Data Driven Design
Facilitate Student Online Collaboration

Rich Baxter, OCT
Robert Service Sr PS
TDSB Google Camp Website

www.TDSBGoogleCamp.ca

All my resources are linked from my Session Description

http://richbaxter.ca/data-driven-design/
Additional Google Apps for Education Resources


One part of the Google Docs suite is the word processing application. The Google Docs word processor, Google Documents, is a web based program that has many of the most common features of other programs such as Microsoft Word. However, it also has the ability to easily share and collaborate on documents with others.

Getting Started with Google Docs

- Drive and Docs: Basics
- How to access your TDSB Google Documents
- How to create a Google Document in Google Drive
- Tip Sheet: How to Create & Share a Google Doc
- How to upload documents to Google Drive
- How to import and convert an existing document (i.e. Word to Doc)

In the Classroom

Collaborate on graphic organizers

Completing graphic organizers within Google Docs allows students to collaborate with one another, share docs with other teachers (such as special education), and provide opportunities for teacher feedback.

What do you do? What do you think? What are you watching?
Data Driven Design
Facilitate Student Online Collaboration
Documenting the 2014-15 school year...and also now...

Written and presented for TDSB Google Camp 3.0
by Rich Baxter, OCT
February 20, 2016
The theory is...

...that in order to become more engaged, students need to be able to collect and interpret data similar to the way agile companies do...

...that by getting kids ‘hungry for their own data’, Data Driven Design combined with the ‘Bootstrapping Checklist’ facilitates online student collaboration and promotes STEAM with an attitude toward mastery learning...

...for students, knowing when and how to commit to a project is invaluable - using an *iterative work cycle is key*... “the process frees the mind”*...
What is a Mastery Mindset?

“Individuals with a fixed mindset believe that their intelligence is simply an inborn trait—they have a certain amount, and that's that. In contrast, individuals with a growth mindset believe that they can develop their intelligence over time (Blackwell, Trzesniewski, & Dweck, 2007; Dweck, 1999, 2007).”
Where and When?

- Robert Service Sr PS in Scarborough, Toronto
- less than 200 students in Grade 7 and 8
- Model School for Inner Cities in the top 20% on TDSB LOI
- 48 students for the 2014-15 academic year, in 2 classes (one in the morning, the other one in the afternoon) - every Friday for **20% Fridays** (Genius Hour)
- New cohort of 45 students for 2015-16. 7 Projects on the go...
- Grade 8 core which includes language, math, and social studies
- Tech - we have WiFi in the classroom, 1 mobile cart (30 laptops), 6 HP Probooks with Adobe Master Suite, student PCs and personal devices, a digital projector and we use GAfE and Edmodo
This is the ‘Bootstrapping Checklist’

A Checklist for Bootstrapping;
Design Invest Build Launch Analyze Repeat

"Following a structured approach to developing new ideas is critical for having a shot at actually being able to measure impact and value."

Kristan Uccello - 09/15
teams formed using a ‘hackathon model’
volunteers pitched their ideas to their classmates based on perceived school needs (or ‘pain points’)
early stage pitches opened up networking and team building conversations during a whole-class follow-up exercise where potential Project Managers and their team members interviewed each other to find the right fit
pitches were scripted and applicants had their scripts too
pretty much the same for Sept 2015
This is NOT a Dragon’s Den - it is a structured workflow

We used materials from MaRS DD as a guide:
Design (October - November) *start as early as possible

There are some important considerations when designing the prototype - I used the MaRS DD Venture Services application as a rough guide and simplified it for my students.

http://www.marsdd.com/venture-services/apply/
Design - student examples

**Pitch**

Have you ever been blamed by a teacher for missing your notes? Well, then you know how hard it is to handle that humiliation. But, what if I told you that you can eliminate that risk forever? This is why me and my group decided to work on The Notetaker. With the program, students can create their own accounts with an absent button on it. When pressing this button, a notification will automatically be sent to your homework partner’s account enabling them to inbox you the notes that you missed. This website can be used by any student, especially ones who are in grade 7 and onwards. Some of the many benefits of this website is that it is free and no existing program yet has this setting of the ‘Absent Button’ which definitely sets the Notetaker apart from other educational apps. After all, thinking about it, has note taking ever being easier than this?

**User Needs**

The Notetaker fixes all the hassles in getting missed work done. The user can access their accounts within an average of a minute! The notification system is also a huge benefit because it replaces the havoc of constantly reminding your friend to send you the notes. Another user need met by our product is the chat system which gives the user a large storage space for their work. All these advantages leads up to our key user need, which is getting missed notes. With the Notetaker, you can connect with and contribute to your peers’ education in a very interactive way, or as we like to call it, the 21st century way.

**Competition**

In our product, students will not see unwanted advertisements and there will also be a very interacting chat function allowing students to inbox each other the missed notes, an option that even the top educational apps doesn’t have. How ever, mainly, The Notetaker is the first website ever to have the Absent Button! This definitely makes us unique compared to our competitors.

**Value**

The benefits of using The Notetaker are endless. This website helps maintain your organizational skills and responsibility and is very convenient. For all those kids who miss school, this is a great option to get your work and notes completed. Another great thing about The Notetaker are note buddies. They help you interact with your friends and get missed notes from class or get help on the lesson quick and easy.
Basic Broadcast Proposal

**Advantages**
It is accessible on any device through wifi unlike school announcements. More news that relate to you. Fun and entertaining way to share school news.

**User Needs**
Having access to trustworthy and informative news that is weekly updated. Robert Service students will benefit more from this than the announcements because of accessibility.

**Value**
Free and accessible through Youtube. You can use this anywhere with a phone and internet. Will be available on appstore and google play store soon.

**Elevator Pitch**
Have you ever missed the announcement, got false information, or just thinks its plain boring? Well then our product is perfect for you! Our product is a Online News web Series, its a funny informing video about robert service news, gaming news, music news, and much more.
Design - student examples

Magic Cover

Elevator Pitch
Pan Point: AWWWW... my device fell from my pocket! I’m SO ANGRY! Have you ever had this problem? Is your device cropped? Are you ANGRY?
Solutions: What you need is a case! Well guess what? We found a device case that won’t fall out of your pocket or if it does, I said “if it does”, then the cover will save the fall. I guarantee that you will never be angry at this problem again. Our most important customers are “you”. If you buy this case, it will be even better in the future. And guess what? We make this case with your money so you’ll get some credit too. Why do you want this case you ask? Well, because the other cases are garbage! Fine not garbage but you save a lot and I mean “A LOT” of money. Save lots of money. NOW! It’s cheaper and better. What else does someone ask for? That’s all a person wants to know. My product is valuable because it saves your devices from getting fragmented. Our competitors are other case companies.

The values I am bringing my customers are that the product that I’m creating is cheap and reliable!

My customers needs are that they need a new cover so they can rely on it. And I’m not just saying any old, worn out, or worthless cover that won’t even help your phone. I’m talking about a cover that can fit any portable devices. My cover may or may not focus on how it looks or its appearance but it focuses on reliability and protection unlike other “fashion” covers that have no value. Another need is people have many devices and when they find a case for an iPhone yes; they have a Huawei at the same time and they are satisfied with the covers they chose but they want the same cover for the Huawei. Most of the time, the same case you’re looking for won’t be there. So, we decided to make a case that fits ALL PORTABLE DEVICES except for iPods.

The advantages of my case is it's cheap, you save money, reliable (don't need to be worried that your device fell), it's all portable devices, won’t fall out of your hand or pocket.
Design - student examples

**User Needs:** We have noticed that most students are constantly forgetting homework, and the students of Robert Service are becoming aware of this problem. Hero Services wants Robert Service to be updated with the latest news and because of our website, there is continuous information based on new homework and information. What we would like to accomplish as a group, is for everyone to have an update of homework from our class, 8C. If this becomes successful, we’d like to expand upon other classes and on to TDSB. Especially, we are aware of the risks of failure and are willing to take a chance.

**Value:** The value that we bring to our customers and classmates is success. It takes responsibility, organization, and dedication to build a web app with the odds stacked against us, but we have a goal to accomplish. We believe that with time, we will be able to influence our class/school to become more responsible. In time, we’d like others to get involved with our task and accomplish just as much.

**Advantage:** The advantage that our group shares is our proficiency of technology and the need for innovative ideas. We’re also skilled at the creation and construction of web apps through trial and error, but we are still expanding our knowledge through this experience. Although, we’d like to acknowledge that there are limits to our ideas; improper equipment and investment issues. Another advantage is making these web apps which are free of charge, allowing students to have an affordable educational advancement.
Investment doesn’t always come in the form of $$$ - in our case, in came in the form of mentoring from our critical friends. This is a photo of Salar Chagpar from the Prepr Foundation as he teaches us about entrepreneurship and data collection and analysis.

"We can innovate education through collaboration, that's the core philosophy of Prepr. Richard successfully lives this philosophy in his class and inspires students to be creative thinkers in order to solve challenges."

Salar Chagpar, PMP - October 2015

http://prepr.org/
Key Points from Marc Lijour:

- Students should get credits toward the Tech Ed Curriculum

- The activity developed in Richard’s class illustrates both the spirit and the body of the Technological Education curriculum. Students learn by solving real-world problems, often open-ended, and they have fun doing it.

- As Eric Raymond, the co-founder of the Open Source Initiative, famously said: every good work starts by scratching one's itch. Investors are looking for these original solutions coming from people who truly understand the problem domain.

- Investors care-abouts: the team (learn how to build a good one), a value proposition (scratching an itch), a disruptive solution (think like Uber).

- Tell your story. Get your show on the road. Invite people in!
Mr. Lijour came to our classroom and talked to us about different technology:

- And how to get your product out there to people to talk about and use
- Some of my classmates went up and presented on what they are trying to create for others to use on google and in the tdsb
- Other students were asking a lot of questions on how the product works, how to make it better

Classroom notes from Grade 8 student
Build (January - March)

Basic Broadcast final website design
For our website design, we have picked most of the qualities from website A. We picked this because a majority of both groups liked what was common in website A. Through our data, we dropped some ideas but are continuing with the ones that were voted on the most. A majority of both surveys asked for blue buttons and we are going to give them that. In website A, a big percentage of the people voted on the videos being on the right side so we are going to continue with that. The new websites layout will be the same as website A because more people liked the layout of website A according to our data. However, the colour scheme needs to be changed because people wanted different colours than the colours which was in website A. The new product should look like this.

https://www.basicbroadcast.com

Basic Broadcast
This Week's Video: March 14th, 2015

March 7th, 2015
March 14th, 2015
Feb 24th, 2015

Comments (08)
FioraMaster_12
Great video guys!! Really interesting. Can we talk about which trip schools should go to in next week's broadcast?

Click to Comment
Welcome

School Journal is a website to help students get organized with school and understand more about last class notes and further information about the day's lesson, we plan to achieve a big community and a huge staff to help with our goal, we need you to help make this happen, please re-visit the website, enjoy you're stay. If you're wondering what google hangout is, it's if you're having trouble with homework and you can speak to a modarator of the website, it's a cool little gadget we added into our website, do not press because it's not available currently but in the future we will have it working, this website is currently incomplete and is going up for A B Testing to see which website is better.
Build - more student examples
The websites were launched in April and I used Edmodo (we still do) to encourage students to A/B test each other's prototypes using the ‘A/B list’ to comply with CASL anti-spamming legislation. Under CASL, unsolicited emails carry a hefty fine.

Because TDSB uses GAfE, students utilized Google Drive, Docs, Drawing, Forms, Sheets, Sites, and their Gmail, and more to get their work done.

As well, approx 70,000 middle and high school students are connected via GMail in the TDSB - so getting feedback from the “Crowd” is now a really interesting possibility.

*This has turned into a email marketing/CRM lesson. This time they used personal online communities to make contact with survey recipients - tried to keep it in TDSB
Analyze (May - June) - student work
A video based on Microsoft’s first build of Windows 10, through the enterprise-based perspective:
https://youtu.be/NfveyXCSIAB

Notice how Microsoft has incorporated the feedback from enterprises, to produce a product that is congenial, in the usage sense, to a broad audience, consisting of both Windows 7 and 8 users. Compare how you are applying your feedback into your 20% projects with how the developers at Microsoft are applying their feedback to refine their Windows 10 product. Try to incorporate usage data into improvements for your projects similarly to how Microsoft is incorporating usage data. This is just to help with the basic concepts we have been familiarized with in class, regarding the analyzing of data to further improve your 20% day product.

Also, find out why Microsoft has “skipped” Windows 9:
http://www.extremetech.com/computing/191279-why-show-less
“In conclusion, data has proven that our team must move on with Product A and eliminate Product B. This is because our team decided to test the best out of two different yet effective features that we were deadlocked upon. Product A has the Absent Button feature with a private chat system in which notes can be shared among homework buddies, while Product B has a public newsfeed layout of all the notes, similar to Facebook and Edmodo. Most users like the Absent Button feature and further comments from them tells us that the newsfeed layout was not effective at all. Therefore, because more users like the features on Product A, we will be using that prototype to move forward with.”

The Notetaker, Grade 8 Team
Analyze - Student Responses

Value:
Is free and gives useful information on the subjects math, english, and science. Gives tutorials, and exercises in order to learn the lessons step by step.

Advantages:
Gives separate lessons for each subject, and has tutorials. Also since we are students building this website. We will understand more of the questions that students tend to have hard time with.

Elevator Pitch:
Now, come and think. Did you ever not understand a question that you felt as if you have just blanked out. If you have, then come to our website because we include lessons that will guide you through the process.

User Needs:
A weekly updated website with new tutorials and exercises, for the learner to enhance their learning experiences. Students from Robert Service will gain more knowledge about the lessons included.

What the Users Liked About Product A

- Math-Exercises Button: 26.3%
- Science-Exercises Button: 36.6%
- English-Exercises Button: 21.1%
- Yes if the locations of the hyperlink are convenient: 10.5%
- Good in visually appealing and layout: 6.3%
Effect on student learning, “What did you learn in my class?”

The **assumption** is that students recorded these skills because they remembered learning/learnt them, and that they remember learning them because they were either engaged or found value in them.

The most popular activities are essay writing, photoshop, PM, 20% Days, Google Drive, and Data Management.

**Data Management is over 400% more popular than Algebra or Geometry - is this due to 20% Days?**

Is Entrepreneurial Ed responsible for the high level of interest in Data Management?

[How] can **Coding** push Algebra and **Computer Assisted Design (CAD)** push Geometry and Measurement?

https://docs.google.com/spreadsheets/d/1WjggIB21Y3xyD6OPNB7Hs5hPcJSBRpzZ5C5qQf6xig/edit#gid=0
The benefits of the analysis phase in the Bootstrapping model is the concept of Validated Learning.

“Startups exist not just to make stuff, make money, or even serve customers. They exist to learn how to build a sustainable business. This learning can be validated scientifically by running frequent experiments that allow entrepreneurs to test each element of their vision.”

The goal of the 5 Step Arts Based Inquiry Model (Fairmount PS, Toronto, 2013) was to embed both the Creative and Critical Analysis Processes in an iterative cycle. It was a cross-curricular (21 Curriculum Strands, not including French or Music), wholly integrated, intensive full day Grade 8 Core inquiry cycle over 5 months.

The 5 month process is documented here: https://prezi.com/wj2khrlstd_v/5-step-arts-based-inquiry-model/#
Many iterative workflows are designed to test ideas using analytics and feedback.

The most agile companies are able to re-iterate this flow very quickly.

By teaching students to do this at a younger age, they can also become agile and independent learners.

But they can also learn to compete in our global economy - and this is what makes this type of learning authentic.
“Despite the long-standing interest in educational technology reforms, many studies have found that incorporating advanced information and communications technologies (ICT) into classrooms has proven difficult. A key limitation to many ICT projects, particularly in the developing world, is a lack of integration between pedagogy and technology.”

Elizabeth Buckner and Paul Kim

Data Driven Design combined with the Bootstrapping Checklist provides this integration between pedagogy and technology to facilitate online collaboration for intermediate students allowing student project to carry on, year over year.

Are your teachers engaging students in iterative cycles where data collection by the students is embedded in the process?
There are many intersections with SMILE and DDD; the iterative cycle, team-based learning, and net competencies - many of the same competencies are practiced on 20% Fridays.
Dr. Paul Kim - SMILE

Chief Technology Officer and Assistant Dean of the Graduate School of Education at Stanford University

The Net Competencies are places where SMILE and DDD intersect.

Here are more details about SMILE:
https://gse-it.stanford.edu/research/project/smile

Increasingly Important Net Competencies

- Know how to search intelligently
- Know who knows and can do what
- Know how and when to approach
- Know how to present and persuade
- Leverage networks at the fullest extent
- Delegate, yet make it a win-win for all
- Use the right tools proficiently and timely

Net Competencies + Domain Knowledge = 21st Century Workforce
Getting students at a young age to look at challenges in their communities as potential opportunities goes a long way to changing their attitudes toward seeing the benefits of lifelong learning and a mastery mindset.

This type of learning actually encourages innovation - and thus authentic STEAM design thinking and production - by having students produce practical and authentic solutions to their own real world problems - they are also preparing for their futures.

Because students can now use their ‘voice’ - validated by data - to advocate for resources to move projects forward, the potential for adding value to a school/board via acquired mentoring and community partnerships now becomes an important part of any School Improvement Plan - the school simply needs to make space, time, and $$$.
“Start with finding your purpose. Helping your community and yourself is a good first thought and a source of energy and inspiration. As Eric Raymond, the co-founder of the Open Source Initiative, famously said: every good work starts by scratching one's itch. Investors are looking for these original solutions coming from people who truly understand the problem domain.”

Marc Lijour, OCT, BSc, MBA
We skyped with Max Brodie and these were the take-aways:

- Mash what you love with Programming
- Be unreasonable (dream big)
- 10X your Ideas (Larry Page, Google Co-founder)
- Get that Feedback!
- Never say ‘NO” when Brainstorming - say “yes -but” - build on top of others’ ideas

Start Now! You are only 14 - you have no mortgage!
Early Observations - September 2015

- 50 Grade 8 students appear very receptive - the *tone* has been set for the rest of the year
- 20% Fridays improve chances of success on Learning Skills for the November Progress Report which will help students get into secondary programs of their choice
- 20% Fridays are cross-curricular, with emphasis on Data Management as a year-long math strand. Language strands include Media Lit (research, design, and promotion), Oral Comm (pitches, classroom conversation, group conversations and negotiations, presentations), Reading (research, interpretation of text - emails etc.), writing (proposal, analysis and presentations of findings, emails etc)
- STEAM is flows from the design process (brainstorming, researching, designing, building, data analysis, re-designing and testing)
Early Observations - September 2015

- All pitches at the 2015 Hatchery Demo Day (U of T) emphasized how important their teams are - this is an important way for students to look at group work
- Lots of opportunities for arts kids to help market products - even of those kids not directly involved in building of prototypes (another link to media studies)
- It is important to train students at the Formal Operational Stage (Piaget) of cognitive development
- Students are learning to get feedback from ‘the Crowd’. This is an invaluable skill to be practiced at this age and will produce very sophisticated learners and producers
- We are already addressing mental health issues related to dealing with failure (TED talks)
  - 80% of startups fail

“20% Days taught me necessary learning skills that i wouldn't of learned form a textbook or from writing a test. It gave me a drive to learn these things, and was a reason for me to come to school.” Grade 8 Student
Basic Iterative Workflow and Analytics

- As student groups become more agile, they will get better at analytics, and thus they will **run cycles faster and more of them** - and the likelihood that projects actually come to fruition increases the longer students keep at it - but only with our support.

- **Students in the 2015-16 year have completed a Bootstrapping Checklist in 5 months** with 7 Projects completed. They presented their A/B choices based on data collected on January 22, 2016.

- The team members are now free to continue another iteration together, or to politely decline and thus become free to join the other groups.

Link to 2015-16 student work: https://drive.google.com/drivefolders/0B9NN3SMjtJmTm9Cdi1oR3JQOU
“From a system perspective this same trust for learning-focused conversations must exist for administrators, with their local peers and Superintendents of Education. From this branch of growth toward true adoption of inquiry-based learning we can see that there is a call for a common understanding about inquiry, the mandate of the revised curriculum and the intersection with Assessment, Evaluation and Reporting practices.”

“The inquiry habit of mind is the foundation for other structures of exploration as well, for example the Data-Driven Design iterative process for entrepreneurial collaboration. These dispositions align with the Learning Skills evaluations for reporting.”

“One thing quite clear is that all educators can and ought to be leading together for inquiry learning; teacher-librarians, classroom teachers and administrators share instructional leadership in this journey.”


https://sites.google.com/site/treasuremountaincanada4/-co-teaching-for-deeper-learning/van-wonderen
“20% days were something that definitely made me more interested in school. It taught me project management skills and how to collaborate effectively with different personalities. Also, through this program, I learned skills such as coding and using different Google Apps which made school work from other subjects such as Math much easier to do.”

Grade 8 Student

“This program helps to boost your confidence and it provides a working platform for students whose minds steer towards creative, independent projects where they have the freedom to choose where to go, rather than sitting in a class and following a textbook. I believe that entrepreneurial education is something that prepares you for real life and gives you a skills set which you can rely on to be successful by following your passions.”

Grade 8 Student
Thank you!

Contact information for
Rich Baxter, OCT, BFA, LLM, BEd

Website: richbaxter.ca
Email: baxterich88@gmail.com
Twitter: @mistaboxta
Instagram: @mistaboxta
Linkedin: ca.linkedin.com/in/baxterich88
Stay connected through the Teaching & Learning with Technology AW Site

Best way to stay in touch? Sign up for an Announcement Alert.

www.TDSBGoogleCamp.ca  16.02.16  #TDSBCamp
The Digital Lead Learners (DLL) initiative is a Professional Learning Network of volunteer elementary and secondary teachers interested in and dedicated to supporting the curricular use of technology. During the 2013-2014 school year, DLL provided over 75 after school workshops to over 700 teachers and hosted a K-12 ICT MarketPlace with over 400 attendees.

DLL Learning Goals:

- Build educational technology capacity in each FOS through a sustainable professional learning model
- Support TDSB priorities through the curricular use of technology (i.e. Google Apps for Education, ICT Standards, Blended Learning, Academic Workspace, STEM)
- Foster innovative practices and educational technologies in TDSB classrooms

bit.ly/TDSB_DLL

Additional Technology Support: After School Workshops
Please provide your feedback

bit.ly/TDSBCamp3FB