the project was to set the context for the project. This included introducing the concept of design and how it related to the idea of improving the school community.

Intended Outcomes
We intended for the students to open their mind to a new way of thinking, and to begin to gain agency and belief that they can make a difference.

RESEARCH

Goal
The goal of the research phase of the project was to build a foundation for the students' future ideas, based in real human needs. We aimed to show students the value of a beginners mind (objective data collection) and techniques for gathering data in a objective, qualitative way.

Intended Outcomes
We intended for the students to build empathy, experience generative thinking, and gain objective observation skills.

SYNTHESIS

Goal
The goal of the synthesis phase of the project was to have the class identify the next chapter or future state possibility of the problem. They would do this by turning the stories from their research into meaningful insights to form a point of view and direction for prototyping new ideas.

Intended Outcomes
We intended for the students to cultivate optimism in making the current situation better, to build capacity for managing complexity, to trust in their intuition and to gain a viewpoint and confidence to express it respectfully.

PROTOTYPE

Goal
The goal of the prototyping phase of the project was to facilitate a meaningful conversation about designing testable ideas. This involved explaining what a prototype is, and how to build ideas based on the values discovered in the synthesis of the research. We wanted to demonstrate how to take blue-sky ideas to a testable place without abandoning them.

Intended Outcomes
We intended for the students to learn how to brainstorm innovative ideas, to gain the hard skills to visualize abstract concepts, to feel the power of making, and become effective communicators of their thoughts and ideas.

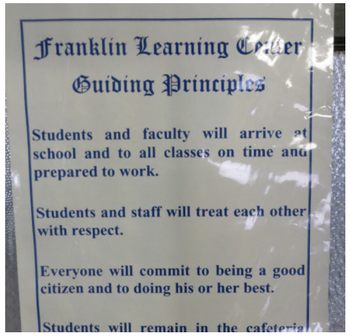
TEST & ITERATE

Goal
The goal of the test and iterate phases of the project was to learn how to gather constructive feedback on a rough prototype. Then how to take that feedback and iterate on the prototype to form a more refined version.

Intended Outcomes
We intended for the students to build resilience, to learn adaptability, and to experience a collaborative working environment.

Observing

Prior to beginning our project, we visited The Franklin Learning Center to observe Mr. Geyette's class. We wanted to take note of how the culture currently existed before bringing in a new way of working/thinking. We observed things such as: teaching style, lesson plan structure, group dynamics, individual student personalities, and the school-wide policies.

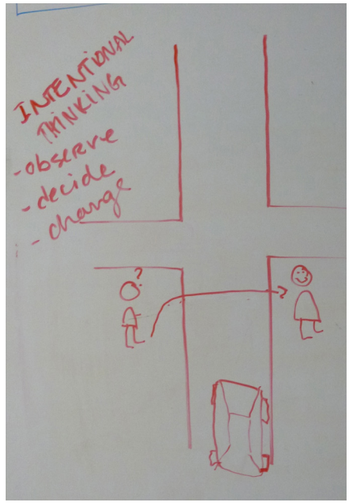


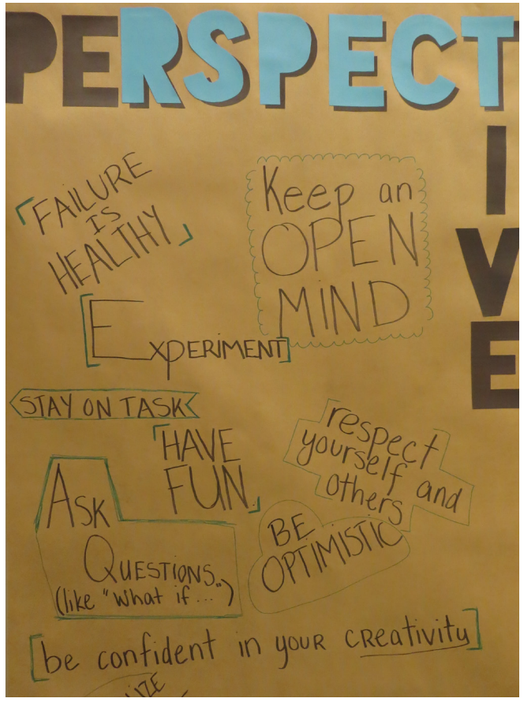
INTRODUCTION

We had met with Mr. Geyette and decided that the focus of the project would be the community of The Franklin Learning Center (FLC). This topic was intentionally broad, and we wanted to have the students explore all aspects of the space–not only the environment, but also the people and systems involved.

On our first day of class, we wanted to be careful in how we introduced the students to the concept of design. We did not want to overwhelm or confuse them too much, since we knew it was something they may have never heard of before.

First, we shared some design guiding principles to connect a designerly mindset into the already established culture and mindset that we had observed at FLC.



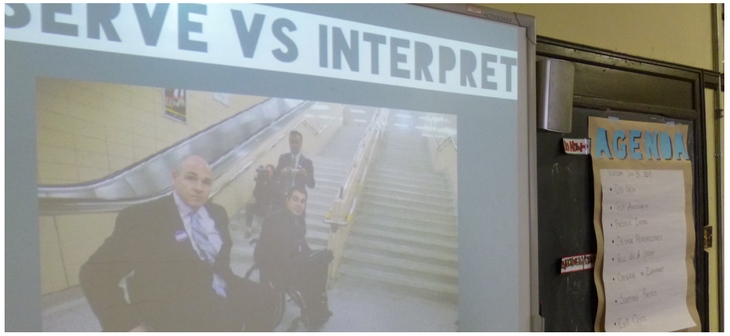


Next, we talked about how "design thinking" is rooted in intentional thought–a concept shared with us by one of our thesis committee members, Dr. Charles Burnette. We shared Dr. Burnette's example scenario of crossing the street to demonstrate the concept. At the end of explaining the thought process used by someone crossing the street, we added the additional step that considers this intentional thinking process as a design process–acknowledging the possibility of making it a better experience, or wanting to improve how others experience the process. Then, actually acting on that opportunity by designing new solutions that better fit the needs of the people using the product/environment/service/system.

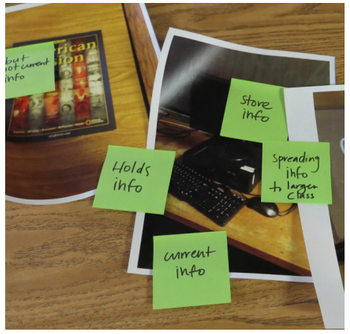
We told the students that this concept was the crux of our collaboration, and that our goal was to show them the practical, design-based tools that can help them affect this type of positive change in their school community.

RESEARCH

Observe vs. Interpret Mindset
To kick off the project, the students were tasked with taking two photos before coming to class–one of something "working" in the school, and the other of something "not working or broken" in the school. These photos would become the basis for building the specific topics that the students will address in their project teams.



To introduce the idea of "Observe vs. Interpret" mindset to the students, we led them through an exercise with their photos from around the school. We defined observing as looking at a situation without applying your own personal filter or judgments, and we defined interpreting as applying your own point of view and experience to make assumptions about what you think is happening in a situation. After explaining the difference between observing and interpreting, we asked them to apply it to their own images. First, we asked them to only describe only what they saw in their image, without interpreting. Then we asked what the reason might be for their answers, and had them write at least five possible interpretations.



Next, we transitioned into a more active experience of scrambling everyone's photos (both "working" and "not working/broken") all together in the center of the table. We stood around the table and began to identify connections between what was physically in the photos, as well as conceptual connections–according to what had been shared in the stories. Once the photos were all clustered, we captured the greater themes/topics that represented each grouping, and captured them on sticky notes.

War Room Building
To organize the student's project work throughout the next month or so, we decided to use "war rooms." The concept comes from Winston Churchill and World War II, when they created underground rooms to manage the intelligence and decision-making during the war. For designers, the concept of the "war room" translates to a physical space for externalizing the various research artifacts and ideas gathered throughout the project. Initially, in the Research Phase, these artifacts will consist of photos, observation notes, action research data, quotations from interviews, etc.

Instead of just providing the students with pre-made war rooms, we wanted them to take part in building their own "tool". We structured the activity with constrains, like only providing a set number of materials, limiting the amount of construction time, and stipulating that the final form must stand on it's own. We also attempted to address common core standards directly by having the students write directions for how they constructed their war rooms. That writing was difficult to complete in the time we had allotted for the activity.

RESEARCH

Action Research: Introduction
Mr. Geyette began the action research phase by explaining the difference between qualitative research and quantitative research. He shared the purpose of each, the type and form of data collected, the type of analysis, and the form of the final research reports. After clarifying the difference, he introduced the type of research the students would be conducting for their project–action research. Action research is a qualitative method; borrowed from Social Science, where designers include the people they are designing for in the data collection process.

We thought this type of research would be very valuable to the student teams because it provided the opportunity to gather not only a high quantity of responses from the school community members, but also the ability to ask further questions, in person, of the people participating in the research. The act of questioning helped to reinforce the use of those 21st Century skills of adaptability and collaboration.

To give context to this new way of researching, we showed examples of Candy Chang's installation titled "Before I Die..."

Photo credit: Candy Chang

where she invited the community to share their thoughts by finishing the phrase. We also shared some of our own work our own action research conducted, such as an installation at The Free Library of Philadelphia.

Action Research: Plan
To help the students plan their action research installation, we distributed a "planning canvas" we had created. *The full document can be found in the Appendix section.* The first section asked questions, such as: why is the issue important to you, why should students care about this issue, and what questions could you ask the people who interact with your board to learn more from them. The second section provided a space to brainstorm a "fill-in-the-blank phrase" (modeled after Candy Chang's installation) to be used to gather their target audience's thoughts/feelings.

Action Research: Make
To make the action research installations, we divided the team into two groups. One group painted the stenciled phrases onto large rolls of brown paper, and the other group learned how to use Adobe InDesign to create a poster explaining their topic.

To make the large data collecting sheets, we used white gesso as the paint, and the group used foam brushes to paint over their taped down stencils. It took a little bit of practice to get the right painting technique, but once the group figured it out, they cranked out the four sheets they needed. It was great to see everyone collaborate and iterate on his or her process as they saw things that did/didn't work.

The students learning Adobe InDesign picked it up very quickly. We had created a simple template of text boxes and images boxes, and showed them how to change fonts, colors, add images, and other icons in an "as needed" learning experience.

Action Research: Do
To help the groups stay organized when implementing their action research with the student body, we had each group member chose a role to play. The roles included: Photo Documenter, Questioner, and Notetaker. The students installed their research panels in the morning, and gathered research with the entire student body, over the course of all three lunch periods. From just observing, it seemed that once the passing by students learned about what the project was, they were eager to fill in the phrase with their thoughts. After the first chaotic, 30 minute lunch period, the papers were already full of data.

We had a break before the next lunch period, and the teams reflected on the experience. They said that as much as they had planned and practiced, that it was really hard to be that organized when it was actually happening. They also expressed that the other students didn't understand what the project was or what they were suppose to write.

We also realized that there had been some profanity written on the papers, so we spent our break time crossing out the inappropriate responses. The Questioners said that it was hard to keep people from writing profanity, but committed to being more forceful about it the next lunch period.

SYNTHESIS

The synthesis phase of the project was about analyzing the data that had been collected during the action research installation. Mr. Geyette revisited the idea of qualitative research–noting that what the students had collected was made up of thoughts and feelings, and therefore words and images were the data they were going to be working with. He explained that the teams would first be recording their data onto sticky notes, then they would be clustering that data to uncover relationships.

We walked around to facilitate the teams in uncovering patterns, and anomalies. Once the group members were happy with the clusters they had formed, they titled each one with a phrase that captured the theme in the data. Then, as a group, they chose one to move forward with. We encouraged them to base their decision on what was most interesting or intriguing to them.

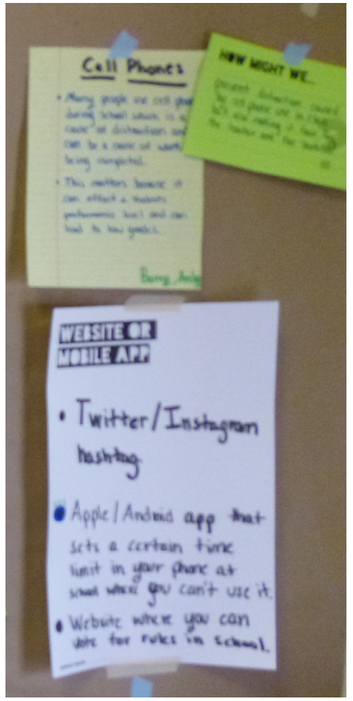
PROTOTYPE

To begin prototyping, the students reframed the "problem/issue" area they had chosen to focus on from the synthesis phase, into an opportunity. We used the framework: "How might we address [insert problem/issue statement]?" to help this process. Then, to begin brainstorming ideas, we introduced four solution lenses: campaign, new school service/program, physical environment, and mobile application or website. The framework expanded to: "How might we address [insert problem/issue statement] with a [insert type of solution]?"

The brainstorming was timed, allowing each group seven minutes to brainstorm at least three different ideas for the type of solution. Once the seven minutes were up, the class all moved on to the next lens, and repeated that process until they were finished with all four. In the end, each group had 12 ideas, and chose one to flesh out into a testable prototype.

Mr. Geyette introduced the students to the concepts of storyboards and scenarios, and explained how they can be used as tools for communicating how a new idea would work. He also introduced various physical prototyping tools like: phone wire frames for the teams creating a mobile application, floor plans with furniture icons for the team doing a physical environment, and t-shirt templates for the team doing a campaign. We also showed the students examples of our own prototyping work to demonstrate the versatility of the tools.

A valuable prototyping tool that the students used was a mobile app called: "POP: Prototyping on Paper" by WooMoo Inc.. It afforded them the ability to make the sketches of their app screens interactive. POP is a very intuitive application and the students quickly picked up how to use it.



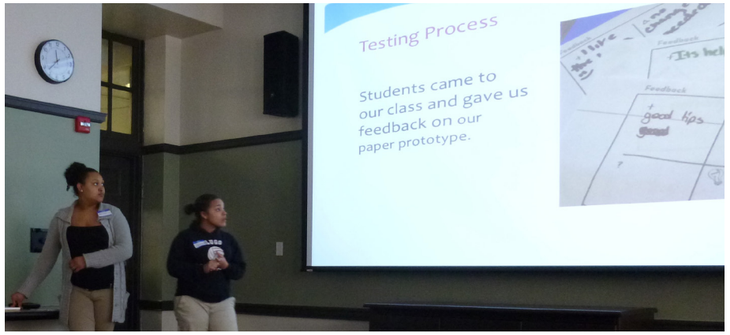
TEST & ITERATE

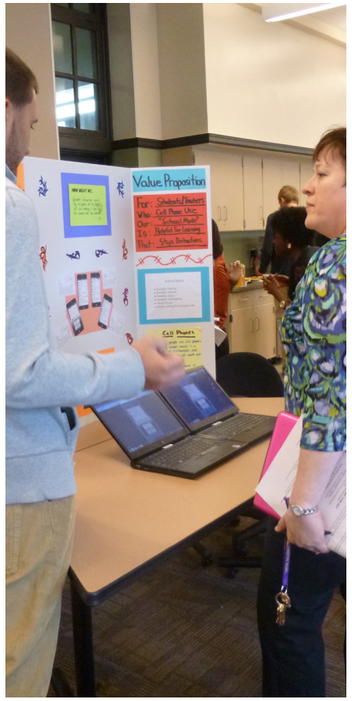
The students spent a couple weeks developing their prototype and getting it into a form that could be tested with their "end users" (students). Mr. Geyette invited two outside classes of students to come and try out the groups' prototypes and give constructive feedback. We gave the reviewers a structure to follow, which included writing down something you like, something you would change, a question you have, and an idea you have.

The students then reviewed the feedback and refined their prototypes accordingly.

DESIGN FAIR & PRESENTATIONS

To wrap up the project, we hosted a design fair and invited visitors from the greater school community to come and see what the students had been working on. The students created tri-fold exhibits with the design tools they had used throughout the different stages of their project process, and used computers or 3-D models to demonstrate how their final prototypes functioned. After the visitors had time to explore the fair and see the students' projects first-hand, we had the teams present additional details about how they used the design process to generate the idea for their final prototype.





In the end, the students developed innovations that addressed the problems they had uncovered within the Franklin Learning Center community.

The final projects included:
"My Drugs": a mobile application
"School Mode": a mobile system update
"Tweet Base": a mobile application
"50/50": a campaign and website
"Study Hall": a new student lounge

In more detail...
"Tweet Base" is a mobile application that censors tweets. The app helps students learn to decipher between what content is appropriate to publish on social media, and what is inappropriate. Tweet Base offers suggestions for changing curse words or other inappropriate content, and also has an option to auto-correct the user's tweets.

"50/50" is a campaign and accompanying website that advocates for mutual respect between teachers and students. The campaign calls for both sides to make a more concerted and public effort to understand and demonstrate respect for one another. 50/50 includes a website that sells branded merchandise, which is meant to be worn throughout the school day to draw attention to how teachers and students treat each other.

KEY MOMENTS IN THE PROJECT DEVELOPMENT

Defining moments throughout the course of the project that had a great impact on the development of our role and relationship with the teacher and students

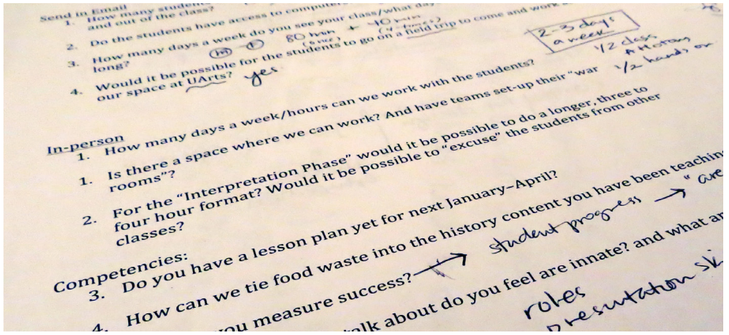
The key moments in the project development reflect the synthesis of data we collected during each interaction with Mr. Geyette and the students. After returning to our studio from being at The Franklin Learning Center, we conducted an "after action report" to digest and reflect on what we had experienced. The key sections of the after action report consisted of: what was expected to happen, what actually happened, what went well (and why), and what could be improved (and how). We also used blogging as a medium for reflecting on our project, and wrote two tracks–one more theoretical/conceptual, and the other with more focus on the application of our work.

The full after action report can be found in the Appendix section.
Our blog address is: www.collectiveindwell.com

LESSON & ACTIVITY PLANNING

What We Did

We developed and designed custom lesson and activity planning methods and tools to support the meetings with our teacher-partner, Mr. Geyette. One of the tools we developed was the "Activity Planning Canvas" (pictured on the opposite page), which was modeled after the Business Model Canvas developed by The Business Model Foundry. The objective of the canvas was to standardize the process of proposing design-based activity options–represented by interchangable cards–to the teacher. Once an activity had been chosen, then the canvas provided space to flesh out the logistics (timing, materials, prep work, etc.) as well as how it would be assessed.



What We Learned

We learned that Mr. Geyette's time was precious and limited, and the over-designed collaboration tools required too much time to understand and use. Our collaboration ran more smoothly when we simply discussed the ideas and plans for upcoming class periods. We used methods and tools such as: storytelling scenarios, role playing, and rough sketching.

What It Informed

Early in our project we learned which co-creative methods and tools for planning were most effective in our collaboration. This learning informed the all subsequent interactions between us and Mr. Geyette. Specifically, we recorded our notes from the planning and reflection sessions with Mr. Geyette and typed them into a shared Google Doc. This provided the opportunity for him to review and make edits at a later time.

R S P T I

DIRECT INSTRUCTION & FACILITATION

What We Did

For the first lesson and activity with the students at The Franklin Learning Center, we led the majority of the process–from deciding on the concepts to delivering the instruction. This meant that we also developed the presentation content and graphics, and facilitated the activity that followed the lesson.

What We Learned

We learned that delivering direct instruction should not fall in the scope of our role as designers, and that it is more effective when it remains as a responsibility of the experienced teacher. The content that we had taught on that first day needed to be re-taught by Mr. Geyette because the students had not understood it as we had delivered it.

What It Informed

This pivotal moment occurred early in the project and informed our roles and relationship for the remainder of the partnership. It affected how we structured the decision-making of concepts to teach, the creation of the presentation, the delivery of the content, and the facilitation of activities *(a representation of this evolution can be found on page 90)*.

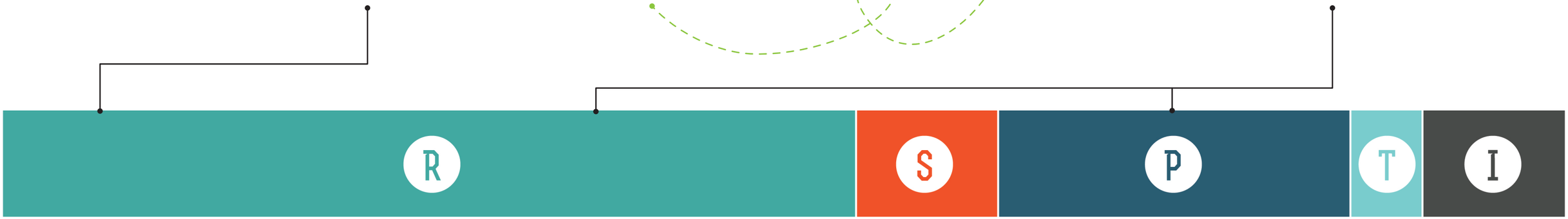
BUILDING CREATIVE CONFIDENCE

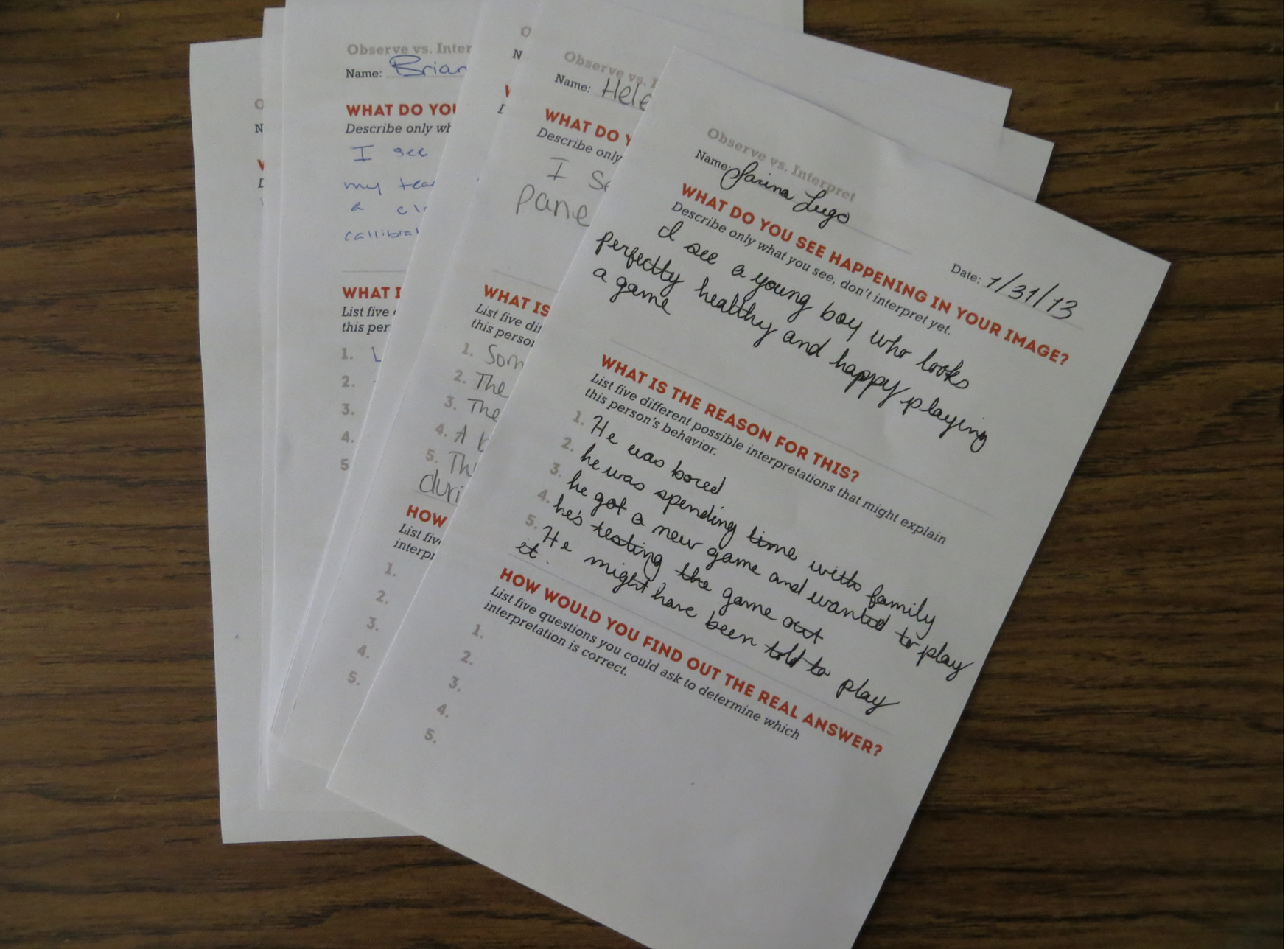
What We Did

Throughout the project we aimed to balance a "new way of thinking" with a "new way of doing." When we asked the students to express their creativity through making, we intentionally structured the activity with pre-cut materials and constraints (i.e. a specific amount of material, a certain length of time, the final form must be free-standing, etc.).

What We Learned
We learned that halfway-made materials and constructive constraints built the students' confidence in their creative abilities. We also discovered that this is the area where we, as designers, could add the greatest value to the collaboration with Mr. Geyette and to the project with the students. Our skills in visual design and fabrication, as well as facilitation of non-designers in creative, generative activities helped form the majority of our role throughout the partnership.

What It Informed
Our understanding of how to successfully structure a "new way of doing" activity informed how we planned each session that involved some form of physical construction. By deciding on a format and preparing the materials ahead of time, the students became engaged more quickly and expressed a greater sense of accomplishment in the end. This type of working occurred most often in the Action Research phase and the Prototyping phase.





ASSESSMENT OF UNDERSTANDING

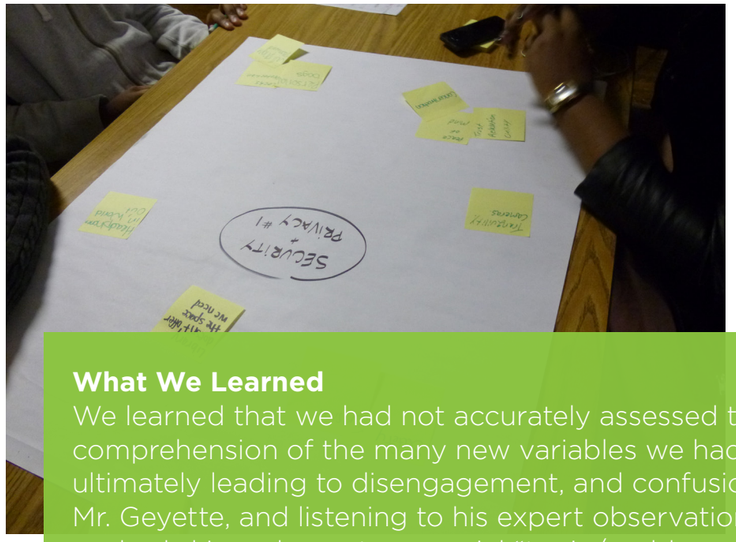
What We Did

After developing an observe vs. interpret mindset at the beginning of the research phase, we asked students to chose a problem/topic area to focus on for the remainder of the project. Once the topic groups were formed, we introduced the concept of action research–something they had never heard/seen before–and instructed the groups to begin planning their own action research interventions. This sequence took place in one, 80-minute class period, and was led primarily by us.

WAY OF DOING

Name: _____ Date: _____

○	○	○	○	○
Extremely familiar with doing activities this way	Very familiar with doing activities this way	Moderately familiar with doing activities this way	Slightly familiar with doing activities this way	Not at all familiar with doing activities this way



What We Learned

We learned that we had not accurately assessed the students' comprehension of the many new variables we had been throwing at them– ultimately leading to disengagement, and confusion. After debriefing with Mr. Geyette, and listening to his expert observations we figured out that we had skipped over two crucial "topic/problem definition" steps in the transition to action research planning. We discovered that we needed to trust Mr. Geyette to identify and manage when the students were not comprehending a new concept.

What It Informed

This moment helped us to realize just how different the design-based learning experiences were for the students. We needed to scaffold their learning by modeling the new ways, providing opportunities to practice, adding in more supportive steps, and extending the timeframe of certain sections (i.e. prototyping). As classroom management shifted back to part of Mr. Geyette's role, he was able to set a better pace for the project lessons and activities.

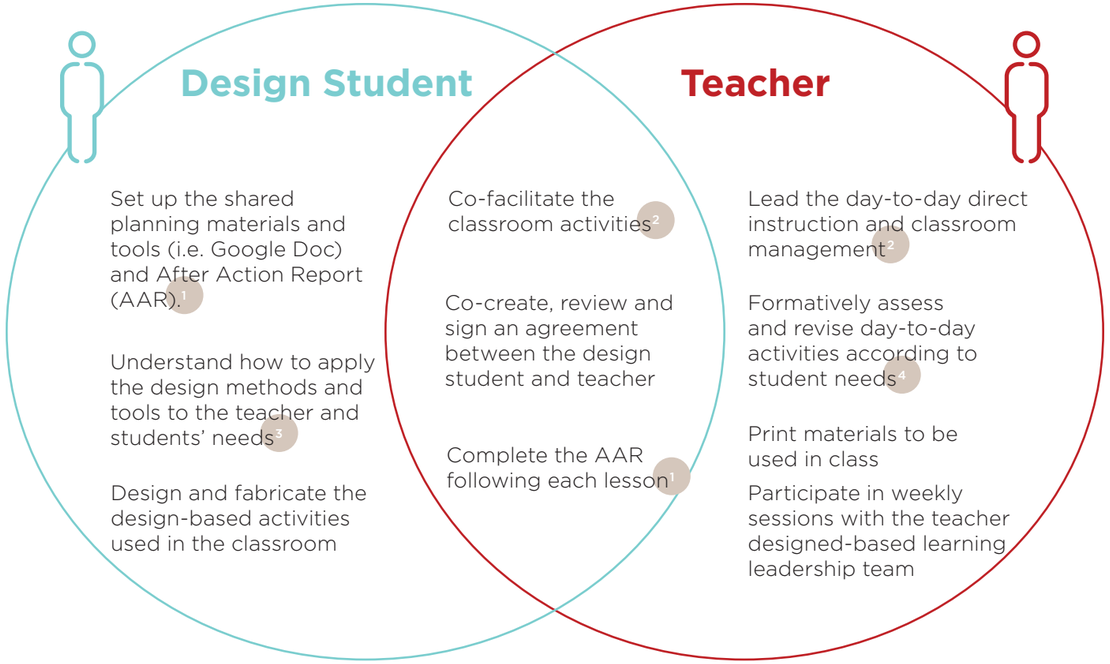
Evolution of the roles
The roles of the teacher (Mr. Geyette) and design students (us) transformed significantly over the course of the project. Although the relationship was always collaborative, the distribution of responsibility shifted from us to Mr. Geyette. This progression happened just as we had intended, and reflected the time that it takes to assimilate a new way of thinking/working into an already established culture.

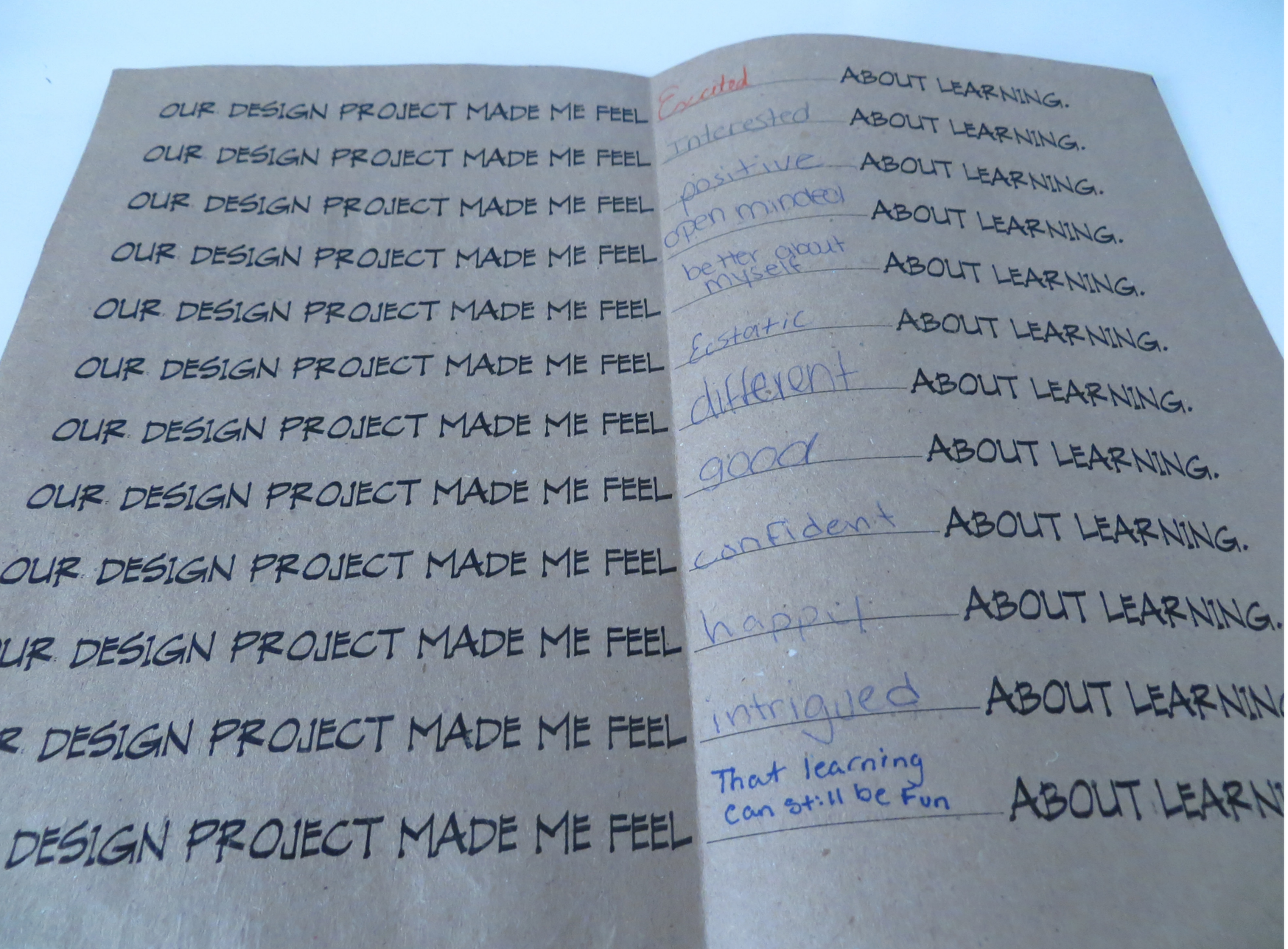
How the roles actually evolved over the course of our four-month partnership:

	MR. GEYETTE	US
1 Beginning	Facilitating activities	Deciding on concepts Expanding on concepts Creating presentations Teaching new concepts Facilitating activities
2 Middle	Deciding on concepts Teaching new concepts Facilitating activities	Deciding on concepts Expanding on concepts Creating presentations Facilitating activities
3 End	Deciding on concepts Expanding on concepts Creating presentations Teaching new concepts Facilitating activities	Deciding on concepts Facilitating activities

The key moments informed how we defined the relationships in the model
The key moments and evolution of the roles directly informed how we defined the relationship between design student and teacher in the model.

1. Lesson & Activity Planning with the Teacher
2. Direct Instruction & Facilitation of Design-Based Learning
3. Building Creative Confidence in the Students
4. Assessment of Student Understanding





REFLECTION ON THE DBL PROJECT

At the end of the design-based learning project presentations with the students, we hosted an informal reflection session. We asked them how they felt about the project as a whole and their learning throughout the process. The answers and discussion that followed was a discussion about their experiences and the 21st century skills they learned. Each comment made reference to one of the 4 C's of 21st Century Skills: creativity, collaboration, communication or critical thinking.

Specifically, the students expressed surprise at being able to create a working prototype of an original idea they had. There was discussion about starting a design major at the FLC, showing their willingness to take this project beyond one classroom. A few teams spoke about the idea that collaborating with certain people they would not normally have chosen to work with, gave them the chance to learn perseverance and patience. They made reference to the fact that the tests they spend a lot of time preparing for don't teach them anything for the future. They don't take that information beyond the test room. Because we were there to support them, there was a lessened fear of failure. When something didn't work, we encouraged them to find out why and then make changes or continue on to make their prototypes successful. Lastly, they discussed that because they learned a process they should be able to use it in other classes with different content.

A sample of student reflections on the design-based learning project:

"We worked very hard on our project and it was nice to see the outcome of all our hard work. I would like to take this project further than just a class grade. It didn't even feel like we were doing this for a grade. It felt like we were doing this project because it was something we wanted to do. We got a lot done it feels like it took way more than just 20 days to complete this project.

I learned that I am comfortable interacting with people I don't know. I also learned that when you work in teams you can make a better product. 2 minds are better than 1. I learned that I have an interest in implementing change. If I could make something that can benefit people I would.

This project has made me more confident in my school work. I know I can come up with great ideas and work to make them successful."

–Briana B.

"I learned how to use other people's thoughts as a way to help my own, teamwork and cooperation was a huge part of this project for me. My felt as my partner did a very good job as well, we both put in the effort and helped each other all the way throughout the whole process of this project."

–Barry C.

"During this process I learned a lot about myself, working in teams, and implementing change. I always knew I was a little creative but I didn't know I could design a website."

–Shaidiah M.

"I learned to compromise. I don't have to be as out spoken as I am sometimes. I learned to be more patient. I also learned that I can work up to a very high standard if i just put my mind to it."

–Bria C.

"During this process what I learned about myself was that I have to improve my time management and group effort. Also, I learned while working in groups I have to be more assertive and clear about my ideas and when I feel uncomfortable in situations. What I learned about implementing change was that no matter what age you are and what your interest are it is possible to make change."

– Sarina L.

Mr. Geyette's reflection on our collaboration:

"The best teaching and learning takes places when a group of people embraces the unknown. There is always great excitement and trepidation when approaching something new in the classroom. Alex and Kelly offered the students in my class the chance to venture into that space. Despite my unfamiliarity with design thinking and its applications in the classroom, we dove into mutually beneficial relationship centered on developing students' 21st century skills.

The vision for this collaboration between the University of the Arts and Franklin Learning Center drove the entire process. The process meandered at times and was fraught with a myriad of logistical and student issues, however it was grounded in demonstrating that the paradigm for teaching and learning can shift. We wanted students to walk away from the project empowered by a process and a tangible product that offers utility to the school community. In this regard the process and project were successful.

This process impacted the students. They wrote. They collaborated. They struggled. I struggled. They thought. They asked. They designed and redesigned. They spoke and people listened. They think about themselves differently. They think about school differently. I see it in their eyes, and the way they walk. I read it in their reflections. The students that emerged from this process were not the same as the ones that entered.

I learned much from this experience, however my enduring understanding is to always take students out of their comfort zones. School is predictable in the worst ways (ease of work, rigid schedule, irrational adults, boredom, lack of originality). Students have developed coping mechanisms that allow them to be successful in these environments without actually being engaged. Educators cannot allow this visage confuse the teaching and learning process.

Design thinking has a place in the education lexicon. If nothing else, let this case study remind us of the skills, experiences and opportunities that our education systems deprive students of on a daily basis. Everyone involved in educating students deserve better, but especially our youth. The recipe for change begins with recognizing the need to apply new processes and frameworks to learning. In applying the principles of communication, collaboration, critical thinking and creativity to schools, nearly anything is possible with our students and the institutions that can serve them."

04

BACK MATTER

BACK MATTER

Extra goodies!

Glossary

Action research
As defined by McCutcheon and Jung:
Systemic inquiry that is collective, collaborative, self-reflective, critical and undertaken by participants in the inquiry

Agency
The extent to which individuals believe that they can control events that affect them.

Artifact (Tool)
As defined by The Interaction Design Foundation:
Any product of human workmanship or any object modified by man

Arts integration
As defined by The John F. Kennedy Center for the Performing Arts:
an approach to teaching in which students construct and demonstrate understanding through an art form. Students engage in a creative process that connects an art form and another subject area and meets evolving objectives of both.

Brainstorming
As defined by The Design Dictionary:
Brainstorming describes a problem-solving technique by a group of people in any field and involves the spontaneous and uncensored contribution of ideas from all members of the group.

Campaign
As defined by The Design Dictionary:
The term "campaign" is most commonly used in the context of the military, politics, or advertising, and refers to a series of connected activities intended to produce a desired result.

Clustering
A method of data organization intended to define categories based on likeness of information.

Co-creation
Engaging people with different backgrounds and roles to work collaboratively as part of the same team, in order to examine and innovate a given experience.

Collaborative Design
As defined by The Design Dictionary:
Until relatively recently, design was commonly perceived as a predominantly individual activity; the designer, trained in his or her craft, was expected to identify, frame, and solve a design problem more or less in isolation from others. In the twenty-first century, however, this perception of the design process is becoming increasingly removed from actual practice. Designers today routinely work in teams, collaborating to create processes and products that reflect the different kinds of expertise amongst the team members—and designers who are not skilled as collaborators are increasingly unlikely to be successful.

Common core standards movement
A movement to establish common content standards

Competency-based
As defined by The Franklin Learning Center: This means that each student receives credit for units completed in a class. When they have completed the required credits for that class, they can move on to the next class.

Content standards
What students should know and be able to do

Contextual Interview
Conducted in the environment, or context, in which the service process occurs allowing interviewer to both observe and probe the behavior they are interested in.

Creativity
As defined by The Design Dictionary:
Creativity is a complex and much debated term referring to the process of undertaking creative work. Generally it is a word that distinguishes a method or an activity from one that is overtly intellectual, formulaic, methodological, or critical.

Creative Confidence
As defined by David Kelley from IDEO:
The ability to come up with breakthrough ideas, combined with the courage to act.

Design Thinking
As it applies to our work at the Franklin Learning Center with Mr. Geyette and the students, and defined by "Design Thinking for Educators" Toolkit created by IDEO:
Design thinking is about believing we can make a difference, and having an intentional process in order to get to new, relevant solutions that create positive impact.

Empathy
As defined by Liz Sanders:
Understanding another person's situation, experience, or perspective, as if it were one's own

Empathic Design (Observation)
As defined by Liz Sanders:
A design approach stressing the importance that the designer(s) achieve empathic understanding of the intended user(s) of a product or service

End User (User group)
Person/group of people who uses a product, service, physical environment, or system

Formative Assessment
Refers to formal and informal assessment procedures employed by teachers during the learning process in order to modify teaching and learning activities to improve student attainment.

Generative Thinking
As defined by Liz Sanders:
Producing ideas, insights and concepts

Hard skills
As defined by Wiktionary:
A technical skill, not one that is interpersonal.

Innovation
As defined by The Design Dictionary:
Innovation in design is a change in the development, production, distribution, or use of an artifact, environment, or system that is perceived as being different from its precedents by its proposed users or target audience

Installation
A piece of work placed in a physical space for others to interact with

Iterative design
As defined by Wikipedia:
A design methodology based on a cyclic process of prototyping, testing, analyzing, and refining a product or process.

Model
As defined by The Design Dictionary:
The ability to project an idea and make it tangible has made the model an indispensable planning tool (for example of artifacts) since the beginnings of human inventions.

Pattern
As defined by Jon Kolko:
A design paradigm, illustrating habitability–something that is beginning to be found in more than one product, system or service

Pedagogy
The method and practice of teaching.

Performance standards
Standards that describe what level of performance is "good enough" for students to be described at a certain level

Product
As defined by The Design Dictionary:
A product is the type of object that human beings produce at any given moment in their history.

Product Design
As defined by The Design Dictionary:
Product design is a practice that involves the creation of objects that are simultaneously functional and aesthetic.

Prototype
As defined by The Design Dictionary:
Prototypes (Greek protos = first) are intended to test the function and performance of a new design before it goes into production.

Resilience (Psychological)
As defined by Wikipedia:
An individual's tendency to cope with stress and adversity

Role playing
Physically acting out what happens where people interact with products or services.

Scaffolding
Support structure to help novices learn but that goes away once beyond the novice stage

Scenario
Illustrate a story line describing the context of use for a product or service.

Skills (hard and soft)
As defined by bemycareercoach.com:
Hard skills are skills where the rules stay the same regardless of which company, circumstance or people you work with. In contrast, soft skills are self management skills and people skills where the rules changes depending on the company culture and people you work with.

Storyboard
A series of drawing or pictures that visualize a particular sequence of events.

Glossary (continued)

Synthesis
As defined by The Design Dictionary:
For many designers, synthesis describes the design process itself. Its literal meaning is the combination of a variety of objects, ideas, and/or intentions to produce a new complex whole.
The process of design described in the entry for discipline describes design's unique quality of negotiating a range of specialist knowledge and techniques in order to reconcile these into a coherent design artifact.

System
As defined by The Design Dictionary:
System (from the Greek word systema meaning a whole compounded of parts) refers to a combination of related parts organized into a complex whole, such as the cosmos, organisms, political or social bodies, or even cognitive constructions such as a theory or philosophy.

Tacit knowledge
Knowledge built up over time through experience concerning the problem

Testing
As defined by The Design Dictionary:
Almost all designed artifacts and services have to be tested in some way or other. This is to determine if the design performs as originally conceived and intended or to identify unexpected consequences prior to a design going into final production and distribution, or implementation.

Tools
As defined by The Design Dictionary:
Broadly speaking, a tool is any course of action, occurrence, thought, or object that assists, facilitates, or makes possible another course of action, occurrence, thought, or object.

User interface
As defined by Wikipedia:
The space where interaction between humans and machines occurs.

Value
As defined by The Design Dictionary:
Value refers to the relative worth or utility of something.

War room
A physical space for externalizing the various research artifacts and ideas gathered throughout the project.

Wireframe
Creating a visual representation of a user interface, abstracted to show behavior and controls instead of color or emotion.

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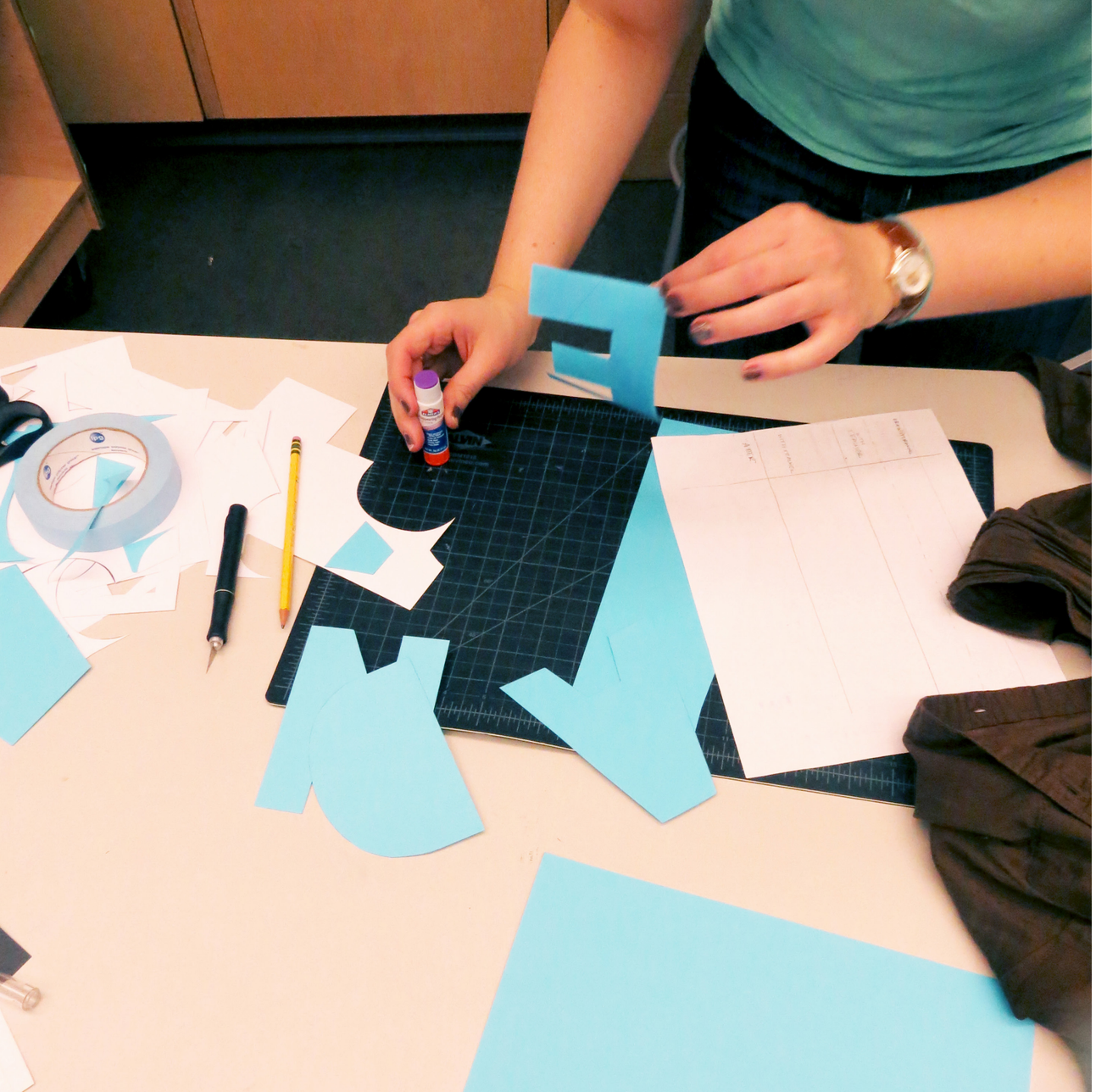
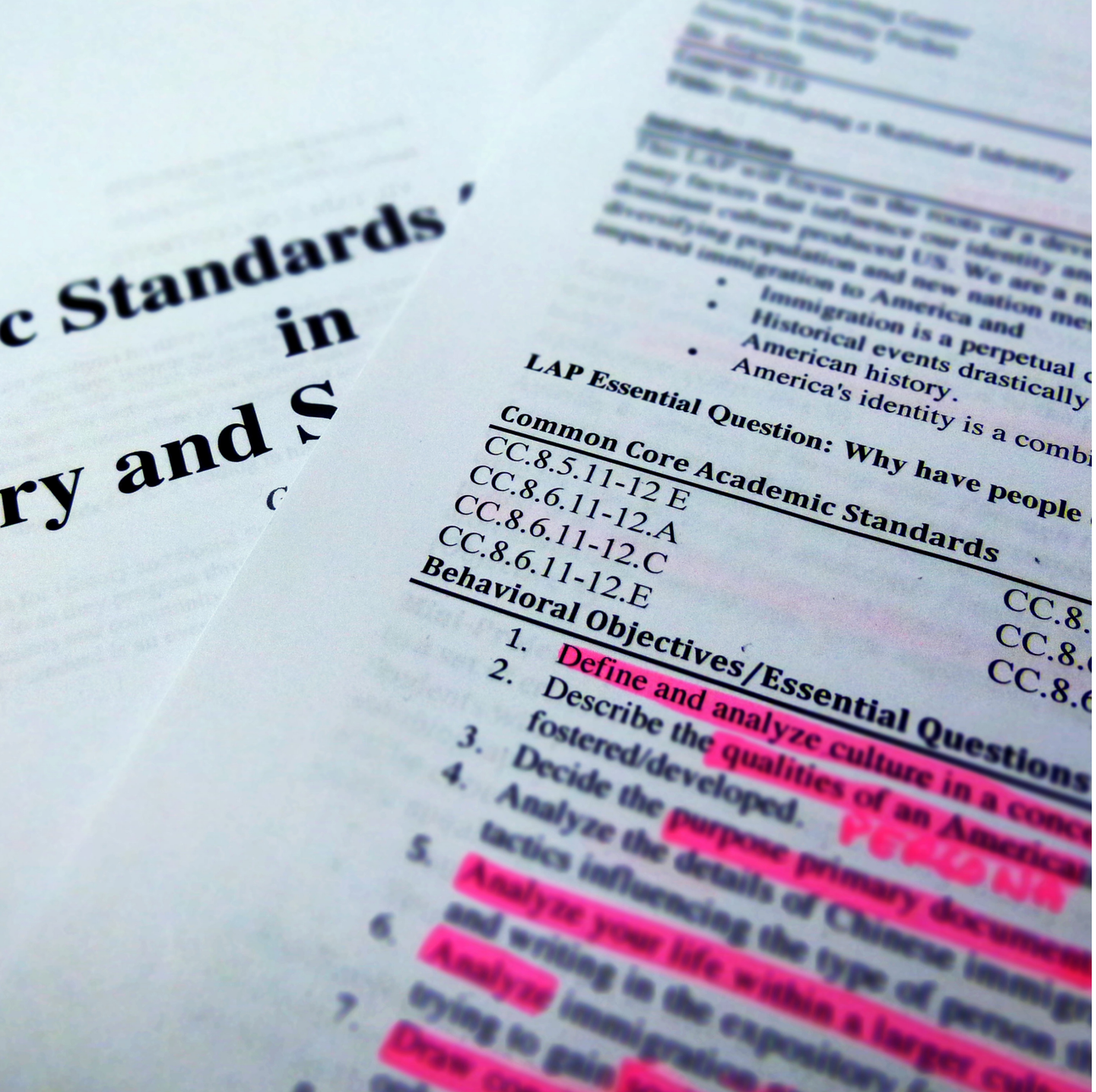


APPENDICES

Extras!

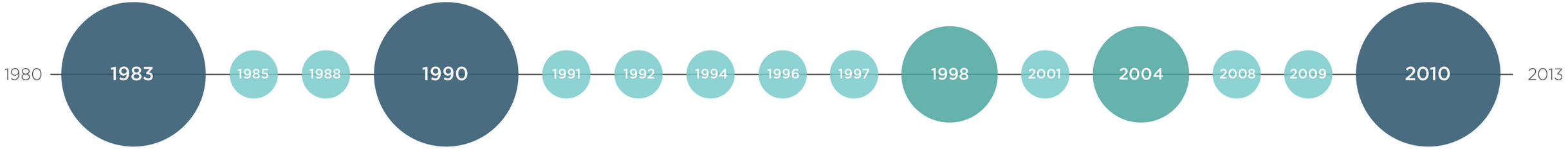


THE STANDARDS BASED MOVEMENT: A LITERATURE REVIEW

The most significant education reform movement to impact the current state of public education in the past 30 years

The current public education system has been largely shaped by the standards-based education movement. The reform calls for measurable, comparable standards for all students throughout the United States as well as internationally. This section outlines the history and evolution of the movement; discusses the implication for K-12 art and design curriculum; and concludes with how it has affected the district and school we partnered with for our project.

There are two types of standards that will be discussed: content standards, which describe what students should know and be able to do, and performance standards which describe what level of performance is "good enough" for students to be attain at each level.



What is the history of the standards based reform movement?

The standards-based reform movement began in 1983 when the National Commission on Excellence in Education, under the Presidency of Ronald Reagan, published the report titled: "A Nation at Risk." The report highlighted results from the quantitative performance measurements in schools. The report had a strong message of poor test scores, declining graduation rates, and failure to meet the needs of a competitive workforce. Once released, the report received extensive media coverage and made failing schools a political focus. George H.W. Bush campaigned as president with the promise of tackling the education crisis.

In 1989, Bush organized the first National Education summit, which agreed to set goals to be achieved by the year 2000. In 1990, the National Center on Education and the Economy (NCEE), led by Marc Tucker, and the Secretary's Commission on Achieving Necessary Skills (SCANS) defined the standard set of job specifications and qualifications that an applicant would need to fill the job so that a 'certificate' of skills attainment for that job would mean the same thing throughout the United States. This became the basis for education reform laws, standards, and assessment systems in the 1990's and ultimately the principles of the standards-based education reform movement.

In the 1992 presidential campaign, Bill Clinton promised to push education reform even harder than Bush. As president Clinton passed a bill called "Goals 2000"with the goal to set world-class standards with a national framework for education reform. The bill covered research, consensus building and systemic changes to promote the development and adoption of a voluntary system of skill standards nation-wide.

By 1998, almost every state had implemented, or was in the process of implementing academic standards for the areas of math and reading; however, not all of the goals set forth in the "Goals 2000" bill were attained. This resulted in the "No Child Left Behind Act" (The Elementary and Secondary Education Act) being signed into law in 2002. This was yet another attempt to push for federally-mandated standards-based education reform and increased accountability within the schools. The Act required that states develop assessments in basic skills to be given to all students at certain grades if they are to receive federal funding for schools. The Act does not outline a national achievement standard; the achievements are set at the state level. In 2010, the Obama administration released a blueprint for revising "No Child Left Behind" (The Elementary and Secondary Education Act). The blueprint emphasizes the importance of strict adherence to the standards to ensure that not only the students succeed in college, but also that America gets back "on a path to global leadership."

"The Act required that states develop assessments in basic skills to be given to all students at certain grades if they are to receive federal funding for schools."

Why did the standards based reform movement begin?

In 1983, the Cold War was in full force and Ronald Reagan was facing political troubles. The U.S. economy was not doing well, and the polls showed that although he was still strongly favored by men, Reagan had not yet won over the women's vote (who cared about issues such as: housing, health and education). The U.S. Department of Education's National Commission on Excellence in Education, led by Terrell H. Bell, Secretary of Education, hoped to link the country's economic turmoil to the poor situation of U.S. schools. Although the report, "A Nation at Risk," contradicted Reagan's education agenda, it received so much media coverage that the President was advised to support it in his campaign for second term of his presidency–focusing on tough education reform. This switch in political agendas emphasizes the importance that is placed on education as a strong political issue.

Where do art and design fit in with the standards-based reform movement?

Running within the larger Standards-Based Reform Movement was the push to create standards for arts education. One of the most widely recognized sets of standards is the Discipline-Based Art Education (DBAE) standard. In the early 1980's, the J. Paul Getty Trust developed DBAE. These standards promoted education across four disciplines within the arts: studio production, art criticism, art history and aesthetics. Following the release of these visual arts standards, a tension emerged between the design community and The Council for Basic Education. Designers felt that design had not been adequately considered or represented as a distinct set of standards. However, the standards committee and art education leaders believed that design was just another subset of the arts, and did not require specific language within the standards. Therefore, student achievement in design is appropriately measured by the visual arts standards. These standards are not required to be adopted by a school or states education department. They serve as suggestions for how students should be measured in the arts.

> "Therefore, student achievement in design is appropriately measured by the visual arts standards."

What is the history of the national standards for art education?

The creation of national standards for art education paralleled the greater national movement to set common set of standards for all areas of study. Although the 1983 report, "A Nation at Risk," did not directly address arts education, many arts education leaders used public relations efforts to link reforms with art. Interestingly, designers noted a close connection between the report's focus on "commerce, industry, science, and technology innovation," and the outcomes of design education; however, arts educators missed the opportunity to leverage this obvious correlation.

In 1985, J. Paul Getty Trust and the Getty Center for Education in the Arts developed the Discipline-based Arts Education (DBAE) standards. Throughout the late 1980's and early 1990's, reforms such as Secretary's Commission on Achieving Necessary Skills (SCANS) and Goals 2000 were being constructed. Although the release of the Goals 2000 legislation in 1994 included the arts, many of the positive learning outcomes were lost on the public and educators from other core subjects.

Why were these standards developed?

The pressure to develop educational standards was so significant in the 1980's, and still continues today, that arts education had to follow suit. The learning outcomes in arts classrooms were even set up to be tested in the way in which other disciplines were–paper and pencil objective tests. The hope being that this would gather measurements that could standardize learning activities and curriculum content across all subjects.

Expert Interview

THE UNIVERSITY OF THE ARTS

Teresa Unseld is the Director of the MA Art Education Program at University of the Arts.

Ms. Unseld shared with us the four main elements of classroom management: consistency, fairness, and infractions, consequences. When all of these elements are in concert with the teaching philosophy, the classroom is in order and gives the optimal situation for students to be their most productive. Part of that classroom management should be creating an environment of respect that is grounded in design values.

When interacting with Mr. Geyette we discovered first hand that these were the things he values and is most expert at implementing in the class. Her perspective helped us to frame how we situate ourselves in the relationship between designer and teacher in the model we are creating. We quickly learned that we are not assessment designers or classroom management experts, but that teachers are trained in those ways. This allowed us to outline where the line between teacher and designer is drawn.

How did art standards adapt to the new demand for interdisciplinary and applied learning?

Although DBAE, and the four disciplines of arts education gained a spot within the national standards reform, the structure was not considered to fit well with the movements of the late 1990's where interdisciplinary learning was taking hold. A new approach to arts education emerged, called "arts integration."

Arts integration is defined by The John F. Kennedy Center for the Performing Arts' as "an approach to teaching in which students construct and demonstrate understanding through an art form. Students engage in a creative process that connects an art form and another subject area and meets evolving objectives of both." This method is distinguished from traditional arts education because it is not a long-term, sequential practice taught by a certified art educator.

> "An approach to teaching in which students construct and demonstrate understanding through an art form. Students engage in a creative process that connects an art form and another subject area and meets evolving objectives of both."

The 1992 SCANS reform by the NCEE was updated in 1997, titled: "The New Standards Project," and included arts integration. The document states that arts integration is best done with "applied art," which many believe to be another name for design. The section of the study that discusses applied learning notes performance standards, rather than content standards–making the point that it is not an appeal for a new subject, but rather acknowledges that such competencies apply to all subject areas. These competencies are described in terms of connecting the work students do in school, with the demands of the twenty-first century workforce.

Meredith Davis describes those competencies in the article Making a Case for Design-Based Learning, "[…] the capabilities people need to be productive members of society, as individuals who apply the knowledge gained in school and elsewhere to analyze problems and propose solutions, to communicate effectively and coordinate action with others, and to use the tools of the information age in the workplace." To measure performance in this area of applied learning standards, assessment strategies have used design projects as the instruments for evaluation.

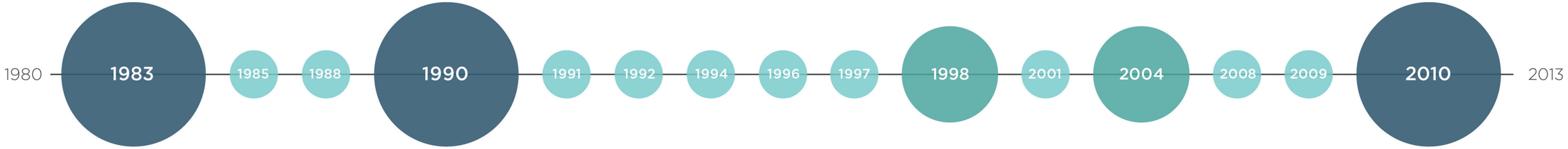
How did the content standards change and where do arts integration and applied arts fit?

Just as a new set of performance standards were being discussed in the late 1990's, so were the standards that outlined the type of content being taught. The movement became known as the "Common Core Standards." These content standards do not prescribe ways to teach, and educators have since been considering how to weave the benefits of applied learning, together with the Common Core standards. Common Core Standards have been adopted by a majority of the states, and the content reflects the interdisciplinary nature of the applied learning performance standards set by the NCEE.

This parallelism has led to a greater recognition of the importance of integrated learning; however, educators are in debate about which teaching approach is best. There are two main methods that have emerged: arts integration/ applied art, as discussed before, and a new approach called "Science, Technology, Engineering, Math (STEM)." Judith A. Ramaley, the former director of the National Science Foundation's education and human-resources division, created the STEM program.

It is an approach to teaching that incorporates technology and engineering into the regular curriculum of mathematics and science subjects. In addition, STEM encourages students to actively engage in problem-solving and exploratory learning. Proponents of arts integration argue that there are unique parallels between the common core standards, the rigorous art process, and the demands of the twenty-first century workforce–making it a more beneficial addition for educators than other approaches like STEM. Some of the key points of the arts integration argument, as outlined in "Making a Case for Design-Based Learning," include:

- A need to shift students' perspectives from products to processes, is noted in the Common Core Math Standards, which is inherent in the creative process
- Process-based learning, combined with access points (engagement), makes teaching and learning equitable and supports each student's unique cultural, social, emotional and intellectual needs
- Arts integration is naturally engaging because everyone has one form of art (music, performance, visual, etc.) they connect with and use as a means to make sense of the world
- Teachers are struggling with incorporating analysis and synthesis (outlined in the Common Core Reading and Math Standards) into the classroom, and arts integration would provide the methods to teach these skills.



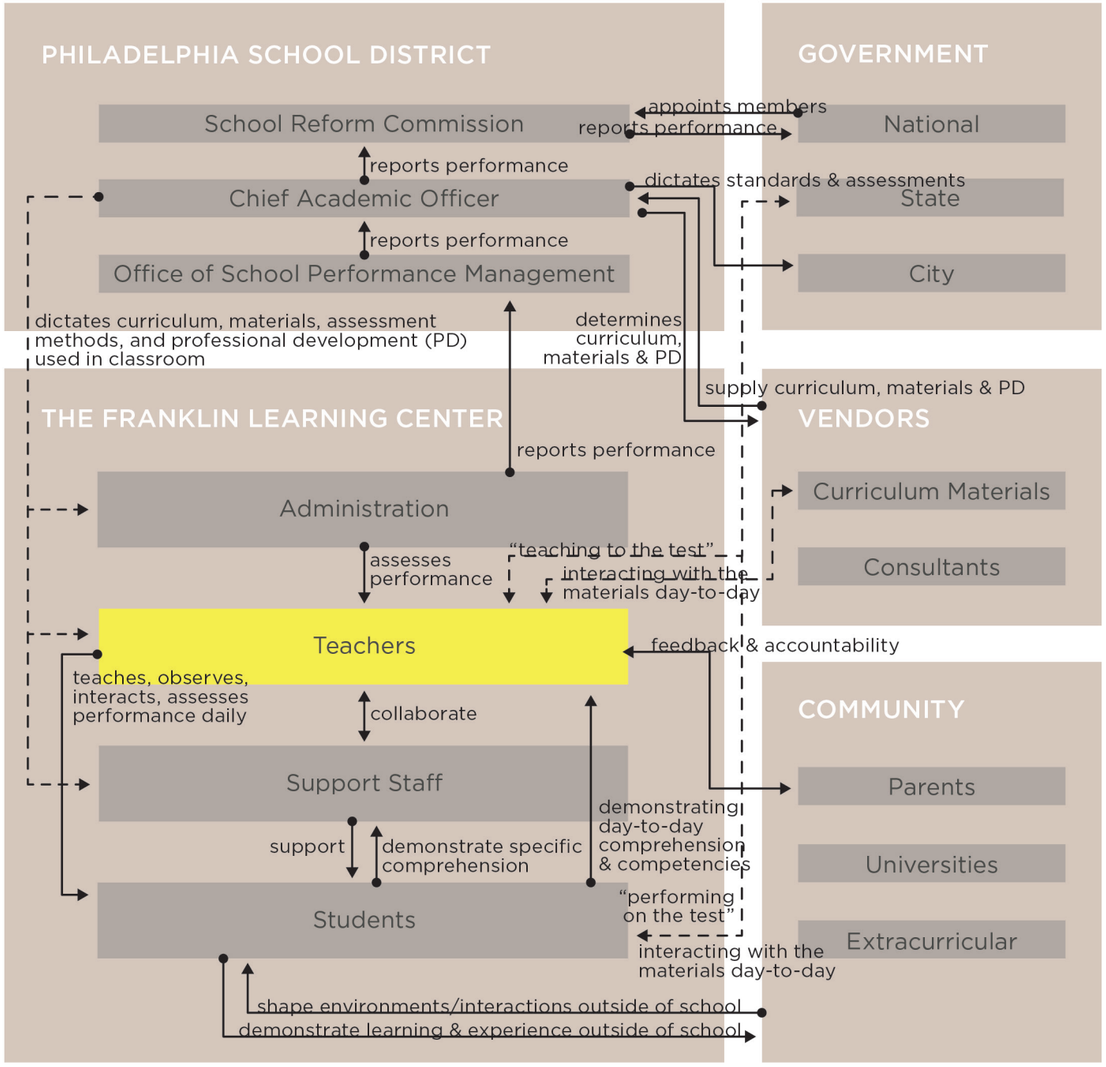
What is the history of the Common Core Standards?

In 1996, leading governors and business leaders at the National Education Summit established an organization called Achieve. Achieve is an independent, bi-partisan, non-profit education reform organization. In 2001, Achieve partners with other education and business institutions to launch the American Diploma Project (ADP). This initiative is created to identify the essential knowledge and skills that are most demanded by higher education and employers.

After two years of research, ADP released their first research report in 2004, titled "Ready or Not: Creating a High School Diploma That Counts." The document outlined a common core of English and Mathematics academic knowledge and skills that American high school graduates need for success in college and the workforce. From 2004 to 2008, Achieve studied individual state efforts to set standards for high school graduates to be college and career-ready. They found significant commonalities between states, and were able to identify a set of consistent English and mathematics content and performance requirements. In 2009, Achieve began to develop the Common Core State Standards and in 2010 the final set of standards were released. To date, 48 states have adopted the Common Core Standards in English and Mathematics.

"Anything that is worth teaching can be presented in many different ways. These multiple ways can make use of our multiple intelligences."

–Howard Gardner



This graphic represents the stakeholders in the Philadelphia School District community, and their interactions with the Common Core standards. The visual complexity is intentional and meant to represent the disconnect between the policy, administered at a district and government level, and the "day-to-day" implementation of teaching the standards, by the teachers.

The State of Pennsylvania and The Common Core Standards

The State Board of Pennsylvania adopted the Common Core Standards in July 2010. A decision was made to create a set of PA-specific Common Core Standards that would also include the organization and design of the previous PA Academic Standards.

Philadelphia School District Standards and Our Collaboration with The Franklin Learning Center

The PA Common Core Standards that we are interacting with through our collaboration with The Franklin Learning Center American and African American History Class are the History and Social Studies 6-12 standards. These outline two main areas: reading and writing.

The standards in reading describe a set of deep, critical thinking skills: "Students read, understand, and respond to informational text in the content area with an emphasis on comprehension, vocabulary acquisition, and making connections among ideas and between texts with a focus on textual evidence. [Main themes include:] Key Ideas and Details, Craft and Structure, Integration of Knowledge and Ideas, and Range and Level of Complex Texts." The writing standards describe a breadth of skills to achieve clarity in communications: "Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content. [Main themes include:] Text Types and Purposes, Production and Distribution of Writing, Research to Build and Present Knowledge, Range of Writing.

As we understood what those standards mean for history, we discussed how strictly to adhere to them in the classroom with Mr. Geyette and left it up to him as to how far to push those standards. With his knowledge of the standards and how he's taught them previously, he was able to guide the lessons in the direction he saw fit.

21ST CENTURY SKILLS DESCRIPTIONS

The Partnership for 21st Century Skills (P21) is a national organization that advocates for 21st Century readiness for every student. The following pages outline their framework definitions for 21st Century skills. We referred to these definitions throughout our project.

P21 Framework Definitions

To help practitioners integrate skills into the teaching of core academic subjects, the Partnership has developed a unified, collective vision for learning known as the Framework for 21st Century Learning. This Framework describes the skills, knowledge and expertise students must master to succeed in work and life; it is a blend of content knowledge, specific skills, expertise and literacies.

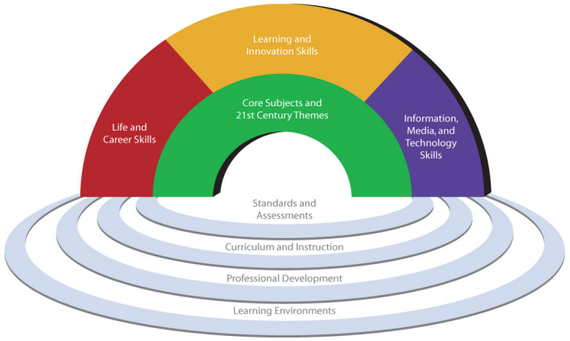
Every 21st century skills implementation requires the development of core academic subject knowledge and understanding among all students. Those who can think critically and communicate effectively must build on a base of core academic subject knowledge.

Within the context of core knowledge instruction, **students must also learn the essential skills for success in today's world, such as critical thinking, problem solving, communication and collaboration.**

When a school or district builds on this foundation, combining the entire Framework with the necessary support systems—standards, assessments, curriculum and instruction, professional development and learning environments—students are more engaged in the learning process and graduate better prepared to thrive in today's global economy.

While the graphic represents each element distinctly for descriptive purposes, the Partnership views all the components as fully interconnected in the process of 21st century teaching and learning.

21st Century Student Outcomes and Support Systems



21st CENTURY STUDENT OUTCOMES

The elements described in this section as "21st century student outcomes" (represented by the rainbow) are the knowledge, skills and expertise students should master to succeed in work and life in the 21st century.

CORE SUBJECTS AND 21st CENTURY THEMES

Mastery of **core subjects and 21st century themes** is essential for all students in the 21st century. Core subjects include:

- English, reading or language arts
- World languages
- Arts
- Mathematics
- Economics
- Science
- Geography
- History
- Government and Civics

In addition to these subjects, we believe schools must move to include not only a focus on mastery of core subjects, but also promote understanding of academic content at much higher levels by weaving **21st century interdisciplinary themes** into core subjects:

Global Awareness

- Using 21st century skills to understand and address global issues
- Learning from and working collaboratively with individuals representing diverse cultures, religions and lifestyles in a spirit of mutual respect and open dialogue in personal, work and community contexts
- Understanding other nations and cultures, including the use of non-English languages

Financial, Economic, Business and Entrepreneurial Literacy

- Knowing how to make appropriate personal economic choices
- Understanding the role of the economy in society
- Using entrepreneurial skills to enhance workplace productivity and career options

Civic Literacy

- Participating effectively in civic life through knowing how to stay informed and understanding governmental processes
- Exercising the rights and obligations of citizenship at local, state, national and global levels
- Understanding the local and global implications of civic decisions

Health Literacy

- Obtaining, interpreting and understanding basic health information and services and using such information and services in ways that enhance health
- Understanding preventive physical and mental health measures, including proper diet, nutrition, exercise, risk avoidance and stress reduction
- Using available information to make appropriate health-related decisions
- Establishing and monitoring personal and family health goals
- Understanding national and international public health and safety issues

Environmental Literacy

- Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water and ecosystems
- Demonstrate knowledge and understanding of society's impact on the natural world (e.g., population growth, population development, resource consumption rate, etc.)
- Investigate and analyze environmental issues, and make accurate conclusions about effective solutions
- Take individual and collective action towards addressing environmental challenges (e.g., participating in global actions, designing solutions that inspire action on environmental issues)

LEARNING AND INNOVATION SKILLS

Learning and innovation skills increasingly are being recognized as those that separate students who are prepared for a more and more complex life and work environments in the 21st century, and those who are not. A focus on creativity, critical thinking, communication and collaboration is essential to prepare students for the future.

CREATIVITY AND INNOVATION

Think Creatively

- Use a wide range of idea creation techniques (such as brainstorming)
- Create new and worthwhile ideas (both incremental and radical concepts)
- Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts

Work Creatively with Others

- Develop, implement and communicate new ideas to others effectively
- Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work
- Demonstrate originality and inventiveness in work and understand the real world limits to adopting new ideas
- View failure as an opportunity to learn; understand that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes

Implement Innovations

- Act on creative ideas to make a tangible and useful contribution to the field in which the innovation will occur

CRITICAL THINKING AND PROBLEM SOLVING

Reason Effectively

- Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation

Use Systems Thinking

- Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems

Make Judgments and Decisions

- Effectively analyze and evaluate evidence, arguments, claims and beliefs
- Analyze and evaluate major alternative points of view
- Synthesize and make connections between information and arguments
- Interpret information and draw conclusions based on the best analysis
- Reflect critically on learning experiences and processes

Solve Problems

- Solve different kinds of non-familiar problems in both conventional and innovative ways
- Identify and ask significant questions that clarify various points of view and lead to better solutions

COMMUNICATION AND COLLABORATION

Communicate Clearly

- Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts
- Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions
- Use communication for a range of purposes (e.g. to inform, instruct, motivate and persuade)
- Utilize multiple media and technologies, and know how to judge their effectiveness a priori as well as assess their impact
- Communicate effectively in diverse environments (including multi-lingual)

Collaborate with Others

- Demonstrate ability to work effectively and respectfully with diverse teams
- Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal
- Assume shared responsibility for collaborative work, and value the individual contributions made by each team member

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

People in the 21st century live in a technology and media-suffused environment, marked by various characteristics, including: 1) access to an abundance of information, 2) rapid changes in technology tools, and 3) the ability to collaborate and make individual contributions on an unprecedented scale. To be effective in the 21st century, citizens and workers must be able to exhibit a range of functional and critical thinking skills related to information, media and technology.

INFORMATION LITERACY

Access and Evaluate Information

- Access information efficiently (time) and effectively (sources)
- Evaluate information critically and competently

Use and Manage Information

- Use information accurately and creatively for the issue or problem at hand
- Manage the flow of information from a wide variety of sources
- Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information

MEDIA LITERACY

Analyze Media

- Understand both how and why media messages are constructed, and for what purposes
- Examine how individuals interpret messages differently, how values and points of view are included or excluded, and how media can influence beliefs and behaviors
- Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of media

Create Media Products

- Understand and utilize the most appropriate media creation tools, characteristics and conventions
- Understand and effectively utilize the most appropriate expressions and interpretations in diverse, multi-cultural environments

ICT (Information, Communications and Technology) LITERACY

Apply Technology Effectively

- Use technology as a tool to research, organize, evaluate and communicate information
- Use digital technologies (computers, PDAs, media players, GPS, etc.), communication/networking tools and social networks appropriately to access, manage, integrate, evaluate and create information to successfully function in a knowledge economy
- Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies

Partnership for 21st Century Skills

LIFE AND CAREER SKILLS

Today's life and work environments require far more than thinking skills and content knowledge. The ability to navigate the complex life and work environments in the globally competitive information age requires students to pay rigorous attention to developing adequate life and career skills.

FLEXIBILITY AND ADAPTABILITY

Adapt to Change

- Adapt to varied roles, jobs responsibilities, schedules and contexts
- Work effectively in a climate of ambiguity and changing priorities

Be Flexible

- Incorporate feedback effectively
- Deal positively with praise, setbacks and criticism
- Understand, negotiate and balance diverse views and beliefs to reach workable solutions, particularly in multi-cultural environments

INITIATIVE AND SELF-DIRECTION

Manage Goals and Time

- Set goals with tangible and intangible success criteria
- Balance tactical (short-term) and strategic (long-term) goals
- Utilize time and manage workload efficiently

Work Independently

- Monitor, define, prioritize and complete tasks without direct oversight

Be Self-directed Learners

- Go beyond basic mastery of skills and/or curriculum to explore and expand one's own learning and opportunities to gain expertise
- Demonstrate initiative to advance skill levels towards a professional level
- Demonstrate commitment to learning as a lifelong process
- Reflect critically on past experiences in order to inform future progress

SOCIAL AND CROSS-CULTURAL SKILLS

Interact Effectively with Others

- Know when it is appropriate to listen and when to speak
- Conduct themselves in a respectable, professional manner

Work Effectively in Diverse Teams

- Respect cultural differences and work effectively with people from a range of social and cultural backgrounds
- Respond open-mindedly to different ideas and values
- Leverage social and cultural differences to create new ideas and increase both innovation and quality of work

PRODUCTIVITY AND ACCOUNTABILITY

Manage Projects
- Set and meet goals, even in the face of obstacles and competing pressures
- Prioritize, plan and manage work to achieve the intended result

Produce Results
- Demonstrate additional attributes associated with producing high quality products including the abilities to:
  - Work positively and ethically
  - Manage time and projects effectively
  - Multi-task
  - Participate actively, as well as be reliable and punctual
  - Present oneself professionally and with proper etiquette
  - Collaborate and cooperate effectively with teams
  - Respect and appreciate team diversity
  - Be accountable for results

LEADERSHIP AND RESPONSIBILITY

Guide and Lead Others
- Use interpersonal and problem-solving skills to influence and guide others toward a goal
- Leverage strengths of others to accomplish a common goal
- Inspire others to reach their very best via example and selflessness
- Demonstrate integrity and ethical behavior in using influence and power

Be Responsible to Others
- Act responsibly with the interests of the larger community in mind

21st CENTURY SUPPORT SYSTEMS

The elements described below are the critical systems necessary to ensure student mastery of 21st century skills. 21st century standards, assessments, curriculum, instruction, professional development and learning environments must be aligned to produce a support system that produces 21st century outcomes for today's students.

21st Century Standards
- Focus on 21st century skills, content knowledge and expertise

Partnership for 21st Century Skills

- Build understanding across and among core subjects as well as 21st century interdisciplinary themes
- Emphasize deep understanding rather than shallow knowledge
- Engage students with the real world data, tools and experts they will encounter in college, on the job, and in life; students learn best when actively engaged in solving meaningful problems
- Allow for multiple measures of mastery

Assessment of 21st Century Skills
- Supports a balance of assessments, including high-quality standardized testing along with effective formative and summative classroom assessments
- Emphasizes useful feedback on student performance that is embedded into everyday learning
- Requires a balance of technology-enhanced, formative and summative assessments that measure student mastery of 21st century skills
- Enables development of portfolios of student work that demonstrate mastery of 21st century skills to educators and prospective employers
- Enables a balanced portfolio of measures to assess the educational system's effectiveness in reaching high levels of student competency in 21st century skills

21st Century Curriculum and Instruction
- Teaches 21st century skills discretely in the context of core subjects and 21st century interdisciplinary themes
- Focuses on providing opportunities for applying 21st century skills across content areas and for a competency-based approach to learning
- Enables innovative learning methods that integrate the use of supportive technologies, inquiry- and problem-based approaches and higher order thinking skills
- Encourages the integration of community resources beyond school walls

21st Century Professional Development
- Highlights ways teachers can seize opportunities for integrating 21st century skills, tools and teaching strategies into their classroom practice — and help them identify what activities they can replace/de-emphasize
- Balances direct instruction with project-oriented teaching methods
- Illustrates how a deeper understanding of subject matter can actually enhance problem-solving, critical thinking, and other 21st century skills
- Enables 21st century professional learning communities for teachers that model the kinds of classroom learning that best promotes 21st century skills for students
- Cultivates teachers' ability to identify students' particular learning styles, intelligences, strengths and weaknesses
- Helps teachers develop their abilities to use various strategies (such as formative assessments) to reach diverse students and create environments that support differentiated teaching and learning
- Supports the continuous evaluation of students' 21st century skills development

- Encourages knowledge sharing among communities of practitioners, using face-to-face, virtual and blended communications
- Uses a scalable and sustainable model of professional development

21st Century Learning Environments

- Create learning practices, human support and physical environments that will support the teaching and learning of 21st century skill outcomes
- Support professional learning communities that enable educators to collaborate, share best practices and integrate 21st century skills into classroom practice
- Enable students to learn in relevant, real world 21st century contexts (e.g., through project-based or other applied work)
- Allow equitable access to quality learning tools, technologies and resources
- Provide 21st century architectural and interior designs for group, team and individual learning
- Support expanded community and international involvement in learning, both face-to-face and online

About the Partnership for 21st Century Skills

The Partnership for 21st Century Skills is a national organization that advocates for the integration of skills such as critical thinking, problem solving and communication into the teaching of core academic subjects such as English, reading or language arts, world languages, arts, mathematics, economics, science, geography, history, government and civics.

The Partnership and our member organizations provide tools and resources that help facilitate and drive this necessary change.

Learn more and get involved at http://www.21stcenturyskills.org.

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The Action Research Planning Canvas
This is the planning canvas used during the Action Research: Plan phase.

WHAT'S THE PLAN?

Use this canvas as a guide for planning your action research.

Team Name: _____

BASICS

Why is this issue important to you?

List three reasons why students should care about this topic:

1

2

3

What will you ask the people who interact with your board to learn more from them?

1

2

3

4

5

THE PHRASE

Brainstorm below and then write your team's final decision in the box at the bottom.

FINAL STENCIL

HASHTAG

_____

TEAM ROLES

Who will fill the roles of:

Note Taker: _____
Responsibilities include taking notes in a clear form about what the participant is saying, including quotes.

Questioner: _____
Responsilbities include interacting directly with the participants and asking questions to understand why they feel the way they do.

Photo Documenter: _____
Responsibilities include taking photos of the people interacting and the board itself.

DETAILS

Location: *Outside the Lunchroom*

Time: *all three lunch periods*

Date: *March 6th*

MATERIALS LIST

- roll of brown paper
- stencil
- paint
- roller/brush
- camera
- notebook
-
-
-

FONT SELECTION

What font do you want use for your stenciled phrase?

Action Research Role Cards
These are the role cards used during the Action Research: Do phase.

THE NOTETAKER

Responsibilities: Taking notes in a clear form about what the participant is saying, including quotes.

Deliverables: Written notes of from at least three of the same people that the Questioner talked with

Things to keep in mind:
• You don't have to write every word down
• When you hear someone's response to a question, write down what stands out to you–good, bad, surprising, interesting, different, repeated, etc.

Other things to remember:

THE PHOTO DOCUMENTER

Responsibilities: Taking photos of the people interacting and the board itself.

Deliverables: At least 10 photos

Things to keep in mind: Make sure to take photos of people writing, and of the Questioner and Note Taker interacting with people

Other things to remember:

THE QUESTIONER

Responsibilities: Interacting directly with the participants and asking questions to understand why they feel the way they do.

Deliverables: Stories describing what you talked about with at least three people

Things to keep in mind:
• Ask why, even when you think you know the answer
• Encourage stories.
• Listen to nonverbal cues–be aware of body language and emotions.
• Don't be afraid of silence
• Don't suggest answers to your questions.
• Don't ask one-word-answer questions.
• Only ask one question at a time.

Other things to remember:

After Action Reporting (AAR)

Following each interaction with Mr. Geyette and the students we reflected on the experience in the form of an AAR. This matrix tool (pictured on the left) provided a consistent structure for making sense of our back-end process and subsequent outcomes. We placed the sequence of the student project process in the upper-left corner, with each design-based lesson, activity or tool running along the top. Then, we followed the same categories for each (running down the left side)–they included:

- Inspiration
- How we planned for it to go
- Time to prepare
- Time to do in class
- How it actually went
- 21st Century skills
- Key take-aways

The Detailed After Action Report

Sequence	OBSERVE VS. INTERPRET			
Lesson/Activity	Photo Taking and Storytelling	Presentation of Concepts + Demo	Written Worksheet Activity	Photo Scramble and Sort (theme identification)
Inspiration	IDEO	zen buddists, IDEO	IDEO	affinity map/sorting
How we planned for it to go	- created role sheets of storytelling - photos printed and ready to present	introduce concepts of observe and interprest and show one example photo to talk through	students think of one of their photos and write only what they observe and then why they think that might be	put everyone's photos into the center of the table and sort like concepts into "spaces", physical and conceptual
Time to prepare		45 min	30 min	
Time to do in class	2 hrs 10 mins total			
How it actually went	- trouble sending/emailing photos to Mr. G - students didn't refer to role sheets	went well when Neil delivered the concept, Kelly and Alex are not teachers	some students didn't get the "interpretation" - did more of a cause/effect, but formative assessment helped detect this for clarifying the next day	- sorting went accroding to plan, if not better - picking groups was not as serious (interest driven) as anticipated
21st Century Skills	responsibility, media literacty, accountability, communication		critical thinking	initiative, problem solving, creativity
Key Take-aways	- have students use digital cameras/dropbox/google drive to collect images - more involvement of teacher in activities (participation) - absences can be a problem - more structured storytelling or leave it out	- present more examples when introducing - rhetorical questions/care of wording, can be sticky for teacher - more effective to have NG teach than us (determining roles of designer/teacher)	- case where formative assessment worked well - good way to incorporate writing	- students got into sorting more than expected - boys more creative in connections/sorting, girls in storytelling - how can we structure the groups to be more interest based

WAR ROOM BUILDING			ACTION RESEARCH (INTRO)	
Presentation of War Room Idea	Construction	Instruction Worksheet	Defining the Problem Space	Present Qualitative/Quantitative and AR concpet
our work in MiD, Temple Design Challenge, WWII	Realm/Project H, Alex G disks	us, Chuck model airplane activity	Neil G	Jeremy Studio, sprint
	planned for each team to use all the pieces, bigger structures	planned for the team to collectively write instructions	planned for teams to generate ideas about what their topic means to them on stickies and white paper	they would understand the concept and be able to generate their own AR activities
15-30 mins	a lot - cutting cardboard, coordinating	no prep, just copy worksheet	20 mins	20-30 mins
10 mins	30 min (day 1) 10 min (day 2)	part of 40 mins of construction	30 mins	30 mins
fine, no questions about what it was, good amount of examples	- went well, each group had a structure - teams not a afraid of starting over - had to pull out tape to help the structures stand	didn't finish the instructions, only one person wrote them after, not a group activity	- a lot of absences, some worked alone so its not as collective as we'd hoped - students needed pushing to think "outside of the box"	the needed more scaffolding/structure and help to define the problem, more hands on with adult than expected
	collaboration, problem solving, creativity, adaptability	communication, accountability	commuication, collaboration, critical thinking	
need more distinctions between "room" and wall	- no blatent copying of other groups' ideas - groups weren't afraid to start over	structure the time better to allot for enough to complete the instructions	- this step needed to be added in with more structure and time allotment - important to ask the right questions to pull students along - learn by feeling, experiential learning - adult facilitation/guidance necessary	- chose and embed which method of AR teams will use within the presentation - videos were engaging and interesting to the students

The Detailed After Action Report

Sequence	ACTION RESEARCH (PLANNING)	ACTION RESEARCH (MAKING)		
Lesson/Activity	Planning Canvas	Painting Phrases	InDesign Poster	Pitch practice with random objects
Inspiration	Business model canvas, our own experience	Candy Chang "Before I Die..."	Artist Statement	College sales class
How we planned for it to go	Planned for students to fill out the "why students should care" section first, then "phrase" section second, and finish by picking a font.	Students write their phrase or planning worksheet, pick font then we prepare to laser cut, we gather materials, students attach stencils with tape to brown paper sheets and paint	Planned for students to already have outline from planning canvas, expected students to need a lot of instruction to use InDesign	Expected creativity in coming up with what the object was, expected students to strictly follow pitch template (3 questions), expected voting participation
Time to prepare	60 min	A lot-cutting stencils 3 hours	20 min	60 min (making paddles, gather objects, and put together presentation)
Time to do in class	30 min	80 mins	50 min	25 min
How it actually went	had a hard time thinking of questions before having a phrase chosen, didn't finish all of the parts of the canvas--like font	Took longer to cut stencils than we thought, we picked fonts because they didnt get to it in class before, students completed 4 36" x 64" brown sheets	Forgot to bring planning canvases so "poster designers" wrote from memory, most students picked up InDesign very quickly-needing little assistance (especially if interested), eager to use images from online sources without considering copyright	Took some prompting of the 3 questions, one student refused to participate, even after all the others went, the "number 1" students got into it, were excited by it
21st Century Skills	communication, collaboration, critical thinking, productivity	adaptability, productivity, collaboration, problem solving, communication, leadership	media literacy, creativity, info literacy, responsibility	communication, creativity, critical thinking
Key Take-aways	-move the "phrase" section to the first position, the worksheet kept the students on task, but there may have been too much asked on the one sheet of paper. A possible iteration would be to have a large wall canvas, and individual worksheets that build the canvas	Mesmerized and got really into planning, maximizing efficiency, saw students thinking in process improvements way-iteratively solving problem, not a tone of phone use, by the last one all students were engaged in painting	Teach more options for graphic design (like patterns, creating own icons, background), more discussion needed about image and logo copyright and intellectual property; if interested, adoption of new software happens quickly-students don't need much help.	Hard time picking one application of random object--had a case of the "and's", put incentive and measurement on voting then will be taken more seriously and more engagement, red and green paddles worked well, a tangible form of voting, having teacher model was a good plan

ACTION RESEARCH (DOING)		
Role Cards	Role Play/Rehearsal	Implementation Day
	design methods	Candy Change "Before I Die..."
thought students would use them to write questions on and use as reference during the event when they got stuck	one team at a time puts work up in hallway while rest of the class pretends to be their peers at lunch time	expected some engagement and teachers and faculty coming to check out the project also expected some profainity and inappropriate responses
30 mins		30 mins
10 mins	35 mins	3 hrs
some used during role play but not during actual implementation day	most students showed effort, got out of their seats and seemed to enjoy the role playing	- group dynamics, people slacking, inequality of work - lots of humor/disrespectful/profain comments on the boards - lots of student engagement and staff interest - not a lot of teachers came through - by the 3rd lunch, students were tired and "checked out"
responsibility, productivity	creativity, adaptability, accountability, collaboration, initiative	communication, cross cultural skills, initiative, collaboration
try to have students write their own roles and responsiblities	- the activeness of the role play was great - made it real for them when they got up to do it, weren't seriosu about it before - experiential learning	- lots of energy (pos and neg) showed they care - emotions easily effected, little resiliency skills - reflection after each lunch period was good, maybe more structure next time, allow them to gripe but ask how to make it better - during that reflection, some students were more apt to help the others out, more positive bring up the negative ones - role play definitely helped prepare them - students have demonstrated "care" for their issue, got a taste of what its like for teachers to try to engage them and their peers in important topics

The Detailed After Action Report

Sequence	SYNTHESIS		
Lesson/Activity	Record Data (3/12)	Sort/Cluster Data and Write Theme (3/13)	Problem to Opportunity and "How Might We...?" 3/13/14
Inspiration			IDEO/Design Thinking
How we planned for it to go	10 minutes of silent recording, copy off of poster/cut photos/transfer notes, follow their roles, lots of post-its, three stories from the Questioner	Mess process of sorting data into themes using wall space	Easily switch from problem statement to opportunity statement, have them pick one theme, write a problem statement, turn into HMW on the sheet
Time to prepare	20 min	10 min	20 min
Time to do in class	20 min	30 min	10 min
How it actually went	students werent enthusiastic about copying, some jumped to insights/reasons and inferences	hard for them to sort along, and relate it back to main point, writing themes was difficult, took chairs away	took chairs away, it was easier to go from theme to HMW problem statement- was a little confusing, differing levels of specificity in HMW statements
21st Century Skills	responsibility, accountability, productivity	leadership, collaboration, communication	inititative, critical thinking
Key Take-aways	Include more incentives, increase excited around "digging" into data, more structure for how to analyze photos, more emphasis on direct quotes and how to extract/interpret data from them	More structured activity for clustering...talk about taxonomies more intentionally with the groups	"active" work resulted in better engagement but complaining increased, each team needs one facilitator/adult to sit and ask questions as they work.

IDEATION	PROTOTYPING	
Brainstorm Ideation and Solution "Lenses" 3/14	Case Studies and Elements	Making the Prototypes (scenarios, storyboards, wireframes, floorplans, shirt templates)
From _____to____ UArts charrette	Alex's brain :)	Kolko
Students explore and brainstorm 3 ideas in 4 categories for 7 min per category	computer/secondary research to pull out common elements of their type of prototype	Be done by Thurs. for testing with another class, easily translate written story to scenario and sketches
20 min	10 min	30 min
50 min	40 min	5 day to first draft
Became apparent who's topics lended themselves to which categories, worked well to get them to think in dofferent buckets of solutions, easy for them to decide which to go with, brainstorming "on the spot" led to a slow start	A & K not present in class, but NG said some groups did well analyzing and pulling out the elements	complaining about repetitive drawing on the app wireframes, some reframed prototype ideas, hesitant to put pen to paper, more participation when given print outs of buttons and phones,
innovation, creativity, problem solving	critical thinking, info literacy	creativity, problem solving, innovation, initiative, media literacy, collaboration
Structured brainstorming was necessary	helped them think about other projects, and pull out elements to include in their own	thinking of one instance to create a scenario was tough for some

CASE STUDIES

A look into what is currently taking place in the education system that is most comparable to our model for university design student-public school teacher partnership, and design-based learning

These comparable models serve as case studies to inform our future model. They span two categories: schools and consultancies. They represent varying expertise and different locations across the United States. We believe these schools and consultancies are exemplary models that disrupt or reform the current education system, without completely demolishing it.

PHILADELPHIA SCHOOL DISTRICT

School Reform Commission

Chief Academic Officer

Office of School Performance Manage

THE FRANKLIN LEARNING CENTER

Administration

Teachers

Support Staff

Students

VENDORS

COMMUNITY

Parents

Universities

Extracurricular

We watched a Google Hangout on Connected Learning with Mimi Ito and Katie Salen (pictured above). Ito and Salen are leaders in the Digital Media and Learning initiative led by The MacArthur Foundation. Connected Learning is a new theoretical and practical model for developing learning opportunities in schools.

For our work, the Google Hangout provided valuable information about the new role and responsibility adults have in student-driven learning. We frequently found ourselves in the role of "Translator" while facilitating design activities with the students at Franklin Learning Center. When we observed a specific personal interest of a student, we used that as a pathway to teach new concepts and encourage greater engagement and ownership of their project.

Photo credit:
http://commons.wikimedia.org/wiki/File:KatieSalen.jpg

SUPPORT STAFF WITHIN A SCHOOL

Examining models where a public school sees the role of designer as a valuable support mechanism

Key take-aways from public schools with designers embedded within the staff:

- Teachers can easily access the support services provided by the designers
- Designers can provide more customized learning activities and materials
- Fosters a collaborative approach to curriculum development–between teacher, designer, and content expert
- Relieves some barriers of time and money (designers are typically funded through separate, private sources)
- Professional development should happen daily through intentional scheduling and with support of designers as facilitators
- Teachers arrive early and stay after the students to make time for professional development or curriculum development
- A smaller teacher to student ratio allows for better implementation of design-based learning
- Pair teachers with a small group of students to act as advisors and mentors
- Middle and High School are ideal age range

Limitations of public schools with designers embedded within the staff:

- Serves only one school–a limited number of teachers and students (based on geographic location)
- Not scalable
- Higher cost per student, and requires additional funding from private sources

We found a commonality between the two larger public school systems–New York City and Philadelphia–and the vehicle for developing key leadership that allows for design-based learning to emerge. Both Ms. Aragon at Quest to Learn, and Mr. Geyette, our teacher-partner at the Franklin Learning Center, were/are involved with Leadership Academies organized by the respective cities' school district.

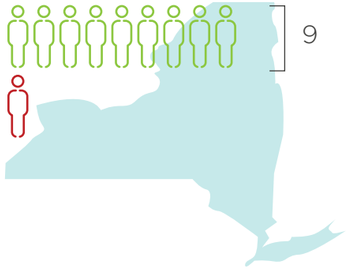
Q2L

Public Grades 6-12

Mission

"Quest to Learn supports all students in the pursuit of academic excellence, social responsibility, respect for others, and a passion for lifelong learning. The school is committed to seeing every student achieve the excellence required for college and career, and enabling every student to develop the skills and habits of mind needed to navigate successfully today's increasingly complex, information-rich global world."

Student to Teacher Ratio



Quest to Learn

Administration

Elisa Aragon is the school's principal. She was selected to participate in the New York City Leadership Academy, a key part of the Chancellor's mission of transformation for the public education system.

Teaching Staff

Teachers at Q2L are expected to help shape and sustain the school's vision, to mentor and support the students in their learning, and to contribute to a deeper understanding of the opportunities and challenges of a game-based learning model. They will be fluent in game-like approaches to learning, which means they are able to tolerate ambiguity and uncertainty. They model forms of civic engagement, are receptive to others' perspectives and are a dedicated member of the Q2L professional community.

Each teacher who joins Q2L will take part in a three-yearlong professional development program to develop the six dimensions of a Q2L teacher: designer, assessor, systems thinker, wellness integrator, technology integrator, and practitioner.

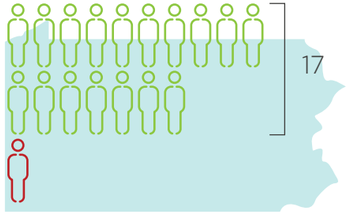
CHAD

Public Grades 9-12

Mission

"CHAD is committed to an innovative program of study, integrating the design process with the mastery of a strong liberal arts education. We have a thoughtful academic environment that engenders love of learning, intellectual curiosity, and new ways of seeing. We also prepare students for higher learning and responsible citizenship."

Student to Teacher Ratio



Charter High School for Architecture and Design

Administration

The Charter High School for Architecture and Design (CHAD) was founded by the Philadelphia Chapter of the American Institute of Architects as its Legacy 2000 Project and opened in September 1999. Dr. Peter Kountz is the head of the CHAD. He has been involved with school and university teaching and administration since 1969. He joined CHAD in July of 2005.

Teaching Staff

CHAD teachers are professional educators, practicing architects, designers, and artists. They strive to create dynamic, student-centered classrooms in which democratic principles thrive. One of the main responsibilities of a CHAD teacher is their commitment to the personal growth of each student. Each teacher is an advisor to a small group of students–monitoring their progress, offering guidance, and encouraging them to reflect, develop skills, take risks, and follow their passions.

CHAD's professional development revolves around using assessments as the method to inform teacher instruction.

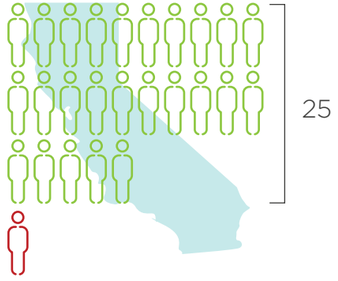
REALM

Public Charter Grades 6-12

Mission

"To advance knowledge through rigorous studies, cultivate resiliency, develop critical thinking skills, and equip students in grades 6-12 to serve our communities and the world in the 21st century. REALM enrolls all students in a college preparatory curriculum that builds critical creativity through a love for design thinking, teaches grit to engage with immersive and interactive technologies, and connects discoveries in the classroom to action in the community."

Student to Teacher Ratio



Revolutionary Education and Learning Movement

Administration

REALM is the first and only charter middle and high school located in the Berkley, CA school district and was opened in the fall of 2011. Victor Q. Diaz serves as the principal of REALM. Mr. Diaz has worked in schools for more than 12 years, and is currently earning his Ph.D in education at U.C. Berkley.

Teaching Staff

Emily Pilloton is the Director of Creativity at REALM. She is the founder of Project H and is in charge of bringing Studio H's design/build curriculum into REALM Charter School

Teaching practice at REALM is based in a love for the students and community. One way this is demonstrated is through teachers greeting each student with a smile and a handshake, and calling them by name as they enter the classroom.

REALM teachers arrive early and stay after school to gather formally and informally with other staff to reflect and share teaching practices as the main form of professional development. Teachers also interact with support staff, such as: Campus Manager, or Instructional Coach to discuss the best strategies for classroom management.

Expert Interview

Alex Gilliam is the director of Public Workshop, an organization that creates uniquely engaging opportunities for youth and their communities to shape the design of their cities.

In the classroom Alex told us that he believes that the most effective way to engage the students is the have them co-create the tools with us that they will use throughout the project. It is important to make their lens as students visible and acknowledge that they understand what is most relevant and question why it is important to them and ask what is at stake if this problem isn't addressed. These are principles of community that we've heard echoed in other places throughout our research, both in person and in literature.

Image credit: Mark Stehle, Tribeza

Support Staff

Students

GOVERNMENT

National

State

City

VENDORS

Curriculum Materials

Consultants

COMMUNITY

Parents

Universities

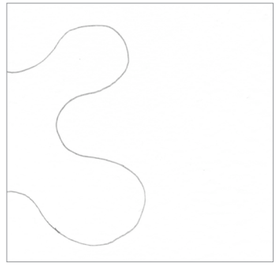
Extracurricular

OUTSIDE DESIGN CONSULTANCY

Exploring consultancy models where designers support teachers as external collaborators

The following design consultancies operate under various models; for profit, non profit and within a university. They all operate on a small scale of ten or less employees, but do work that extends beyond those employees. When exploring these to influence our model, we were critical to identify the limits of the models. Each consultancy, expressed some type of limitation when attempting to scale the model up to reach more students or branch out into different schools. Some of them operate on the framework of a bigger model, like IDEO's Design Toolkit for Educators–an open source guide for implementing design thinking–but each consultancy sees the value of designers being the leaders of those processes and guiding teachers through it.

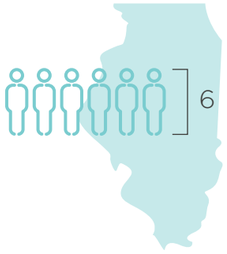
Third Teacher



Overview

"Third Teacher is the efforts of a multidisciplinary design team who is trying to explore the future of learning through a consultancy type model of pairing designers with k-12 school teachers. Third Teacher functions as a for profit consultancy under the umbrella of Cannon Design, a large architecture firm."

Size of Staff



RED Lab

Overview

"The RED Lab is a combined effort of the Stanford Education School and the Hasso Planttner Institute of Design (d.school). The reward for the collaboration is great because it allows different disciplines within the same academic setting to join forces for deeper research."

Size of Staff

Center for Urban Pedagogy

Overview

"CUP is a non-profit company that uses design and art to improve civic engagement in New York City. They emphasize civic engagement and create tools to be used by organizers and educators all over New York City and beyond to help their constituents better advocate for their own community needs."

Size of Staff

Third Teacher

Services

The process Third Teacher follows is human-centered, connection seeking, experiential, and iterative. Using this process they offer services of visioning + programming, architectural design, strategy + organizational design, user research, professional development, and community workshops.

One unique aspect of Third Teacher is the "Prototype Design Camp" that they offer. It allows students to come to a workshop in which they tackle big, real world issues and are allowed the space to explore all prototype options.

Limits

It might be difficult to sustain this type of work because of the problems that come with scaling their efforts. It seems as though they do a lot of one time engagements with teachers or schools but have a hard time sustaining their presence beyond the event.

RED Lab

Services

The mission of RED Lab is to partner with local schools to explore the feasibility of design thinking as a new way to teach and learn. They advocate for design thinking as "an orientation to learning that encompasses active problem solving... It builds on the development of creative confidence that is both resilient and highly optimistic."

The RED Lab serves as a great model for how to partner Universities with public education systems. They have an emphasis on building and making things to show the value of design in the classroom. The Lab is good at exposing why design thinking is a viable way to teach 21st Century skills.

Limits

The opportunities for improvement revolve around scaling and funding. Because they are under a university as a research entity, there is enough funding to carry out the research they work on.

Center for Urban Pedagogy (CUP)

Services

Although they have a multitude of offerings, the three main programs that are of most interest are: Teacher Trainings, Urban Investigators Program, and the City Studies Program.

The City Studies program pairs artists and designers with public school teachers to develop lesson plans for a research project in which the students go out into the community and solve problems in a designerly way. The products that come out of the City Studies program are often sellable on the CUP website. The proceeds from those sales go to fund some of the programs and fellowships that CUP offers. The program emphasizes using visuals to explain complex city issues or processes that the public often has a hard time understanding.

Limits

The products that come out of the City Studies program are often sell-able on the CUP website. The proceeds from those sales go to fund some of the programs and fellowships that CUP offers. It is still unclear how frequently these programs are run or how the educators find out that these services are available.

Candidate Biographies

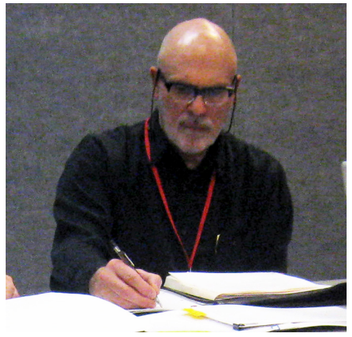
Kelly Babcock
I have had a passion for art and design as long as I can remember–using the visual medium as a way to help people communicate their ideas. However, after working as a professional graphic designer for some time, I felt that there was something missing in my design practice. Now, after two years at University of the Arts, I can happily say that I have found what was missing. The MiD program introduced me to human-centered design, and provided me with the knowledge and skills to use design as a strategy for affecting the positive change I was searching for.

Our thesis work has been a great opportunity to apply what I have been learning. The education sector is an challenging area, with lots of potential for innovation, and I have thoroughly enjoyed being a part of it. I look forward continuing my work, and discovering new ways to use design to impact how youth learn.

Alexandra Visconti
Over the last two years I have enjoyed exploring the opportunities for design in everything from education systems to start up companies. In pursuing my undergraduate degree I explored the ways that photography and sculpture can work together to communicate one message and give the viewer a full sensory experience, a holistic experience design, not just a visual one.

To me, design means an optimistic, problem solver way of thinking. I didn't know until two years ago that the way I have viewed the world, since a young age, has been directly in line with design values. As with most things in life, one size does not fit all in educational systems and models, but design can offer a flexible and adaptable way of working within that system.

Committee Members



Dan Rose
Dr. Rose taught our design synthesis seminar. Having been through more zooming in and out than we thought was possible, he showed us how to truly think at all scales from the micro to the extreme macro. His extensive knowledge and interest in anthropology was of most help throughout this process. An artist in his own right, he understands the process that we work through, and challenged us to dive deeper at each step.

Charles Burnette
Dr. Burnette started the Master of Industrial Design program at University of the Arts. After hearing about his work in design and education, we explored his idesignthinking framework. Starting ahead of his time, he was able to explore the world of design thinking in K-12 education. His work served as an example for us to follow and push forward. Throughout this thesis process he has been our champion. With a great expertise and knowledge of the field, he guided us to push past speed bumps and into the world of innovative exploration.