Using a Blended Learning Model to Facilitate Personalization of Reading Instruction for Primary Students

by

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Submitted in partial fulfillment of the requirements for the degree of

MASTER OF EDUCATION IN EDUCATIONAL LEADERSHIP

VANCOUVER ISLAND UNIVERSITY

We accept the Process Paper as conforming to the required standard.

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Abstract

Recognising the need for personalization in the education of primary students learning to read prompted this project to examine how the implementation of a Blended Learning model could fulfill that potential. It addresses the Critical Challenge Question: How can a Blended Learning model be applied to facilitate personalization of reading instruction for primary students? The project specifically examined the use of a Station Rotation Blended Learning model in the K-3 primary classroom. The project includes three key areas: apps, models of delivery, and assessment.

A variety of apps were examined to meet the individual learning needs of students. Some of the APPS were chosen to provide teachers with feedback, while others were selected to engage students in practice-based skills at their individual level. Models of delivery examines how to set-up the classroom, storage of technology devices and how the teacher will instruct students in regards to accessing technological devices. Finally, the area of assessment looks at how the use of devices can be used for teacher assessment as well as student self-assessment.

This project was a collaborative design opportunity with two teacher colleagues, one who examined the subject area of Math, and the other Writing, in the primary grades. The co-created website is intended to provide teacher colleagues with the resources and information needed to start implementing a Station Rotation Blended Learning model, in their own classrooms.

Major Project url: https://primaryblended.weebly.com

*Keywords:* Blended Learning, Station Rotation, Apps, Models of Delivery, Personalization.
Acknowledgements

I would like firstly to thank my family for their encouragement throughout this entire process. To my husband David for taking on almost all the daily household chores, and my son Liam for helping with some of the dreaded house cleaning duties. To two of my daughters, Mariah and Lauren, for reading and helping me throughout this journey in editing projects and papers. To my daughter Maddisen thank you for taking on more of the family events and holidays by doing the cooking and baking. I couldn’t have done it without all of you!!

I would also like to thank my two wonderful colleagues Carla Takach and Danica Farrell, without the two of you pushing me at times I wouldn’t be here. It was such an advantage working in the same school while completing the OLTD graduate diploma program and working together on our major project—this alone increased my learning and growth tenfold. Working with both of you made this learning adventure more exciting and more enjoyable.

I would like to acknowledge and thank all my other fellow students and instructors in the OLTD program. Your different perspectives and insights have aided in my professional growth. Together we created a safe place to express our worries and dreams of creating an enhanced K-12 education system through the use of technology.
## TABLE OF CONTENTS

Abstract........................................................................................................................................ii

Acknowledgements.........................................................................................................................iii

List of Tables ..................................................................................................................................vi

List of Figures.................................................................................................................................vii

Chapter 1-Introduction....................................................................................................................1

  Justification of the Project...............................................................................................................1

  Purpose of the Project...................................................................................................................2

  Project Overview..........................................................................................................................2

  Definition of Terms.......................................................................................................................4

Chapter 2- Literature Review Primary Blended -Reading...............................................................7

  Introduction..................................................................................................................................7

  Defining Blended Learning..........................................................................................................8

    Rotation model..........................................................................................................................8

    Flex model...............................................................................................................................9

    A La Carte model....................................................................................................................9

    Enriched Virtual model...........................................................................................................9

  Why Blended Learning?..............................................................................................................10

  Considerations to Blending the Primary Classroom.................................................................11

    Devices and screen time.........................................................................................................11

    Station Rotation Blended Learning model.............................................................................12
The Pedagogical Benefits and Challenges to a Station Rotation Blended Learning Model...

The benefits

The challenges

Personalizing Reading Instruction for Primary Students

Barriers to Implementing a Blended Learning Program

Conclusions

Chapter 2- Literature Review Primary BlendED –Writing

Introduction

The Change Towards Blended Learning

Elements of Blended Learning

The Rotation Model

Station Rotation model

Digital Citizenship and Internet Safety in Primary Classrooms

Personal Writing, Story Writing and Mobile Devices in Writing

Access for Students with Special Needs— Assistive Technology

Technology as a Way to Extend Learning for Writers

Assessment for and of Learning

Conclusions

Chapter 2- Literature Review Primary BlendED- Numeracy

Introduction

What is Blended Learning and Which Model Works Best for Primary Students?

Challenges to Implementing a Station Rotation Model in a Primary Classroom
What Considerations are Essential to Personalizing Numeracy in a Face-to-Face Blended Classroom?...........................................................................................................................................32

Pedagogy to support primary Mathematics instruction........................................32

Personalized learning..................................................................................................33

Mastery learning........................................................................................................34

What Devices Can be Used for Implementing Blended Learning?.............................35

What Apps and Websites are Best Suited for Primary Students?.................................36

Design principals.........................................................................................................36

Evaluating apps and websites......................................................................................37

Choosing Mathematic apps for primary instruction..................................................37

Correlations Between Blended Learning Rotation Models and Achievement ...........38

Conclusions..................................................................................................................39

Chapter 3- Major Project Design..................................................................................41

Major Project Development..........................................................................................41

Website Design Table....................................................................................................42

Key Deliverable: Primary BlendED Resource Website..............................................43

Vetted apps and websites..............................................................................................43

Assessment....................................................................................................................43

How and Why to Blend.................................................................................................44

First steps.......................................................................................................................44

Models of delivery........................................................................................................44

Funding your project.....................................................................................................44

Privacy and permission...............................................................................................45
Research........................................................................................................45
Resources.........................................................................................................45
Peer Review of Project Website and Deliverables...........................................46
Chapter 4- Field/Beta Testing and Findings.......................................................47
Field/Beta Testing and Findings........................................................................47
Google feedback form.......................................................................................47
Feedback sections...........................................................................................48
Feedback Questions..........................................................................................49
Field/Beta Testing: Feedback and Findings.......................................................53
User Profile background information.............................................................53
Website design and navigation.......................................................................54
Accessibility......................................................................................................54
Content- Numeracy..........................................................................................54
Content- Reading..............................................................................................54
Content- Writing...............................................................................................55
Final thoughts....................................................................................................55
Summary and Thoughts on Feedback Process................................................56
Chapter 5- Conclusions and Recommendations..............................................57
Project Overview..............................................................................................57
Conclusions as Applied to the Project Re-Design.............................................57
Outcome Evaluation..........................................................................................59
Results of Findings in Relation to the Literature Review...............................59
Delivery model considerations.......................................................................60
Device and app considerations.................................................................60
Limitations of the Project...........................................................................61
Major Project Recommendation.................................................................62
Major Project Deliverable...........................................................................62
Next steps...................................................................................................63
Final Conclusions.......................................................................................63
References-Reading....................................................................................65
References-Writing......................................................................................67
References-Numeracy..................................................................................69
List of Tables

Table 1. Definitions of Terms ......................................................... 4

Table 2. Website Design Timeline .................................................. 42
List of Figures

Figure 1. Google Form Survey.................................................................48

Figure 2. Google Form Questions..........................................................50

Figure 3. Summary of Key Findings........................................................56
Chapter 1 - Introduction

Personalizing student learning is a large focus of the new B.C. curriculum, which recognizes that no two students learn at the same pace or in the same way. Therefore, personalizing learning for individuals is necessary to meet all student needs. There are many methods teachers use to teach primary students to read, but the challenge is the rate at which individual students learn. How can we meet the needs of all students, those accelerating and those that need a lot more time and practice to grasp an understanding, while fulfilling the mandates of the new BC curriculum?

With this question in mind, and revisiting my journey through the Online Learning and Teaching graduate Diploma (OLTD) program at VIU, specifically OLTD 511-Blended Learning, I began to envision the possibilities a Blended Learning model could present to move towards meeting all student’s needs. I began to foresee how I could utilize technology in my face-to-face classroom to improve not only my own practice but also my students’ educational experience. A large focus of the new B.C. curriculum is to personalize learning to meet the diverse needs of our modern learner, but how do we accomplish this in classrooms in excess of 20 students to one teacher and with extensive ranges of abilities. This project examines the utilization of a blended delivery model, specifically Station Rotation, in meeting the personalized learning needs of primary students.

Justification of the Project

Teachers are challenged with teaching students for the 21st Century—giving them the skills for jobs that have yet to be invented— but how can this be accomplished? Some strategies include allowing students to move through the curriculum at their individual pace and mastering skills while providing teachers with the tools for formative assessment. As well, the ability to
teach to small-targeted groups as well as meeting the four Cs of the 21st Century; Critical thinking, Communication, Collaboration and Creativity is essential. Our world is inundated with new and improving technologies and this project explores the research that justifies the use of technology via a blended delivery model to meet the needs of students and personalize their educational experience.

**Purpose of the Project**

Blended Learning— the carefully balanced use of technology along with face-to-face instruction— is one of the answers to personalization. Specifically implementing a Station Rotation model in the primary classroom allows teachers to teach targeted, personalized lessons to small groups, while the remainder of the class is engaged in other individualized work.

Education blogger, Samantha Casey, writes in her blog post, Advantages and Disadvantages of Station Rotation, “I’ve noticed that they [students] are more focused when we do small group rotations” (2016). This demonstrates that allowing students to work at their individual level and pace results in more student engagement, success and growth.

The advantages of implementing a Station Rotation Blended Learning model into the elementary classroom are obvious. Students are met ‘where they are’ academically and moved forward at their individual pace. Students are more engaged due to the fact that they are working at their individual targeted level and encouraged by the success they achieve.

**Project Overview**

For my major project I worked with colleagues Carla Takach and Danica Farrell to collectively create a website tool kit for other interested primary teachers that are excited about the prospect of implementing personalized instruction through a Blended Learning model. My
contribution focused on Reading while my teaching colleagues developed resources needed to personalize Writing and Numeracy through Blended Learning in the primary grades.

The tool kit is housed on a collective Weebly site and includes screencast instructions for teachers on how to set up a Station Rotation learning model for instruction in a classroom, recommendations for apps that provide feedback to inform-instruction, apps that allow student skill-practice and apps that assist with assessment. Within the site there will be sections that present permission forms regarding the responsible use of technology as well as examples of scaffolding student learning with technology for teacher colleagues. My focus was sourcing resources to assist students in mastering specific Reading skills, presenting shared lessons/units on Reading instruction and sharing student-based assessment practices around pre-Reading and Reading. Resources and exemplars for increasing student engagement at the various differentiated Reading development stations are shared and finally, a ‘how-to’ guide and resources for colleagues to set-up and implement a small group or Station Rotation model for reading instruction in their classrooms is provided.

It was my initial assumption that the literature and research would indicate that using a Blended Learning model for Reading, would allow teachers to work with small groups of students at their individual levels, and would not only personalize the students learning journey but help in student success and engagement.

Primary educators know that when we are able to give more informed, targeted instruction to our young students—instead of using a teacher-directed, top-down, and one-size-fits-all model—we meet them at their level and help to move their learning forward. It was my initial assumption that the literature and research would indicate that using a Blended Learning model for Reading, would allow teachers to work with small groups of students at their
individual levels, and would not only personalize the students learning journey but help in student success and engagement.

My final major project design decisions were informed through the information gained from my comprehensive Literature Review presented as Chapter 2 of this MEdL Process Paper and through consultations with my two colleagues with whom I collaborated on the major project build. In the Literature Review I investigate what Blended Learning is, why we would use a Blended Learning model, considerations for blending the primary classroom, the pedagogical benefits and challenges to a Station Rotation blended delivery model, personalizing reading instruction for primary students and barriers to implementing a Blended Learning program.

Definition of Terms

<table>
<thead>
<tr>
<th>Terms</th>
<th>Definition</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apps</td>
<td>An application, typically a small, specialized program, downloaded onto mobile devices.</td>
<td><a href="http://www.dictionary.com/browse/app">http://www.dictionary.com/browse/app</a></td>
</tr>
<tr>
<td>Blended Learning</td>
<td>The practice of using both online and in-person learning experiences when teaching students.</td>
<td><a href="https://www.edglossary.org/blended-learning/">https://www.edglossary.org/blended-learning/</a></td>
</tr>
<tr>
<td><strong>Face-to-Face</strong></td>
<td>Any form of instructional interaction that occurs “in person” and in real time between teachers and students</td>
<td><a href="https://www.edglossary.org/in-person-learning/">https://www.edglossary.org/in-person-learning/</a></td>
</tr>
<tr>
<td><strong>Formative Assessment</strong></td>
<td>Assessment so teachers can identify concepts that students are struggling to understand, skills they are having difficulty acquiring, or learning standards they have not yet achieved so that</td>
<td><a href="https://www.edglossary.org/formative-assessment/">https://www.edglossary.org/formative-assessment/</a></td>
</tr>
<tr>
<td><strong>Models of Delivery</strong></td>
<td>The ways in which learning environments and instructional experiences are constructed, sequenced, or delivered.</td>
<td><a href="https://thesecondprinciple.com/teaching-essentials/models-of-teaching/">https://thesecondprinciple.com/teaching-essentials/models-of-teaching/</a></td>
</tr>
<tr>
<td><strong>OLTD</strong></td>
<td>Online Learning and Teaching graduate Diploma program offered through Vancouver Island University, BC, Canada</td>
<td><a href="https://education.viu.ca/OLTD">https://education.viu.ca/OLTD</a></td>
</tr>
<tr>
<td><strong>Personalized Learning</strong></td>
<td>A diverse variety of educational programs, learning experiences, instructional approaches, and academic-support strategies</td>
<td><a href="https://www.edglossary.org/personalized-learning/">https://www.edglossary.org/personalized-learning/</a></td>
</tr>
</tbody>
</table>
### Station Rotation Model

that are intended to address the distinct learning needs, interests, aspirations, or cultural backgrounds of individual students.

The Station Rotation model allows students to rotate through stations on a fixed schedule, where at least one of the stations is an online learning station.

A freemium website creation and Web-hosting service.

https://www.blendedlearning.org/models/

https://whatis.techtarget.com/definition/Weebly
Chapter 2 -Literature Review

Primary BlendED — Reading

Introduction

Children are unique individuals with specific needs that are exclusive to them. They grow and move through different stages of development at various paces. Childhood development looks different for each child, so why, in so many ways, does our education system not honour this? The new British Columbia Education Plan states, “the key focus is personalized learning” (BC Ministry of Education, 2015, p. 1). Children learn at different paces and through a variety of learning styles that need to be recognized and embraced.

This literature review is an examination of how a Blended Learning model can be applied to facilitate personalization in the area of Reading instruction for primary students. It addresses what Blended Learning is, why educators may choose to use it and what model of Blended Learning is most effective in a face-to-face diverse primary classroom. It establishes how a blended model can personalize student learning and enhance engagement. The review identifies some of the barriers to implementing a Blended Learning environment faced by educators.

Early Primary students enter school with various strengths and abilities. In order for them to learn to read there are certain skills that need to be mastered. According to the 2016 research report, “Read About It: Scientific Evidence for Effective Teaching of Reading” there are 5 key areas that are crucial in the success of learning to read. The findings state that these 5 areas are:

1. Phonemic awareness: The ability to hear and identify individual sounds in spoken words
2. Phonics: The relationship between the letters of written language and the sounds of spoken language
3. Fluency: The capacity to read text accurately and quickly
4. Vocabulary: All the words students must know to communicate effectively
5. Comprehension: The ability to understand what has been read (Hempenstall & Buckingham, 2016, pp. 4-5)

The very fact that students develop and learn to read at different rates leads to the importance of establishing a Blended Learning model. A blended model will grant students the ability to learn at their individual, developmental pace, and master concepts through personalized learning.

Through my research investigations, I will demonstrate how specifically implementing a Station Rotation Blended Learning model for reading instruction will allow primary school students to grow and learn at their individual level and pace to meet the mandate of the new BC curriculum.

**Defining Blended Learning**

There are a wide variety of pedagogical teaching methods available to educators today, and Blended Learning is among them. What is Blended Learning? Blended Learning is defined as education delivered in part online and in part face-to-face. Students are in control of some element of their learning being it time, place, path and/or pace. As well, the subject the student is learning online and face-to-face is connected to create an integrated learning experience (Horn & Staker, 2015). Horn and Staker (2015) identify the four main models of Blended Learning as the Rotation model, Flex model, A La Carte and the Enriched Virtual model.

**Rotation model.** In the Rotation model there are four-sub categories-Station Rotation, Lab Rotation, Flipped Classroom and Individual Rotation. In the Station Rotation model, typically students work with the teacher in small groups at their targeted skill level, and then
rotate through an in class technology station and a peer and/or individual station to put the skills learned at the teacher station into practice. Lab Rotation is like Station Rotation but students move to a computer lab for the technology rotation. Flipped classroom consists of students independently receiving online lectures or lessons and then using classroom time with the teacher to solidify understanding. Finally, the Individual Rotation model has students rotating through on an individual, customized schedule set-up through either the teacher or through a computerized algorithm. (Horn & Staker, 2015)

**Flex model.** The Flex model, unlike the Rotation model, starts “with online learning and add[s] physical supports and connections where valuable” (Horn & Staker, 2015, p.47). Online learning is the main component of student learning in the Flex model.

**A La Carte model.** The A La Carte Blended Learning model is mostly implemented at the high school level. Students take some entirely online courses while also attending classes at a face-to-face bricks and mortar school (Horn & Staker, 2015).

**Enriched Virtual model.** The Enriched Virtual Blended Learning model is set up so students have set days and times that they are in a face-to-face classroom environment, and the remainder of the time they work independently online whenever and from wherever they prefer (Horn & Staker, 2015).

It is quite common for schools to use a variety of these models by combining them in different ways to reach a customized program (Staker & Horn, 2012, p. 2). Now that we have an understanding of the different Blended Learning models we need to look at why educators would choose to blend the face-to-face primary classroom with an online component.
Why Blended Learning?

The primary classroom, like most K-12 classrooms, is filled with students that have varying, complex and unique learning needs. The days of teaching to the middle level in hopes of reaching the majority of students are gone. Kaye Thorne (2006) author of eBook, “Essential Creativity in the Classroom-Inspiring Kids” states, “Blended Learning represents a real opportunity to create learning experiences which can provide the right learning at the right time and in the right place for each and every individual” (p. 105). Educators strive to meet individual student’s needs and personalize a learning program to fit those needs. Using a Station Rotation Blended Learning model is one way for primary teachers to customize programs for individual students. Allowing students to work at their own pace and providing time for practice has been shown to benefit the struggling student (Schechter, Macaruso, Kazakoff, & Brooke, 2015).

There are six main reasons why educators may choose to implement a Blended Learning model, or models, into their practice, including pedagogical richness, access to knowledge, social interaction, personal agency, cost effectiveness, and ease of revision. However, the overwhelming rationale for implementing Blended Learning is the combination of the best of both worlds (Bonk & Graham, 2005). Stein and Graham (2014) state, “the wealth and availability of information continues to grow at astounding rates, and the skills and knowledge that workers need to thrive in this twenty-first century are ever changing” (p. 12). Exposing students to the digital world prepares them for their futures and the jobs that are yet to be invented. A deeper, more thought-provoking reason for the application of Blended Learning comes from Thorne (2006)

It [Blended Learning] presents an elegant solution to the challenges of tailoring learning and development to the needs of individuals. It also represents an opportunity to integrate
the innovative and technological advances offered by online learning with the interaction
and participation offered in the best of traditional learning (p. 104).

Utilizing Blended Learning in the classroom assists educators in successfully adapting
learning for students through different, more innovative, means to deliver the curriculum.
According to Stein and Graham (2014), “Educational research suggests blended courses are
more effective compared to both face-to-face and online” (p. 15). A 2009 report on 51 empirical
studies, comparing online education with traditional face-to-face courses, concluded that
combining online and face-to-face instruction created a greater educational advantage for
students (Stein, J., & Graham, 2014). If Blended Learning creates greater educational
advantages, educators need to look more deeply at what method and devices would be best
utilized in a face-to-face bricks and mortar primary classroom when applying this delivery
model.

**Considerations to Blending the Primary Classroom**

**Devices and screen time.** Technology brings with it a level of skill, dexterity and
patience most primary students have yet to achieve. According to Neumann and Neumann
(2017), “Unlike personal computers that require more complex fine motor skills to operate, the
intuitive touch-based interface of tablets make them easy to use” (p. 204), allowing even young
students the opportunity to interact with and learn through technology. Most educators would
agree that it is not an ideal situation for young primary students to be in front of screens for long
periods of time. The time spent on devices must be thoughtfully considered to ensure students
are engaged in active vs. passive screen time.

In their paper titled, “Active Versus Passive Screen Time for Young Children,” the
authors describe active screen time as time spent engaging in either cognitive or physical
activities such as video games or homework. Whereas, they describe passive, sedentary screen
time as watching television or videos (Sweetser, Penelope, Johnson Daniel, Ozdowska Anne,
2012). The authors go on to state, “there is a substantial body of research that illustrates the
benefits of Active Screen Time in terms of cognitive skills and development” (p. 96). With this
information in mind it is important that students are exposed to different technologies that allow
for active screen time that enhances their learning. The benefits of active screen time and
allowing students to work at their own pace or level, needs to outweigh the negatives associated
with passive screen time. The Station Rotation model of Blended Learning affords the educator a
well-balanced amount of active screen time, which benefits the learner, engaged in these digital
learning experiences.

Station Rotation Blended Learning model. The Station Rotation model seems the
obvious choice for adapting the face-to-face primary classroom setting. Many traditional
classrooms already have a similar form of rotations minus the technology rotation. With a
Station Rotation delivery model, students would be accessing individually levelled online
content for approximately 15-20 minutes during the technology rotation aspect.

A case study of the Station Rotation model in a third grade classroom suggests five
lessons for future educators to consider when implementing Blended Learning into their face-to-
face classroom. These five suggestions include giving yourself permission to make mistakes and
learn from those mistakes, to be flexible, to start small, and to not worry about blending every
subject, every day, to remember that teaching a whole class lesson is needed sometimes, and to
collaborate with other Blended Learning educators (Truitt, 2016).

There are many additional considerations educators need to examine before
implementing a Station Rotation Blended Learning model into their practice. Before introducing
technology into classroom rotations we need to consider the benefits and challenges that we may face when blending a primary face-to-face classroom using a station rotation model.

The Pedagogical Benefits and Challenges to a Station Rotation Blended Learning Model

The benefits. There are four key benefits to implementing the Station Rotation model in a primary classroom. The first benefit is that it frees up the educator and allows them to work on targeted skills, with small groups of students. Secondly, it allows students to work at their individual pace mastering skills and creating more engagement with their work. Thirdly, it allows for student creativity by engaging with different technology applications and finally, it allows for flexibility of student movement within the different rotation groups depending on their prior knowledge and strengths of a topic (Casey, 2016).

The challenges. With any new idea that we bring to the classroom to make learning more accessible, and engaging, we must be aware that there will also be challenges. Challenges are not necessarily negative however. Armed with knowledge of possible challenges prepares the educator and allows time for them to face these challenges head on. Some challenges encountered in a study of a fourth grade class were technology applications not working properly or technology updates interrupting the learning during a rotation, off task behaviour of students during the independent technology rotation and, the noise level in the classroom in general, and particularly, while transitioning from station to station (Casey, 2016). While these create an added stress for teachers in regards to classroom management, they don’t outweigh the benefits of implementing a Station Rotation model in a primary face-to-face classroom.

Routines and relationship building are essential to help address these challenges. A study conducted in primary classrooms at the beginning of the school year found effective teachers build relationships and routines with their students, which teaches students how to be self-
regulated learners (Bohn, Roehrig, & Pressley, 2004). Building routines and expectations not only around classroom culture and expectations, but also around the use and expectations around technology is imperative. Once these expectations and routines are formed, educators will have the tools necessary to begin personalizing reading (or other instruction) for students engaging in a Station Rotation model.

**Personalizing Reading Instruction for Primary Students**

What exactly do primary teachers want to improve for their struggling to read students? What is missing for these students that is a barrier to their learning and engagement? Many students lack the very basic reading skills such as the ability to rhyme, identify rhymes, hear and say phonics sounds, and blend sounds to create words. Would students advance in these areas if they were given the opportunity to have targeted small group, teacher led lessons, complimented with specific skill development through the use of technology?

One study, conducted over two consecutive school years using iPads with the lowest reading group of first graders, found students made elevated average gains, increases in time-on-task behaviour, increased engagement when using targeted reading skills and improved reading skills overall (Burns, Larabee, & Jennifer, 2014).

Similarly, a group of four kindergarten students using a computerized tutoring program focusing on letter sounds resulted in improvements in letter sound knowledge and fluency. The authors state, “educational technologies may work best as supporters and facilitators of quality reading instruction rather than replacements for teaching” (Burns et al., 2014, p. 452).

Another study used a Computer-Assisted Learning (CAL) program, Accelerated Reader (AR), where the study results confirmed that computer-assisted learning had a positive impact on elementary students’ reading achievement. The study noted that students who engaged in the
CAL reading program had greater learning gains than that of their traditionally-taught peers (Shannon, Styers, Wilkerson, & Peery, 2015). This demonstrates the need for a Blended Learning model, like Station Rotation, for meeting the targeted needs of primary students. Using a Station Rotation model to personalize reading instruction sounds like a direct-route to meeting individual student needs, but there are barriers to implementing a Blended Learning program that need to be considered.

**Barriers to Implementing a Blended Learning Program**

There are always barriers to implementing any new or different way of teaching, but if we identify and arm ourselves with background knowledge the barriers become less obstructive, and more like minor hurdles to clear. In ‘Knocking Down Barriers’ the authors identify two main barriers for the face-to-face elementary education system to consider before implementing a Blended Learning program. These barriers include the redesigning of teacher roles and the purchase and management of the technology and infrastructure (Horn, Gu, & Evans, 2015).

Traditionally, teacher roles in the elementary classroom include teaching all the subjects areas to their entire class of students. For Blended Learning success, this may need to develop into a more cooperative teaching model with more open spaces and multiple teachers supervising the learning (Horn et al., 2015).

Another barrier faced by educators wanting to begin a Blended Learning program is that of technology and infrastructure. Funding is always an issue in education and implementing technology brings with it the need to purchase and manage technological devices and infrastructure. Educators need to advocate the benefits that technology brings to the personalization of student learning. When the powers that be have a clearer understanding of these benefits they are more apt to find ways to implement. This could be as simple as looking to
other districts already doing something similar to what they envision, allowing students to bring their own device and only providing devices for those students who do not have one, and finally looking at outside funding and or grants that can be applied for in order to get started (Horn et al., 2015).

**Conclusions**

Technology is a huge part of everyday life in the 21st Century. New applications and devices are being created almost daily to seemingly enhance and improve our day-to-day lives. Just as students today are not like those of thirty years ago, nor should the education system stay the same as the model developed during the industrial revolution. Technology is, and should be, playing a new role in the education of students today. One of the positive aspects of technology is its role in facilitating a more personalized education for individual learners. Students are not all the same, and therefore their educational programs should not all look alike. Every student should be given the opportunity to learn and grow at his or her individual pace. Utilizing a Station Rotation Blended Learning model in the primary face-to-face classroom supports this personalization. As the 20th Century educational reformer John Dewey (n.d.) stated, “If we teach today’s students as we taught yesterdays, we rob them of tomorrow.”

British Columbia educators need to understand what, and how, technology can reform the education system for the 21st Century. They need to be advocates for technology and Blended Learning models in order to meet the government’s mandate to personalize student learning and promote critical and creative thinking, collaboration and communication (“BC’s New Curriculum,” n.d.). As Stein and Graham (2014) contend, “using connected mobile tools such as Smartphones, tablets, and laptops, we purposefully “blend” physical and online activities to create optimal experiences” (p. 9). Together with technology we can meet the needs of all
students and personalize the education system in support of the ‘educated citizen’ described in the new curriculum.

The findings of this comprehensive literature review will be applied to the design and development of my Master of Education in Educational Leadership (MEdL) Major Project as presented in Ch. 3 of this Process Paper.
Literature Review

Primary BlendED — Writing

Introduction

In my face-to-face primary grade 1 and 2 classroom, I have been interested in looking at how mobile technology can support my beginning writers. In researching my Critical Challenge Question, “How can a Blended Learning model be applied to facilitate personalization of writing instruction for primary students?” I have found that there is some literature to specifically support Blended Learning in a primary face to face classroom, but many gaps still exist. In this literature review, I investigate how technology can support writing in a face-to-face classroom which also engages a Blended Learning delivery model.

It seems as though blended delivery is still a topic that challenges the beliefs of many educators. Education is changing. It is changing at a rapid pace, and not everyone is ready for the changes that need to come. Today’s students are not the same students as in the past who were dependent on teachers and parents to directly deliver information or knowledge. Students are now using iPads, iPods, Smartphones, computers and software programs in every aspect of their lives, (Alkhamis, 2015). To keep our students engaged, and to prepare them for their futures, educators must be willing to embrace the changes in education and pedagogy. Technology is evolving at such a rapid rate, and we need to evolve our teaching styles alongside this shift. Technology and mobile devices can play a key role in our teaching and in our students learning. These tools can be used to effectively support a blended delivery model.

The Change Towards Blended Learning

Change in education is coming, and not everyone is ready for it. Our culture of teaching and learning is a deeply embedded ideal, often defined by how we were taught — it is all we
know, after all (McLeod et al, 2014). Technology in education is becoming a new reality, and students in the 21st Century are benefiting from the positive change it brings. Blended Learning and the use of technology in primary classrooms, is still a very new concept. To have a blended model work in a primary classroom it will be essential to understand what Blended Learning is. Blended Learning has a two-part definition. (Horn and Staker, 2012) explain that

Blended Learning is a formal education program in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path, and/or pace and, at least in part, at a supervised brick-and-mortar location away from home (p.3).

**Elements of Blended Learning.** The two elements of Blended Learning that are essential for any program are: student control over path and pace; as well as being present in a classroom for part of the students’ learning. What students learn online must influence what they learn face-to-face, and it is necessary for the teacher to be involved and be tracking (through the online program’s teacher feedback feature) what students are doing at home so that they can support and scaffold students learning at school. This could facilitate a teacher sharing a program with students that they access at both home and school— where the teacher is provided formative feedback as to how their students are progressing via questions within the program. (Horn and Staker, 2012) state that someone associated with the brick-and-mortar setting provides the supervision for online learning, rather than a parent or other adult. Teachers are still essential to a successful online or Blended Learning program. Blended Learning, as a whole, looks different in many settings. Teachers can apply a blended model of learning to many face-to-face classrooms given the appropriate amount of technology and structure is in place to support this delivery option.
Thibault et al., (2015) found that the connections among agents and tools in a Blended Learning environment are rich and diverse, enhancing the process of distributed cognition across its elements. Blended Learning can be a beneficial practice for both the educator as well as the learner as Blended Learning leads to personalization in education. To effectively blend a face-to-face primary classroom, it could be beneficial to implement a Rotation model of education in a face to face classroom.

The Rotation Model

A Rotation model is a model that best supports a blended face-to-face classroom. (Horn and Staker, 2012) define a Rotation model – as, “a program in which within a given course or subject (e.g., math), students rotate on a fixed schedule or at the teacher’s discretion between learning modalities, at least one of which is online learning” (p.8). Teachers are able to personalize learning for students and this will ensure that student centered learning is at the forefront of all learning opportunities. Using a Rotation model, teachers with student-centered beliefs can integrate technology in the classroom in more student-centered ways (Ertmer and Ottenbreit-Leftwich, 2010). In a primary classroom, Blended Learning can be applied to have students working in a Rotation model, where they are in a classroom every day, but where they still have choice over time, place and pace of their learning in a specific subject area. This control of time and place may have students choosing which days of the week they use technology.

A Rotation model would support a primary classroom that is using mobile technology such as iPads or a class set of Chromebooks. Mobile learning eliminates the need to have special dedicated computer labs and offers teachers full freedom to let students work with online applications whenever they need to (UNESCO, 2010).
**Station Rotation model.** Specifically, within the described Rotation model, a Station Rotation approach is the most practical application of Blended Learning in a primary classroom. A Station Rotation model is a Rotation model implementation where a given course or subject (e.g., Math) has students rotate on a fixed schedule, or at the teacher’s discretion, among classroom-based learning modalities. The rotation includes at least one station with Internet access for online learning, (Horn and Staker, 2012). Using a Station Rotation model would support the learning that is already taking place in most primary classrooms. Students are accustomed to seeing the Station Rotation approach, so if teachers are utilizing that model and implementing technology rotations, students would be gently scaffolded into using technology. Before we can let students begin to delve into the technology and applications that we want them to be using, students need to be informed about digital citizenship and internet safety.

**Digital Citizenship and Internet Safety in Primary Classrooms**

The Internet can be a large, formidable open resource. It can be a source of anxiety for educators when they start to use a Blended Learning model. Wohlwend (2009) emphasized that understanding technology has become an important preparation for life. When we, as educators, choose what technology to bring into our classrooms, and also our students lives, we must be mindful to choose programs that are safe and that support our students in being informed digital citizens. All too often we hear of students who have used the Internet in a negative way, for example, bullying other children using social media. It is important to instill early on, a set of values and beliefs around being responsible digital stewards. As primary classrooms typically form class sets of beliefs and values, we can build from the values and classroom guidelines that we already have in place and apply them to online classrooms or content.
Children need to be taught that what they share online stays there. They need to be informed that they are responsible for what they put out into the networked world. They also need to know that the Internet is not always safe, and that there are things we can do to protect ourselves amidst a technology-infused world. The current generation of students was born into a society where technology is ubiquitous, and this generation is very familiar, and comfortable, with technology (Alkhamis, 2015). This level of comfort can sometimes lead students into a false sense of security. When using technology with students, it is important to be aware of what they are doing with their mobile devices as well as constantly leading by example as to how they should behave when they are using Internet-connected mobile devices. When teachers evaluate and select the apps and programs that students use, they need to be aware of the specific purpose and be making the best decisions that they can regarding suitability and appropriate use. Educators should be testing the programs before implementing them with a class so that they can see where some of the challenges may lie.

**Personal Writing, Story Writing and Mobile Devices in Writing**

Mobile learning needs to be understood as an emerging repertoire of learning and teaching practices rooted in the belief that interaction and collaboration within a traditional classroom are often not as effective as they could be (UNESCO, 2010). Mobile devices will enable students to collaborate and interact with one another in new ways. For example, students can use devices to work collaboratively to create stories. Paul (2016) states that his general guiding principle is “to use handwriting to process and digital tools to create and demonstrate” (paragraph 8). Utilizing mobile devices to create edited books using applications such as Book Creator or Pictello are great ways to showcase student’s writing in a non-traditional manner. Mobile devices can be utilized for students within a pre-existing writing program. A Rotation
model can be employed, whereby students share a device with a partner, or they work on devices during specific teacher-chosen days. Mobile devices will enable students to stretch themselves, and express themselves in many new ways that are not accessible to them without technology available in classrooms.

Bratitsis et al., (2012) reported that computers attracted students’ attention and provided strong motivation for lengthened engagement in the story writing process. Traditional story writing can be very challenging for primary students, but mobile technology can offer an alternative to traditional paper and pencil writing. Students can illustrate, use pictures or videos to animate and enhance the stories they have written. For primary students in particular, it can be very difficult to record ideas on paper. Technology could be used to-document students’ brainstorms as audio recordings to listen back when they need new ideas—like a digital brainstorm. Young children often become frustrated with the difficulties they encounter as they attempt to record their ideas on paper (Christensen, 2017). It is important to remember that students of all abilities need access to learning tools that work for them. Mobile devices are one way for students to access writing even when they find writing challenging.

**Access for Students with Special Needs—Assistive Technology**

The use of mobile devices in primary classrooms directly improves student agency, engagement and motivation. Mobile devices support the accessibility of content for all learners. Levy (2014) explained that iPad's act as a translation, communication, and individualization tool with unrivaled effectiveness. In so doing, these devices reduce frustration, build confidence, and, well, just *work* in teaching students the skills they need to learn to thrive.

Students with disabilities will benefit from having alternate ways to learn, explore and then demonstrate their understandings. Mobile devices support students working together, and
cooperatively. Students can work together as they dive into new content and apply what they’ve learned in the classroom (Burns, 2018). The goal of the educator is to always reach our students at both ends of the learning spectrum, and mobile devices and assistive technology make that possible. One of the most important things that we gain from mobile devices and technology in the classroom is that we now have the ability to ensure that all students receive the type of educational experience they need, at the time they need it (McLeod et al, 2014). Being able to personalize our student’s education and ensure that they are getting what they need, when they need it is a huge challenge for teachers who already feel they are spread too thin. Teachers cannot always be everywhere they are needed, and it is comforting to know that students can be working at their own pace despite whatever else is happening in the classroom. Mobile devices also support communication between learners, as well as with the teacher. By attending to the needs of learners with disabilities, learning provision is also improved for those who have hidden disabilities and those who learn more effectively when material is presented in alternative ways, (UNESCO, 2010). In short, educators are able to reach all of our learners by engaging mobile technologies.

Mobile devices make learning accessible to all learners and there are many practical ways in which m-Learning supports diverse learners. UNESCO (2010), mentioned tools that can be used, such as dictionaries downloaded to mobile phones or game consoles, that are helpful as reference tools for learners with dyslexia and other learning challenges. Text-to-speech conversion and voice recognition are also helpful for students who may have written output challenges. In having assistive technology available for our students who need it, we are ensuring that students class time and learning experiences are meaningful for them. Universal design for learning is also a concept that lends itself to meaningful learning for individual students. When a
teacher can plan with the “the three principles of UDL: Provide multiple means of engagement, provide multiple means of representation, provide multiple means of action and expression” (CAST, 2014) pg. 59, they will be planning for the needs of all students. The guidelines would be used to evaluate and plan goals, methods, materials, and assessments for the purpose of creating a fully accessible learning environment for all (CAST, 2011). Technology can be used to reach all of our learners, and it can also be used to engage our students who are needing an extra challenge in their learning experiences.

**Technology as a Way to Extend Learning for Writers**

Mobile devices and m-Learning are ways to extend student’s learning and writing. Geist (2011) noted that the iPad is a useful tool for elementary students because it “allows children to manipulate objects in a natural way with little adult intervention” (p. 765). Students who struggle with written output may succeed with little adult support when using an iPad. Students can use multiple programs in order to extend or support their writing. Apple has iMovie, which can be used to create movie trailers. Students can use this app to create a movie trailer for a book, or a story that they have written.

Research shows that online programs used at school need to be ones that can also be accessed at home. When students have access at home as well as at school, they are more likely to continue to write at home—as well as stretch themselves as they can take risks at home when they may have support from adults as well as privacy from peers. Recently, two studies that separately followed fifth and eighth graders who used tablets for learning in class, and at home, found that learning experiences—including writing—improved across the board (Lynch, 2017). This is important to note, as students who are able to access content at school and at home saw improvements in their writing. When we can provide learners with apps and programs
to use at both school and at home, they are able to independently practice needed skills without direct instruction from the teacher.

Students need visual stimulation, which could be facilitated by apps, as well as other means, to creatively express themselves. Writing can be enhanced by visual depictions facilitated by easy to use apps. Book Creator, Pictello, and Explain Everything are three iPad apps that are very well rated in terms of accessibility and ease of use for primary students. These apps can be used to brainstorm, plan, write, as well as showcase written work. These apps lead to student’s increased engagement with their work, as well as giving students alternative ways to present their learning.

**Assessment for and of Learning**

Students have opportunities to show their learning in alternative ways when they are able to use mobile devices. Students are able to work from their own strengths, as well as having the ability to show their learning in multiple ways. Alternate assessment tools can be employed to present learning in a variety of ways. According to the BC Education Plan,

Students, teachers and families will benefit from more flexibility and choice with respect to how, when and where learning takes place. This means schools must have flexibility to design learning opportunities that really work for students and boards of education need the latitude to organize programs that extend beyond the typical school and classroom format (p.10).

This could have students using iMovie to show a video trailer that they have created for a story they wrote, they could use Pictello to voice over pictures and scenes that they have made—*telling* a narrative story instead of writing it. Students will become activated learners through using iPad technology, while discovering their own skills, and feeling more successful and in
control of their own learning. They may become more motivated to learn simply by choosing, and playing, their own educational games (Geist, 2011). Hung, Hsu, & Rice (2012) suggest that when using online programs, information stored in learning management server logs can provide a very rich source of data for investigating actual learner behaviors—something that is typically very difficult to do in face-to-face environments. Educators can then use this data to inform their teaching. Mobile devices provide rich assessment for and assessment of learning. These opportunities will support teachers in stretching their learners and providing rich and meaningful learning opportunities for their students. Teachers using alternative means of assessment are able to assess students from an asset-based model rather than a deficit-based model where each student has to represent their learning in the same way.

Conclusions

My research into how to use Blended Learning to support writing has resulted in some key learnings. These include the fact that the two elements of Blended Learning that are essential for any program are: student control over path and pace; as well as being in a classroom for part of their learning experience.

Students of all abilities will be supported by a blended classroom utilizing mobile devices. It is important to remember that students of all abilities need access to learning tools that work for them. Mobile devices are one way for students to access writing even when it could be a learning opportunity that they find challenging. By having assistive technology available for our students, we are ensuring that students’ class time and learning experiences are personalized and meaningful for them.

Educators need to try and bridge the gap between what happens at home, and the learning that happens at school. When students have technology access at home as well as at school, they
are more likely to continue to write at home— as well as stretch themselves by taking risks within a secure space. By using mobile devices to present their learning, students are able to work from their own strengths, as well as having the ability to showcase their learning in multiple ways. Teachers are therefore able to assess students from an asset-based model rather than a deficit-based model where each student has to represent their learning in the same way.

The findings from this comprehensive Literature Review will be applied to my major project design and development as presented in Chapter 3 of this Process Paper.
Literature Review

Primary BlendED — Numeracy

Introduction

Schools were originally designed for the industrial age when most students leaving high school entered factory jobs. In today's world, graduating students will be applying for jobs that require a greater knowledge and skill set than their predecessors. We are now in the information age where, with technology, knowledge is at everyone's fingertips. With the demand for 21st Century skills in the workplace, our education system needs to change in order to produce “well-educated citizens who are able to think critically and creatively and adapt to change” (“Curriculum Overview | Building Student Success - BC’s New Curriculum,” 2018, para. 8).

Students don’t learn at the same pace; this attribute even varies from subject to subject (Horn and Staker, 2015). We all have different aptitudes and bring different prior knowledge to each learning experience. This affects the speed of knowledge retention as well as how we gain knowledge. The new BC curriculum sees personalization as a way of ensuring all students’ diverse needs are met and students achieve their full potential. Through high quality and engaging learning opportunities, flexible timing and pacing, and with tailored learning supports that meets students’ needs (“Curriculum Overview | Building Student Success - BC’s New Curriculum,” 2018).

One way to personalize learning in a primary classroom, which typically has an adult to child ratio of 1:22, is to use a Blended Learning delivery model. This practical application led to my Critical Challenge Question ‘How can a Blended Learning model be applied to facilitate personalization of numeracy instruction for primary students?’ which will be addressed by this literature review.
This literature review will define Blended Learning, reveal which model is best suited in primary education and examine the challenges and benefits of implementing a Blended Learning model in a face-to-face classroom. It will explore what is essential to personalize numeracy in a face-to-face classroom as well as, consider the current research to determine what mobile devices and apps might help to facilitate the study of Mathematics for primary students. Lastly, the literature review will explore the correlation between the rotation model and achievement in Mathematics in the primary classroom.

What is Blended Learning and Which Model Works Best for Primary Students?

Blended Learning is the mix of face-to-face instruction with online learning components. Horn and Staker (2015), define Blended Learning as “any formal education program in which a student learns at least in part through online learning, with some element of student control over time, place, path, and/or pace” (p. 34). The face-to-face aspect takes place in a school or learning center that is away from the student’s home. Both learning environments work together to provide the students with an integrated learning experience. Horn and Staker present four main types of Blended Learning models that are currently being used in various educational settings. These include: the Rotation model; Flex model; A La Carte model; and the Enriched Virtual model.

Face-to-face schools are moving toward a more hybrid model in “an attempt to deliver ‘the best of both worlds’— that is, the advantages of online learning combined with all the benefits of the traditional classroom”(Christensen, Horn, & Staker, 2013, p.5). The hybrid models that appear to work best for teachers of primary students, wanting to begin using Blended Learning are the Rotation models where “students rotate— either on a fixed schedule or at the
teacher’s discretion—among learning modalities, at least one of which is online learning” (Horn & Staker, 2015, p. 37).

“One of the key reasons why teachers and schools should consider blending is for the ability to better support different types of learners” (Oliver & Stallings, 2014, p.7). In Mathematics, not all students are learning at the same pace, therefore one lesson cannot possibly address all student needs. Using a Station Rotation approach would allow the teacher to work with smaller groups, while others would be able to work independently on their individual assignments using technology. Research demonstrates that “practicing with the computer increased students' academic engagement rate while allowing for teachers to provide direct instruction to small groups” (Schoppek & Tulis, 2010, p. 10). Using the Rotation model in our face-to-face classroom would allow teachers to help personalize instruction for all learners.

**Challenges to Implementing a Station Rotation Model in a Primary Classroom**

Despite the advantages that a Station Rotation model, that incorporates mobile devices, offers both over face-to-face instruction and fully online instruction, there are still some barriers to implementing it at the primary level. The most notable challenge is the lack of digital fluency on the part of both the teachers and students (Mirriahi, Alonzo, & Fox, 2015, p. 11). Professional development time is needed for teachers to effectively implement a Blended Learning environment. This is deemed important as “research reminds us that changing the medium or modality of instruction requires more than just new technology, but also new attitudes and skillsets” (Laura Kassner, 2013, p. 12). It also takes more time to plan a Blended Learning course than a face-to-face course (Oliver & Stallings, 2014). Teachers must take on the role of an instructional guide versus the traditional deliverer of content.
Primary students also need to learn proper digital skills in order to be successful in a Station Rotation approach. In Kenney and Newcombe’s (2011) study they found, “one weakness of the approach mentioned by the students was the difficulty of learning on their own and not being able to immediately ask questions if they were unsure about the material” (p. 9). When working with primary students, it is necessary to scaffold both the technology skills as well as the concept learning skills when designing a Station Rotation program. “Blended teaching presents the content in an attractive manner, due to the various effects, which enables meeting the different levels of the students, and designing activities which are appropriate to the real levels of the students” (Yaghmour, 2016, p. 7). Many primary blending models make use of peer tutors where students are often helping each other during their technology station. Catherine Attard (2013) notes, the lack of having a 1:1 ratio of iPads per students encourages sharing and “sharing promotes reasoning and supports the development of mathematical language” (p. 39). Understanding the benefits and challenges of implementing a Station Rotation model, primary educators need to consider what the essential components are to personalize numeracy instruction in a face-to-face classroom.

**What Considerations are Essential to Personalizing Numeracy in a Face-to-Face Blended Classroom?**

**Pedagogy to support primary Mathematics instruction.** Research on effective Mathematics teaching is based on the constructivist learning theory where students build or construct their knowledge from experience and previous understandings (Simon, 1995). As educators we need to be able to access where students are at, in order to provide activities and problems that are at their level of understanding. Students then can access their prior knowledge to construct new meaning. Students need to be active in this process and the teacher is more of
the guide, allowing the students to construct their understanding. Del & Diaz (2017) state, that students need to “master the basic strategies of computation using them in different contexts” (p. 3). Using a Blended Learning model allows students to progress at their own speed and develop mastery of these skills. The 20th Century psychologist Lev Vygotsky argued that for optimal learning to occur students need to be in the zone of proximal development (McLeod, 2012).

Using a Blended Learning Station Rotation approach allows teachers to work with smaller groups to promote this optimal learning environment for all students.

**Personalized learning.** A variety of considerations need to be addressed in order for personalization to happen in the primary classroom. To personalize Blended Learning, Hunsinger- Hoff (2016) states, “personalized learning can’t be realized unless teachers know their students well—their interests, their prior experience and learning, and what motivates them” (p. 3). The author suggests using the first few weeks of school to get to know students by providing them with personal surveys and presenting technical activities that allow the teacher to get to know each student as an individual. These mini lessons should be two-pronged in the sense that you teach a concept as well as provide technical lessons. Not only do teachers need to learn about student’s interests and prior knowledge, they also need to learn how their students view themselves as learners. The author goes on to state

> It is indeed empowering for every student to know that they are smart in some, usually several, ways. Empowering students by guiding them to discover and take pride in their strengths, as well as acknowledge and accept their shortcomings as opportunities can set the stage for a year-long quest in the classroom when intelligences are recognized and celebrated (Hunsinger-Hoff, 2016, p.7).
Mastery learning. To fully personalize learning educators must allow students to master skills in a content area (Horn & Staker, 2015). This is especially important when learning Mathematics, as students need mastery of sub skills in order to fully grasp higher skills. In typical face-to-face classrooms the time needed to develop mastery skills is simply not available, which often creates frustration for students who are not ready to move on to more advanced skills. Yaghmour, (2016) states that one way Blended Learning addresses this is through repetition.

one of the most important features of Blended Learning, and one of the factors which contribute to its success, because it enables learners to receive the same message from several sources, in different forms and at different times (p.2). Kenney & Newcombe (2011) encourage teachers to take time to decide what should be delivered online and what should be taught face-to-face in the Blended Learning classroom. They advise teachers “to make sure that the two components are blended or integrated thus complementing each other” (p.6). What Mathematics the teacher delivers online must review and assess their understanding of what Mathematics is taught face-to-face. It is imperative that the apps and programs have assessment tools built in that can provide the teacher with information as to what concepts students are grasping and what may need further instruction. This personalization would ensure that their level of instruction was ‘just right’ in making students feel successful. In Mathematics students don’t often grasp concepts the first time therefore “Blended Learning is more compatible with the pace of the student, which enables it to improve the achievement of the students” (Yaghmour 2016, p. 8).

When student-centered learning is done well, it creates a sense of student agency and ownership for their progress and helps them guide their own learning. This helps students to
develop the learning skills needed to be successful “in today's rapidly changing world, in which knowledge and skills become outdated quickly” (Horn & Staker, 2015, p. xxvi).

Many students are more motivated to complete their work by using technology as it is perceived by young children to be fun and engaging. A study of first year primary students found that “70% of the students consider that learning is easier when educational software is used” (Zaldívar-Colado, Alvarado-Vázquez, & Rubio-Patrón, 2017, p. 8). Since using technology is very motivational what devices are best suited for primary students?

**What Devices Can be Used for Implementing Blended Learning?**

Research has shown that the use of mobile devices in primary classrooms directly improves student agency, engagement and motivation. Mobile devices increase the accessibility of content for all learners. Levy (2014) explained that, “iPads act as a translation, communication, and individualization tool with unrivaled effectiveness. In so doing, these devices reduce frustration, build confidence, and, well, just *work* in teaching students the skills they need to learn to thrive” (para. 1). Additionally, students with disabilities benefit from these alternative ways of learning and exploring which also provides them a supplementary way to show their understanding.

There are many advantages to using iPads in the classroom. “Devices within school environments is their ready access to the Internet and other resources, longer battery life, size, and a short learning curve” (Crichton, Pegler, & White, 2012, p. 29). iPads are portable and can be used in a variety of settings. Overall, iPads with their touch screens are the most desirable mobile device to be used in primary classrooms. They’re intuitive nature using icons makes navigating apps and websites more manageable for the younger learner. When educators choose
apps for their students they need to take into account the design, versatility and the educational benefits.

**What Apps and Websites are Best Suited for Primary Students?**

**Design principals.** Ease of use needs to be addressed when choosing an app or device for our young learners. “Educational software in general should be easy to use, intuitive, interesting, and, of course, effective in producing learning in students” (Zaldívar-Colado et al., 2017, p. 5).

Teachers need to consider choosing apps that have clear, direct instructions for students, as primary students can be distracted when apps are not straightforward. Apps that use audio are also very important. Zaldivar-Colada et al. (2017) express that given that first-year primary students still do not read well in general, it would help them to concentrate if the educational software gives students instruction through audio, and if students can answer either through audio or through clicking on displayed options ( p. 10).

Another consideration when choosing Mathematical apps and websites for primary students is whether the program builds in the scaffolding skills. When choosing apps for Mathematics, you want to be cognoscente of how the app will help provide the instructor with information on individual student progression and understanding. This information will help guide the instructor as to what to review or teach them next. Many apps have built in diagnostics and will adjust the assignments according to the student’s unique skill development. This allows the students to work “on problems requiring skills that are in the associative phase of their development which is efficient because no student is forced to practice procedures he or she has not yet understood or procedures that are already automatic” (Schoppek & Tulis, 2010, p. 3).
This embedded assessment tool “frees teachers from the mundane tasks of grading rote items and provide immediate feedback for students and parents” (M. West, 2013, p. 7).

**Evaluating apps and websites.** Haelle (2017) suggests filtering apps using the following five key questions. Does it promote active mental engagement (thinking, predicting, questioning, drawing connections, and reflecting)? Will it help focus students learning without having distractions built into the app? Does it scaffold learning? Is it interactive and provide either feedback through the teacher or app? Does it clearly define objectives that can be tracked and assessed by the student or teacher? Given these five key questions educators can make knowledgeable choices when selecting appropriate apps for primary Mathematics instruction.

Apps that are recommended for use in personalization are apps that allow students to show what they know and provide teachers insight into how they approach and solve problems, which “enables teachers to see explicitly how children’s brains work differently” (Hunsinger-Hoff, 2016, p. 6). Websites and apps that enable teachers to create customized surveys for students, which provide insight into multiple intelligences, as well as finding students’ motivations and interests are valuable because of their ability to gather information as well as assessment, making them great additions to a Blended Learning classroom.

**Choosing Mathematic apps for primary instruction.** Mathematical apps that work well with primary students allow the teacher to create assignments and have students’ progress at their own pace once they have mastered the previous concepts. These programs need to provide teachers with diagnostic data on individual student understanding. They also need to provide students with immediate feedback and teachers with ongoing assessment, which helps guide the face-to-face small group instruction. These apps also allow students to progress beyond their grade level providing challenges and reducing boredom that they often experience in a traditional
face-to-face classroom. Educators know that when students are working in their ‘zone of proximal development’ they are more likely to achieve Mathematical fluency.

**Correlations Between Blended Learning Rotation Models and Achievement**

There are many advantages to Blended Learning including increasing student information literacy skills, self-regulation and time management skills, self-monitoring of progress due to increased teacher and/or system feedback, motivation and opportunities to work at one’s own pace and allowing for increased understanding (Oliver and Stallings, 2014). In a study of third grade students using a Rotation Model in math twice a week showed “that even a moderate amount of individualized practice was associated with large improvements of arithmetic skills and problem solving, even after a follow-up period of 3 months” (Schoppek & Tulis, 2010, p. 2). This extra practice time allowed students to solidify skills in their associative level which allowed students to master a skill before moving on. This skill acquisition is not a short-term gain as demonstrated in another study of first grade students using educational software in Mexico, which showed positive benefits after a year (Zaldívar-Colado et al., 2017). In another study, Yaghmour (2016) also found using a Blended Learning approach demonstrated statistical difference in student achievement in grade 3 mathematics (Yaghmour, 2016). Evidence that support these findings include individualization, skill practice at ‘just right levels’, smaller group instruction and student’s ability to achieve mastery before moving on.

An additional study with positive results showed eighth graders using Mathematical software to support their Blended Learning. This study also found “that students who experience greater achievement in a self-paced blended course have more positive attitudes toward Mathematics at the end of the course” (Balentyne & Varga, 2017, p. 67 ). Although this study was conducted with older children, the correlation between achievement and attitude is also
something to be aware of when teaching younger students. Educators need to ensure students feel good about themselves at an early age and if there is a way of encouraging and promoting a positive attitude towards Mathematics, then they need to follow those suggestions.

**Conclusions**

An educational shift towards incorporating technology in face-to-face education is needed to better meet the needs of all students and provide them with the skills necessary to be successful in the 21st Century. Through my research I found Blended Learning to be an effective way to engage our students, while providing instruction and learning on a personalized, individual basis. The educator benefits by receiving instant feedback on the students’ progress, and the ability to observe the learners’ performance and needs which, subsequently provides information to support small group instruction. Blended Learning allows students time to master skills before moving on - it puts them in their optimal zone for learning where the level of difficulty is ‘just right’. This in turn makes all learners feel successful and helps develop a positive attitude towards their Mathematical abilities. Students are also more motivated to spend time working through problems, as using technology aligns with what is happening in the technology-enhanced world outside of school.

Blended Learning may not be the solution to all of the problems that our education system faces but it allows students flexibility in the way they learn Math. Technology allows students to have access to lessons and resources from online databases, as well as providing them with an avenue to review and practice material independently. Most importantly it allows students to master Mathematical skills while working at their individual pace. Blended Learning meets the focus of the new BC curriculum as it provides “flexible teaching and learning, and an
emphasis on building a strong foundation of mathematical understanding and

skills” (“Mathematics | Building Student Success - BC’s New Curriculum,” 2018, para. 4)

Overall, Blended Learning is an effective way to personalize numeracy in our face-to-face Math classrooms. The research returned little information on how Blended Learning might open communication between home and school. This leaves me to wonder if parents are more aware of what and how their child learns when engaged in a Blended Learning program?

The conclusions drawn from this comprehensive literature review will be applied to the major project design and development as presented in Chapter 3.
Chapter 3- Major Project Design

With the ever-growing expectation of personalized learning it is imperative that teachers look for ways to individualize student learning. This can be a very difficult feat with large classes of 20+ students to one teacher. Searching for ways to accomplish this lead me to look at how technology could be utilized in the primary classroom to support individual student learning. This search lead to me to my critical challenge question, *How can a Blended Learning model be applied to facilitate personalization of reading instruction for primary students?* This journey led me, along with two colleagues Carla Takach and Danica Farrell, to Blended Learning using a Station Rotation delivery model, which gives the primary face-to-face educator the ability to personalize learning for their students. The Major Project was co-created with two colleagues in order for us to create a cohesive website for other elementary primary teachers. A destination or toolkit to access information and resources about implementing a Station Rotation Blended Learning model into their practice. The Primary BlendED Weebly website essentially contains materials for three distinct projects in different subject areas. The three of us wanted to create an easily navigated space where face-to-face primary teachers could begin their own journeys, no matter how big or small, in blending 1, 2 or 3 subject areas into their practice. It is our goal to maintain and expand on our existing major project build, and to invite other teacher colleagues to provide their experiences and materials in order to continue creating an essential hub for the 21st century primary educator.

Major Project Development

One of the important aspects that all three of us collaborating on the build could agree upon was the importance of creating a clean, uncluttered and easily navigated website. During the beginning of July 2018 we began building the website structure. We collaborated on what we
would want to see in a toolkit to support us in starting a Station Rotation model in our own classrooms. This assisted us in designing categories in each subject area. In the end these categories consisted of apps and assessment. Along with these subject specific areas we collaborated on additional areas that we felt were key to creating a user friendly and cohesive website. These include why and how to blend; first steps, classroom models, funding your project, privacy and permission, research and resources. We allowed ourselves two solid months in the summer of 2018 to solidify our vision and make it a reality.

**Website Design Timetable**

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Build—Weebly Site Initial Meeting</td>
<td>July 2018</td>
</tr>
<tr>
<td>—decided on initial set up of site</td>
<td></td>
</tr>
<tr>
<td>Research on various apps and websites to use for Blended Learning with primary students. Compared and share resources with colleagues</td>
<td>July 2018</td>
</tr>
<tr>
<td>Feedback on site design from Supervisor (Mary O’Neill) and suggested edits applied</td>
<td>July 2018</td>
</tr>
<tr>
<td>Feedback on site design (Avi Luxenburg) via Zoom</td>
<td>August 2018</td>
</tr>
<tr>
<td>Improved site format using suggestions from Supervisors in face-to-face meeting with MEdL project colleagues.</td>
<td>August 2018</td>
</tr>
<tr>
<td>Added all details and attached all links to resources including alphabetizing all resources.</td>
<td>August 2018</td>
</tr>
</tbody>
</table>
Sent website link to Supervisor (Mary O’Neill) for review                  August 2018

Met via Zoom with Supervisor (Mary O’Neill) to discuss and review suggestions                        August 2018

Edited site for final review                                                                                     August 2018

Chapter 3 Procedures and Methods for Building Online Site completed                                        August 2018

Google Form sent out for feedback review                                                              September 2018

Key Deliverable: Primary BlendED Resource Website

Vetted apps and websites. Under the apps category the user will find appropriate reading skills apps that provide student feedback to teachers in order to guide their instruction, reading skills apps for students to access in order to practice various skills and reading skills apps that teachers can use for whole group instruction. Many hours were spent searching for, playing with and evaluating apps. It was my intent to find free or low-cost, well designed apps as cost is always an issue when implementing new ideas into our teaching practice.

Assessment. In the assessment section the user will find several different ways to utilize technology for assessment purposes. Looking at different ways to utilize the iPad camera and recording functions, book creator app to demonstrate reading comprehension and sources for digital rubrics. This section will provide the user with different, innovative ways to assess their
students and have their students self assess. It is my intent to continue adding to this section as I find new and innovative ways to use technology for assessment purposes.

**How and Why to Blend**

Visitors will discover several tabs to visit under the why and how to blend tab. In the development of the Primary BlendED website we felt that it was important to provide the user with necessary information about why we chose to blend, the research and how to blend. This led to the development of; first steps, models of delivery, funding your project, privacy and permission, research and resources.

**First steps.** The three of us felt there was a necessity to provide a section for teachers to start their own journey. First steps provide some really good advice for anyone starting on the blended digital path. Danica Farrell, one of the other two colleagues who co-created Primary BlendED, was fortunate to spend the 2017-2018 school year exploring, with ten iPads, in a Set-BC project. Over the course of the year she came to learn many essential things when it came to using technology with her face-to-face primary students. In this section she very succinctly gives some advice to help others before starting on this journey.

**Models of delivery.** Models of delivery demonstrates to the user how I plan to set up a Station Rotation model for primary reading instruction, and how to add gamification to personalize and motivate students. This section is meant to provide important things to consider before, during and after these models of delivery are undertaken. This area will continue to grow as I implement these models of delivery into my practice and learn what works and what doesn’t.

**Funding your project.** Over the course of our OLTD diploma journey the three of us started looking at what and how we could bring technology into our own teaching practices and classrooms. It was along this journey that we made a proposal to our school district in order to
get technology devices into our classrooms and into the hands of our students. This experience led us to look at ways, the average public school teacher, could get the technology needed to personalize their students learning. This led us to share possible areas within their districts that could be approached as well as, community grants that teachers could apply for.

**Privacy and permission.** During the second week of August 2018 Carla Takach and I built the digital citizenship and privacy section of the major project build. We referred to FIPPA, (Freedom of Information & Protection of Privacy Act) which is the most important thing teachers need to understand when implementing technology into their practice. The internet or web bring with it many issues surrounding protection and privacy that educators need to understand, follow and implement in order to protect their students and themselves. Additionally, we added an area for our specific school district forms for easy access to our colleagues in our district. In the future we would welcome other school districts to add links to their forms as well in order for quick and easy access. Finally, we included some teacher created permission forms due to our experience of not always finding forms for specific uses of technology. Overall, this area is meant to help the educator protect themselves from liability by informing themselves and following the correct protocol when implementing technology into their classrooms.

**Research.** A lot of research was done prior to and during the course of building the Primary BlendED website. My two colleagues and I felt it was very important to include our research into personalized learning in order for the reader to view the ample research that supports our motivation in creating our website, and for implementing technology into our teaching practices.

**Resources.** We wanted to create and provide an inspirational area essentially a great place to go to find some great blogs, books, videos and websites that we encountered along our
learning journey. This is a great place to start as most of these will inspire and excite the educator who wants to meet the individual needs of her/his students and help motivate even some small changes to their practice.

**Peer Review of Project Website and Deliverables**

With the completion of our website build my two colleagues and I embarked on creating a survey to get feedback from other teaching colleagues. We asked a group of 15 colleagues, ranging from very experienced using technology to very uncomfortable using technology, to review our website and provide us with feedback and recommendations in a Google form using rating scales, multiple choice and long answers. We sent this form out to our colleagues the first couple of weeks in October 2018 and gave them ten days to complete and return to us for evaluation. The results and recommendations from this review and feedback process were collated and detailed in Chapter 4 of this Process Paper.
Chapter 4 - Field/Beta Testing and Findings

Field/Beta Testing and Findings

We completed version one of our project build in August 2018. Once complete, the website was publicly published in September 2018. Together we prepared clear questions, in survey format, that would provide us with feedback on the overall website design and each of the three subject areas presented. Mary O’Neill was consulted, as project Supervisor, and we finalized our survey questions to inform site revisions as v.2. Together, we established a variety of sources that we could request feedback from, and a call was made to review the v.1 site build.

**Google feedback form.** An email containing an invitation to review the website containing a URL and a link to the Google Form was sent to our MEdL cohort, colleagues in the teaching profession, district administrators and Vancouver Island University education faculty. The review process was conducted over nine days, after which we met to analyze the results of the twelve responses received. The Google Form was anonymous to provide respondents the opportunity to give honest feedback. Our form contained five distinct sections, with subsections added to reflect each topic area specifically. Please refer to the image in Figure 1 below.
Figure 1. First page of the Survey as a Google Form sent out to colleagues.

Feedback sections. The first section “User Profile—Background Information”, included questions which would reveal to us what the demographic of our reviewing audience was. These questions were used to create a whole picture of the audience and would tell us if our reviewers were currently using technology in their practice, and if they already had an understanding of what Blended Learning was.

The second section, “Website Design and Navigation” sought feedback on ease of use for navigating and maneuverability between different pages on our site.

The third section of our site build was titled “Accessibility” and focused questions on how easy and intuitive the site was to use on different devices.
The fourth section was our “Content” section, where we asked specific questions regarding blending the different content areas and if the assessment tools were clearly explained. The questions were asked in order for us to see if there were any gaps with the information that we provided, and if our content areas were fulfilling our goals of showcasing the importance of personalization in education.

The last section titled “Final Thoughts”, was a request for the reviewers to provide any additional information they felt was lacking and wasn’t addressed by our previous questions.

**Feedback Questions**

For review of our Major Project and key deliverables, we constructed an anonymous questionnaire to help guide and inform us about the user’s background, website design and navigation, content, clarity and usefulness of the site. An example of our Google form questions can be viewed in figure 2 below as well as, a list of all questions that were presented through the Google Form.
Figure 2. Screen shot of some of the Google Form questions presented on our survey.

Section 1 – User Profile Background Information

1. What grade are you currently teaching? (Or what grade have your most frequently taught?)

2. Do you currently use technology in your classroom?

3. What would you need to implement a Blended Learning model into your current teaching assignment? (Check all that apply to you)
4. If you checked the other box above, please indicate below what you would need to implement a Blended Learning model into your practice.

5. After reviewing the website, would you now consider implementing Blended Learning into your current teaching assignment? Why or why not?

Section 2 – Website Design and Navigation

1. Does the welcome page clearly introduce the purpose of the website?

2. In not, how could the welcome page be altered to better explain the purpose of the website?

3. Was the website easy to navigate through the pages and the various content areas?

4. Is there anything you would change to make the navigation more intuitive?

Section 3 – Accessibility

1. What device did you view the website from?

2. Please comment on any access difficulties you may have experienced viewing the website?

Section 4 – Content (Numeracy, Reading and Writing)

1. The section 'Numeracy Apps' has been designed to provide teachers with resources to support numeracy instruction. Was this section successful in showing how the various apps could support numeracy instruction in a Blended Learning environment? Why/why not?

2. In the section 'Math Assessment' were the various tools used to support student assessment clearly explained? Is there something that could be altered or augmented to improve understanding?
3. In what ways could the information on Numeracy apps, assessment and delivery be better arranged, augmented or added to in order to aid in a user developing an understanding of how to implement Blended Learning in Math?

4. The section 'Reading Apps' has been designed to provide teachers with resources to support Reading instruction. Was this section successful in showing how the various apps could support Reading instruction in a Blended Learning environment? Why/why not?

5. In the section 'Reading Assessment' were the various tools used to support student assessment clearly explained? Is there something that could be altered or augmented to improve understanding?

6. In what ways could the information on Reading apps, assessment and delivery be better arranged, augmented or added to in order to aid in a user developing an understanding of how to implement Blended Learning in Reading?

7. The section 'Writing Apps' has been designed to provide teachers with resources to support Writing instruction. Was this section successful in showing how the various apps could support Writing instruction in a Blended Learning environment? Why/why not?

8. In the section 'Writing Assessment' were the various tools used to support student assessment clearly explained? Is there something that could be altered or augmented to improve understanding?

9. In what ways could the information on Writing apps, assessment and delivery be better arranged, augmented or added to in order to aid in a user developing an understanding of how to implement Blended Learning in Writing?

Section 5 - Final Thoughts
1. In what ways could the information on Writing apps, assessment and delivery be better arranged, augmented or added to in order to aid in a user developing an understanding of how to implement Blended Learning in Writing?

2. Please add any final thoughts or suggestions that would help improve the development of our website.

Field/ Beta Testing: Feedback and Findings

The call for feedback received 12 responses in total. These responses reflected opinions and perceptions from colleagues teaching Kindergarten through post-secondary. Overwhelmingly, the responses were positive towards our Primary BlendED website resource. We received various suggestions, which supported us in version 2 of our project build. All feedback was evaluated, and suggestions were implemented where deemed appropriate.

User Profile background information. The majority of the feedback evaluators were k-3 teachers, with the second greatest number being grades 6-8 educators. The largest group of evaluators are currently using technology in their classroom. Some of the main identified needs to implement Blended Learning were; classroom devices and infrastructure as well as maintenance and replacement of devices when required. On reviewing the website, it was evident that many respondents would consider implementing a Blended Learning model in their practice, with a few respondents showing some concern over the possibility of too much screen time for their students as they use devices at home and at school. This concern was also met with some hopefulness, as it was recognized that technology can enhance concepts currently being taught, while promoting the development of digital learners and 21st Century skills. Respondents appreciated that Blended Learning allows for greater personalization and inclusivity to meet the unique needs of individual learners.
Website design and navigation. The website was built using weebly.com, which has limitations. One of the suggested changes was to take away the drop-down menu, but Weebly provides no adequate alternatives to this type of navigation. Other respondents mentioned that the site was well laid out, and that it was very intuitive. Although the majority of respondents felt that the website Welcome page clearly introduced the purpose of the website, they also felt that there was a need to have a clear definition of what Blended Learning is, on the Welcome page. The navigation seemed clear and intuitive to the participants who were evaluating our site build.

Accessibility. All of the reviewers used a laptop or a desktop computer to review our site. Unfortunately, no other devices such as a Smartphone or tablet were used in the review process. There were no reports of difficulties accessing the site from the devices used. Most of the reviewers said the site was very intuitive. The only suggestion for change was the font size and colour of the menu.

Content — Numeracy. The content area of Numeracy was created in order to help teachers personalize their Numeracy program using a Blended Learning model. The technology chosen also provided the teacher and students with ongoing feedback to help guide small group focused instruction. In all, the feedback was very positive. Evaluators were happy that there was a variety of apps listed that included the costs, pros and cons of each app, as well as a more detailed overview of each app, providing further information. There was a suggestion that there be a link from the Numeracy Apps/Assessment sections back to the Blended Learning Model section for ease of demonstrating it in practice. Another suggestion regarded the organization of the various assessment rubrics and advised making it more attractive or cleaner looking.

Content — Reading. The content area of Reading was created in order to assist educators in personalizing their Reading program by implementing the use of technology in a
Station Rotation Blended Learning model. The feedback received on the Reading section was overall very positive. One suggestion was to change the background to more vibrant colours, to create more distinct differences to each of the sections. Another suggestion was to include a brief overview in the Assessment section for the various tools.

**Content — Writing.** The content area of Writing was created in order to facilitate teachers using technology in order to support student Writing, and students creating Writing products. The feedback on the Writing section was that it was, overall, clearly introduced and detailed. It was mentioned that the evaluators appreciated that there were links to other websites where teachers could find even more information. There was a suggestion about adding in the BC Performance Standard quick scales to the assessment section of the Writing pages. It was suggested to link Danica’s Pictello Project on this part of the site, to be used as a testimony to its benefits in practice.

**Final thoughts.** The reviewers indicated appreciation for the diversity of apps and technologies listed in all areas of the website. Overall, they found the site very user friendly and extremely comprehensive without being overwhelming. There was an indication that consistency of photo size, fonts and colour needed to be addressed. It was also suggested that a video explaining what Blended Learning is, and evaluation of apps for androids would enhance the practicality of the website. In conclusion, the reviewers provided a lot of positive, and some constructive, anecdotal feedback. They felt the variety of apps and tools suggested, and the website overall, was a much-needed resource lacking in the area of primary education. With the new BC curriculum’s emphasis on personalized instruction, the utilization of technology with a Blended Learning model is timely. There were suggestions to link the content areas back to the
delivery models for ease of referencing for the user. Below is a summary of the key findings collated from the responses gathered on the Google form survey.

**Summary of Findings**

- Font and Color Changes needed
- Needs for link back to Blended learning models
- Needs for Clearer Blended Learning Definition
- Clear Welcome Page
- Easy to Navigate
- Use Apps to Support Instruction

![Summary of Findings Chart](image)

*Figure 3. Screen shot of the summary of key findings chart from the Google Form survey.*

**Summary and Thoughts on Feedback Process**

Overall, the feedback received from the field/beta testing was positive and constructive. It was clear that the majority of respondents implement, or would like to implement, technology and employ a Blended Learning model in their practice. The website and the resources and tools within it were well received.

The responses to our Google Form provided useful feedback and led to our concluding that the Primary BlendED website and resource toolkit were well-received, and the overall project achieved our initial goals in addressing our Critical Challenge Questions. Taking into consideration the constructive suggestions collated from the field/beta testing has allowed us to move forward and make positive changes to our website as v.2 revisions. These changes and concluding remarks will be addressed in Chapter Five of this Process Paper.
Chapter 5 - Conclusions and Recommendations

Project Overview

The need and desire to create personalized learning experiences for my students prompted this Process Paper and project build. The B.C. education system recognizes the need for individual and personalized learning. The challenge is how to accomplish this in primary classrooms of upwards of 24 students to one teacher. At the same time, everywhere we go we are surrounded by technology. We are a society that has information literally at our fingertips 24/7. When we combine personalized learning and technology, it is simple to see how educators could potentially accomplish richer learning and create individualized educational programs for all students.

The intent of this major project was to create, along with my two colleagues Danica Farrell and Carla Takach, a resource specifically aimed at primary teachers. It was our intention to support primary teachers in creating rich classrooms with individualized and personalized learning for their students through a Blended Learning model. To accomplish this, the three of us set out to build a website to house the needed information and resources for primary teachers to access and use in their transition to a Blended Learning classroom.

The website build was designed to define Blended Learning and guide the user through three primary subject areas- Numeracy, Reading and Writing. Each subject area gave the user the needed information and structure to begin implementing a form of Blended Learning in their practice.

Conclusions as Applied to the Project Re-Design

The Major Project build was published online, https://primaryblended.weebly.com/ , in October 2018 and a call was made for colleagues to review the site. Twelve participants
completed the anonymous Google Form survey, the results of which informed the redesign of the website. Overall, the website was well received, and all reviewers concluded that it was a great resource to enhance foundational skills through technology, as it provides primary teachers with tools and techniques to help meet the unique needs of individual learners.

General anecdotal comments about the layout and content of the website were, overall, very positive. When asked if there was anything that could be changed to make the navigation of the website more intuitive, the majority commented that there were no changes needed. Some participants suggested on having less drop-down menus and less white space at the top of the website and larger font size. Unfortunately, these are all limitations of the Weebly site builder and cannot be altered.

In general, the comments were all positive on how the resource was developed and presented. All felt the site was clear and easy to navigate. Some of the suggested changes that we made to the site after reviewing the data are as follows;

- Added a definition on home page for “Blended Learning” and included a video.
- Changed the “Blending Your Classroom” heading to “Curricular Content”
- Added a button for “Models of Delivery” to the header section of each subject area app page.
- Added a button for “Models of Delivery” to the end of each subject assessment area app page.
- Added heading explanations for the Reading and Numeracy assessment pages.
- Refer to the Reading Apps page for literacy skills, linked from the Writing page.
- Changed the colour backgrounds and fonts on all of the app pages so that sections are distinct.
• Indicated whether each app is Android compatible or not.
• Made sure that photos are flush left under each app.
• Added Performance Standards under Assessment for each curricular content area.

We made these changes because we felt that they were in line with our vision for our Primary BlendED website. These changes felt natural and augmented the flow for visitors to our site.

**Outcome Evaluation**

Our project endeavored to provide a resource for primary teachers in order for them to implement a Blended Learning program, which will facilitate personalized learning for their students. We feel that our project build answered our original inquiry questions. Our Major Project researched the best ways in which to implement technology into a face-to-face primary classroom. We endeavored to seek contextual research and practical applications of technology and have worked towards compiling this information and sharing it with other teachers so that they have a place to start their own technology journey. In particular, “How can a Blended Learning model be applied to facilitate personalization of Reading instruction for primary students?”

**Results of Findings in Relation to the Literature Review**

The literature review examined articles and theories of how a Blended Learning model can be applied to facilitate personalization in the area of Reading instruction for primary students. This is in accordance with the new BC Education Plan which states, “the key focus is personalized learning” (BC Ministry of Education, 2015, p. 1). The website along with the deliverables were created based on the findings of the literature review. The two significant
findings that influenced the website and its deliverables were classroom model delivery, and
device and apps considered appropriate for the early primary student.

**Delivery model considerations.** Upon careful review of the many Blended Learning
models the Station Rotation model stood out as the obvious choice for the primary classroom.
There are four key benefits to implementing the Station Rotation model in a primary classroom.
The first benefit is that it frees up the educator and allows them to work on targeted skills, with
small groups of students. Secondly, it allows students to work at their individual pace mastering
skills and creating more engagement with their work. Thirdly, it allows for student creativity by
engaging with different technology applications and finally, it allows for flexibility of student
movement within the different rotation groups depending on their prior knowledge and strengths
of a topic (Casey, 2016).

In the website build, model considerations were addressed in all areas of the website. On
the landing page we included a Canadian video demonstrating a Station Rotation model of
delivery in an early primary classroom. A section on the website was included for classroom
models, which explained the different models and how the teacher could use them in their
practice. Under each of the content areas in both the apps and assessment pages a button
returning the user to the models of deliveries section was included.

**Device and app considerations.** When choosing which device to use I took into
consideration that most early primary students have yet to attain a level of skill, dexterity and
patience that is needed to use a desktop computer with a keyboard and mouse. According to
Neumann and Neumann (2017), “Unlike personal computers that require more complex fine
motor skills to operate, the intuitive touch-based interface of tablets make them easy to use” (p.
204), allowing even young students the opportunity to interact with and learn through
technology. Along with a wide variety of educational app choices and its intuitive nature the iPad became the tool of choice.

Once the iPad was the technology tool, of choice I began looking for reading apps that would assist in creating rich learning opportunities for students, during the technology rotation. When configuring the apps section on the website build the apps were sectioned into three different categories for ease of use for the educator. The categories consisted of apps to support personalized reading instruction, apps to support student practice with targeted skills and apps to support whole group instruction.

Limitations of the Project

Some of our limitations were around our choice of building our major project using Weebly. Weebly itself limits the user to specific parameters of font choice, page colour, and white space. We did not know these limitations until we neared the end of our build and attempted to make some changes based on feedback from our project evaluation survey and which we were unable to accomplish. Another limitation for our project build was time. This project build was a large undertaking and we were limited in the resources that we were able to share as we had limited amounts of time in which to review the apps that we suggested to our viewers. We were limited in attempting to ensure that the options for apps were cost friendly so that other teachers would find their programs sustainable over long periods of time. We were unable to create a singular spreadsheet for each content areas apps of choice, due to time constraints. Weebly had limitations on web design, as we found it challenging to upload pictures and have them be sized appropriately.

One of the most challenging limitations that we encountered was trying to implement three separate visions into one site. When you have three unique perspectives, there are times
when you compromise, accept and change things that you may not have altered independently. This limitation turned into a great opportunity for growth for each of us and affected our site in such a way that created an enriched product.

**Major Project Recommendation**

Using a Station Rotation model in primary classrooms is the most effective way to teach with technology. Teaching the expected behaviours, and needed skills to a small group at a time is necessary for students to understand how to use the different apps accurately. Using a Station Rotation model allows the teacher to differentiate and personalize the learning that is taking place while the student is using technology. When creating classes on different apps, the teacher should pre-group students in ability groups so that they are able to release different content as the different groups are ready, as this is only available in paid subscriptions if you don’t create separate classes for each ability group. The device that is most practical for primary classrooms is the iPad. It is the most diverse device, and it supports many apps. Blended Learning in the primary classroom allows teachers to reach learners who have many diverse learning styles.

Blended Learning is such a new method of teaching. Other educators can use our research and have a point at which to start their own discovery of Blended Learning. There is a lot of room for growth with research into Blended Learning, and eventually there will be longitudinal studies around the effectiveness of Blended Learning in primary classrooms.

**Major Project Deliverable**

Through this process of creating our major project, we have grown as learners and have grown our skills in web development. Our product, our major product build, has been a challenge to create, but in the end we feel that it adequately addresses the need that was identified when we set out to create this resource for primary teachers. The resource includes
diverse tools and models with which a teacher could adapt their face- to- face classroom quite easily. We have built a resource that encompasses the start of the process as well as the end, in assessment. There are tools that teachers can use individually, or that they can use as a collective.

**Next steps.** Some of our next steps for our website build include continuing to source apps that may be useful for each of the content areas. These apps can be both paid, and free apps. We could group our apps by price once they become a robust list of apps. We will continue to work on screencasts for how to set up classes within specific free apps as well as create screencasts for the assessment apps- in an effort to show our readers some examples of how to implement assessment within a Blended Learning model. We want to create a spreadsheet which includes all of our apps of choice, and gives the reader specific information about each app at a glance, for example price etc. We want to compile more resources based on what teachers have submitted to the site around what they are doing in their classroom.

**Final Conclusions**

In the 21st Century world technology is used in every facet of society. However, the education system, in the primary grades, is slow to embrace this shift. Primary educators need to begin developing these skills in their students in order to ensure they don’t fall behind. Using a Station Rotation Blended Learning model allows for these skills to develop without compromising the play-based learning that is paramount in the primary grades.

The Primary BlendED website was designed to serve as a resource for primary educators wanting to implement Blended Learning into their practice. Although it was a challenge, having three visions for our project ultimately made our site stronger and more robust. We were able to delve deeper into content, and have three people converse and make decisions, which led to
much growth for us personally and professionally. We have ended up with a site that honors each of us individually and collectively. Results gathered from the Major Project field testing confirmed that the resources provided in the website are successful in positively answering my Critical Challenge Question, “How can a Blended Learning model be applied to facilitate personalization of Reading instruction for primary students?” as it demonstrates how to implement a Blended Learning model into a face-to-face primary classroom in order to personalize Reading instruction for young students.
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**Primary BlendED — Numeracy**


