

Redefining field trips  
Use it don't fight it  
Mobile engagement

Slide 1: Lee and students with mobiles out

So I am odd individual. I knew in 7th grade that I was going to be a science teacher. I had a teacher that not only made science come alive but also gave me a hope to become something more. Then in 8th grade a mentor of mine, my 8th grade science teacher, did this. (bucket of water spun around my head) Then he says, "that is Physics!" it was from that moment I was hooked! All I have wanted to do since has been to advance the understanding of Physics

Slide 2: Valleyfair

That mentor teacher followed me to 9th grade and I got to learn a little more about Physics and Chemistry from him. For some reason back in the day our school decided to do a field trip to Valleyfair. I remember going, but there was no learning objectives for the day, there was no packet, there was no intention for learning. I remember going to the park and going on all of the rides with my friends and thinking in the back of my mind, "How great would it be to do some Physics experiments here?!"

Slide 3: Teens talking about texting

Every year I have been teaching I have brought my students to an amusement park to learn physics. Some trips went better than others, but as a good educator we are always trying to make learning happen. I was starting to notice that my students no longer really wanted to go on the rides. They wanted to 'set-up camp' and play video games or text their friends. I was getting tired of it the constant low desire to go on the rides, so I thought how can I stop

competing and make their mobile devices a part of the learning? I mean they were going to be on them anyway, might as well make it a part of the expectations.

#### Slide 4: m-Learning and research

- learner centred: it builds on the skills and knowledge of students, enabling them to reason from their own experience.
- knowledge centred: the curriculum is built from sound foundation of validated knowledge, taught efficiently and with inventive use of concepts and methods.
- assessment centred: assessment is matched to the ability of the learners, offering diagnosis and formative guidance that builds on success.
- community centred: successful learners form a mutually promotive community, sharing knowledge and supporting less able students.

There is actually very little research that has concluded the effectiveness of m-learning.

There are some that warn that the ideology of m-learning could be overblown. But as long as these areas are met, then effective learning happens the hard part is finding the right app for the job.

#### Slide 4: Practicing at Shanghai Disney

Shanghai Disney Resort Opened in Late spring 2016. Now Disney has an entire facility in California that does physics research. Mostly in the fields of optics and sound (makes sense as they want to tell a story) But their parks are different, they need the impossible become real, they need magic. And all that magic really is is misdirection and applications of science. So I wanted my students to better understand the science behind the magic.

#### Slide 5: David with students

Not only were our students going to be able to meet with imagineers, but I wanted more! I had heard that sometimes the lines exceeded 2 hrs in length, and was not content with that time being wasted. I wanted students to be able to access an app that was going to help them learn something about the ride they were going to go on. But there was no app like that already in existence.

Have you ever had students in the past say this is too hard/I just don't understand/ I can't figure this out...? Ask teacher how they responded...

For me It had been a while that something was too hard, so I wanted to know that experience again, and I wanted to have an app that did a specific thing. So I did something that I was terrified of, I learned how to code, and over the school year spent a considerable amount of time learning som basics, and some moderate level coding. I am not good at it, and that would take experts say another few thousand hours to get good, but I know that the scariest thing is fear of failure, not the actual content of any one thing.

#### Slide 6: Learning to code

Again, there was no app for what I wanted to do, so I made it. Like I said I am not good at it yet, but I found that there are a lot of different languages to program in. I evaluated my students and in China 80%+ of my students had an iPhone, so I learned how to write in Swift 3.0 (iPhone app language) Then in Swift there are a few different methods (namely storyboard - laying out things in a flow chart, or programmatically - typing it all out). I chose to learn how to programmatically write my app. There is a wonderful site called [letsbuildthatapp.com](http://letsbuildthatapp.com) and is run by a programmer that breaks down the language in easy to understand bites, so you never bit off more than you can chew.

## Slide 7: China limitations

One of the main features that I wanted was a way for students and staff to interact in the park. I found a database program that would allow students and staff to log in to the app and then they would be able to share information on an activity feed. Unfortunately that database was owned and operated by google, and all things google has been blocked in China for about 5 years now. So we had to find another China approved app to have those interactions while at the park.

## Slide 8: WeChat

Well in China there was already an app for that and we knew that 95%+ of all students already had it on their phones. We used an app called WeChat to facilitate our staff student interactions while at the park. We decided to make one bus a group. I had created all of the groups and invited students and other staff 1:6 ratios, so I got to control the group and could kick out students that were being vulgar. Thankfully that didn't happen. Though we had a few cheeky posts.

## Slide 9: Vidometer

Another app we wanted to use was something called Vidometer. Vidometer is a app that allows for internal phone sensors to overlay with video from the phone. Inside each phone is an accelerometer that can measure up to 3g in 3 directions, a barometer, and a gyroscope sensor. However there is another limitation with that app and it is the inability to make and record more precise measurements.

## Slide 10: NCSU MyTech

So we chose to use NCSU MyTech for that data logging, as that technology is currently beyond my programming abilities. Demo the app a little.

#### Slide 11: What we learned from 2017

Now using three different apps for different purposes during the day made it difficult for students to be able to understand what was needed when and where. Few students downloaded the Vidometer app, and it was the first time that students used the NCSU MyTech app. On top of that the app that I wanted students to use while waiting in line was rejected by Apple, because even though the imagineers and a manager knew we were going to use photos from a recon trip to Disney, we did not have written permission to use photos taken inside the park. The greatest thing that I think we should have done before hand was used the apps in a classroom setting before going to the park.

#### Slide 12: Moving forward

I have just moved back from China, and am looking forward to working with other educators here in MN to develop an app that will work at Valleyvair and will be ready by their science days presentation