

# **Rapid Prototyping for Professional Educators**

by

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## **ABSTRACT**

Rapid prototyping provides an effective educational methodology that can save time and provide more collaborative learning environments. This report describes the development of Rapid Prototyping for Professional Educators (RPPE), a workshop series designed to provide professional educators with the foundational and working knowledge needed to create and foster new and exciting learning environments using rapid prototyping.

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## **Introduction**

The purpose of this report is to highlight and share my findings and observations of using a rapid prototyping process to design and deliver a workshop series to professional educators about using rapid prototyping in their classrooms. One of the goals in designing the final version of RPPE was to frame and showcase how rapid prototyping can be used by professional educators in their classrooms without exclusively having to design and use games. Readers of this report can expect to find some of my projected assumptions before designing and delivering the workshop paired with my observed conclusions reached after delivering three workshop sessions. Readers of the report can also expect to find a breakdown of what rapid prototyping is, where it came from, an explanation of my methodologies used as well as my final takeaways from the project. I am also including a comprehensive set of appendices consisting of the workshop outline, workshop learning objectives, all my final lecture materials, supporting documents and speaker notes.

As an educator, one of the most amazing and rewarding moments for me is seeing light bulbs go off in my students as comprehension comes over them. Every student has a different reaction. Some students' eyes grow enormous while other students obtain huge "permagrin" smiles. Some students stand still in shock, their mouths gaping wide open,

while others take a leap high in the sky that would make Superman jealous. Often the shyest, most soft-spoken students are the ones who let out the loudest yells of joy. In every case, visible emotional signs come to life as they conquer their latest learning hurdle. It's the most amazing thing to watch.

Students are not the only ones who have light bulb moments. Educators can have them too. I experienced a profound light bulb moment while taking Introduction to Research (ED6902) online at the University of New Brunswick. We were tasked with writing a research proposal. My research proposal focused on the potential relationship between rapid prototyping, educational frameworks and professional educators. The further I got into researching and writing the proposal the more I realized the enormous potential rapid prototyping has for all professional educators. This recognition led directly to the writing of this proposal and the subsequent designing of "Rapid Prototyping for Professional Educators" (RPPE) as my final MEd project.

A foundational motivation in designing this workshop series was to share my professional experiences using rapid prototyping in the classroom with my educator colleagues. I have been teaching Prototyping for many years as a college professor of game art/design at Sault College. The more MEd courses I took, the more I imagined how the prototyping process and methodology could be useful to other teachers in fields of study outside of game design. The more I learned about pedagogy and the science and psychology of learning, the more my vision became clearer. Faced with picking my final major MEd project, the path was already clearly laid out and RPPE was born.

## **Rapid Prototyping Overview**

In this model, software engineers design and produce a quick prototype of a product and test it out for functionality and viability. Rapid prototyping is essentially a problem-solving process. Before I get into the specific methodology I used for RPPE, I will first outline the basics of what rapid prototyping is, where it came from and how it can be beneficial to professional educators of any field of study.

“There is a design methodology called rapid prototyping which has been used successfully in software engineering. Given the similarities between software design and instructional design, we argue that rapid prototyping is a viable model for instructional design” (Tripp & Bichelmeyer, 1990, p. 31). In this quote, Tripp and Bichelmeyer acknowledge that rapid prototyping has been used most successfully in software engineering. Changes are made to the prototype resulting from tests and feedback. A final product is arrived at only after many tests and reworks based on the feedback and test results. Tripp and Bichelmeyer also suggest that software design and instructional design share commonalities, therefore, making rapid prototyping viable for designing instruction. Since a large part of an educator’s job is designing instruction, it would stand to reason that they would benefit from the advantages of rapid prototyping.

One of the strengths of the prototyping process is the way solutions are found to design problems. Problems are not inherently engineering based nor design based, and as such the prototyping process is an effective way to design and solve problems in a variety of professional disciplines. In the prototyping process, problems are solved in real time

using tangible feedback instead of solutions being predicted in advance. For educators, the immediate advantage of using the prototyping process is a reduced amount of time preparing lessons and dealing with the unpredictable. Educators using the prototyping process tend to design more generalized outlines of topics to be studied and then deal with learning and other problems collaboratively while they happen in class. Professional educators are overburdened. Faced with overpopulated classrooms and the realities of dealing with unfamiliar and often untrained roles including counselling, acting as surrogate parents, and performing administrator duties, professional educators have even less time today to focus on teaching than ever before.

Another huge advantage of rapid prototyping is the direct connections that come from educators interacting with students and students interacting with other students. Educators are not stationary in front of the classroom but are in the trenches with the students helping them work through problems and learn. Because of the open nature of the creative prototyping process, students get an opportunity to speak up and creatively contribute without fear of being looked down on or criticized. In the prototyping process, no ideas or suggestions are ever looked down upon. Rather all ideas are used as stepping stones to generate more refined ideas. This creative process both gives students and educators a sense of comfort and fosters a willingness to contribute because they are encouraged and not shut down. For example, an educator teaching students how to cook chicken parmesan using the rapid prototyping process might ask a student how they could deconstruct chicken parmesan and turn it into something different. The student then would be tasked with generating ideas and the specifics on the how. Rapid prototyping is not about directly learning a specific topic a certain predefined way. Rapid prototyping is very much about experimenting, iterating and learning by doing. A third advantage of rapid prototyping is the flexibility provided for assessment strategies. Educators can opt 4

to collaborate with students on evaluation criteria, in a very constructivist way, or choose to mark assignments themselves following more traditional methods. This flexibility leads to time savings and work load efficiencies for educators.

All of these advantages lend rapid prototyping well to a variety of topics, and project ideas. Group-based projects such as designing a multi-player board or card game can work extremely well because there are many active participants who can offer up new ideas and provide immediate feedback. The rapid prototyping process is not limited to group-based projects only. Whether it's deciding what new car to purchase or what to make for dinner tonight the rapid prototyping process can be an effective problem solver because ideas are constantly being engaged and revised instead of pre-solved and predicted.

Despite its advantages, rapid prototyping has its share of challenges. For one, prototyping is largely group-based. If any group members are not engaged in the activity or learning, be it because they are absent or just disinterested, it can lead to less effective classroom sessions because learning is interdependent and reliant on group dynamics. Games are perceived as fun and are one way to foster engagement and counter this challenge. As a result of unmotivated students and bad group dynamics, educators can often find themselves re-engaging students in the activity instead of focusing on moving forward with facilitation and progress. Another challenge for educators is the upfront time required to learn and redesign or design lessons using rapid prototyping. Dealing with the discomfort of something new is always a challenge.

Another challenge has to do with the power dynamics inherent in groups and group work. Often the more aggressive and vocal students can take over projects and



groups. To mitigate against this I make a point of constantly breaking up group compositions from project to project and shifting the roles of students each time. Students who have led groups before are asked to perform a different role in different projects.

In the end, with RPPE I aimed to provide educators with a new tool in their educational tool box, a methodology that can save time and provide effective learning opportunities for students and educators.

## **Literature Review**

When researching literature for this project I didn't find many direct links between rapid prototyping and professional educators. I was looking for specific examples of professional educators using rapid prototyping in their classroom and for examples of rapid prototyping learning programs catered towards professional educators. Once I refined my search to include the use of games and not specifically rapid prototyping, I was able to find examples of educators using games and prototyping methodology effectively in their classrooms.

Baker (2017) provides an extensive guide for teachers who are looking to add games into their classrooms. Baker not only breaks down the basics of game-based learning but also writes in depth about the pedagogy behind the scenes, how to design lessons, what evaluation models can be used and why and how instructional design can be used in game-based applications in the classroom. Prototyping as a game design process is covered numerous times in the text and Baker acknowledges prototyping as common and effective way to make games: "This kind of approach is common in game

development where it is important to have a playable version of the game as soon as possible, even if it is incomplete. Ideally, this also includes extensive play testing so that the developers can ensure the game will work as intended” (Baker, 2017, p. 250). A few key words from this quote are important when considering how I chose to design RPPE. The words “playable as soon as possible” are important because it precludes learners from trying to solve all problems in their heads in advance. Problems in rapid prototyping are not only solved interactively in real-time but often come about as a result of play testing and player experiences not explicitly predicted in advance. The words “play testing” are important because they describe exactly what and how learning occurs. Game players play games, and as a result of their actions and reactions effective problem solving and learning take place.

Akcaoglu and Kale (2016) looked at teaching pre-service teachers how to use game design in future practice. Akcaoglu and Kale looked at a number of studies that concluded that game design using a prototyping process effectively teaches system analysis and design, troubleshooting and decision making skills. Akcaoglu and Kale also looked at the perception and knowledge of pre-service and experienced teachers in the classroom and found that many teachers looked down on games due to a lack of upkeep of technology and a lack of personal experience in playing games. Their results are important for me as I had to deal with existing negative perceptions and context of games and technology in my workshop sessions. The combination of the rapid prototyping references and resources listed above alongside the specific use of game design in professional classrooms presented in the literature review had a large impact on the

decisions I made when designing and delivering the lessons, activities and materials used throughout the three workshop sessions. For example, in workshop session two I designed an activity in which participants had to design a fact-based game about their collective subject matter areas.

Due in part to the interactive and collaborative nature of rapid prototyping, it shares many connections and similarities to constructivist learning. Constructivist learning theory also puts an onus of responsibility of the learner. Driscoll (2005) states, “constructivism rests on the assumption that knowledge is constructed by learners as they attempt to make sense of their experiences. Learners, therefore are not empty vessels waiting to be filled but rather active organisms seeking meaning” (p. 360). Educators within constructivist classrooms are “facilitators of learning; students must be taught to take responsibility for their own learning; learning is an active process; learning must be presented in ways meaningful to the students; and basic skills will be learned in authentic situations, not by separate concentration of the skills themselves” (Gordon, Taylor, Oliva, 2019, p. 125).

## **Methodology**

One of the goals in designing the final version of RPPE was to frame and showcase how rapid prototyping can be used by professional educators in their classrooms without exclusively having to design and use games. In order to finalize all design, delivery and evaluation aspects of the workshop series, I led three developmental prototyping sessions with professional educator volunteers over a three-month period, from January to March

2019. During these sessions, I effectively used the prototyping process to design the final materials for delivering the completed workshop package. All final materials are included in this report as appendices.

The target audience for the final version of RPPE are professional educators of all levels. For the proposed developmental prototyping workshop sessions, I used my professional and personal connections and found five volunteer participants with whom I led three workshops over four months.

During the developmental prototyping sessions, I used an industry standard video game rapid prototyping process presented by Brenda Brathwaite and Ian Schreiber in *Challenges for Game Designers* (2009). The following is an overview of this process.

**Step 1 – Rapid Prototype:** Prototyping must be rapid. The more iterations the higher quality the end result will be. Wasting any time predicting outcomes or problems is not helpful. Rather problems are immediately seen in context.

**Step 2 – Play test:** In non-gaming terms this simply means the prototype lesson or instructional material needs to be used, seen and or tested in context. The play test is used to identify strengths and weaknesses in the design.

**Step 3 – Revision:** Changes to the design are made to eliminate weakness and build upon strengths. Sometimes changes are small and other times it leads to an entirely different direction for the design.

**Step 4 – Repeat:** Go back to the prototype and, based upon revisions, iterate again.

In designing and delivering RPPE to professional educators, I used a constructivist approach, meaning that the workshop participants took an active role in the design process. The RPPE developmental prototyping sessions were conducted on three

different Monday nights between 7 pm - 9 pm in an appropriately equipped classroom at Sault College.

### **Phase 1: Focus Groups**

My design plan included co-creating prototyping sessions with a small focus group consisting of five volunteer professional educators from my local area, including both grade-school and post-secondary educators. The first session activities and outlines were designed and created based around lessons, activities and experiences I have had over the past eight years of teaching rapid prototyping at the post-secondary level. A corresponding research ethics application was written and approved before the workshop sessions began.

The professional educator volunteers and I used my prepared outlines and activities as a base and then during discussion periods we fleshed out the specific topics and examples to be used in the final unit of study. Effectively during these sessions, we prototyped all of the final specific topics of study for RPPE together. This gave me valuable insight into the level of familiarity professional educators had with rapid prototyping and how they saw being able to use prototyping effectively in their classrooms.

I kept a development journal of each of these sessions, chronicling important facts, observations and notes resulting from discussion and activity testing. The developmental journal is included in the attached appendices. Names of the participants have been removed to preserve confidentiality. All three prototyping sessions laid the

groundwork for designing the finalized workshop. At the end of the developmental workshops, I took the journal data and information obtained during the sessions, analyzed and used it to design the final lesson plans, assignments and deliverables.

## **Phase 2: Design Instruction**

The focus group and developmental workshops formed the basis of the instructional design of the final workshop series. Feedback from the workshop volunteers was invaluable in forming and designing the specific activities and lessons. For the developmental workshops, I designed and used a variety of materials and activities I have used in my professional practice. To introduce rapid prototyping in action, the first activity I designed was simply asking participants “What’s for Dinner?” I wanted the first activity to feel familiar and accessible to participants. I also wanted to demonstrate how flexible rapid prototyping can be and to introduce an activity that was not a game. I tasked participants to write their answers on a provided card and to share their answers with each other in four distinct one-on-one presentations. I tasked participants with providing constructive feedback on the dinner ideas during the presentations, including how they might suggest new twists on an old dinner idea. After each presentation, participants were then tasked with looking at all of the feedback they got and adjusting their dinner ideas where they felt necessary or perhaps even trying a new idea.

I observed and facilitated the group presentations, and multiple times I pointed out and demonstrated what a facilitator (the role a professional educator takes on) does during rapid prototyping activities. For example, in prototyping learners can often get

sidetracked. A couple of times I got participants back on task by re-emphasizing the prototyping process steps and steering them back in the right direction. So my role as the facilitator in this case was to keep participants on task by bringing the conversation back to a specific relevant aspect of the assignment (a specific focus on the four prototyping steps). In another example some of the participants had a hard time with giving constructive feedback. As the facilitator I suggested to first start with something good and then to discuss something that either needed improvement or that could be changed to a different effect. So my role as the facilitator in this case was to provide a way for participants to give meaningful feedback. I then asked each participant what they thought of all of the various dinner ideas and this was followed up by an open discussion by participants.

An interesting thing happened during the group discussion. The dinner choices of each participant directly reflected the cultural background and interests of each individual. This led to a discussion about how food and culture are intertwined. It was at this point in the session that I noticed the first “light bulbs” going off. In my experience, professional educators like connections and connected things. When the initial question of dinner turned into a discussion about the relationship between culture and food, participants began to openly discuss how they could effectively use the prototyping process directly in their own classrooms. For example, one participant was looking for ways to reach his adult learners. The accessible nature of the exercise (who doesn’t need to eat dinner after all) combined with how the discussion led to cultures and food caused

the participant to pause the discussion and tell the group this would be perfect for his students.

For the second activity I introduced participants to games and game design using rapid prototyping. Games are very versatile and can be effectively used for any subject and any age group. Games also provide a great example of using rapid prototyping in practice because as a design process rapid prototyping is widely used in the game industry. The first step in the prototyping process was tasking workshop participants with writing down on cards provided any 10 facts that came to mind based on their respective subject area of expertise. During my lecture before the activity I showcased some examples of fact-based games like Jeopardy, Family Feud and Trivial Pursuit. We looked at a few examples of facts used in game formats such as clue-based facts. With examples of fact-based games and formatting in hand, I tasked participants with formatting their 10 facts into a game like format. The second step in the prototyping process was to put participants into a group where they brainstormed and presented game design ideas using their collective facts. The third step in the prototyping process occurred organically as participants revised their own facts and the format of their facts to meet a common design goal. The final step in the prototyping process was to repeat steps 1-3 until an end product was completed. As a facilitator, I sat in on the discussion providing guidance and gentle pushes, but the group ended up creatively working together to design a few fact-based game ideas. The first step in the facilitation process is to ensure everyone understands the task at hand and is working towards a possible solution. Some of the participants despite the examples provided in the lecture component were still unsure of



what constituted a fact. As the facilitator I provided different examples targeted to their specific area. A math teacher for example might write  $2+2=4$ . Facts in this exercise could be as simple or complicated as the educators desired. The actual simplicity of the initial ask confused some of the participants. Once participants were working on their respective facts I walked around the room observing. As the facilitator I started by discussing accessible examples of fact-based games such as Trivial Pursuit. From there participants were able to contribute their own game ideas and organically new game ideas took shape. As the facilitator if I felt the brainstorming was going off topic I brought the group back on target. Finally I provided participants with a summary of ideas generated and helped to shape the final game idea into a playable format. The facilitator then provides support and guidance to keep learning on the right track. The facilitator allows participants to do the work and provides gentle pushes in the appropriate direction.

One of the better ideas that came from the group was making a game in which students would be tasked with making connections between the facts of their respective different subjects. Again, the light bulbs went off during this part of the process as soon as the participants recognized the potential of such connections.

During this session I was prepared to deal with the potential negativity and unfamiliarity of games. I asked participants what games they had personally played and what was fun about them. Participants had a variety of experiences with games. Some were hardcore gamers consistently playing the latest and greatest game titles. Others were more casual about games indicating they had played or regularly play phone games. Some had only played board or card games in their childhood. In all, however, everyone

had at least a familiarity with playing games. In fact, most participants had even used existing games in their classrooms before. However, none of the participants had considered *making* a game in their classroom before. Upon seeing how simple and fun it was to come up with simple game ideas and connections, all participants indicated they would use games in their classrooms using rapid prototyping in the future.

Given a couple of pre-designed activities and rapid prototyping experiences, workshop participants in the third activity were tasked with designing an outline and assessment strategy for a rapid prototyping activity for their own subject area and students. Participants were free to collaborate with each other but ultimately were responsible for creating and presenting their outlines and ideas to the rest of the workshop participants to gain feedback. Participant ideas for the outlines ranged from a game about the circulatory system to a hands-on building game in which students would create sustainable living environments. During the presentations and discussions an interesting question came from one participant. I am paraphrasing here but the essence of the question was: What is the difference between a presentation assignment I would normally give vs a presentation done using rapid prototyping? My response was to highlight the iteration cycle of prototyping. In a normal presentation assignment, the student would typically get one shot to ensure their materials were collected and accurate, likely based on very specific assignment criteria designed by the teacher. In prototyping, the assignment criteria could be jointly decided by the student and teacher and the presentation would be put together by going through many cycles of feedback and revisions. Allowing the student to select the topic and things he/she wants to learn gives

the student some form of ownership and responsibility over their learning. The participant understood the difference then and acknowledged how potentially powerful prototyping could be for a student.

All three activities shared a foundation in prototyping methodology. They start with a basic idea/outline and, through iteration, observation and meaningful revision, take participants to a tangible end working together. I have analyzed my journal entries, observations and participant feedback from all three sessions and have made revisions and additions to the final materials.

### **Phase 3: Evaluation of Design Materials**

Evaluation of the development workshops consisted of documented observations and feedback from participants. I asked participants a set of questions about each session and documented their comments and suggestions. The questions I asked at each session were:

1. Did the lecture provide enough informed information about the topic?
2. Was the tone of the presentation appropriate for professional educators?
3. What information could be added/removed to improve the materials?
4. Were the activities as designed appropriate and meaningful?
5. Could you see yourself using rapid prototyping in your classroom and how?
6. Do you have any other comments or observations?

A number of participants approached me personally outside of the workshops and provided further feedback. For example, one participant suggested that I physically bring in more games to the game sessions. The participant felt it would help break down the

intimidation factor of games if participants recognized games they might already play. I learned even professional educators can be intimidated and made to feel uneasy. Moving forward I would do more to try to ease the sensibilities of participants such as bringing more games and game examples to the session.

#### **Phase 4: Final Design of Materials**

After the focus group workshops sessions were completed, I went back and analyzed all feedback and completed an instructional design pass on the final materials required for the final workshop series. Specifically the list of changes to my final materials included:

- Adding images to my lectures
- Splitting session three into two distinct sessions
  - Session 3 - Outlining and Lesson Planning
  - Session 4 - Assessment Strategies
- Adding a call to action slide at the end of sessions
  - For example at the end of session one I asked participants to bring in their favourite games for session two
- Revising the assessment requirements of the workshop by removing the individual grading requirement of the activities in favour of discussion-based feedback

### **Results and Conclusion**

Most of the methodology I initially planned was used. I made a couple of adjustments once I had final participant names, numbers and a classroom booked. I switched the order

of activities one and two, opting to do the “What’s for Dinner?” activity first and the game activity second. I wanted a more accessible and familiar activity to ease participants in at the outset. The other adjustment I made was to modify my evaluation methodology based on logistical reasons and on the observation of participants. The workshop didn’t require any specific assessment of participants’ individual work. The group-based discussions in each of the three sessions provided a platform for participants to adequately evaluate and provide feedback to each other. Furthermore, due to sensitivity around participants’ time and based on participant feedback, I opted to break the final workshop materials into four sessions, splitting the outlining/lesson planning and assessment materials into their own distinct sessions. Having a fourth session dedicated to assessment would provide more time to devote to the associated assessment activity in the delivery of the final workshop.

### **Final Takeaways**

I learned much during the process of designing and delivering the RPPE workshop. My first takeaway relates to the level of familiarity professional educators had with rapid prototyping. After doing the workshops I noted that professional educators in my workshops had varying degrees of familiarity with parts of the prototyping process but had never seen nor worked with it packaged the way I presented it. Some of the educators, for example, have used games in their classroom effectively but none of them had ever had their students make a game. My proposal for this project included the writing of mock profiles of prospective participants, but none of that preliminary work

prepared me for the exact reality of the situation in terms of how familiar participants were with any aspect of rapid prototyping. Based on feedback from participants, I modified my workshop session lecture one to include a slide in which I ask professional educators what rapid prototyping means to them. This new slide will allow future groups to get to know each other better and will give me a better idea at the outset of the workshop how familiar participants are with a rapid prototyping process. This technique is also a great example of Wlodkowski's (Galbraith, 2004) establish inclusion motivational strategy in practice.

My second takeaway is the importance of acknowledging that the struggles of professional educators are confirmed and real. Professional educators are looking for new ways to deal with their stresses. Each of my workshop participants described their own unique stresses, and they were not only open to using rapid prototyping in the future but recognized specifically how rapid prototyping could be an effective way to deal with their own unique problems. Participants acknowledged the stress relief of time saved in both lesson preparation and assessment. One participant went so far as to say she was going to use peer to peer and group evaluations immediately in her classroom.

My third takeaway is that no matter how prepared you might be to run a workshop, you will always have to deal with unknown factors. In my case, unknowns included the number of participants, their respective backgrounds and subjects, logistical and time issues, variable participation from session to session, and group dynamics. In my current classroom, I tend to react to unknowns on the fly. In the future after running a

workshop of this nature I plan on having a more formalized back-up plan to better deal with unknown factors.

My fourth takeaway is that the learning motivations and behaviors of professional educators are much different than those of the young adult learners I am more familiar with at work. I found the workshop participants more engaged and motivated to participate in the activities and respond to questions and discussion. One of the implications I drew from this is that the context of the course can impact the overall experience. I also learned how important it is to consider the needs of the learners. These professional educators were not paying for the course but yet participated at full force. It also speaks to the place in life adults are compared to young adults. These professional educators were passionate and dedicated to their craft and it showed.

My fifth and final takeaway is that my instincts and training have served me well. I could not have designed and delivered this workshop this effectively without the knowledge and experience gained during the more than two years working on my MEd.

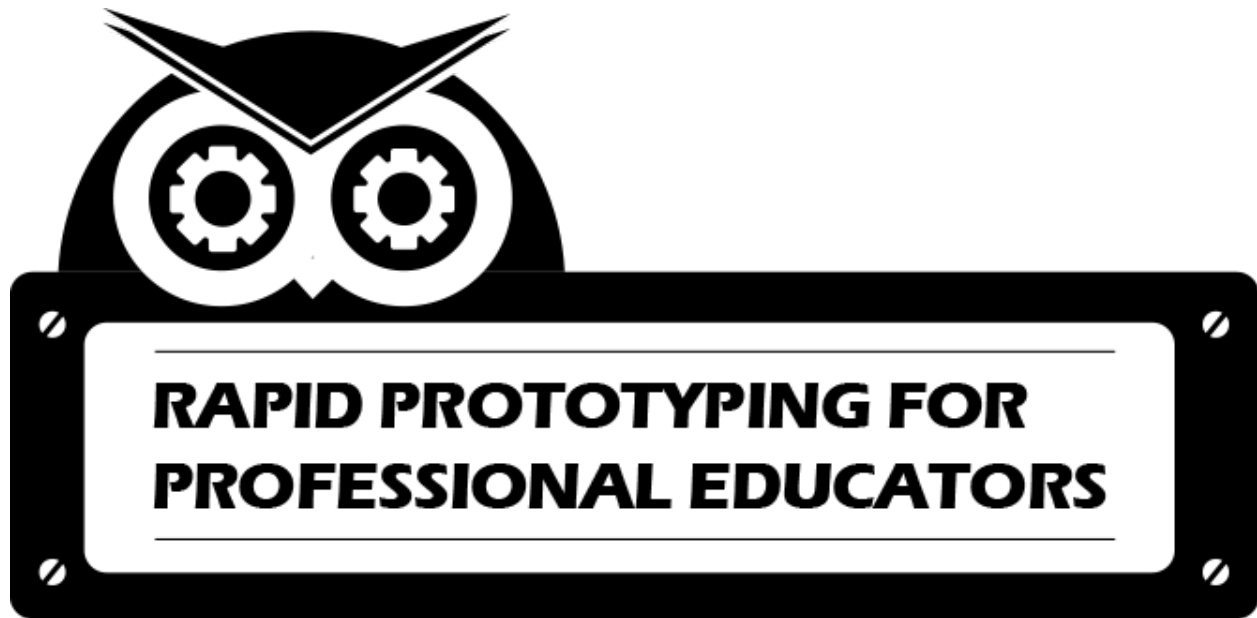
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## **Appendix A**

### **Workshop Outline**



## **Workshop Description**

In Rapid Prototyping for Professional Educators workshop participants will learn about the advantages of designing and delivering lessons using rapid prototyping. Participants will discover where the rapid prototyping process came from and how it can be effectively used in the classroom. Participants will gain hands on experience using an industry standard game-based rapid prototyping process to complete group-based prototyping tasks. Specific time will be spent on learning how to design and deliver lessons using rapid prototyping and how to evaluate rapid prototyping-based assignments.

## **Workshop Duration**

Rapid Prototyping for Professional Educators requires between 10-12 hours to complete all lectures and exercises. Times will be scheduled during evenings and weekends. Each session requires approximately 3 hours.

## **Workshop Learning Delivery**

A classroom, lab or space with:

- An projector
- A computer to run the presentations
- 5-10 Packages of blank cue cards
- 25 Pencils, and pens
- 2-4 pads of illustration paper
- 2-4 pads of lined paper
- Google Slides
- 18-20 6-sided dice
- A varied selection of board and card games (including 1 deck of cards)

## Workshop Learning Objectives

### Learning Objective 1

1. Given two distinct examples of learning models the learner will be able to distinguish between constructivist learning and other approaches to teaching and learning

**Bloom Classification:** Cognitive domain, Comprehension tier

### Learning Objective 2

1. Given a preset list of advantages and challenges the learner will be able to identify correctly the key advantages and challenges of the rapid prototyping process covered in class

**Bloom Classification:** Cognitive domain, Comprehension tier

### Learning Objective 3

1. Given a formalized iterative process the learner will be able to recite in correct order all 4 identified steps

**Bloom Classification:** Cognitive domain, Synthesis tier

### Learning Objective 4

1. Given an identified game the learner has played the learner will be able to identify one fun aspect of the identified game

**Bloom Classification:** Cognitive domain, Analysis tier

### Learning Objective 5

1. Given a series of preset game formatted facts the learner will be able to construct one fact from their subject area of expertise in a game like format

**Bloom Classification:** Cognitive domain, Synthesis tier

### Learning Objective 6

1. Given a list of outline methods the learner will be able to identify correctly all 3 rapid prototyping outlining techniques discussed in class

**Bloom Classification:** Cognitive domain, Comprehension tier

### Learning Objective 7

1. Given a list of assessment methods the learner will be able to identify correctly all 3 rapid prototyping evaluation techniques discussed in class

**Bloom Classification:** Cognitive domain, Comprehension tier

### Learning Objective 8

1. Given the successful creation of a rapid prototyping lesson idea, the learner will be able to defend their rapid prototyping lesson idea to a group of peers

**Bloom Classification:** Cognitive domain, Evaluation tier

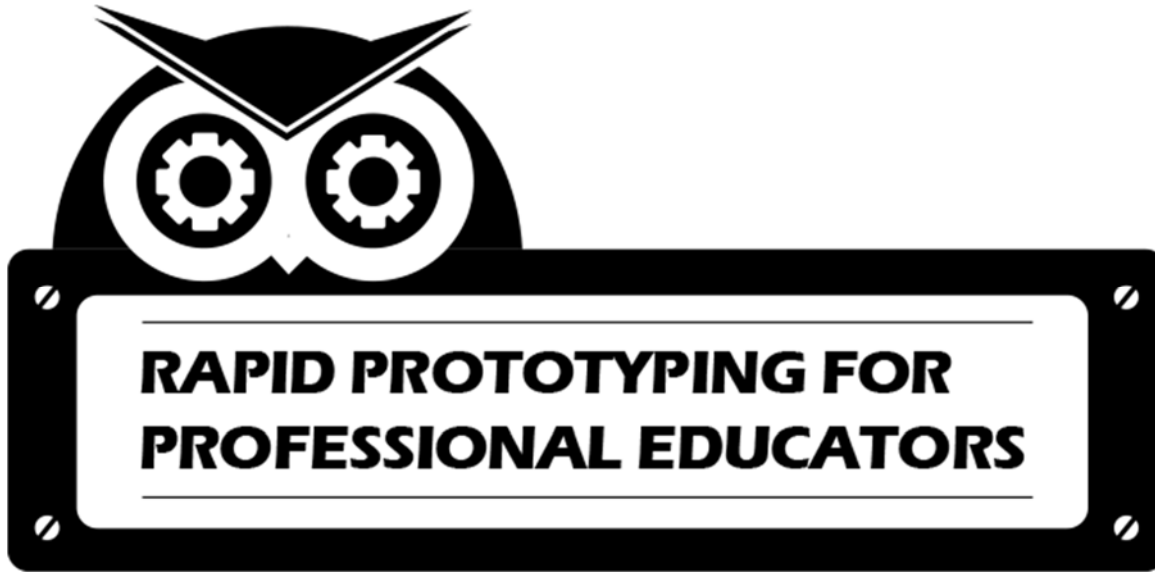
### Learning Objective 9

1. Given the successful creation of a rapid prototyping assessment idea, the learner will be able to defend their rapid prototyping assessment idea to a group of peers

**Bloom Classification:** Cognitive domain, Evaluation tier

## **Appendix B**

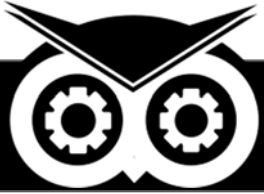
### **Workshop Presentations**



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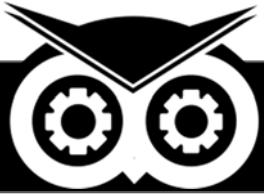
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## About Instructor

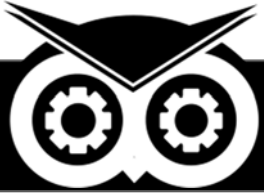
- Jeremy Rayment
- Instructional Designer, Educator
- Currently teaching Video Game Art & Design @ Sault College
- 10+ years of post-graduate teaching experience & curriculum development
  - Sault College
  - Canadore College
- 20+ years of New Media design and production experience
  - Web sites, Games, CD-ROM, DVD-ROM, TV, Radio, Animation



# What Does Rapid Prototyping Mean to You?

- What have you heard?
- What do you already know?
- Have you ever heard of?
  - Experiential learning
  - Collaborative learning
  - Discovery learning
- What do all three forms of learning have in common?



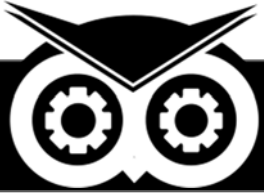


# What Does Rapid Prototyping Mean to You?

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- What do you already know?
- Have you ever heard of?
  - Experiential learning
  - Collaborative learning
  - Discovery learning
- What do all three forms of learning have in common?
  - **Answer:** All 3 forms of learning have constructivism in common







# What is Rapid Prototyping?

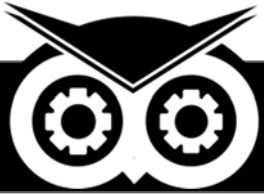
- Rapid Prototyping originated as a design process
- Used often in manufacturing and games
- Rooted in constructivist learning theory
  - Constructivist learning theorists advocate:
    - Individuals construct their own understanding of the world by reflecting on their own experiences
- **Example:** Learning how to cook a new recipe
  - Instead of memorizing the ingredients, cooking techniques, and requirements
  - Cook the new recipe hands on, mistakes and all
- Relatively new player in the field of instructional design
- Practical classroom applications
  - Not so shy anymore are you?
- Tremendous creative learning potential
  - You could give the same assignment for years and not see the same submission



# Rapid Prototyping Advantages

- Minimal preparation and evaluation time required
- Intimate learning experience
- Allows students to shine





# Rapid Prototyping Challenges

- Requires engaged student participation
  - Teachers shift from lecturers to facilitators
  - Its common to have to engage and re-engage students
- Often due to its collaborative nature, best results come from group-based activities
- Requires an upfront commitment of time and resources to:
  - Prepare new materials
  - Learn how to facilitate and manage the prototyping classroom and activities

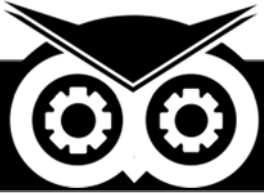




# Rapid Prototyping Process

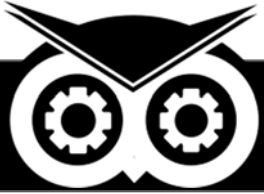
- Step 1 - Rapid
- Step 2 - Playtest/Presentation
- Step 3 - Revise
- Step 4 - Repeat steps 1-3 until finished
- Key Points
  - Designs are not completed in our minds by ourselves
  - Designs are proven out by experimenting with others
  - Patterns in feedback from playtests/presentations inform the revision stage
  - Eureka moments
  - Experimentation is encouraged
  - No idea is a bad idea





# Rapid Prototyping Process - Step 1

- Step 1 - Rapid
  - Has to be fast!
  - Issues and problems must be shown and not thought about
    - Think less
    - See more
  - Use a timer, set an initial time to get:
    - 1st version
      - In game design terms often called “The First Playable” version
        - The first version people can interact with



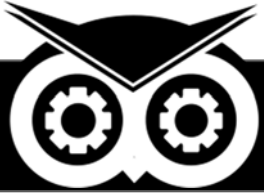
## Rapid Prototyping Process - Step 2

- Step 2 - Playtest/Presentation
  - Multiple sources are key
  - Take notes
    - What was good, bad?
    - What could be improved?
    - Not always about negative
    - Look for alternative ideas



## Rapid Prototyping Process - Step 3

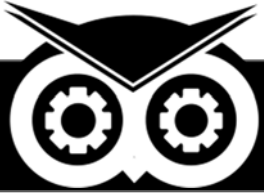
- Step 3 - Revise
  - Patterns
    - 1 in 5 people who interacted with this project said
    - 4 of 5 people who interacted with this project said
    - Gives us concrete evidence a problem exists or
    - Gives us concrete evidence something has been done well
    - Not everyone will give useful feedback
      - Patterns help us sort through the feedback
  - Redo is not a swear word
    - Students tend to fall in love with their first idea
    - Students tend to be resistant to abandon work done
  - Experimentation encouraged



## Rapid Prototyping Process - Step 4

- Step 4 - Repeat steps 1-3 until finished
- Signs you are finished
  - How many total playtests?
    - 1 is not enough, 100 is probably too many
  - Emotional response
    - Made me feel something
  - How many similar patterns?
    - As time goes on similar patterns should go down as you address them in the revision stage





# Rapid Prototyping Time!

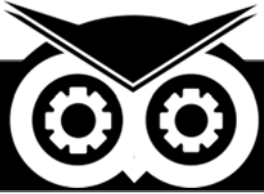
- What's for Supper?
- Using a piece of paper and a pencil write down what you are having or what you want to have for supper tonight
  - No fast food or restaurant meals please
  - Homemade meals only!
  - For example: (Chicken spinach alfredo), (Maple glazed salmon, green beans, brown rice), (Fish N' Chips, coleslaw)
- Find a partner and present your supper ideas to each other
- Provide constructive feedback/suggestions to each other
  - That's a good idea but....
  - What if you were gluten free?
  - How about a different protein or sauce or side dish?
  - How are you planning on cooking it? Why not try?
  - I have fussy teenagers to!
    - How do you get them to eat greens?





# Rapid Prototyping Time!

- Take meaningful notes on the feedback you receive
  - Who said what when?
- Present your supper idea to 3 other people
  - Take meaningful notes on the feedback you receive from the 3 new people
- Look through your notes and find any common patterns of feedback
  - For example:
    - 3 out of 4 people suggested trying ground pork over ground beef
    - 2 out of 4 people suggested using a crock pot
- Based on patterns and feedback received modify your supper plans
  - It's not about what is "right" or "wrong"
  - It's about experimentation and idea sharing
- Repeat the presentation/playtest, modify stages until a final result is achieved



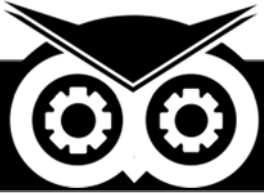
# Review

- Rapid Prototyping is an instructional design process
- AND it is also an intimate learning experience for both students and educators
- Can be used for any subject
- Requires less up front preparation time
- Requires less time for evaluations/marking
- Educators become part of the learning process
  - In the trenches with students
  - Learning is interactive and engaging



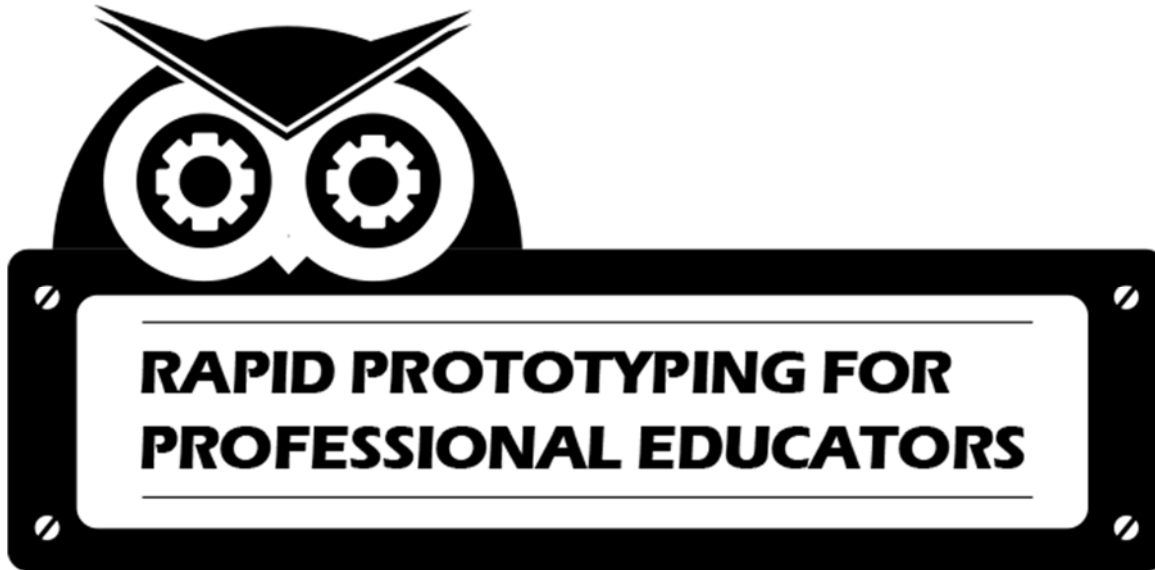
# Questions?

- Questions?



## Next Session

- Game Night!
- Bring your favourite board or card game



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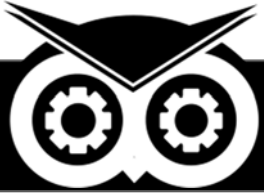
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# Rapid Prototyping Review

- Remember our example?
  - Learning how to cook a new recipe
  - Instead of memorizing the ingredients, cooking techniques, and requirements
  - Cook the new recipe hands on, mistakes and all
- Design process & intimate learning environment
- Requires less prep and evaluation time

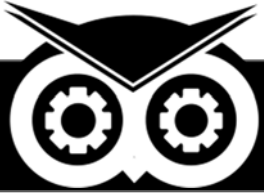




# Rapid Prototyping Process

- Step 1 - Rapid
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# Game Night!

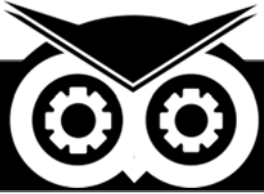
- Games are a good way to use rapid prototyping in your classrooms
- Games can be made for any subject matter and for any age group
- Games don't have to be complex, but they should be fun!
- What makes these games fun?
  - Rock, Paper, Scissors
  - Tic Tac Toe
  - Twister
  - Solitaire
- What games do you play?
- What makes those games fun?





# Game On!

- Fact-based Questions
  - Category/Clue-based (i.e. Jeopardy)
    - Category: Also a baseball word (\$200)
    - Question: A bargain so amazing it's almost like you are paying nothing
    - Answer: ?
  - Category/Fact-based (i.e. Trivial Pursuit)
    - Category: Sports
    - Question: The name of the baseball team in Toronto
    - Answer: ?
  - Fill in the blank/Hangman/Wheel of Fortune
    - Category: Mythology
    - Clue: A shockingly powerful weapon
    - \_ j \_ \_ \_ \_ r



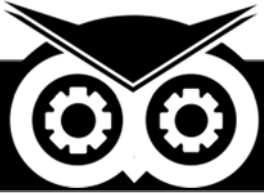
# Game On!

- Fact-based Questions
  - Family Feud
  - Smarter than a 5th grader
  - Others?



# Game On!

- Individual Tasks
  - Format your 10 facts into a more game like format
  - Remember RAPID - Your 30 minutes starts.....



# Game On!

- Games can be as simple as Rock, Paper, Scissors
- Group(s) Tasks
  - Create a simple game using your collective facts as the focal point
  - Create a “First-Playable” version of your game
    - Core or essence of the gameplay
    - Present/playtest your game
    - Collect feedback on your game
      - What was done well? What was done poorly? What could be improved?
      - Was it fun? Why or why not?
    - Revise your game based on feedback
  - Use your own personal experiences with games for inspiration
  - KISS (Keep It Simple Students)
    - Easier to start simple and work



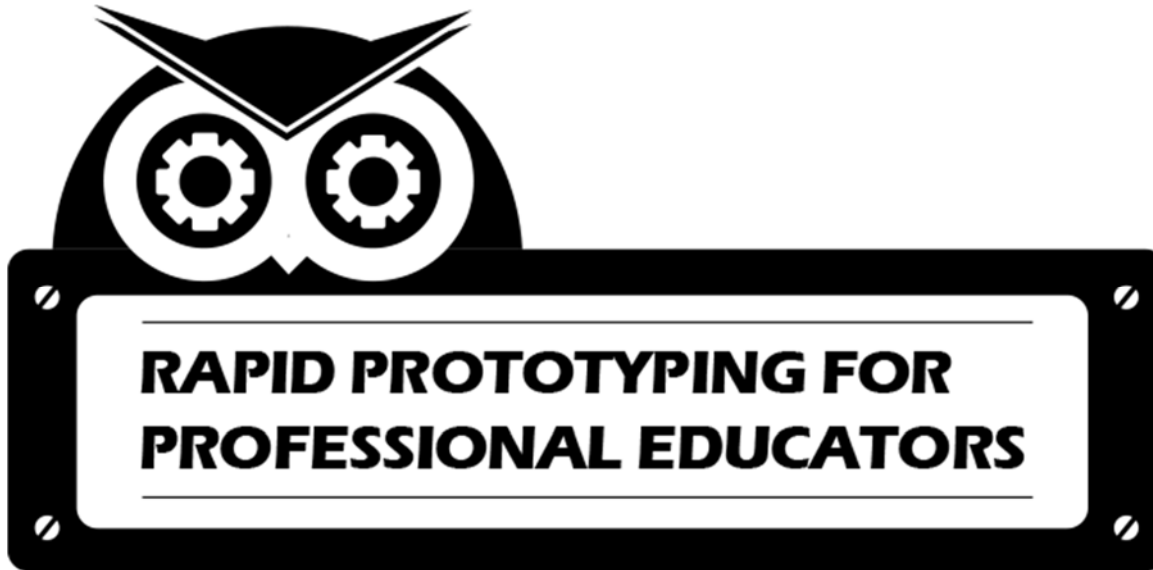
# Questions?

- Questions?



## Next Session

- Preparing Rapid Prototyping Lessons

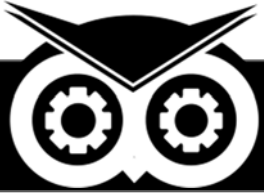


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# Rapid Prototyping Outlines

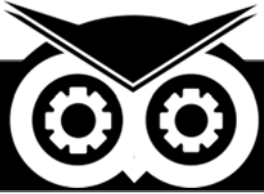
- Task-based
  - WebQuest example
- Open ended
  - What's for Dinner?
- Brief-based
  - Theseus and the Minotaur example



# Rapid Prototyping Outlines -Task-based

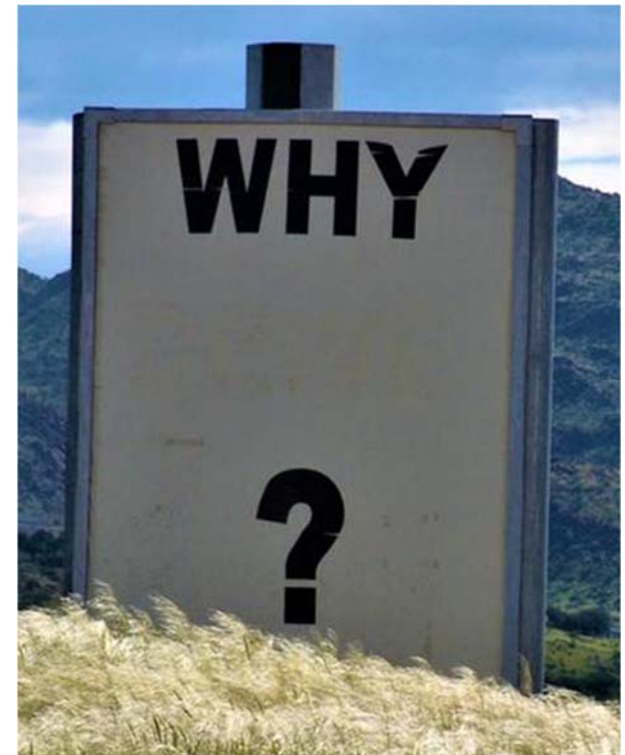
- Task-based - For example: WebQuests
  - <https://sites.google.com/site/historyofvideogamewebquest/>
  - Create an overarching task for students to complete
  - Create a process for students to follow
  - Create a starting resource list
  - Students go off and explore to find answers





# Rapid Prototyping Outlines - Open Ended

- Open Ended
  - What's for dinner?
    - Ask a simple question
  - What do you want to learn about topic x?
    - Let students take some control on their learning
  - Flip a learning objective around
    - How will students learn objective a?





# Rapid Prototyping Outlines - Brief-Based

- Brief-based
  - More detail than open ended
  - Guides students in a general direction
  - Not so much detail that it answers everything for students
  - Still requires students to actively work at learning
  - Theseus and the Minotaur board game example

## VGA202- Class Assignment #2 – Video Game Artists Working in a Team

In teams produce game art assets for *Theseus and the Minotaur*, a paper-based maze game. This exercise is about applying the prototyping process in an artistic team-based environment. So remember your prototyping steps and know your role in the team.

Your art team should include:

- 1) Character/creature artist(s)
- 2) Environment and prop artist(s)
- 3) UI/Interface artist(s)
- 4) One art director in charge of the creative/artist vision of the project who reports to the game producer (who is your friendly neighborhood professor)

### Game Brief

Read the story of Theseus, the Minotaur and the maze.  
<http://greece.mrdonn.org/theseus.html>

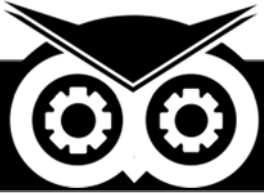
### Game Asset Requirements

Character/Creature artists

- 2 playable characters (Theseus and the Minotaur) Moveable player tokens
- 3 other characters need to be illustrated and integrated as part of the game somehow (Daedalus, Ariadne, King Minos) Discuss this as a team. Where would these characters best fit in the game? Why? How?

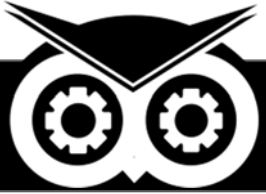
Environment/World artists

- 1 maze (environment)
- 2 different props inside the maze (minimum, more are welcome)  
(i.e. crate, torch, piles of bones, etc use your imagination and pay attention to your story reference. You must keep on theme and vision. The props are required to be interactive game play elements. For instance, a pile of bones might block a particular pathway in the maze requiring an attack dice roll to remove them.)



# Rapid Prototyping Outline Activity

- Create a simple outline for an lesson idea using rapid prototyping
- Don't worry about specifics
- Focus on the core idea and how your students could benefit from rapid prototyping
- What format will you use?
  - Task-based
  - Open ended
  - Brief-based
- Share your outline with the class



# Questions?

- Questions?



## Next Session

- Assessment Strategies

## VGA202- Class Assignment #2 – Video Game Artists Working in a Team

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UI/Interface artists

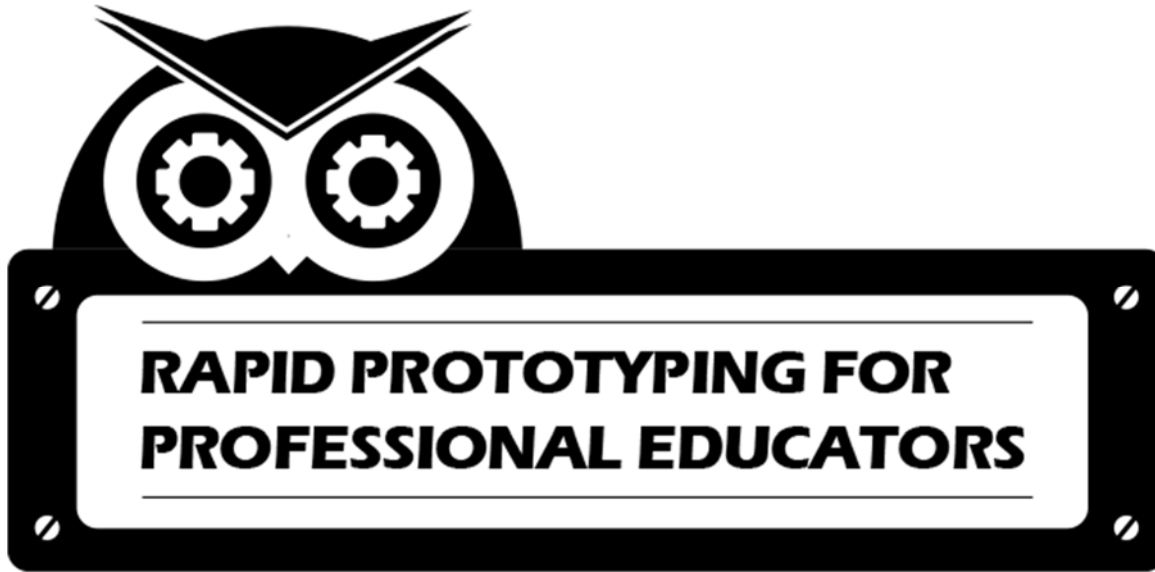
- 1-scorecard and or health bars (1 health bar for Theseus, 1 health bar for Minotaur)
- Skill icons, dice skins, tile images, card graphics, animations, effects, etc all where applicable

Game Designers – Team Effort

- Movement mechanic – How will the players move around the maze? (i.e. dice, tiles, etc)
- Combat mechanic – How will players engage in battle? (i.e. combat dice, cards, etc)
- Other game mechanics where required (i.e. collection, exploration, etc)

**Final game assets including all revision materials, and all notes/feedback taken based on prototyping are due at the end of class February 15.**





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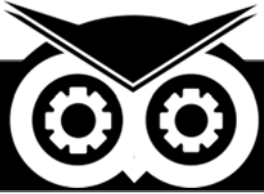
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# Rapid Prototyping Evaluation

- Peer to peer
  - Group-based
  - Self evaluations
- Traditional
  - Rubric-based
  - Journal-based
  - Exams
  - Tests
- Mix and match
  - Rapid Prototyping is flexible

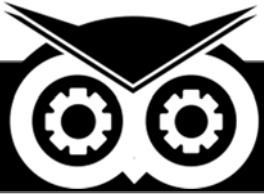




# Rapid Prototyping Evaluation Peer to Peer

- Peer to peer
  - Have students evaluate each others work
  - Have students evaluate their own work
  - Criteria can be determined by educator or by group collectively
  - Best of both worlds
    - Mix peer to peer with educator evaluated

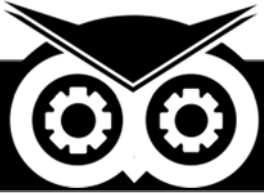




# Rapid Prototyping Evaluation Traditional

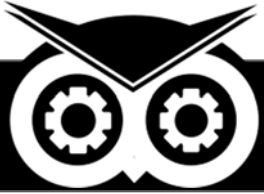
- For the lesson outline we did last session select an appropriate assessment strategy
- What method will you use?
  - Traditional
  - Peer to Peer
  - Mix and Match
- Present your assessment strategy to the rest of the class





# Rapid Prototyping Evaluation Activity

- Traditional
  - Rubric-based
  - Journal-based
  - Exams
  - Tests
- Groups
  - Individual + Group marks



# Questions?

- Questions?



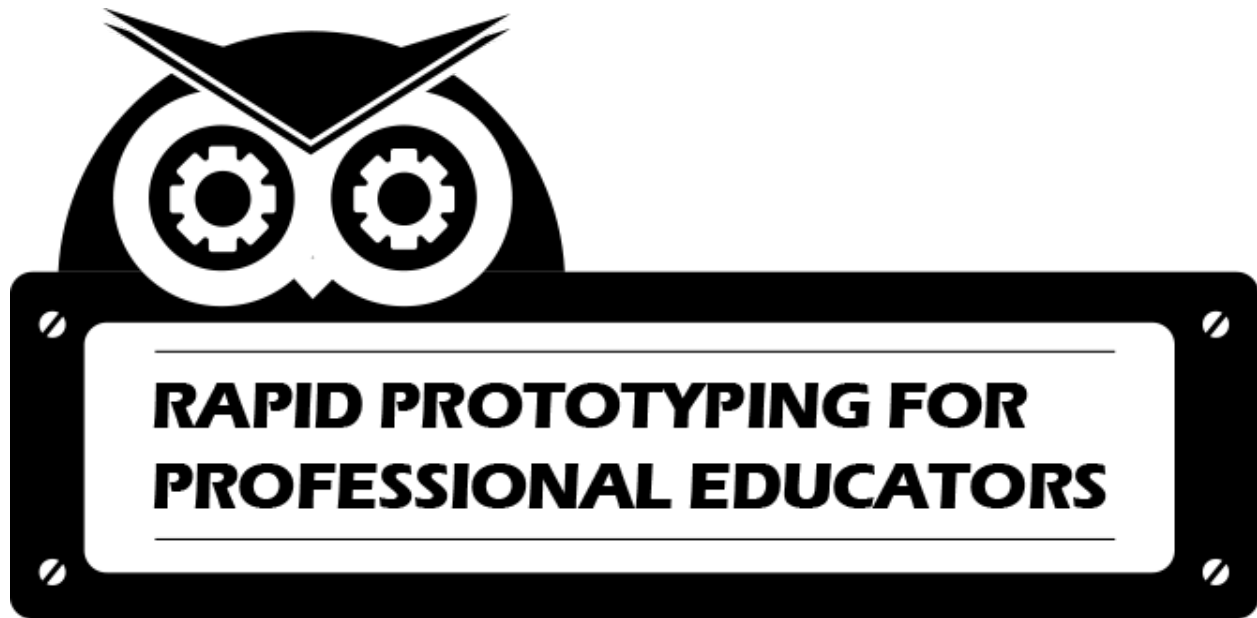
# Thank You!

- Thank you for your time and participation!
- Good luck with your rapid prototyping lessons!
- [jeremy.rayment@gmail.com](mailto:jeremy.rayment@gmail.com)

## **Appendix C**

### **Workshop Speaker Notes**





## Session Notes

### Session 1

#### Overview

The purpose of the first session is to provide background information on rapid prototyping as a design and learning process. The advantages and disadvantages of using rapid prototyping will be also be looked at. Finally, a 4-step industry standard game-based rapid prototyping process will be introduced and analyzed followed by a hands on group-based rapid prototyping activity centered around the question “What’s for dinner?”.

#### Slide 2,3 - What Does Rapid Prototyping Mean to You?

This set of slides are meant to break the ice and allow workshop participants to introduce themselves and get to know each other by sharing any experiences they might have using rapid prototyping in an educational setting. At the end of slide two, I ask the question “Have you ever heard of?” and list three different types of learning all of which have constructivism in common. All three forms of learning are also trending in education circles today. This slide is meant to lead into slide three where I look at rapid prototyping and its constructivist learning roots.

**Classroom Context:** You could use a similar ice breaking strategy in your classroom before delivering your rapid prototyping lessons/activities by asking your students if anyone has done an assignment similar to what you might be planning. For example, if you are having your students design a game you might ask your class if anyone has designed or made a game before. If so ask them to share some of their experiences with the rest of the class. In order to get more focussed responses you might consider asking a more directed question such as: What was one positive thing you can remember making your game?

#### **Slide 4 - What is Rapid Prototyping?**

The three forms of learning mentioned in slides two and three are examples of constructivist learning. Rapid prototyping is another example of constructivist learning. Constructivist learning theorists advocate that learners construct their own understanding of the world by reflecting on their own experiences. In the lecture, I used the example of learning how to cook a new recipe to differentiate between learning methods. In a constructivist learning environment students would learn a new recipe by hands on cooking and experimenting with ingredients instead of just memorizing.

Rapid prototyped lessons and activities are very much about hands on learning and iterating on designs and ideas. In fact, rapid prototyping started as a design process in manufacturing sectors and is also often used today in game design. The idea that a design process can also be used simultaneously as a learning process might come as a surprise to some. As educators we are used to instructional designing our lessons, materials and assessment strategies but what if we put some of the onus of learning on our students? What if students became an essential part of their own learning process? During the lecture when covering the practical classroom applications bullet I talked about how one of my students overcame a chronic shyness/anxiety issue to not only stand up and present her game concept idea to the rest of her class but to earn the respect of her class by winning the concept competition. Rapid prototyping as a learning process can allow students to take ownership of their learning by allowing students to focus on aspects of projects and assignment of specific personal interest to them.

**Classroom Context:** When preparing your rapid prototyped lessons you could give your students a choice in what and how they approach the topic. For example if your learning objective is about cooking chicken, students could choose to do their project on tacos or pizza or even sundaes.

In my last point I talk about the creative potential of rapid prototyping. In classes I have taught, I have given out the same base outline for a game for multiple years. As it turns out, not a single submission has been the same or in fact even remotely close to each other. Each and every time I do the same base assignment completely new and exciting learning takes place.

#### **Slides 5,6 - Rapid Prototyping Advantages, Challenges**

In slides 5 and 6 I talk about the advantages and challenges of using rapid prototyping. Lessons developed using rapid prototyping generally take less time to design, deliver and evaluate saving you precious time. With rapid prototyping, you act primarily as a facilitator which allows students to take some ownership on their learning experience. The downsides include a time investment required up front for you to learn and experience rapid prototyping and a reliance on group-based activities. In the end rapid prototyping is not perfect for every learning experience. This workshop is aimed at providing you with another teaching tool to add to your toolbox.

#### **Slides 7- 11 - Rapid Prototyping Process**

In slides 7 - 11 I outline a 4-step rapid prototyping process I use in my classroom. Feel free to use this process in your rapid prototyping lessons. It is best to stick to using all 4 steps in the proper sequence during the process. Students will try to skip steps because they feel like they have done it already. I often tell my students in advance they will be sick of their projects because the process relies heavily on repetition for success. However, I also tell them if they stick with it they will see the fruits of their labours come to life.

### **Slide 12 - Rapid Prototyping Time**

In slide 12 I present a rapid prototyping activity for workshop participants to work through. The inspiration for the activity came from trying to find something common to everyone without knowing who all might attend. All I knew for certain was that a random number of professional educators from my local area were coming. Everyone needs to eat right? That literally was how I came up with the activity idea. Based on the 4 step rapid prototyping process I created a number of tasks and conditions for participants to follow.

**Classroom Context:** When preparing your rapid prototyping lessons you can look for inspiration all around you. I will get into specifics on how to design rapid prototyping lessons in session 3 but for now I would suggest keeping a journal or digital notes anytime you get inspired by something that might suit a particular lesson or activity. I suspect most if not all of you already keep journals or archive ideas for lessons. For rapid prototyping lesson ideas however try a new perspective. Instead of asking yourself how can I make students learn specific objective a, b, or c shift your mindset to one of your students. Ask a new question from the perspective of one of my students. How would I want to learn specific objective a, b or c? Rapid prototyping is about immersive, interactive learning and shifting our perspective to a student's point of view can help inspire new ideas.

## **Session 2**

### **Overview**

The purpose of the second session is to provide a game-based rapid prototyping lesson and activity. Games are a great choice for any rapid prototyping lesson because they can be made for any age group and for any topic.

### **Slide 2,3 - What Does Rapid Prototyping Mean to You?**

These slides provide a review of what rapid prototyping is and the 4 step process covered in session 1. You can always refer back to the session 1 slides for reference.

### **Slide 4 - Game Night!**

In slide 4 we looked at how versatile games are. Games don't have to be complex to be fun and can be made for any age group covering virtually any topic. We looked at some simple examples of games like Tic Tac Toe to discover what makes them fun and also to demonstrate most of us are at least familiar with games and gaming. You don't need to be intimidated by

games whether that means playing a game or thinking about the prospect of actually making a game.

**Classroom Context:** Think about one game you have played in your life. Describe one aspect of the game that you found fun. You can use this exercise in your classroom to inspire your students to create new ideas for game based rapid prototyping activities. For example the building aspect of Minecraft could inspire a game project about carpentry.

### **Slides 5-6 - Educator's Role - Game On!**

In slides 5 and 6 I provided some examples of fact-based games. We talked about research and how to find meaningful examples of games and game ideas. Whether it was game shows or card/board games, iPhone games or even full fledged video games most of us have some experience with gaming. Start with what you know when researching and branch out as you explore ideas and concepts.

### **Slides 7-8 - Educator's Role - Game On!**

In slides 7 and 8 I tasked participants with writing down 10 facts about the subject matter of their respective expertise. These facts were to form the basis of our game for the nights activity. Once we had our facts gathered I tasked participants to format the fact in a more game like format similar to the examples in slides 5,6. We all got into a group and began to shape our game.

**Classroom Context:** When planning a game-based lesson there is no need to have all the rules and game instructions planned out in full. Instead allow your students to help shape the game from the beginning. As the educator start with a simple idea and create a simple outline containing specific things you would like your students to include in the game. For example the 10 facts I asked you all to create based on your subject matter. Create a series of simple tasks to help guide your students through the designing of the game but allow them to be involved in the design and execution of all aspects of the game. In fact if you break your students into multiple groups allow each group to shape their own game and then have groups play all the different versions. Multiple group play will empower students to help each other and will spark new ideas for their own games.

## **Session 3**

### **Overview**

The purpose of the third session is to provide examples and context for designing rapid prototyping lessons.

### **Slide 3 - Rapid Prototyping Outlines - Task-based**

In slide 3 I looked at an example of a WebQuest assignment I gave to my students. I talked about how a strike forced me to find a way to condense lesson materials for my students and how WebQuests perfectly fit the bill. In WebQuests a set of tasks are designed by the educator

which the students follow as part of the assignment. These tasks are not step by step instructions on specifically how to execute an assignment. Rather the tasks are meant to provide a structure where students fill in their own blanks. In the example shown my students were tasked with designing a fact-based game about the history of video games. I provided a set of tasks for the students to use based around the 4-step prototyping design process but students in their groups shaped the specifics of their own games and rules. So the educator isn't responsible for designing the game in this case but for providing and facilitating a framework for students to take ownership of their own learning. If we think back to our dinner example the learning tasks would not be step by step instructions on how to prepare a dish but rather a set of tasks designed for the students to explore and come up with their own dinner idea and recipe.

**Classroom Context:** The specific aspects of designing and delivering WebQuests is beyond the scope of this workshop. For more general information you can check out <https://webquest.org/>

#### **Slide 4 - Rapid Prototyping Outlines - Open-Ended**

In slide 4 I looked at open ended outlines. I went back to our first exercise where I simply asked participants "What's for dinner?" Open ended outlines provide a topic for learning but allow students to help shape how they might want to learn.

**Classroom Context:** When designing an open-ended outline get your students involved. Ask them how they might want to learn about topic a, b or c. You could also flip a learning objective around and ask yourself how your students might want to learn instead of telling them how they are expected to learn.

#### **Slide 5 - Rapid Prototyping Outlines - Brief-Based**

In slide 5 I looked at open brief-based outlines. I went over a specific brief-based outline I use in my prototyping 1 course. A brief-based outline is a more detailed overview of the assignment or project but still leaves room for the student to take ownership and experiment. It differs from task-based outlines in that there are no defined tasks. A brief might include a resource list or story research links or specific expectations students are required to fulfill. Students come up with a process or tasks themselves based on the brief-based outline.

**Classroom Context:** You can think of brief-based outlines more like a puzzle. As the educator you know there are certain bits the students must use in order to learn a given topic. If the student needs to learn about lasagna for example one of the puzzle pieces would probably include the use of lasagna noodles. So you give your students all the pieces of the puzzle they need to use to learn but let them task out how they go about learning.

## **Session 4**

### **Overview**

The purpose of the fourth session is to provide examples and context for assessing rapid prototyping assignments and projects.

### **Slide 2 - Rapid Prototyping Evaluation**

This slide provides an overview as to the main ways rapid prototyping lessons and assignments can be assessed. The beauty of rapid prototyping is you can use any evaluation technique you are familiar with or are governed to use. You can also use peer to peer, self evaluation or group-based evaluations as well or mix and match assessment strategies to best fit your lesson.

### **Slide 3 - Rapid Prototyping Evaluation - Peer to Peer**

In slide 3 we talked about specific examples of peer to peer assessment strategies that can be used with rapid prototyping lessons. I showcased a rubric I used in my WebQuest assignment and highlighted the fact the rubric criteria was decided upon by my students. Again we see how rapid prototyping lessons can be used to encourage students to take ownership of their activities. In this case my students collectively had to come up with and agree upon the final criteria they would be using to evaluate each others projects. As the instructor I decided I wanted to use a rubric-based assessment but that is where my involvement stopped. My students took ownership and saw the assessment through.

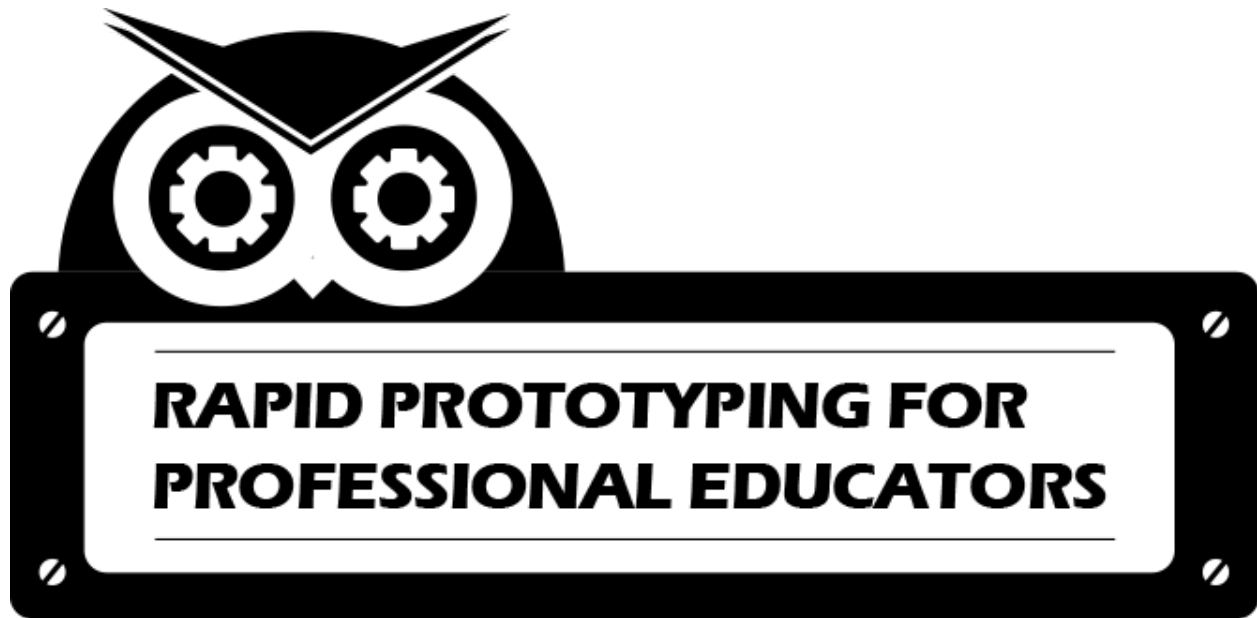
### **Slide 4 - Rapid Prototyping Evaluation - Traditional**

In slide 4 we talked about mandates professional educators are often required to use for assessment. Sometimes our hands are tied and we have to assess our students based on governed requirements. Rapid prototyped lessons are not restricted by any assessment requirements. Rapid prototyping-based lessons, activities and projects can be assessed using any mandated or other technique required.

**Classroom Context:** When it comes to choosing an assessment strategy for rapid prototyping lessons where possible get your students involved. Ask them what they would do to evaluate their projects if they were the teacher.

## **Appendix D**

### **Workshop Feedback Journals**



### **Journal Entry 1 - Session 1 - Rapid Prototyping Basics**

Date: February 25, 2019

Location: Sault College Room M1230

Time: 7pm-9pm

#### **Participants:**

Participant 1 (Grade School Teacher)

Participant 2 (College Professor)

Participant 3 (College Professor)

Participant 4 (Adult Teacher)

#### **Notes:**

- Lecture materials were the correct tone and written for the correct audience
- More visuals would help the presentation polish
- Ask the question "What does prototyping mean to you?" before breaking out the lecture content explaining it. This is meant to foster some discussion of the participants to get to know them a bit and gauge their experience with prototyping in the classroom.
- Many of the participants indicated after the presentation of the basic materials that they has some form of similar experiences in their classrooms
- None of them had experienced the prototyping package as presented
- All of them stated they could see the potential of using prototyping in their classrooms
- During the night's exercise I asked participants to prototype what they would like to have for dinner
  - Participants then presented their dinner ideas to each other asking for feedback and suggestions on how to make their dinner ideas better or different.
  - Participants had to be reminded to take notes just like normal students.



- Participants not only learned how they could make their dinner ideas better but learned wholly new dinner ideas.
- All participants were eager to try out new dinner recipe ideas. Mexican lasagna was a particular favourite idea.
- Participants learned about each other's cultural background and how important food was to all of them culturally.

## **Journal Entry 2 - Session 2 - Rapid Prototyping Using Games**

Date: March 4, 2019

Location: Sault College Room M1230

Time: 7pm-9pm

### **Participants:**

Participant 1 (Grade School Teacher)

Participant 2 (College Professor)

Participant 3 (Adult Teacher)

### **Notes:**

- Lecture materials were the correct tone and written for the correct audience
- More visuals would help the presentation polish
- Ask participants in advance to bring in their favourite games be them board, card or video games. Seeing a whole collection of different games would help everyone feel comfortable with the idea of making a game because most people would have played some form of game before even if they didn't consciously think about it.
- All of the participants had "lightbulb" moments during the activity where they could see and would use prototyping and games in their professional practice.
  - Participant 2 said he would use the fact-based approach for a game idea
  - Participant 1 said she would use the game making aspect of prototyping in her classroom now that she was comfortable with games. She brought up the game Monopoly that she has used in previous classroom activities but after making a game and seeing how learning also occurs during the design process she loved the idea of games in her classroom.
  - Participant 3 works with adult learners. After our creative exercise he loved the idea of using english word games and even more designing with his students english word games for learning.
- During the nights exercise I asked participants to prototype a simple fact-based card game based on facts created based on their own unique areas of subject expertise.
  - Participants first were asked to write down 10 facts in their respective area on cue cards
  - Participants were shocked I think at how simple the request was. Once I gave them an example ( $1+2=3$ ) they were able to create their 10 facts. I had to explain that facts could be as simple at  $1+2=3$ .
  - I then showed them some more game like examples of facts

- Participants were given 20 minutes to format their facts into a more game like format
- Using a standard deck of cards I showcased a simple card game “War”. I did this to visually demonstrate that games can be simple and don’t have to be complicated to be fun.
- We all got in a group afterwards and brainstormed ideas on how to take the collective facts and turn them into a game.
- Participant 2 created facts about 3d art, Participant 1 created facts around sharing and Participant 3 created facts about rock and roll history.
- Some ideas that came out of the brainstorming session included:
  - Timers. How many facts can you list in 9 seconds or less
  - Charades. Acting out facts.
  - Creating links between the 3 different subjects in a game action
    - Find keywords in the facts and make a sentence using all 3 subject categories
    - Keywords became a new way to further manipulate the facts into new forms
      - This was a good teaching moment to highlight how students can get attached to work they have done and become resistant to changing their work. One thing leads to another which leads to a better end product. The end can’t be reached without the beginning.
  - Share a song with someone in a 3d manner
  - Create a points system where answering facts correcting leads to accumulating points. More points equates to winning.

### **Journal Entry 3 - Session 3 - Rapid Prototyping Designing and Evaluating Lessons**

Date: March 25, 2019

Location: Sault College Room M1230

Time: 7pm-9pm

#### **Participants:**

Participant 1 (Grade School Teacher)

Participant 2 (College Professor)

#### **Notes:**

- Lecture materials were the correct tone and written for the correct audience
- Participants understood and agree splitting up designing and evaluating lessons makes sense for the final workshop
- Participants were first tasked with creating a basic lesson idea/outline in their content area using rapid prototyping as a design and delivery framework
- Participant 2’s idea was to make a board game covering the respiratory system. Her students would have to research the facts and present them in a clue-based game-like

framework. Students would use the respiratory system as an actual game map to traverse and explore. Work and gameplay would occur during her scheduled lab times. A massive lightbulb moment occurred when we collectively discussed how a large class size (60+) could impact learning in a rapid prototype environment. I suggested she could have multiple groups designing different games based on the respiratory system and that students would actually learn the facts by play testing the different versions of the game. Leslie saw the impact and potential of this immediately.

- Participant 1's idea was to have her students prototype (build) unique structures. She seemed to revert to her more traditional ways of designing lessons. In that she would provide all the materials and students would do a presentation. I asked her and Leslie both how the prototyping aspect of the lesson could be strengthened. Ideas to strengthen the lesson included having the student learn/research the facts and included an overarching task for the group at large to achieve. So instead of students in isolation building structures, students at large in the entire class could prototype a new city/town by building essential structures required for a city/town to flourish.
- After the presentations and discussion around designing lessons a few key prototyping advantages became more clear to the participants. The notion and advantages of students being responsible for researching their own facts as part of the learning process really hit home after discussing both lesson ideas. It saves the teacher many hours of lesson prep time and provides the student with some degree of control over their own learning. We talked about anywhere from 3-7 hours on average it takes to prep any given lesson non prototyping lesson. With prototyping hours could be shaved off their prep time and they recognized this. I think also having a group discussion after the lesson presentations helped participants understand they don't have to be alone. The feedback step presented originally is starting to have an impact on participants now even in the designing and application of their own work.
- Both participants made a point of suggesting to me that I copyright my materials and give consideration to offering workshops of this nature on a full-time basis. We talked about school boards and colleges paying presenters to do workshops for their PD days and that this kind of information would be something they would sign up for.
- Participant 1 asked me what the difference between a project-based lesson and a prototyping lesson might be. She was having a hard time I think separating how she works normally and how she might work using prototyping. I answered her by suggesting projects can be different. With prototyping the real key is the feedback stage. In a traditional project-based assignment a student would get one shot to get it right. They do the work, hand it in and hope it's correct. In prototyping students must go through multiple feedback stages where they present their information to multiple sources to garner feedback which is then revised until a final version is completed. In essence students get multiple chances to submit their projects instead of just one. Additionally by presenting and interacting with other people student gain different insights and perspectives on the materials potentially greatly enhancing their learning experience.
- The evaluation section was a bit shorter but was also effective. We talked about how all existing assessment tools can still work effectively. Participant 2 is mandated to use

multiple choice tests for example and she didn't see any issue assessing a rapid prototyping lesson using multiple choice.

- We talked about rubric and peer to peer evaluations. Light Bulbs went off in both participants when I showed them my assessment strategy for my History of Video Games WebQuest. I told them I knew I wanted an individual component (journals) and some form of group assessment component. I showed them my rubric and as soon as I told them the group determined the evaluation criteria together they both immediately saw the potential for time saved and for student responsibility and self motivation.
- We talked about strategies for group-based projects and how I always have an individual and group based assessment components for my group-based assignments.

## **CURRICULUM VITAE**

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