



Personalization Using a Blended Learning Model in Face-to-Face Primary Classrooms.

by

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Abstract

My Critical Challenge Question presents the opportunity: “*How can a blended learning model be applied to facilitate personalization of writing instruction for primary students?*”

I have 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. Specifically, I have researched how blending a Writing program will help teachers support all of the learners in a primary classroom.

This project was a joint endeavor with colleagues Carla Takach and Gina Farrell. We have each taken an aspect of learning and have created a place for teachers to find information in order to start their own journey. Our project is split into three distinct learning areas—Numeracy, Reading and Writing. I have focused on Writing and have researched practical technology applications to support Writing in a primary classroom. According to the BC Education Plan (2015), “Educators will need greater access and supports to use technology that enriches the learning process, and to connect with each other, parents, and communities” (pg.8). I see this project as a tool for educators, and a place where educators can seek, share and synthesize some understandings around implementing technology in their own classrooms. The main challenge that I am endeavouring to support is personalization in education.

Students are individuals and have differing needs from each other. In a face-to-face classroom, where you often have one teacher and 24 students, how can we best use the tools that we have in order to stretch and teach each one of our students?

[Resource Website: https://primaryblended.weebly.com/](https://primaryblended.weebly.com/)

Keywords: Blended Learning. Primary blended classrooms. Station Rotation Model. Writing. Education. Numeracy. Reading.

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Chapter 1 – Introduction

Project Topic and Introduction

In working through my Online Learning and Teaching graduate diploma (OLTD) at Vancouver Island University, my eyes have really been opened to the ways in which technology can facilitate individualized and personalized learning for students of all ages. In particular however, I felt that I did not learn enough about implementation of technology specifically in primary classrooms. I feel the need to search for more information to learn how to effectively apply a blended model to my face-to-face classroom delivery. I have learned the importance of integrating technology into my classroom and am looking to explore practical ways in which I will be successful in implementing a blended delivery model into my practice.

During the 2018-2019 school year, I was fortunate to have applied for, and received, a SET BC grant, in which my classroom received 10 iPads for use over the academic year. It was a blessing, as well as a huge challenge and learning curve to try to implement technology in a school where we have been so lacking in the integration of technology over the past years. I have had to build my students' knowledge of technology use from the ground up. I am now interested in creating a base of knowledge and information for other teachers as they begin to seek ways to incorporate technology and blended learning into their classrooms. As a result of some of my questions and interests, my Critical Challenge Question presents the opportunity: *“How can a blended learning model be applied to facilitate personalization of writing instruction for primary students?”*

Purpose of the Major Project

My Major Project is important because I will be researching the best ways in which to implement technology into a face-to-face primary classroom. I am endeavoring 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 elementary classrooms we are faced with the challenge of meeting the needs of all of our learners. Each of our students has a different learning style as well as differing learning needs. Specifically, I have researched how blending a Writing program will help teachers support all of the learners in a primary classroom.

This project was a joint endeavor with colleagues Carla Takach and Gina Farrell. We have each taken an aspect of learning and have created a place for teachers to find information in order to start their own journey. Our project is split into-three distinct learning areas—Numeracy, Reading and Writing. I have focused on Writing and have researched practical technology applications to support Writing in a primary classroom. According to the BC Education Plan (2015), “Educators will need greater access and supports to use technology that enriches the learning process, and to connect with each other, parents, and communities” (pg.8). I see this project as a tool for educators, and a place where educators can seek, share and synthesize some understandings around implementing technology in their own classrooms. The main challenge that I am endeavouring to support is personalization in education.

Students are individuals and have differing needs from each other. In a face-to-face classroom, where you often have one teacher and 24 students, how can we best use the tools that we have in order to stretch and teach each one of our students?

Key Deliverables

For my MEdL Major Project, my plan was to collectively create a website toolkit that can be used by other primary teachers who want to implement a personalized, blended program. I have looked specifically at Writing within a primary, face-to-face classroom. This website was co-designed with teaching colleagues Carla Takach and Gina Farrell, who developed the resources needed to personalize the subjects of Reading and Numeracy within the primary, blended mode.

I used this opportunity to research the specific skill of writing facilitated by a blended delivery model, to share my own growth with other teachers in order to support them in also using a blended model, when applicable, to their own practice. Using a blended model as the base for my project provided tools and, an appropriate framework, with which to proceed.

Horne and Staker (2012) provide a helpful definition:

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).

I have specifically used Horn and Staker's (2015) Station Rotation model, combined with whole-group instruction and individual work, in order to best meet the needs of my students. I used a mobile set of iPads to support my students to write, edit and publish their writing. This project is important as I see technology as a way to bridge some gaps that we currently have in face-to-face learning. I see my students at both ends of the learning spectrum benefiting from the opportunity to learn in a different, engaging way.

Website resources. The website build houses permission forms for privacy and accessibility, subject-appropriate apps and instructions on how to use them, models of delivery (which could include both the f-2-f computer lab and mobile “devices”), assessment for Math, Reading and Writing as well as information on how to access grants for funding long-term sustainability. Within our build, we will separate the website into three distinct parts: primary Reading; Numeracy; and Writing. We also worked together to build examples for teachers on how to scaffold students’ learning with technology and how to begin with limited technology background. We built digital citizenship and internet safety for primary grades into our site, as well as suggesting lessons and introductory units for teachers. We housed our toolkit through education.weebly.com, a free website development tool.

Our design decisions were further informed by a comprehensive literature review presented as Chapter 2 of this MEdL Process Paper. I used specific topics such as digital citizenship in primary classrooms, mobile devices in Writing, access for students with special needs—specifically assistive technology, as a way to extend learning for gifted writers and technology integration as a way to expand learning for struggling writers.

Justification of the Major Project

Wohlwend (2009) emphasized that understanding technology has become an important preparation for life. I pursued my project research and built this resource in the area of blended learning in primary classrooms as I see that there have not been many instances where primary classrooms have been included in the current research and development. My project provides a culmination of research around how a primary face-to-face teacher can start to implement some aspects of blended learning into their classroom.

I have shown how Writing can be supported by using a blended approach in support of personalization of learning for students. 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).

Mobile learning is presented as a scaffold for my research and project build. 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). This enables more teachers to access technology in their own classes and allows this learning to happen at each student’s own pace— a specific mandate of the new BC Education Plan.

Project Timeline

June 15	Literature Review submitted for completion of OLTD 510
July 15	Final Literature Review Completed (Ch.2)
July 15	MEDL 680 Begins. Chapter 1 under development. Major Project website v.1 build begins
September 8	Ch.1, Ch.2 and Ch.3 completed. Major Project website v.1 build is complete
Sept 1	MEDL 690 begins
October 13	Google Form for Feedback Developed
October 19	Call for Reviewer Field Testing – Invitations sent
October 28	Reviewer Field Testing – collating begins (Ch.4). Major Project Website v.2 build starts
November 15	Ch.4 Complete. Chapter 5 under development. Major Project Website v.2 build complete
December 1	Chapter 5 complete. Completed Paper sent to Supervisor for Final Review
December 15	Dean signs off on completed paper
December 31	MEDL 690 ends

Definition of Terms

Term	Brief Description	URL
Assistive Technology	Any item, piece of equipment or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of children with disabilities.	http://www.gpat.org/georgia-project-for-assistive-technology/pages/assistive-technology-definition.aspx
Blended Learning	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.	http://eric.ed.gov/?id=ED535180%5Cnhttp://files.eric.ed.gov/fulltext/ED535180.pdf
Digital Citizen	Someone who is skilled in using the internet in order to communicate with others, buy and sell things, and take part in politics, and who understands how to do this in a safe and responsible way	https://dictionary.cambridge.org/dictionary/english/digital-citizen
Face-to-Face Delivery	The traditional classroom or face-to-face instruction is when the instructor and the students of an educational institution are in a place devoted to instruction and the teaching and learning take place at the same time.	https://www.lib.purdue.edu/uco/ForInstructors/face_to_face.html
Mobile Devices	A portable, wireless computing device that is small enough to be used while held in the hand; a handheld.	https://www.dictionary.com/browse/mobile-device
Mobile Learning	Mobile learning is learning based on mobility often through mobile devices like Smartphones, iPads, other tablets, and wearable technology.	https://www.teachthought.com/the-future-of-learning/a-definition-for-mobile-learning/
Personalization	Learning that is tailored to the preferences and interests of various learners, as well as instruction that is paced to a student’s unique needs.	https://www.iste.org/explore/articleDetail?articleid=124
SET BC	Special Education Technology – British Columbia (SET-BC) was	https://www.setbc.org/background/

	established in 1989 to provide assistive technology services for students with physical disabilities.
Station Rotation Model	A Rotation-model implementation in which within a given course or subject (e.g., Math), students rotate on a fixed schedule or at the teacher’s discretion among classroom-based learning modalities. The rotation includes at least one station for online learning. http://eric.ed.gov/?id=ED535180%5Cnhttp://files.eric.ed.gov/fulltext/ED535180.pdf

Conclusion

In closing, some of the assumptions that I initially made as to what research may indicate regarding applying a blended learning model to support student success with primary writing included: technology increases access for all students; technology will assist students who are struggling as an alternate way to represent their learning; students who use technology will improve their writing content; students who have access to technology will choose to use it; and assistive technology is expensive and can be challenging in terms of learning to use it. I also made a general assumption that there is a lack of research and case study evidence regarding how technology will support our primary students— specifically primary Writing.

My project provides a compilation of research around how a primary face-to-face teacher can start to implement some aspects of blended learning into their classroom. Findings are presented in Chapter 2 in support of the Major Project website build.

Chapter 2- 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' brainstorming 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 (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 subskills 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, “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” (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.

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 Chapter 3 of this Process Paper.

Chapter 3 – Procedures and Methods

Major Project Development

My Major Project deliverable is a website that houses information for teachers who are wanting to start their own blended learning journey. This project was a joint endeavor with colleagues Carla Takach and Gina Farrell. We have each taken an aspect of learning and have created a place for teachers to find information in order to start their own journey. Our project is split into-three distinct learning areas—Numeracy, Reading and Writing. My Critical Challenge Question provided context for my investigations: *“How can a blended learning model be applied to facilitate personalization of Writing instruction for primary students?”*

I have focused on Writing and have researched practical technology applications to support Writing in a primary classroom. Our Major Project was developed as a tool to support primary educators who are looking to implement a blended model into their own classrooms. We have included practical information such as ‘first steps’, ‘funding’, ‘FIPPA’, and other information that supports teachers in getting started. We have each researched our content areas and developed collections of assessment and apps applicable to each of the three areas of learning. We researched, vetted and then provided a list of apps as well as information on the specific apps that will help teachers choose the appropriate one for their purpose. On our website we also gathered tools applicable to starting a journey in technology. We developed first steps, provided research on blended learning, applicable funding sources as well as classroom models that will support a blended learning delivery style.

For Writing, I researched applicable apps that would support writing in a primary classroom. These apps were grouped into areas to facilitate teacher choice. These areas included book making, comics, script writing, word processing and extras. The apps included in the

Writing section were ones that I have vetted, and that I feel would benefit teachers who are trying to blend their primary student's writing. I found apps that were easy to use for student use and independence. Students will be able to choose a means of expressing themselves that is different from the traditional pen and paper. They will be able to stretch themselves using different methods of output.

Major Project Design and Considerations

To begin, we designed the schema for our build. The build started as a basic site that was housed on education.weebly.com. It then developed into the specific areas that are currently presented. We began with the understanding that we had individual focuses on Numeracy, Reading and Writing. We met together to discuss how we would create one vision, which would be showcasing blended learning as whole. Our site began to form. We added nested pages - sharing who we are in order for our audience to have confidence in the site authors. We decided to have subpages branch from main pages rather than all nestled at the top together. To do this, we used buttons on many of the pages that take our audience to other information. We built our site so that teachers would choose a subject area upon arrival. They would then be directed to choose apps, or assessment. We tried to be succinct in the information that we shared as we knew that we must have our readers find the information they are looking for within three clicks of the mouse. Carla, Gina and I worked together on many of the pages, but worked individually for our specific content areas.

Individual Content Areas

We worked individually on our subject content areas, which made some of the build challenging. In order to have the three content areas resemble one another, we had to be careful to use a similar format to maintain consistent flow throughout. I found creating the Writing

section to be challenging as the content is very different from Reading and Math, which can be very much gamified. For Writing, I focused on the applicable assessment that would be simple and easy for teachers to follow in the assessment section. I was part of a Special Education Technology (SET BC) grant for the 2017-2018 school year and I kept in mind some of the apps and assessment that I found useful during that opportunity. I chose to group my apps into book making, comics, script writing, word processing and extras. Within these categories, I was able to find three to four apps which could support student writing in different methods.

Design and Navigation Changes

Once we completed our initial site build, we then had a meeting with Avi Luxenburg, a professor in the OLTD graduate program. In this meeting, Avi raised some good points around navigation and overall design. We implemented many of the changes that he suggested, which is why you now see our main headings as welcome, why & how to blend, and blending your classroom. We chose to make the ‘welcome’ page a space where our readers can learn about us in an attempt to lend credibility to our research as well as to show teachers starting out that we are reliable sources. We then used the ‘why & how to blend’ as a space where we would house the utilities of blending learning. We have the ‘blending learning’ page as a space where teachers can choose a content area and immerse themselves in that area. When our site felt like it had been thoroughly changed from the initial design, and once it felt more like it was completed, we invited Mary O’Neill, our project Supervisor, to also review our site. She supported us in making further changes that were primarily grammatical.

Major Project Implementation and Feedback Process

As a group Carla, Gina and I approached the senior leadership in our School District (#72) for their support in order for us to present a blended learning project for the 2018-2019

school year. We shared our proposal with two groups that collectively make up the technology team in School District #72. We were approved to have two of our classes receive a technology package that would include 10 iPads each. The third class, which is my class, currently has a group of 10 iPads due to a SET BC project that I completed in the 2017-2018 school year.

We are working collectively in an effort to blend our classrooms. Gina will be blending reading for her kindergarten class, Carla will be blending Math for her grade 2/3 class and I will be blending my Writing program for my grade 1/2 class. We built our site as a way for other teachers to find support in blending their classrooms. We are each passionate about our content area, and hope to try to incorporate aspects of each other’s content research into our own classrooms later on in the year.

We worked together to decide who we would be asked to review our project build and provide feedback. We decided on a blend of teachers and technology specialists alike. We have asked a variety of fellow educators to review our site build and provide us with anonymous feedback through a Google Form. Results of reviewer feedback will be collated and findings applied to version 2 of our site build as detailed in Ch. 4 of this Process Paper.

Project Timeline

June 15, 2018	Project Build -Weebly Site Initial Meeting -decided on initial set up of site
June 15, 2018	Literature Review submitted for completion of OLTD 510
July 15, 2018	Final Literature Review Completed (Ch.2)
July 15, 2018	MEDL 680 Begins. Chapter 1 under development. Major Project website v.1 build begins

July 27, 2018	Ch.1 Completed
August, 2018	Added all details and attached all links to resources including alphabetizing all resources.
August, 2018	Sent website link to supervisor (Mary O’Neil) for review
August, 2018	Met via zoom with supervisor (Mary O’Neil) to discuss review suggestions
August, 2018	Edited site for final review
September 1, 2018	MEDL 690 begins
September 16, 2018	Chapter 3 Procedures and Methods for Building Online Site Complete
October 19, 2018	Call for Reviewer Field Testing – Invitations sent
October 28 , 2018	Reviewer Field Testing – collating begins (Ch.4). Major Project Website v.2 build starts
November 21, 2018	Ch.4 Complete. Chapter 5 under development. Major Project Website v.2 build complete
December 1, 2018	Chapter 5 compete Completed Paper sent to Supervisor for Final Review
December 15, 2018	Dean signs off on completed Paper
December 31, 2018	MEDL 690 ends

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.

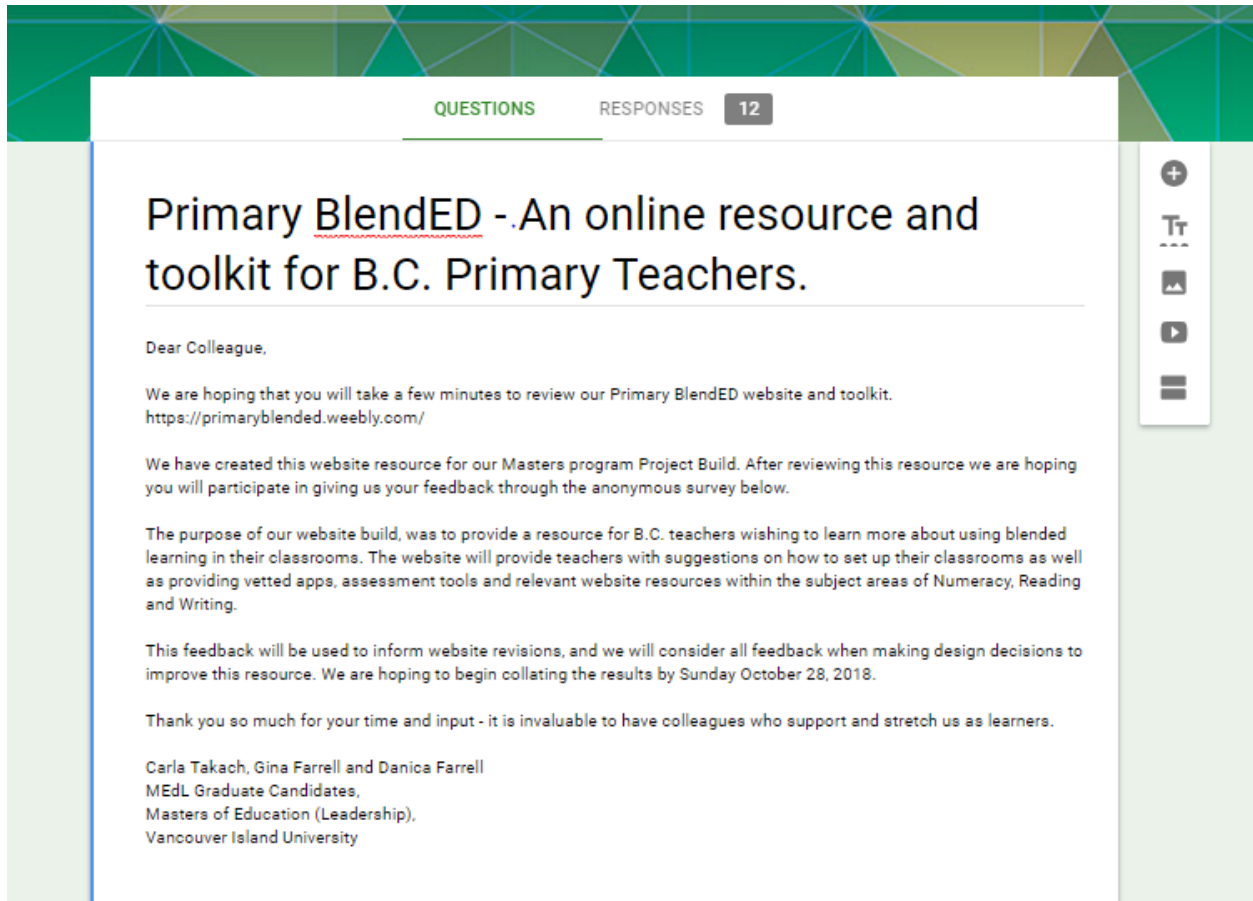


Figure 1. First page of the Survey on a Google Form sent out to colleagues

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 understood 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.

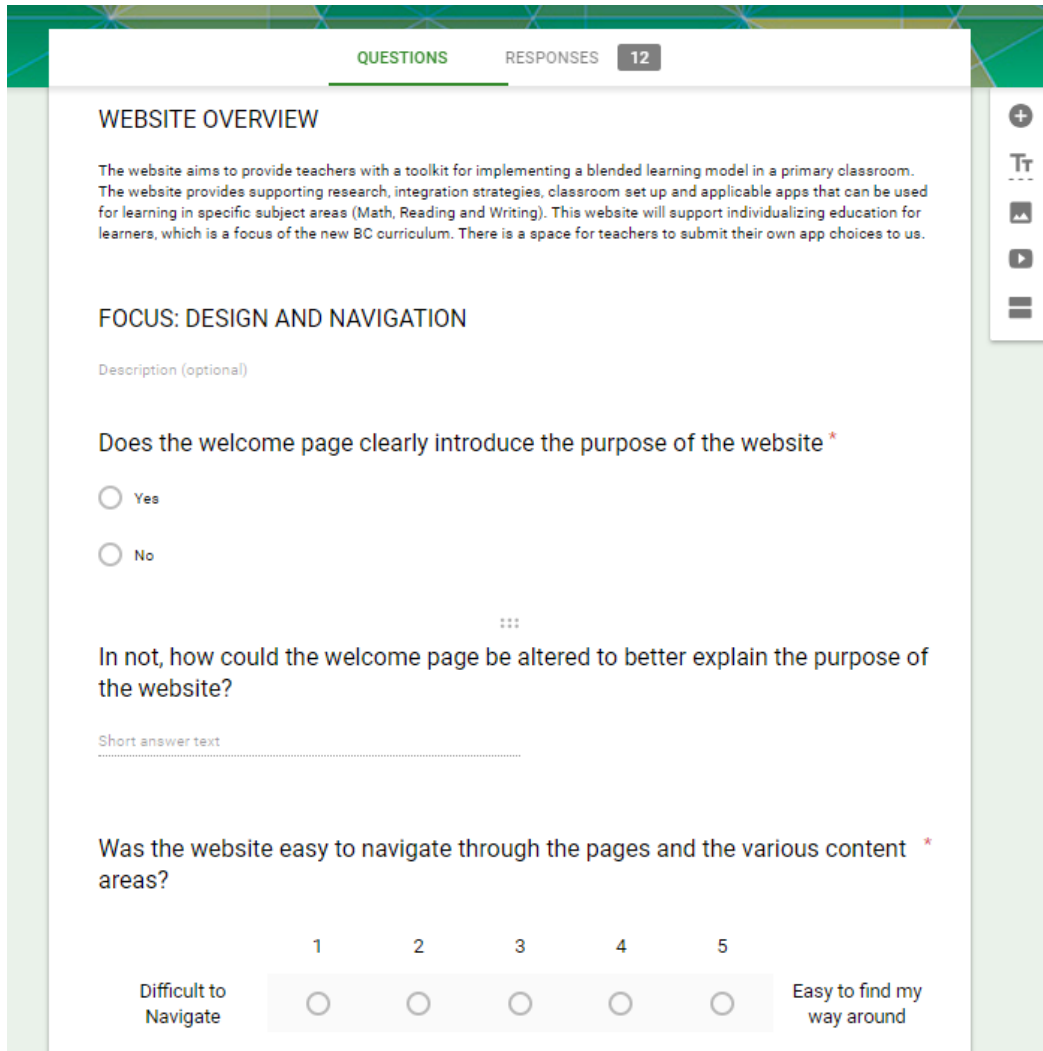


Figure 2. Screen shot with some of the Google form questions presented on our survey

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.

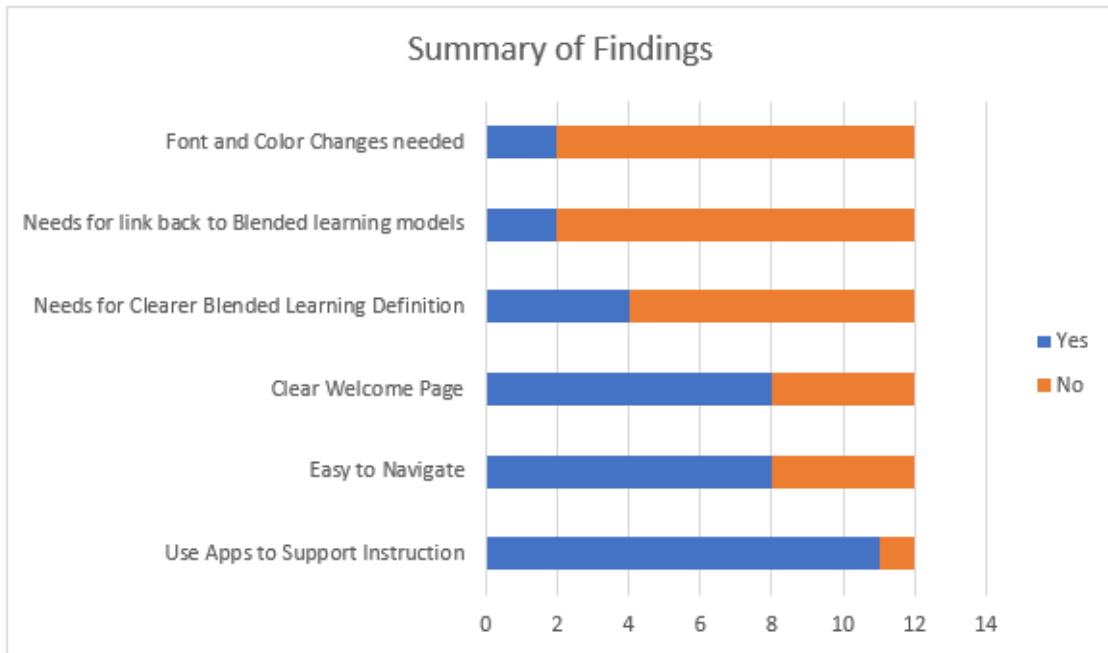


Figure 3. A screen shot of the summary of key findings chart from the Google Form survey

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 Gina 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 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.
- Change the “blending your classroom” heading to “Curricular Content.”
- Add a button for “Models of Delivery” to the header section of each subject area app page.
- Add a button for “Models of Delivery” to the end of each subject assessment area app page.
- Add heading explanations for the Reading and Numeracy assessment pages.
- On the Writing page, add a link to the Reading Apps page for literacy skills.
- Change the colour backgrounds and fonts on all of the app pages so that sections are distinct.

- Indicate whether each app is Android compatible or not.
- Make sure that photos are flush left under each app.
- Add 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. I feel that our project build answered our original inquiry questions. In particular, my personal inquiry questions, which was *“How can a blended learning model be applied to facilitate personalization of writing instruction for primary students?”*

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.

Results of Findings in Relation to the Literature Review

As I previously mentioned in my literature review, 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. The version 2 of our project deliverable clearly showcased the apps that I chose based on the research that I did in Chapter 2 of this paper. My research informed the choices that I have provided for other educators. My research also informed the way that I presented these choices, as I sectioned these apps so that teachers could view them based on a skill they were working on.

Limitations of the Project

Some of the perceived limitations of the Major Project were attributed to the choice of Weebly as our web design and development tool itself limits the user to specific parameters of font choice, page colour, and white space. These limitations were not known to us 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 spread sheet 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 have 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 Recommendations

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 increased 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. We will continue to provide 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 spread sheet 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

The Major Project Build was directly linked to my Critical Challenge Question which was *“How can a blended learning model be applied to facilitate personalization of writing instruction for primary students?”* Gina, Carla and I worked hard to create a resource that was going to be a resource for teachers in personalizing their own blended learning program. Our intent was to create a site where teachers could find resources that would help them get started in their own classroom. I feel that we have met the intention of our Critical Challenge Questions.

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. We are going to continue to gather teacher examples, and add to our lists of resources so that our site can grow in an organic way. We will continue to work collectively on our next steps which have been clearly outlined above.

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