

# COMMUNITY SCIENCE PROJECT FOR FLIPPED CLASSROOM

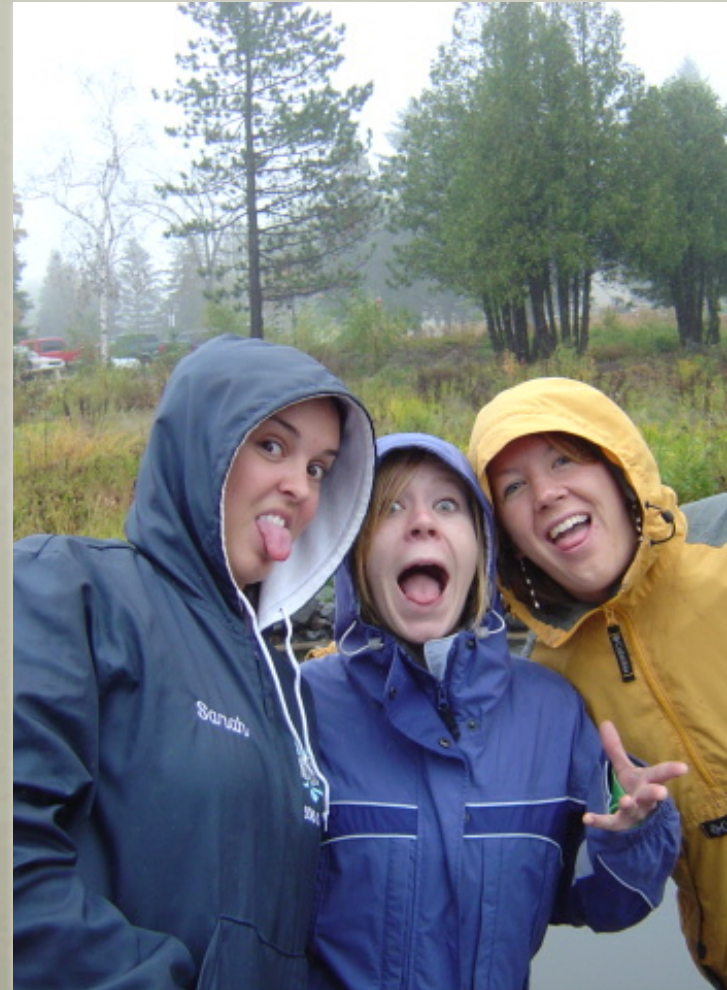
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# Community Science project

- Real-life and community/family connections
- the opportunities to explore their physical, cultural and social worlds
- meaningful learning experiences to learners. (NAEYC, 2000)
- a meaningful context and motivation to make the leaning experience authentic (NCTM, 2001).





## PROBLEM

- Lack of building connections with communities

# Technology

- Research information about the community in depth
- Promote communications
- Increase motivation
- Support social interaction (Clements & Nastasi, 1993)
- More interest in community (Andes & Claggett, 2012)



# COMMUNITY PROJECT

Place	Math (M) /Science Contents (S)	Technology
Whole-Food Coop	(M) Measurement (S) Organic Food & Instant Food	Online Discussion Board Wiki Blogging
Chocolate Factory	(M) Measurement (M) Graphing (M) Algebraic Reasoning (S) Chemical Reaction (S) Process of Making Ice Cream	Online Discussion Board Wiki Blogging
Ice Cream Store	(M) Measurement (M) Graphing (M) Algebraic Reasoning (S) Chemical Reaction (S) Process of making ice cream	Online Discussion Board Wiki Blogging Ice Cream Machine
Nature Center	(M) Measurement (M) Functions and Relationship (S) Living eco-system and life cycles	Online Discussion Board Wiki Blogging Website of the center Virtual Reality of the center
Hawk Ridge	(M) Measurement (M) Functions and Relationship (S) Hawk Life Cycle and living environment	Online Discussion Board Wiki Blogging Website of the center Virtual Reality of the center Binocular
Brew House	(M) Measurement (M) Algebraic Reasoning (S) Chemical Reaction (S) Process of Brewing	Online Discussion Board Wiki Blogging Website of the center
Planetarium	(M) Number and Operations (M) Geometric Reasoning (S) Constellation (S) Earth Movement	Online Discussion Board Wiki Blogging Website of the center
Rock Climbing	(M) Algebraic Reasoning (S) Balancing and Motion Human Body	Online Discussion Board Wiki Blogging Website of the center
Page Mill	(M) Measurement (M) Algebraic Reasoning (S) Chemical reaction (S) Process of how to recycle paper	Online Discussion Board Wiki Blogging Website of the center
Hospital	(M) Functions and Relationship (M) Math in Human Life (S) Technology and science used in hospital	Remote measuring system Automotive operating system
Fire Station	(M) Measurement	Fire Engine

**Participants: 60 future elementary teachers for 2 semesters**



# Instruments: CSS (Customer Satisfaction Survey) & Reflective Survey



# Schedule



- ❖ Divide into 12 groups
- ❖ Research community resources
- ❖ Visit the place in advance
- ❖ Sign up for the day
- ❖ Visit the place with the class
- ❖ Reflect the visit with surveys



# Technology used during the project

## Research community Resources

- Websites, blogs, Wikis, Social Medias

## Contact and Visit in advance

- Phone, Websites, Social Medias

## Sign up for the Project

- Google Doc

## Review after the project

- Web-based Interactive social Media Sharing Tool

## Evaluation

- Web-based Survey Tool

# CSS results

Community Places	Q1.	Q2.	Q3.	Q4.	Q5.	Q6.	Q7.	Q8.	Total	<i>M</i>
Chocolate Factory	4.3	4.5	4.7	4.2	4.8	4.5	4.7	5	36.7	4.59
BrewHouse	4	4.5	4.8	4.2	4.5	4.5	4.6	4.5	35.6	4.45
Whole Food Co-op	4.6	4.7	4.8	4.5	4.8	4.7	4.8	5	37.9	4.74
Planetarium	4.7	4.5	4.9	4.7	5	4.8	4.9	4.9	38.4	4.8
Rock Climbing	4.5	4.7	4.8	4.3	4.8	4.5	4.7	4.9	37.2	4.65
Pagemil	4.3	4.6	4.7	4.5	4.7	4.5	4.8	4.7	36.8	4.6
Hospital	4.4	4.6	4.8	4.5	4.9	4.6	4.9	4.6	37.3	4.66
Nature Center	4.8	4.8	4.9	4.8	5	4.8	5	4.8	38.9	4.86
Hawk Ridge	4.7	4.8	4.9	4.9	5	4.9	5	4.8	39	4.88
Ice Cream Store	4.5	4.5	4.7	4.5	4.7	4.5	4.8	4.9	37.1	4.64
Fire Station	4.7	4.7	4.7	4.6	4.6	4.5	5	4.9	37.7	4.71
Aquarium	4.8	4.8	4.9	4.8	5	4.9	5	4.8	39	4.88
<i>M</i>	4.53	4.25	4.8	4.54	4.82	4.64	4.85	4.82		

# Reflective Survey I

Theme	Student Responses
Hands on experiences	<p>“I liked breaking up into groups and doing different stations. Also, it was nice that they had a hard copy and e-copy of handout for us of all the resources.”</p> <p>“I liked that we got to see how their ice cream is made.....”</p> <p>“... <u>doing hands-on activities.</u>”</p>
Learning from Community and Virtual Resources	<p>“It was fun to get off campus and learn about science in new environments through <u>internet and community places!</u> The people facilitating the tour at the ice cream store were very knowledgeable and had a lot of interesting.”</p> <p>“I like moving to different stations....”</p> <p>“It was so nice to be outside and the information that the group gave us was great and very informative. I really learned and enjoyed it.”</p> <p>“I loved the walk. Very Cool idea!!!”</p> <p>“Very <u>informational to research community place information using websites...</u>”</p>
Pedagogy Connection	<p>“Good information, nice experiments, good resources”</p> <p>“The large variety of activities that that offer.”</p> <p>“The different science experiment stations gave the students examples of lesson to teacher before going on a field trip. <u>Online resources were also available. It gives the students prior knowledge to what they will be learning.</u>”</p> <p>“<u>that I learned about all of the opportunities that exist there.</u> I never knew there was so much to do. I also did not realize there were so many ways to make it cost-efficient!”</p> <p>“The amount of actual and e- resources dedicated to students at the center. There is hundreds of different ways to use the community area.”</p> <p>“I liked that there are so many opportunities for us (as future teachers) to take our students to Hartley, essentially for FREE! I think it's a great thing that Hartley does for students of all ages with their summer programs, and the programs they offer to students during the school year. I also like learning about their "Green" building. I REALLY enjoyed watching the students learn in the classrooms they had today. That was neat to watch part of a presentation and watch the students explore science.”</p> <p>“Applies science to sports: something kids like and can experience every day!”</p>
Content Connection	<p>“.....I think that the process that they explained to us was pretty interesting. It was less complicated process than I thought. I hope to go there soon sometime.....”</p> <p>“It was interesting and informational to see what goes on behind the scenes.”</p> <p>“...things to tell us about ice cream and how it is related to science. The staff was very friendly and outgoing and helped me learn a lot.”</p> <p>“It emphasizes that science can be found in so many different places in a person's community.”</p> <p>“It was really interesting to see how the .... nature center was focusing so much on the environment.”</p> <p>“it was very informative and educationally based”</p> <p>“The Talks about the solar energy”</p> <p>“Science can be accessed during all seasons and weather and the people that work there are VERY knowledgeable.”</p> <p>“the background information about how they receive funding for their programs. I also liked that anyone can attend the Adult Nights and snowshoe and ice skate.”</p> <p>“Looking at the different constellations when he turned the lights off”</p> <p>“I really liked when the lights went out and we got to look at the "night sky" it was amazing!!</p> <p>I also do not know that much about constellations and it was very fun to find the different stars in the sky!”</p>

## Reflective Survey II

Theme	Responses
Needs of More Hands-on Experiences	<p>“Offering more hands-on experiences:”</p> <p>“Possibly letting the students participate more with the hands-on activity”</p> <p>“Maybe having more hands on learning experiences would make it better”</p> <p>“Doing some more hands-on activities.”</p>
Needs of Information & Guideline	<p>“Being provided more background information physically and virtually .... before hand”</p> <p>“Being better prepared and providing more information verbally instead of having us simply read off the PowerPoint”</p> <p>“.....improved by provided information about different animals while we were walking along the trail.”</p> <p>“Having a sheet or posting guideline Google Docs to follow along with.”</p>
Needs of Time	<p>“More time outside. We didn't get to see much of the Nature Center”</p> <p>“I just wish we had more time! We go on these fun field trips and just don't have enough time to get to see all that is offered. I wouldn't change anything, I thought it was very informational.”</p> <p>“Planning in advance would have been so much better. I didn't know what was going on or what we were doing, it seemed like it was thrown together last minute.”</p>

## Reflective Survey III

Theme	Student Responses
Fun	<p>“interesting to research community places using social media and blogs and to visit the places”</p> <p>“It was a fun project!”</p>
Useful Resource	<p>“Thanks! It's a great resource.”</p> <p>“Great people! Great service!...”</p> <p>“It was a very fun and unique place to visit for science class!”</p> <p>“I had a great time being outside and enjoying nature! It's also good to know about the resources that are out there for us as future educators onsite and online.”</p> <p>“This is a fantastic online and offline resource for any teacher or even interested community member to know about. People can benefit from the nature center and its services.”</p> <p>“Great way to share and to review each group’s Community Projects” using a web-based interactive social sharing tool.”</p>
Future Use	<p>“Very fun community science and definitely something I'd love to do with students in the classroom!”</p> <p>“I think that taking a class to the Nature Center in any season would be great fun. I hope this is something I am able to do in my future.”</p> <p>“Really great planning and preparation!”</p>

# Conclusions

- ❖ The flipped classroom, Community Science Project, made the learning environment where the students understood and developed scientific and mathematical concepts in the context of their own community
- ❖ The Flipped Classroom, Community Science Project, helped and used resources from the community
- ❖ Technology enabled the rich learning environment of the flipped classroom by providing profound learning and organizing opportunities for the participants.

