Teaching to Engage Asynchronous Online Learners

by

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Abstract

Consistently, teachers and researchers have questioned how to engage students who are working in asynchronous online environments. Within our context, we noticed a similar trend: student disengagement in asynchronous online learning activities. The purpose of this project is to identify factors that influence learner engagement in online learning environments, and to identify strategies that engage students in asynchronous online learning. The literature review presents our theoretical framework, which is based on social constructivist perspectives. This is followed by a discussion of blended learning as a modality. Subsequently, we focus on learning design, specifically exploring learning strategies that promote active learning. The final section of our literature review examines teacher presence within collaborative learning environments. Designing engaging online environments is not a simple matter of digitizing existing content and placing it online. Deliberate planning and implementation of curriculum requires professional development around appropriate pedagogy for online environments. The purpose of our project is to provide support to teachers in evolving online/blended learning environments. We have created a resource package which includes documents and videos to outline strategies to engage students in asynchronous online learning environments. Our hope is that educators new to teaching online will be able to implement a variety of activities that lead to increased student engagement.

Keywords: engagement, asynchronous online learning, blended learning, hybrid learning, social constructivism, community of inquiry, universal design for learning (UDL), learning design, active learning, teacher presence

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Chapter One: Introduction of the Project

Our Journey

Jerry Chien, Leanne Huston, Rhyanon Logan-Goyette, and Rochelle Smith, the co-authors of this paper, met working at U-Connect Secondary School in the Langley School District (#35). Jerry began his teaching career overseas working at an elementary school, before returning to Canada to teach at the secondary level for the past three years. Leanne began her teaching career 12 years ago in a K-9 distributed learning program at Lochiel U-Connect, now known as U-Connect. This program expanded to include grades 10, 11, and 12, so she transitioned from an elementary/middle teacher to her current role at U-Connect Secondary. Rhyanon began her teaching career seven years ago as a teacher on call in K-12 and is now in her fifth-year teaching at U-Connect. Rochelle started her teaching career at U-Connect and is in her fourth year of teaching. U-Connect Secondary School currently has approximately 150 students in the blended program and approximately 60 students in the online only program. Part of the U-Connect culture is the diverse community created through a shared learning space, as the building is home to more than just the high school. U-Connect elementary (K-7) and a neighbourhood brick and mortar school Simmonds elementary (K-5) also make up part of the overall school community.

Currently, we are a small school with only eight secondary teachers and eight elementary teachers; most teachers also do not have a full-time contract. U-Connect is a K-12 campus; however, we will be discussing and focusing our project on grades 8-12 at our school. At the secondary level, U-Connect offers the same selection of courses as a brick-and-mortar high school. The authors of this paper make up half of the staff at U-Connect Secondary and, therefore, cover most teaching areas including core academics and electives. For the rest of this

project, when we refer to U-Connect, it will represent the secondary program only, which currently offers two programs: a blended program and an asynchronous online program.

Our blended program has seen several changes since its conception. Initially, we ran a linear timetable (eight classes September - June), with set class times and days, with curricular content and learning activities managed through Google classroom for grade ten and eleven. For grades eight and nine, we co-created learning plans collaboratively with parents without the use of any learning platforms. In 2016, we decided to trial a flexible learning timetable where students had the morning to work on academics, with teacher help and some lessons, but no set class times, and the afternoons were set up for inquiry. Finally, U-Connect became the program we have today. We changed to a semester timetable (four courses for each half of the year) that contains set class times in the morning and optional pathways in the afternoon, all supported by a learning management system (LMS) called Moodle.

U-Connect' asynchronous-only online program has been offered since the adoption of the LMS for grade 10 to 12 learners, who can choose to take individual courses or their full course load. Students who attend blended classes also have the option to take online courses if they desire to take courses that do not fit into their blended timetable.

We now offer three program choices, blended full day, blended half-day, and asynchronous online. The blended program is designed so that students attend face-to-face classes two days a week (full or half-day depending on program choice) and engage with asynchronous online components at home for the remaining three days. For the two days face-to-face each week, academic courses are scheduled in the mornings for all grades, while the afternoon is required for grades eight and nine to cover Applied Design, Skills, and Technology (ADST), arts and careers (Figure 1). Grade 10 to 12 students can choose to attend only the

mornings in person, or they can stay on site all day and choose a passion pathway, Art, Inquiry, or Technology, for the afternoon (Figure 1). While there were many growing pains for students, parents, and teachers, U-Connect is increasingly flexible, inclusive, and student-centered. We continue to evolve as we strive to create the best possible learning environment for our students.

Figure 1

U-Connect Monday and Tuesday Blended Face-to-Face Timetable 2020-2021

U-Connect - Semester 1				
	MONDAY		TUESDAY	
	Course	Teacher	Course	Teacher
9:00 AM	Anatomy 12	CHIEN	Science 10	CHIEN
	Humanities 8	HUSTON	English 12	HUSTON
	Foundations of Math & Pre-Calculus 10	LOGO	Foundations of Math 11	LOGO
	Humanities 9	SMITH	Physical and Health Education 8	SMITH
	Workplace Math 10	Teacher A	Science 9	Teacher A
	Leadership 10/11/12	Teacher C	Flex 10-12	Teacher D
	Flex 10-12	Teacher D		
10:30 AM	Recess			
10:45 AM	Physics 11/12	CHIEN	Flex 8	CHIEN
	Flex 10-12	HUSTON	Foods 11/12	HUSTON
	French 10/11	LOGO	Flex 10-12	LOGO
	Social Justice 12	SMITH	Physical and Health Education 9	SMITH
	Math 8	Teacher A	Career and Life Education 10	Teacher A
	Technology Explorations 10	Teacher B	Law 12	Teacher C
	Flex 9	Teacher D	Flex 10-12	Teacher D
12:15 PM	Lunch			
1:00 PM	Applied Design, Skills, and Technologies 9	CHIEN	Applied Design, Skills, and Technologies 9	CHIEN
	Art Pathway	LOGO	Art Pathway	LOGO
	Inquiry Pathway	SMITH	Inquiry Pathway	SMITH
	Art and Careers 8	Teacher A	Art and Careers 8	Teacher A
	Technology Pathway	Teacher B	Technology Pathway	Teacher B
3:00PM	Musical Theatre	HUSTON		

U-Connect - Semester 2				
	MONDAY		TUESDAY	
	Course	Teacher	Course	Teacher
9:00 AM	Workplace Math 11	CHIEN	Chemistry 11/12	CHIEN
	Humanities 9	HUSTON	Flex 10-12	HUSTON
	Pre-Calculus 11	LOGO	French 8	LOGO
	Humanities 8	SMITH	Physical and Health Education 10/12	SMITH
	Flex 10-12	Teacher A	Flex 9	Teacher A
	Digital Photography 11/12	Teacher B	Psychology 11/12	Teacher C
			Resource (no French) 8	Teacher D
10:30 AM	Recess			
10:45 AM	Life Sciences 11	CHIEN	Flex 10-12	CHIEN
	English (composition/creative writing/literature) 10	HUSTON	English (creative writing/literature) 11	HUSTON
	Pre-Calculus 12	LOGO	French 9	LOGO
	20th Century World History 12	SMITH	Social Studies 10	SMITH
	Math 9	Teacher A	Science 8	Teacher A
	Flex 10-12	Teacher B	Peer Mentoring 11/12	Teacher C
	Career Life and Capstone 11	Teacher C	Resource (no French) 9	Teacher D
	Flex 8	Teacher D		
12:15 PM	Lunch			
1:00 PM	Applied Design, Skills, and Technologies 8	CHIEN	Applied Design, Skills, and Technologies 8	CHIEN
	Art Pathway	LOGO	Art Pathway	LOGO
	Inquiry Pathway	SMITH	Inquiry Pathway	SMITH
	Art and Careers 9	Teacher A	Art and Careers 9	Teacher A
	Technology Pathway	Teacher B	Technology Pathway	Teacher B
3:00 PM	Musical Theatre	HUSTON		

Note. U-Connect blended programs' timetable for face-to-face classes. Within this timetable the courses and teachers are listed, teachers who are not co-authors of this paper are listed as Teacher A, B, C, and D.

Figure 2

U-Connect Wednesday - Friday Schedule: Online Learning with Optional Face-to-Face Sessions

<table>
<tr><th colspan="4">U-Connect – Independent Asynchronous Learning</th></tr>
<tr><th></th><th>Wednesday</th><th>Thursday</th><th>Friday</th></tr>
<tr><td>9:00 am</td><td rowspan="3">Optional Wednesday Learning (O.W.L.) in person

Bi-weekly Open Tutorial

Monthly Field Trip/ Learning Experience</td><td rowspan="6">Independent At Home Learning</td><td rowspan="6">Independent At Home Learning</td></tr>
<tr><td>10:00 am</td></tr>
<tr><td>11:00 am</td></tr>
<tr><td>12:00 pm</td><td rowspan="4">Independent At Home Learning</td></tr>
<tr><td>1:00 pm</td></tr>
<tr><td>2:00 pm</td></tr>
<tr><td>3:00 pm</td></tr>
</table>

Note: Students are not restricted to completing asynchronous online work during the school hours or days. Monthly face-to-face field trips or learning experiences may be full day.

We noticed that students were engaged and working in class, but the challenging part was getting students to work at home on the asynchronous online portion. U-Connect is designed to attract learners with diverse needs, including high-anxiety, elite athletes, high achievers, and homeschooling families. In order to accommodate for the diverse needs of our learners, we have adopted Universal Design for Learning (UDL) strategies. UDL is a framework for designing curriculum to support all learners by providing multiple means of engagement, representation, and action/expression (CAST, 2018b). We feel there is more to learn about how to engage learners and accommodate for diverse learners within an asynchronous online learning environment.

Problem Statement

Researchers have noted asynchronous online courses have low retention rates (Alivernini & Lucidi, 2011; Dietz-Uhler et al., 2007; Jaggars, 2014), and low performance outcomes (Heppen et al., 2017). Challenges found in the research include self-regulation (Bergdahl et al., 2020; Dabbagh & Kitsantas, 2004), motivation (Alivernini & Lucidi, 2011), insufficient supports (Heppen et al., 2017) and an absence of social interaction (Alivernini & Lucidi, 2011). Consistently, researchers questioned how to engage students who are working in asynchronous online environments. Within our context, we noticed a similar trend: student disengagement in asynchronous online learning activities for both our blended and fully online students. We wish to improve our teaching practices by reviewing current literature to address the disengagement problem we, and other teachers, face within online asynchronous learning components.

Purpose of Research

The purpose of this project is to:

- identify factors that influence learner engagement in online learning environments
- identify strategies that engage students in asynchronous online learning,

In the current societal circumstance of the pandemic, all teachers were required to teach remotely, and that transition took place without much time for training. As such, we want to have a participatory role in supporting teachers, by creating resources that can be used to improve online engagement. Moreover, as we have experienced, when teachers transition into online environments, they are given little training. Kumi-Yeboah (2015) confirms that few educators “are offered [training] on technology or how to teach online” (p. 141). The research we have examined stresses the importance of educator training and learning design as key

components of successful online learning. In order to implement a blended learning program, educators need knowledge, time, resources, and support (Francis & Shannon, 2013).

Designing engaging online environments is not a simple matter of digitizing existing content and placing it online. Deliberate planning and implementation of curriculum requires professional development around appropriate pedagogy, as it is insufficient to "deliver old content in a new medium" (Garrison & Kanuka, 2004, p. 99). Teachers require "support for the development of a pedagogical approach, as well as training in specific tool selection and use" (Francis & Shannon, 2013, p. 360). In order to have a successful blended learning program, teachers need "to enhance their technological, pedagogical, and content knowledge" (Paniagua & Istance, 2018, p. 85). In addition, teachers need administrative and technical support, when it comes to "knowledge and experience with online instruction, classroom management in virtual environments, [and] support systems" (Boboc, 2015, p. 29). A common error in blended learning is trying to "cover too much material and include too many assessment activities" (Vaughan, 2014, p. 260), which leads to surface-level teaching. Most importantly, educators need time, resources, and support in order to implement successful blended learning programs (Paniagua & Istance, 2018; Roehl et al., 2013).

It is essential that blended learning programs provide "support for both students and teaching faculty" (Garrison & Kanuka, 2004, p. 102). Blended learning needs to be a well-planned, supported, effective model with ongoing assessment and support for staff and students (Dziuban et al., 2004). Moskal et al. (2013) came to similar conclusions when articulating the requirements for a successful program: the identification and setting of goals, times, administration and faculty cohesiveness, supportive organizational structures, instructional designers, support for students, and continual reassessment. Francis and Shannon (2013) echoed

these sentiments when they noted that institutions need to put resources towards developing pedagogy for blended learning. Patrick et al. (2015) observed that professional development is important for teacher's when taking on this type of initiative; yet Dziuban et al. (2006) stated that most teachers have not completed any formal training in online facilitation. Francis and Shannon (2013), Garrison and Kanuka (2004), Pratt and Kovatcheva (2018) all agree that, for teachers to be the drivers of change, they will require professional development and access to research to implement an appropriate blended model for their learning environment.

Project Overview

The purpose of our project is to provide support to teachers in evolving online/blended learning environments. The project we are currently planning involves creating a resource package, which includes documents and videos to outline strategies to engage students in asynchronous online learning environments. These strategies will be based on current research and our efforts to support best pedagogical practices. Our goal is to ensure this project's content is transferable and includes strategies that can be applied in any online context. Our hope is that educators new to teaching online will be able to implement a variety of activities that lead to increased student engagement. As our school uses the Moodle LMS and our school district uses Microsoft Teams, these platforms will make up most of our examples; however, we will include an outline of the strategies used so that they may be applied using other technology systems.

Definitions

We are outlining key terms to understanding the context of our literature review and our project. Some terms may have more than one definition, such as blended learning, engagement, and collaboration, we will be defining the terms with regards to secondary education as follows.

Asynchronous/Synchronous Learning: Asynchronous and synchronous are terms used to describe the time and place of the learning. Asynchronous learning as Journell (2015), states "does not require the simultaneous presence of senders and receivers" (p. 89). Synchronous learning, on the other hand, is when educators and learners communicate at the same time. However, this can take place in person or remotely. In our context, the terms synchronous learning will refer to face-to face interactions whereas asynchronous learning will refer to online interaction.

Face-to-Face Learning: Face-to-face learning is commonly associated with traditional classroom environments whereby students and teachers interact in-person (Avgerinou & Andersson, 2007). Kumi-Yeboah (2015) further elaborates on how student-teacher interaction must take place at a common physical location based on a set schedule of time. While advances in technology have allowed for synchronous online student-teacher meetings (Kemp & Grieve, 2014), we will be referring to face-to-face learning in the context of both parties being physically present in a brick-and-mortar classroom environment.

Online Learning: While more commonly found in post-secondary, online learning is increasing in popularity as an option for those in K-12, particularly in response to the COVID-19 pandemic. Online learning has been defined as "a form of distance education in which all instruction and assessment are carried out using online, Internet-based delivery" (Kumi-Yeboah, 2015). It has evolved from "text-based, asynchronous 'anytime-anyplace-anywhere' courses" (Irvine, 2020), to a learning environment that can include synchronous meeting times.

Blended Learning: Blended learning is defined in multiple ways and has "been used interchangeably with mixed mode learning, hybrid instruction and technology-mediated/enhanced learning" (Yuping Wang et al., 2015, p. 380). Blended learning became the

term used in North America to describe what was termed hybrid learning in Australia (Irvine, 2020). Hybrid learning, considered to be synonymous with blended learning, includes some combination of consecutive face-to face instruction and online learning (Irvine, 2020; Suwantarathip, 2019; Yuping Wang et al., 2015). Despite the multitude of definitions and models, consistent within the reviewed literature is that blended learning includes both an online and face-to-face component (Dey & Bandyopadhyay, 2019; Francis & Shannon, 2013; Garrison & Kanuka, 2004; Güzer & Caner, 2014; Hrastinski, 2019; Irvine, 2020; Moskal et al., 2013; Norberg et al., 2011; Pratt & Kovatcheva, 2018; Vaughan, 2014). Within our research, we have looked at learning termed “hybrid” and “blended”; however, as it would create confusion for the reader to switch back and forth between these terms interchangeably, and as our program is referred to as a blended learning program, from here onward we will discuss this type of learning environment as blended learning.

Universal Design for Learning (UDL): UDL is a framework that addresses diverse learning needs by creating global strategies that allow all students the opportunity to engage in learning. Ostrowski et al. (2016) notes that as "learners differ in their motivations for learning, comprehension of information, and expression of knowledge, the UDL framework enables educators to design and facilitate inclusive learning experiences for all learners" (p. 222). There are three principles: providing multiple means of engagement, multiple means of representation, and multiple means of action and expression which aim to “improve and optimize teaching and learning for all people based on scientific insights into how humans learn” (CAST, 2018b, para. 1).

Engagement: Vaughan (2014) describes engagement as “the amount of time and effort that students put into their classroom studies that lead to experiences and outcomes that

constitute student success" (p. 248). The classroom studies include course learning material, activities, and assessments designed by the educator (Dixson, 2015; Krause & Coates, 2008).

Active Learning: Active learning is a pedagogical approach to support students in making connections and forming better understanding. This approach is applied using strategies around how students interact with learning materials (Brewer & Movahedazarhouligh, 2018; Curtis & Lawson, 2019; Gilboy et al., 2015; Moreno & Mayer, 2000; Roehl et al., 2013; Zepke & Leach, 2010). Active learning instructional strategies include authentic learning activities, collaboration, problem-solving, reflection, multiple representations, and scaffolding.

Collaboration: Collaboration is a skill that is based on working with others on a task. "Collaborating involves the skills, strategies, and dispositions" of students who work together towards a common goal (BC Ministry of Education, 2016, para. 1). Within an educational context, collaboration may be used between teachers, between students, and between teachers and students. Student to student collaboration is an instructional strategy, employed by teachers, that is used in conjunction with learning activities. Curtis and Lawson (2019) note that a key component of collaboration as an instructional strategy is the conversation and subsequent learning that takes place when students are engaged with a common task.

Search Methods

Our exploration of the literature used in our project was centered around the University of Victoria's (UVic's) library, looking at articles which were categorized as scholarly, peer-reviewed, and published between the years of 1996 and 2020. Our most common search terms that were included as part of multiple searches are: ("blended learning" OR "hybrid learning" OR "online learning") AND "engagement" AND ("high school" OR "secondary school" OR "K-12"). While the terms "high-school" and "k-12" were included often in early searches, due to a

lack of results, they were omitted to broaden the search. We targeted articles for our literature review using a wide array of Boolean searches, see Appendix for the list. In addition to our common search terms, we included: active learning; barriers; challenges; collaboration; community-building; distributed learning; engagement; flipped classroom; inquiry; learning design; online pedagogy; problem-based learning; teacher presence; UDL to yield the research we have included in our literature review.

Delimitations

While we recognize that blended learning and the associated research is broad and plentiful, due to the purpose of this project, and our individual context, we only examined specific aspects of blended learning and student engagement. Each student at U-Connect is provided a laptop computer and has access to an IT specialist at the school, therefore we made the decision to not include accessibility to technology as part of our review. We could have included research on issues that occur from stakeholders, however as a choice program developed within the school district, students, families, and the district are already on board. U-Connect secondary uses an open source LMS to deliver course content, while open source has not been omitted from our research, it will not be specifically addressed. Due to the online courses being self-paced, continuous enrollment does not further impact us at U-Connect, therefore we have made the decision to not specifically address continuous enrollment in our literature review. As previously mentioned, the purpose of this project is to identify factors that influence learner engagement, identify strategies that engage students in asynchronous online learning, and to provide support to teachers in evolving educational environments.

Chapter Two: Theoretical Framework and Literature Review

This chapter includes four parts. The first presents the research's theoretical framework, which is based on social constructivist perspectives. The second part presents blended learning as a modality. The third section focuses on learning design, specifically looking at active learning, flipped learning, and problem-based learning. The fourth and final section focuses on facilitation through an examination of teacher presence and collaborative learning environments.

Theoretical Framework

This section explores the theoretical foundation for online education which teachers use to direct pedagogy and influence instructional strategies. There are three prominent learning theories: behaviorism, cognitivism, and constructivism, which were developed in the 19th century, "a time when learning involved either face-to-face interaction or interaction with static learning materials" (Dennen et al., 2018, p. 154). Despite the evolving world of education, these theories still influence pedagogy and have led to new theories. While all learning theories have their place in education, the authors of this paper will focus on constructivism and its integration in online learning environments.

Constructivism is based on the key tenet that "meaning is constructed through human experiences, but the locus of knowledge construction differs" (Dennen et al., 2018, p. 152). Through sensory experiences, active participation and reflection, students construct meaning as they think critically, problem solve, and apply prior knowledge (Beerenwinkel & von Arx, 2017; Kumi-Yeboah, 2015). According to Dennan et al. (2018), "constructivism relies on the constituted nature of human experience: the context in which we learn and the context that has shaped our at-this-moment selves is integral to the nature of constructivism" (p. 152). There are two main facets of constructivism: cognitive and social. Cognitive constructivism emphasizes the

individual mental process of learning (Dennen et al., 2018; Kumi-Yeboah, 2015), whereas social constructivism emphasizes the social and relational process of learning (Atwater, 1996; Lemke, 2001; Palincsar, 1998; Palmer, 2005; Rogoff, 1998). Between the two facets of constructivism, our focus will be on social constructivism due to its prevalence in the literature as it relates to online learning environments. Kumi-Yeboah (2015) notes that constructivism theory is commonly used in online learning.

Social constructivism revolves around the idea that students construct meaning through social interactions which relates to "a variety of theories and approaches, such as Vygotsky's sociocultural theory (1978); Piaget's (1985), sociocognitive conflict theory and Bandura's (1986) social cognitive theory" (Barak, 2016, p. 285). A key component of social constructivism is learners engaging in collaboration and sharing their understanding in order to construct meaningful learning experiences (Barak, 2016). Collaboration is important as "social constructivists believe that interpersonal dynamics and subconscious discourse enhance cognitive change" (Barak, 2016, p. 285). Penland (2015) and Kumi-Yeboah (2015) both discussed the importance of collaboration when it comes to constructing understanding. Social constructivism demonstrates how this generation of learners will harness the power and possibilities within an online learning environment to communicate, collaborate, and connect with their intuitive use of technology (Penland, 2015). Constructivism affords online students the opportunity to be a part of a diverse community which extends learning beyond the classroom (Kumi-Yeboah, 2015).

Community of Inquiry (CoI) is the social constructivist extension for online and blended learning (Dixson, 2015; Garrison et al., 2000; Garrison & Vaughan, 2008). The use of this theory as a framework for blended learning is supported by an abundance of literature (Garrison &

Kanuka, 2004; Valverde-Berrocoso & Fernández-Sánchez, 2020). There are three interdependent presences of CoI: social, cognitive, and teaching, which are integral to create impactful learning experiences for communities of learners (Dixson, 2015; Valverde-Berrocoso & Fernández-Sánchez, 2020). Online learning environments can cause students to feel isolated and alone (Alivernini & Lucidi, 2011). As CoI is structured around presence and community, the use of this framework may counteract the isolation students feel, leading to higher levels of engagement (Curtis & Lawson, 2019; Zepke & Leach, 2010). CoI, as a theoretical explanatory framework, can work in conjunction with the UDL model, especially based on the overlap in theoretical ideals.

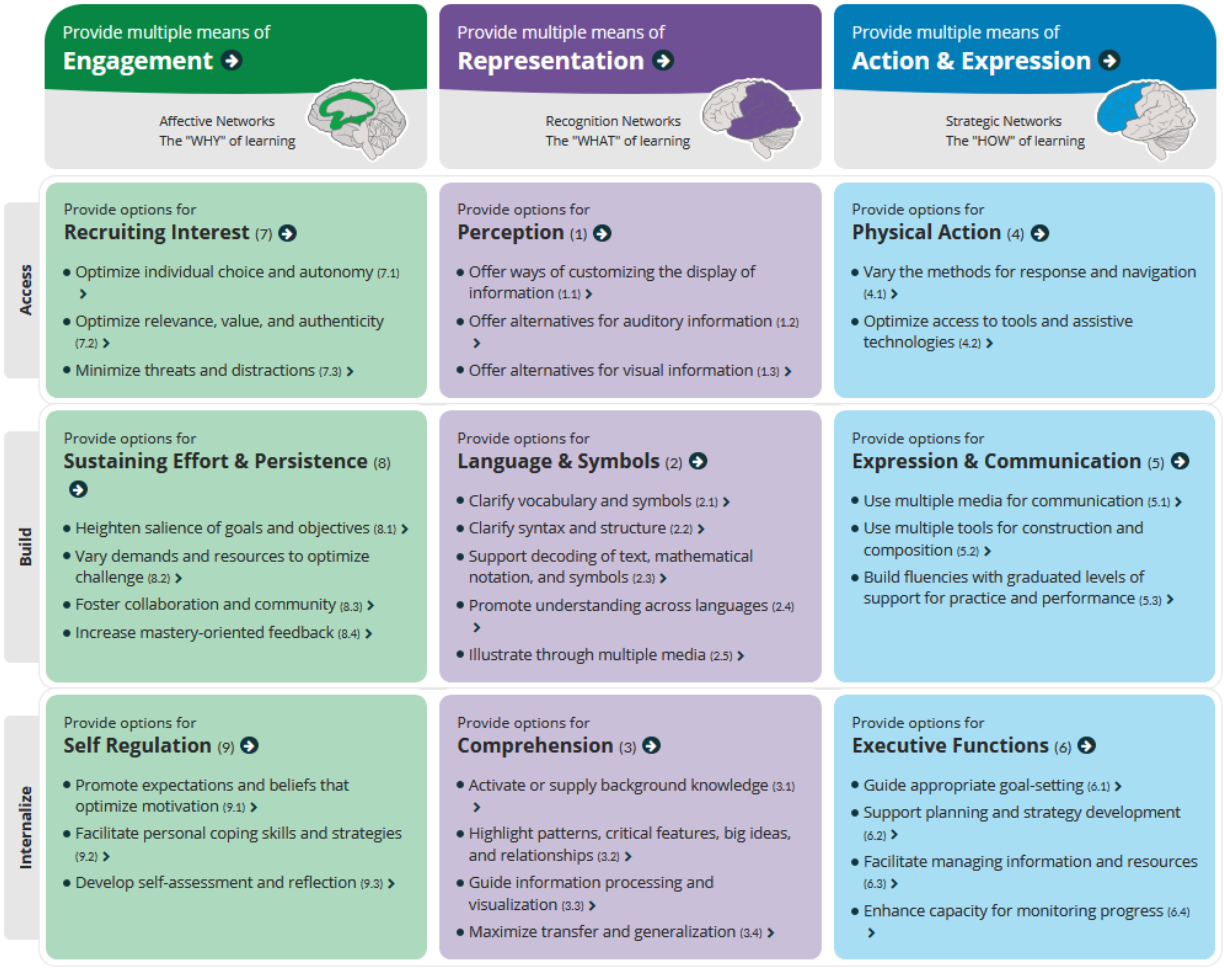
The UDL model is an educational framework that accommodates for diverse learners through the creation of flexible learning environments (CAST, 2018b; Harvey & Daniels, 2015; Katz et al., 2018). Additionally, the UDL model is used to "proactively cater for student difference rather than react to student failure" (Dinmore, 2016, p. 1244), which can lead to increased student engagement (Dinmore, 2016). When following UDL practices, teachers use a variety of methods to present content, in order to support student understanding (Dinmore, 2016; Harvey & Daniels, 2015; Katz et al., 2018; Penland, 2015). Within an online environment, UDL pedagogies are easily put into practice due to modern technologies (Dinmore, 2016; Edyburn, 2010; Ostrowski et al., 2016). As shown in Figure 3, UDL, as "a scientifically valid framework to guide educational practice" (Edyburn, 2010, p. 34), consists of three main tenets: involvement/engagement, representation, and action and expression (CAST, 2018b). Within the engagement tenet (the "Why" of Learning), there are three guidelines around providing options for recruiting interests, sustaining effort, and self-regulation (CAST, 2018b). This focuses on providing multiple ways to engage students as every learner differs in motivation and will

engage in activities differently (CAST, 2018b; Dinmore, 2016). Within the representation tenet (the "What" of Learning), there are three guidelines: perception, language and symbols, and comprehension (CAST, 2018b). The representation tenet involves the delivery of content in multiple ways with consideration of auditory, visual, and language diversity (CAST, 2018b). Within the action and expression tenet (the "How" of Learning), there are three guidelines: physical action, expression and communication, and executive functions (CAST, 2018b). This focuses on how students differ from each other in their ability to express themselves either verbally or in written text. As a result, educators need to ensure students have different methods of expressing their knowledge and understanding (CAST, 2018b).

Arguably there is no "What" or "How" without the "Why." Focusing on the "Why," the engagement factor of UDL, may create higher levels of engagement leading to better student understanding allowing for the "What" and "How" to impact student learning. The affective neural network monitors "the internal and external environment to set priorities, to motivate, and to engage learning and behavior" (Meyer et al., 2014, p. 54). Without engagement, learning cannot take place (Ostrowski et al., 2016). Factors that influence engagement include: "neurology, culture, personal relevance, subjectivity, and background knowledge, along with a variety of other factors" (CAST, 2018a, para. 1). As noted by CAST (2018a), "there is not one means of engagement that will be optimal for all learners in all contexts; providing multiple options for engagement is essential" (para. 1).

Figure 3

UDL Guidelines



Note: This table includes guidelines to provide specific options for each tenet of the UDL. Retrieved from http://udlguidelines.cast.org, by CAST, 2018, Universal Design for Learning Guidelines version 2.2.

Blended Learning Modality

Blended learning has been described as a unique opportunity to incorporate the benefits of online and face-to-face interactions in an educational learning environment (Akyüz & Samsa, 2009; Francis & Shannon, 2013; Güzer & Caner, 2014; Klenner-Moore, 2011; Kumi-Yeboah, 2015; Norberg et al., 2011). Wang et al. (2015) and Irvine (2020) reflected pertinently on the

multitude of definitions and modes, with Wang et al. noting that "a complete view of what constitutes blended learning and how different components of blended learning work together over time to achieve an integrated whole" has not been found (p. 380). In line with the definition of blended learning that was overwhelmingly proposed in the literature, we are working under the interpretation that blended learning is a modality that includes two components consecutively: online and face-to-face (Francis & Shannon, 2013; Garrison & Kanuka, 2004; Güzer & Caner, 2014; Hrastinski, 2019; Moskal et al., 2013; Norberg et al., 2011; Pratt & Kovatcheva, 2018; Vaughan, 2014). As all constructs of blended learning contain both a modality and a pedagogy, care must be taken to discuss each separately as biases towards a modality can be formed. These biases have nothing to do with the modality, but rather are connected to pedagogy. The concern is that these biases may be expressed as an inherent characteristic of the modality (Irvine, 2020). Understanding how modality and pedagogy are defined will help clarify the biases: modality is defined as "the location and timing of interaction" (Irvine, 2020, p. 42), while pedagogy is defined as "the method and practice of teaching" (*Definition of Pedagogy*, n.d.). Blended learning, as a modality, is a specific structure itself that inherently does not dictate the experience in the learning environment; the pedagogy dictates the learning experience. As such, our literature review will address modality and pedagogy as isolated conditions. Appropriately, pedagogy will be reviewed within the teacher section and modality will be the focus within the remainder of this section.

Boelens et al. (2017) discuss how "face-to-face and online components are generally used for different purposes" (p. 11). Many studies consider face-to-face as synchronous meetings in person, and online as exclusively asynchronous individual work (Francis & Shannon, 2013; Garrison & Kanuka, 2004; Güzer & Caner, 2014; Pratt & Kovatcheva, 2018; Vaughan, 2014).

However, this concept is becoming increasingly dated as advances in technology have allowed for synchronous online student-teacher meetings (Kemp & Grieve, 2014). Face-to-face allows for learners to be involved in learning experiences that make use of the fact that you occupy the same space (Gagnon et al., 2020; Kumi-Yeboah, 2015; Roehl et al., 2013). The online portion allows students to work on their coursework by engaging with lessons and activities, such as in an LMS (Garrison & Kanuka, 2004; Journell, 2015). Coursework is accessible to students 24/7, allowing them to extend "learning in a digital format" (Kumi-Yeboah, 2015, p. 142). The designs studied in this research overlaps the context for our blended learning program, which uses a face-to-face component for synchronous meeting time, and an online asynchronous component, the latter of which is the focus of the research for our project. The blended learning components are interdependent, therefore both online and face-to-face learning is required to engage with a course as a whole (Francis & Shannon, 2013).

Teaching is a complex endeavor, one that may become even more so when teaching within a blended learning program as there are many more variables that potentially enhance, but also compound, the complexity of delivering a program that meets the needs of the students and engages them beyond the classroom (Ni Shé et al., 2019). Blended courses, due to their design, require some form of technology for online learning; this may be a school-based or personal device such as an iPad or a laptop to connect with a learning platform or LMS (Patrick et al., 2015). They also require some sort of design or model to shape the course or program (Boelens et al., 2017). What a specific school or institution decides to use is dependent on how they are designing their program, what resources they have available, and what model they are planning to incorporate.

Design

Learning Design Pedagogy

The teachers' role as the source of information, is no longer relevant in the 21st century classroom as accurate information from reliable sources is available at students' fingertips. In addition, Norberg et al. (2011) found the role of teacher as facilitator of learning is "a more sustainable structure" (p. 213). This shift is based on "a reassessment of [solely] didactic teaching methods and an acknowledgement of the growing acceptance of pedagogies influenced by social constructivism" (Dinmore, 2016). Blended learning is proposed as a more sustainable method of education, compared to online or face-to-face, for higher education and secondary schools (Alkış & Temizel, 2018; Francis & Shannon, 2013; Garrison & Kanuka, 2004; Linton, 2018; Norberg et al., 2011; Yen et al., 2018). Learning design refers to the modality and the pedagogy that support and structure learning (Conole, 2018). Pedagogy includes the strategies and approaches to facilitate learning (Kumi-Yeboah, 2015). Learning design for blended learning is unique, as face-to-face and online learning need to intertwine in order to engage students (Güzer & Caner, 2014; Pratt & Kovatcheva, 2018). Blended learning is the modality; however, the interplay of pedagogy and technology remain important to create a successful and sustainable learning environment.

When developing their learning design, educators are faced with many pedagogical decisions, such as whether to emphasize content or skills in their teaching. Although this is not a new discussion, the blended learning modality offers a new perspective and design opportunity. Researchers found that general educational practices ought to evolve to meet 21st century needs based on a few factors: a new understanding of the process of learning, advancements in technology, and the changing contexts of our students (Conole, 2018; Francis & Shannon, 2013;

Roehl et al., 2013). Linton (2018) found that "rather than adapting current teaching and learning structures or injecting technology into our existing practices" (p. 3), the blended learning modality should involve its own learning design structure. Journell (2015) asserted that education that includes online learning needs "to develop its own identity and best practices" (p 102). Blended learning allows teachers to integrate technology and design for the development of 21st century skills. In education, 21st century skills are referred to as core competencies in the BC Curriculum, and include critical and creative thinking; personal and social awareness; as well as communication and collaboration (BC Ministry of Education, 2016). Conole (2018) connects to these core competencies, asking, "how can learners be better prepared for the world that awaits them?" (para. 22). Berrett et al. (2015) asserts that as teachers, if we want our students to be successful, we need to prepare "them for what life will demand of them, which is not a laundry list of content" (p. 17). This shifting role of the teacher as content deliverer to the teacher as facilitator aligns with constructivist learning theory (Penland, 2015). Therefore, it is crucial that blended learning includes "technologies that enable students to interact with the learning experience in ways that are relevant and enhance learning" (Klenner-Moore, 2011, p. 62). Paniagua and Istance (2018) agree that when "computers provide the relevant information, teachers … have more time for concept application," and can use "more interactive and complex classroom activities" (p. 86) to support students' learning. This takes into consideration the shift to learning skills over content as there are pedagogical approaches that tailor to the distinctiveness of blended learning and creating engaging learning experiences.

A major component of blended learning is the "purposeful use of specific instructional strategies and technologies" (Linton, 2018, p. 5). Well-designed online components of the blended learning environment offer convenience (Klenner-Moore, 2011), individualization

(Boelens et al., 2017), self-pacing (Francis & Shannon, 2013), and "multiple technologies to deliver learning" (Akyüz & Samsa, 2009, p. 1745). Face-to-face components tend to increase motivation (Boelens et al., 2017), and engagement through "social and collaborative interaction" (Francis & Shannon, 2013, p. 361). Therefore, "successful blended teachers must develop critical competencies . . . that allow them to leverage technology and face-to-face instruction to meet the needs of all learners" (Linton, 2018, p. 2).

Blended learning, as a mixture of online learning in combination with face-to-face time, has been reported to be as effective as face-to-face (Dixson, 2015; Yen et al., 2018), more beneficial than only online (Heppen et al., 2017), and is proven to be advantageous for the learner in many aspects. Some of these advantages include the development of critical thinking skills (Donovan et al., 2014; Garrison & Kanuka, 2004), increased student motivation, student satisfaction, accessibility, flexibility and engagement (Boboc, 2015; Donnelly, 2010; Francis & Shannon, 2013; Güzer & Caner, 2014; Klenner-Moore, 2011; Norberg et al., 2011; Paniagua & Istance, 2018). When looking at the components of blended learning, basing pedagogical choices on social constructivism in face-to-face tends "to have greater efficiency, immediacy of feedback, no technological issues, greater perceived interactivity and important verbal and non-verbal communication" (Akyüz & Samsa, 2009, p. 1746). When online components are based on social constructivist learning theory, they support skill development, motivation, flexibility (Garrison & Kanuka, 2004), and facilitates "greater reflection and learner control of the ways in which they interact with the content, peers, and instructors" (Boboc, 2015, p. 27). In addition, in line with UDL guidelines, as the content for the online portion of blended learning is available to students anytime anyplace, students have the flexibility to work on assigned course content asynchronously based on their diverse learning needs (Dziuban et al., 2004; Norberg et al., 2011;

Roehl et al., 2013). Utilizing constructivist theories as a foundation for pedagogical decisions, is more likely to lead to the advantages discussed above.

It is important that educators who use constructivist theories as a foundation for pedagogical decisions in face-to-face contexts continue to maintain that theoretical foundation in asynchronous online contexts. How they execute those decisions may be different, but they need to preserve their pedagogical values when shifting to asynchronous online. In fact, allowing teachers to transition from teaching content to concepts, and allowing students to transition from learning through dictated methods to diverse methods is a way to equip our students with 21st century skills (Dabbagh, 2005; Sun et al., 2018). Journell (2015) and Penland (2015) recognize how the process of creating face-to-face and online content mirrors one another. Educators start by "identifying learning objectives and then finding the best methods for achieving those goals while remaining cognizant of the academic needs of students" (Journell, 2015, p. 88). Journell asserts that "good teaching is good teaching, regardless of the medium" (p. 102). Baragash and Al-Samarraie (2018) assert that different delivery modes tend to yield different learning outcomes, so careful selection of online and face-to-face activities allow the teacher to meet their course objectives. This careful selection of content and learning activities can also support personalization for diverse learner needs and aligns with UDL principles to offer choice and variety (Dixson, 2010; Journell, 2015; Pratt & Kovatcheva, 2018). Penland noted that blended learning has increased the opportunity to be learner centered. The personalization of learning is driven by a new understanding of the learning process that includes diverse learner needs and is a key factor in student-centered learning (Kumi-Yeboah, 2015; Pratt & Kovatcheva, 2018). In addition to the teacher in a facilitator role, student centered learning includes using learning theory to plan around student experience (Kumi-Yeboah, 2015). Creating this student-centered

learning environment follows UDL guidelines by designing options in learning activities so that students can use various methods to learn and demonstrate understanding (Austin & Mescia, n.d.; Pratt & Kovatcheva, 2018; Roehl et al., 2013). Moreover, Pratt and Kovatcheva (2018) identified that personalization of learning promotes engagement and active learning as the responsibility of learning shifts from the educator to the student.

Within the blended learning environment, educators choose active learning strategies to engage students in order to increase comprehension. Berrett et al. (2015) and Gilboy et al. (2015) discuss that educators cannot simply lecture to students and expect them to understand. This is further supported by Prince (2004) reporting that students are attentive on average for 15 minutes within a lecture and Roehl et al. (2013), who assert that students have increasingly less tolerance for lecture style delivery. Furthermore, Austin and Mescia (n.d.) describe that while learning may be thought of as active in and of itself, that is not the case. Lectures are one example of passive learning, where students receive information rather than engage with the content. In contrast, active learning involves students in the creation of their understanding through problem solving, inquiry, collaboration, and critical thinking. In order to support the transition from students' passive habits to active learning, Berrett et al. encourages students to look beyond the classroom to evaluate what makes people successful. This may help students to see the need to develop critical thinking skills rather than rote memorization of facts (Conole, 2018; Michael & Modell, 2003). The blended learning modality allows educators to use class time for active engagement rather than passive transmission of information. In addition, when class lectures are eliminated, instructional time is gained which can be used for focused skill development, teacher-student interactions, and adaptations for diverse learner needs (Paniagua & Istance, 2018; Roehl et al., 2013). A challenge that teachers may face, is when students perceive the

content covered at home as increasing their workload. This perception may be due to students being unsure of how to be successful as an active learner (Austin & Mescia, n.d.; Roehl et al., 2013; Sun et al., 2018). However, educators should be aware of how much content they are uploading into the course, or how much content is provided in the pre-built course, as this perception could be reality.

To support the transition to active learning, educators need to focus on providing scaffolds. Beerenwinkel and von Arx (2017) concluded that scaffolding and guidance are integral to any new learning experience. Furthermore, scaffolding within a constructivist learning approach benefits the learner. Scaffolding is especially important for students to understand the assessment goals, which means incorporating formative assessment opportunities. Journell (2015) outlines an example of the progression for a typical unit of study: activate prior knowledge; consult the experts; learn from others; apply your knowledge; reflect on what you learned; check for understanding. This progression is a student-centered approach that allows for authentic assessment (Journell, 2015). Therefore, the educator's learning design or choice of the engagement strategy, balance of workload and focus of assessment will contribute to active learning. Some prominent active learning strategies that can be used for engagement include inquiry, collaboration, and problem-based learning.

The research frequently suggests using active learning strategies to improve engagement in online learning (Prince, 2004; "Using Active Learning in the Classroom," 2011). In addition, Norberg et al. (2011) found that students who were active learners were more successful in a blended environment. Norberg et al. specifically observed that "old habits of passively attending class become increasingly ineffective" and students "who persisted with those behaviors did not fare well in the blended environment" (p. 209). Boelens et al. (2017) noted that blended learning

should “focus on stimulating students’ motivation and providing tasks that require mental effort” (p. 11) in order to make students active participants in their education. Active learning also aligns with student-centered learning and UDL guidelines as students become more aware of their learning and learning as a process. When teachers make use of active learning within the blended learning modality, students use technology to practice and explore skills such as critical and creative thinking, collaboration, and communication (Brewer & Movahedazarhouligh, 2018; Dennen et al., 2018). In connection to CoI, teachers can utilize collaborative work and authentic activities to have students focus on the goal of learning through seeking deeper understanding (Garrison & Kanuka, 2004; Norberg et al., 2011; Roehl et al., 2013; Vaughan, 2014). In class, activities can challenge students to activate prior knowledge, engage with learning, and apply concepts (Paniagua & Istance, 2018). Furthermore Boboc (2015) concluded that when students are engaged they take more responsibility for their learning.

Educators looking to engage students should use student-centered active learning strategies as a foundation for their design as they merge constructivist learning theory and UDL guidelines (Austin & Mescia, n.d.; Brewer & Movahedazarhouligh, 2018; Conole et al., 2004). Norberg et al. (2011) asserts that online delivery of content and follow-up face-to-face discussion allows for deeper understanding and application of the content. One integration of blended learning modality and active learning is referred to as flipped learning. The research highlights flipped learning as a popular application of active learning and major influencer of engagement as well as incorporating strategies such as inquiry, problem-based learning, and collaboration (Conole, 2018; Dabbagh, 2005; Pratt & Kovatcheva, 2018; Roehl et al., 2013). When students are active in the learning process, they become more engaged as noted by Brewer and Movahedazarhouligh (2018). Researchers agree that the flipped learning model allows for active

engagement in class, for instance collaboration and problem-solving, and allows for personalization and inquiry at home (Austin & Mescia, n.d.; Berrett et al., 2015; Brewer & Movahedazarhouligh, 2018; Dabbagh, 2005; Roehl et al., 2013; Yong et al., 2015). When teachers use class time for problem solving, it allows students to see authentic applications and collaborate on solutions (Brewer & Movahedazarhouligh, 2018; Dabbagh, 2005). Students are invested when they can see the application of their learning and are involved in thinking tasks to problem-solve. Ultimately, engaging students in active learning requires that students reflect and become self-aware of their learning which are higher order skills that are transferable to life after high school (Dabbagh, 2005; Sun et al., 2018).

As students practice the skills of engaging, they benefit from teacher-led active learning experiences in order to make connections with course content, ask meaningful questions, and interact with course material ("Using Active Learning in the Classroom," 2011). A student-centered approach takes into consideration that "adolescents are social beings who learn best when allowed to discuss ideas and content with others" (Journell, 2015, p. 87). Although some students are uncomfortable working in groups or prefer to work alone, Dabbagh (2005) and Sun et al. (2018) assert that teaching and monitoring students' collaborative skills will increase their success within group work. Providing individual and collaborative activities will allow for student-centered learning and offer collaborative skill building opportunities (Roehl et al., 2013). Using an active learning strategy such as problem-based learning can increase understanding and address student misconceptions since a teacher is there to help during the toughest problem-solving scenarios (Michael & Modell, 2003; Prince, 2004). When applying problem-based learning strategies, students first need to develop lower-level thinking skills, such thinking as understanding and remembering in their independent asynchronous learning activities (Brewer &

Movahedazarhouligh, 2018; Roehl et al., 2013). Then students can develop higher-level thinking skills, such as creative and critical thinking, in synchronous activities (Brewer & Movahedazarhouligh, 2018; Roehl et al., 2013).

Active Learning

Active learning is applied to teaching strategies that allow students to interact with course material, with the goal of making connections to form better understanding (Brewer & Movahedazarhouligh, 2018; Curtis & Lawson, 2019; Dabbagh, 2005; Gilboy et al., 2015; Moreno & Mayer, 2000; Roehl et al., 2013; Zepke & Leach, 2010). Learning as an active process relates to constructivist theory as the learning takes place when actively constructing meaning (Kumi-Yeboah, 2015). Active learning strategies are educational activities that encourage students to think about what they are doing (Prince, 2004), and are "devoted to problem solving, skill development, and gaining a deeper understanding of the subject matter" (Roehl et al., 2013, p. 46). Further research indicates the purpose of active learning is to engage students as active learners who take responsibility for their learning (Francis & Shannon, 2013; Klenner-Moore, 2011).

Teachers scaffold and model active learning, so students have the opportunity to "practice how to apprehend knowledge and skills and use them meaningfully"("Using Active Learning in the Classroom," 2011, p. 75). To role model, teachers must be willing to field questions that they do not know the answer to and guide students along the construction of their understanding ("Using Active Learning in the Classroom," 2011). Teachers support the transition by designing learning experiences based on what they want students to be able to do with what they learn (Michael & Modell, 2003). While often thought of as passive, a lecture can be active if the teacher includes interaction with questions and allows time for students to discuss

connections with previous knowledge (Prince, 2004). The shift to active learning is noticeable when students are connected and engaged with their teacher, other students, and the content with the goal of constructing deeper understanding (Dabbagh, 2005; Norberg et al., 2011). Students who learn actively acquire skills to transfer knowledge to different contexts and demonstrate profound understanding of course content (Michael & Modell, 2003; Prince, 2004).

Active learning strategies support student engagement, strengthen learning, and increase understanding (Austin & Mescia, n.d.; Prince, 2004; Roehl et al., 2013; Yong et al., 2015). In addition, Dixson (2010) found that active learning "is also touted as a way to engage students in the online environment" (p. 2). These strategies increase participation, help students develop a positive attitude towards lifelong learning, and improve student success (Brewer & Movahedazarhouligh, 2018; Zepke & Leach, 2010). When educators integrate active learning strategies, students have the opportunity to think critically and dynamically to engage with and apply the concepts successfully ("Using Active Learning in the Classroom," 2011). Moreno and Mayer (2000) found that "helping learners interpret and interrelate important information in the familiar versus abstract" (p. 725), promoted deeper understanding of course content, engaged students in their learning, and allowed students to construct and explore their own meaning.

In connection with UDL, active learning allows teachers to address the diverse learning needs of students (Austin & Mescia, n.d.). Asynchronous and synchronous learning environments both employ instructional strategies with the focus of improving self-awareness and self-efficacy in students' learning (Austin & Mescia, n.d.; Dabbagh, 2005; Sun et al., 2018). The strategies that coincide with UDL guidelines include authentic learning activities, collaboration, problem-solving, reflection, scaffolding, and multiple representations. It is important for educators to consider students' strengths and weaknesses when planning active

learning opportunities, as students desire to engage with a learning environment that provides options and allows for personalization (Brewer & Movahedazarhouligh, 2018; Conole, 2018; Roehl et al., 2013). The activities that students found engaging according to Dixson (2010), centered around applying or discussing concepts, which aligns with the UDL guidelines and connects to CoI. Additionally, students feel they have learned when they are able to retain and apply knowledge using acquired skills ("Using Active Learning in the Classroom," 2011). Dinmore (2016) asserts that active and student-centered learning, with an emphasis on the social/ collaborative construction of understanding, are pedagogically best suited for the blended learning modality.

Having students engage in schoolwork is a complex task, especially when it incorporates both online and face-to-face environments. However, Baragash and Al-Samarraie (2018) assert that student engagement in the synchronous component of a blended class promotes engagement in the asynchronous online learning component. Additional benefits of active learning in the blended modality are the combination of social interaction, self-monitored learning, reflection and increased comprehension (Dixson, 2010; Francis & Shannon, 2013). Furthermore, interactions with other students and the teacher to collaborate and engage with content is of particular importance in asynchronous online learning as students often feel isolated (Dixson, 2015). There are several strategies to implement active learning, including collaborative group work, integrating questions, problem-based learning, brainstorming, and personalizing messages (Moreno & Mayer, 2000). To maximize active student-centered learning, students and educators will need training and practice with their new roles (Brewer & Movahedazarhouligh, 2018). Through the active learning process, students solidify long-term understanding, which reduces the need for reviewing material and increases their participation in higher-level thinking

activities ("Using Active Learning in the Classroom," 2011). Several prominent active learning strategies emerged from the literature that coincide with UDL and CoI including flipped learning, inquiry-based learning, and problem-based learning (Garrison & Kanuka, 2004; Güzer & Caner, 2014; Roehl et al., 2013).

Instruction

Flipped Learning

The blended modality in its design is a natural fit for the flipped learning strategy. While the flipped classroom may be considered a form of blended learning, it should not be equated with blended learning (Cheng et al., 2018). For our purposes, we looked at flipped learning as a strategy that could be utilized within a blended learning program as a means to increase engagement with activities during asynchronous independent learning time. The basic premise of this active learning strategy is to have learners explore materials to gain foundational knowledge, and then actively apply that knowledge (Brewer & Movahedazarhouligh, 2018; Cheng et al., 2018; Gilboy et al., 2015; Klenner-Moore, 2011; Roehl et al., 2013). This learning is consecutive and connects the asynchronous online learning to the synchronous face-to-face learning (Norberg et al., 2011). In flipped learning, teachers structure synchronous time for students to "work through problems, advance concepts and engage in collaborative learning" (Roehl et al., 2013, p. 45). Flipped learning is dynamic and interactive (Brewer & Movahedazarhouligh, 2018), and "promote[s] student-centered, active learning" (Gilboy et al., 2015, p. 113). Roehl et al. (2013) observed "more innovation and cooperation" (p. 4) in flipped learning situations as it allowed students flexibility and addresses diverse learning needs. Berrett et al. (2015), Brewer and Movahedazarhouligh (2018), and Roehl et al. (2013) support moving problem-solving and collaborating into the classroom so that educators can assess, track, and support students'

understanding in real time. Additionally, with increased student-teacher interaction, teachers are able to evaluate and have "greater insight into students' grasp of information and learning" (Roehl et al., 2013, p. 47). Researchers and educators alike have found that flipped learning can improve student engagement, self-awareness, and support student understanding, retention, and transference of skills and knowledge (Berrett et al., 2015; Brewer & Movahedazarhouligh, 2018; Roehl et al., 2013; Sun et al., 2018).

While much of the research supports the use of flipped learning, Sun et al. (2018) and Yong et al. (2015) recognize that the variability in the implementation of flipped learning to mixed findings related to increased student engagement. Flipped learning has a greater positive impact when synchronous lectures are replaced with active learning strategies and students have the flexibility to personalize learning new content (Berrett et al., 2015; Brewer & Movahedazarhouligh, 2018; Roehl et al., 2013). The flexibility of having didactic teaching such as lectures and content online allows students to monitor their understanding, revisit topics, and learn at their own pace (Brewer & Movahedazarhouligh, 2018; Roehl et al., 2013; Yong et al., 2015). This structure also supports students' development of metacognitive and self-efficacy skills, as they structure and pace their learning to suit their needs (Sun et al., 2018). Additionally, students were able to recognize that their understanding improved with flipped learning, and assessments demonstrated this as well (Brewer & Movahedazarhouligh, 2018). In line with this, Yong et al.'s (2014) article demonstrates the complexities of assessing how successful flipped learning experiences are on improving student engagement.

The benefits of using technology for flipped learning are illustrated by Klenner-Moore (2011), who found that integrating technology will engage students in the learning, including using asynchronous online "digital media to enhance content" (Gilboy et al., 2015, p. 110). They

go on to state that it is not enough to digitize a textbook to post online, the key is to develop interactive digital content "that support learning objectives" (Austin & Mescia, n.d., p. 1). Klenner-Morre recognizes technology as an effective tool to vary the "types of learning objects and opportunities" (p. 61), which coincides with providing options under the UDL guidelines. This illustrates the importance of intentionally controlling the elements of the learning environment; everything matters.

While there is a lot of research on flipped learning being utilized in math, science, and skill-based courses, there is less research around flipping humanities classes, which supports the notion that a flipped classroom may not be a good choice for all lessons and courses (Berrett et al., 2015; Brewer & Movahedazarhouligh, 2018; Roehl et al., 2013; Sun et al., 2018; Yong et al., 2015). Cheng et al. (2018) found a small but positive effect for the flipped classroom that differed in scale across subject areas with arts and humanities receiving the highest positive effects. What can be learned from this is that this strategy may be beneficial for some lessons across all disciplines. Flipped learning can be a means to create engaging experiences, rather than as an educational model that depends on execution to create these experiences. Within blended learning, where students have access to one-to-one technology and teachers have the time and skills to create experiences, flipped learning has the potential to make use of engagement strategies within class that extend via technology to the online experience (Conole et al., 2004; Dabbagh, 2005).

Inquiry Learning

Inquiry allows students to explore areas of interest with the support of teachers (Lammert, 2020). Inquiry is student-centered, active, question driven, and problem-based; allowing students to construct their own understanding and thus connecting to constructivist

learning theory (Edelson et al., 1999; Preston et al., 2015). Applicable to any subject, inquiry provides students the opportunity to engage with course material and use their knowledge for practical applications (Edelson et al., 1999; Harvey & Daniels, 2015; Preston et al., 2015). Fundamentally, inquiry focuses on the process of exploring open-ended questions (Edelson et al., 1999; Harvey & Daniels, 2015). As an active learning strategy, prior knowledge is applied and utilized in student-generated inquiry projects (Lammert, 2020). They noted that all students have previous experience and knowledge that can contribute to the development of literacy as a learning tool. This intentional pedagogical choice asks teachers to integrate and embed literacy as a practice rather than a set of skills, thereby helping students to develop real-world experience (Lammert, 2020). Makerspaces, collaborative projects, and research questions are all examples of inquiry in the classroom (Harvey & Daniels, 2015). They confirm that teaching big ideas and essential questions allows students to engage with their own questions, while addressing curricular competencies. Additionally, inquiry projects promote thoughtful reflection allowing students to think for themselves (Harvey & Daniels, 2015). Well-designed inquiry enables students to thoughtfully respond to curricular questions, while constructing their own understanding.

Teachers play a key role in the integration of inquiry in any learning environment. Educators skillfully direct, engage, motivate, provide materials, structure interaction, and channel students curiosities (Harvey & Daniels, 2015; Preston et al., 2015). Even though inquiry lends itself well to the blended learning modality (Lammert, 2020), asynchronous and synchronous inquiry activities look different. Synchronous learning allows students to interact in small peer groups, collaborate on ideas, and connect with the teacher for feedback and support in real time. With strong scaffolding, structured meeting times, and clear expectations, students can

also engage with the inquiry process in asynchronous online learning (Journell, 2015). Inquiry is not a solo endeavour, as outlined in the CoI framework, it requires student-student and student-teacher interactions (Dixson, 2015; Garrison & Vaughan, 2008). Teachers take an active role in inquiry projects, as they guide students' curiosities and become facilitators of learning (Harvey & Daniels, 2015; Lammert, 2020). Harvey and Daniels (2015) found students develop comprehension and collaboration skills as they investigate their topics in groups. Therefore, learning through inquiry enables the co-construction of understanding, and provides students with the opportunity to engage in their learning process (Harvey & Daniels, 2015; Preston et al., 2015).

Student engagement in a learning environment is dependent on their motivation, and interest in course content (Edelson et al., 1999). Harvey and Daniels (2015) confirm that curiosity leads to motivation and engagement in the learning, which results in students' construction and application of knowledge. Moreover, Edelson et al. (1999) and Lammert (2020) verify that students disengage from inquiry activities when they are not motivated by personal interests. Authentic learning experiences motivate students to develop skills, apply knowledge, and take ownership of their learning (Edelson et al., 1999; Lammert, 2020). A goal of active learning, realized through inquiry learning, is to teach students to research, think critically, problem solve, and become life-long learners (Lammert, 2020; Preston et al., 2015). Inquiry projects enable students to engage in active learning by developing curiosity, building understanding, and taking action (Harvey & Daniels, 2015).

Inquiry projects also provide a unique opportunity to differentiate learning, based on student needs, utilizing UDL guidelines. Harvey and Daniels (2015) evaluated how flexible and adaptable inquiry projects are in learning environments. They found the only way to practically

address each student's needs is to divide the class into "small, needs-based, flexible groups" (Harvey & Daniels, 2015, p. 51). This structured small group work allows for differentiation, and incorporates background knowledge, strengths, and views of each individual student in the co-construction of understanding (Harvey & Daniels, 2015). Every student "can be a vital part of the group's work without having to read the same materials, do the same task, or have the same learning goals" (Harvey & Daniels, 2015, p. 111).

There is growing evidence of the value of inquiry activities to increase engagement in education (Preston et al., 2015). Infusing inquiry activities can provide a meaningful context for learning as it provides students the opportunity to improve, clarify and apply their knowledge to prepare students to be reflective, systematic, life-long learners (Edelson et al., 1999; Lammert, 2020; Preston et al., 2015). Harvey and Daniels (2015) discuss how "thinking is not a spectator sport" (p. 99), and collaborative inquiry activities bring students with varying viewpoints and diverse talents together to participate in learning. Inquiry provides students with the opportunity to construct knowledge and apply it to real-life situations, which is a goal of constructivist learning (Harvey & Daniels, 2015).

There are many considerations when integrating inquiry into a learning environment, such as teachers comfort level, content scaffolding, and student readiness (Edelson et al., 1999; Harvey & Daniels, 2015). The student-centered approach of inquiry is time-consuming, as it requires teachers to facilitate a learning environment where students co-construct their educational experience (Harvey & Daniels, 2015; Preston et al., 2015). However, Preston et al. (2015) argue that time spent to use a student-centered approach is "offset [by] the depth of understanding of pedagogy gained, the increased level of engagement and the development of life-long inquiry skill" (p. 75). To integrate inquiry into any learning environment, teachers need

to place students “in active, flexible, inquiring, hands-on teams” (Harvey & Daniels, 2015, p. 51). If students struggle with technology, organization, or intrinsic motivation, it would be challenging for them to engage in the inquiry process without teacher scaffolding. Harvey and Daniels (2015) found that “[students] all have different needs. Some are quickly ready for independent practice. Others need more time, support, and guided practice” (p. 320). Inquiry is dependent on the questions that students develop; an open-ended question will allow for thoughtful reflection and exploration of the topic (Burgess, 2018). Moreover, educators are looking for students to demonstrate understanding, which can only be accurately assessed when students share their thinking (Harvey & Daniels, 2015). Understandably, there are some challenges to assessing inquiry projects as “thoughtful work that demonstrates understanding is much harder to grade than a fill-in-the-blank worksheet” (Harvey & Daniels, 2015, p. 320). Despite these challenges, when teachers aim to develop critical thinking, build on understanding, and help students apply knowledge, inquiry is a viable means to engage students in their learning.

Problem-Based Learning

Problem-based learning has been defined as a pedagogical approach where small groups of learners work towards solving a complex, real world problem which does not have a clear-cut solution (Bate et al., 2014; Hmelo-Silver, 2004; Holland & Holland, 2014). Furthermore, Bate et al. (2014) outline problem-based learning as “an active and immersive process in which the students must take significant responsibility for their learning” (p. 1). This immersive process is guided by the instructor with the intent of scaffolding students towards self-directed learning (Evensen, 2000; Hmelo-Silver & Lin, 2000; Loyens et al., 2008). In this way, problem-based learning shares similarities with inquiry-based learning as both methods are "student-centered,

active learning approach[es] focused, on questioning, critical thinking, and problem solving" (Savery, 2006, p. 16). Additionally, both emphasize small groups where students work collaboratively to co-construct knowledge and understanding with the educator in a facilitator role (Dixson, 2015; Garrison & Vaughan, 2008; Williams et al., 2013). However, the main difference between these two approaches is the content of the exploration. In inquiry, the educator's task is to guide and scaffold students' exploration of a topic of interest based on curricular competencies (Lammert, 2020). Educators in problem-based learning use scaffolding techniques to ensure that the teacher's chosen subject matter is covered (Loyens et al., 2008). Servant-Miklos, Norman, and Schmidt (2019) echo that the educator's role in problem-based learning is that of a facilitator, as most of the learning is constructed between students' interactions with the learning resources and one another. Problem-based learning is also often confused with project-based learning, where the course curriculum is centered around a single overarching problem (Dettmers & Brassler, 2017). For project-based learning, the main outcome of student collaboration is the creation of a product that solves the original problem (Dettmers & Brassler, 2017). On the other hand, problem-based learning involves several question topics throughout the duration of a course and does not culminate in a final product or well-defined answer (Dettmers & Brassler, 2017). Assessment is another difference between project-based learning and problem-based learning, as assessment in project-based learning is centered around the product creation and how it addresses the original problem (Dettmers & Brassler, 2017). For problem-based learning, assessment is at the end of each topic and examines the students' learning processes, through the lens of self and peer assessments (Dettmers & Brassler, 2017; Savery, 2006).

Some benefits of implementing problem-based learning is that students become engaged in the learning as they are required to collaborate, and in order to do so, they must develop self-reliance to accomplish what is needed from them to contribute to their co-constructed goals (Bate et al., 2014; Evensen, 2000; Hmelo-Silver & Lin, 2000). Compared to pedantic teaching where concepts often appear disconnected or inapplicable to students' daily lives, driving questions in problem-based learning are based on real-world scenarios and therefore become relevant and engaging (Dettmers & Brassler, 2017). Additionally, problem-based learning provides flexible scaffolding that allows educators to address variations in students' prior knowledge and abilities. Saye and Brush (2002) classify these scaffolds as either hard or soft. They defined hard scaffolds as "static supports that can be anticipated and planned in advance based on typical student difficulties with a task" (Saye & Brush, 2002, p. 81). A prescribed report template to assist students in organizing their arguments is an example of a hard scaffold (Belland et al., 2010; Simons & Klein, 2006). In contrast to the proactive hard scaffolding, soft scaffolds are reactive whereby educators assess student understanding in the moment, and provide timely intervention (Belland et al., 2010; Saye & Brush, 2002; Servant-Miklos et al., 2019; Simons & Klein, 2006). A commonly used soft scaffold is teachers circulating around the classroom and asking probing questions to monitor student learning (Servant-Miklos et al., 2019; Simons & Klein, 2006). Through the adjustment of these two scaffolds, problem-based learning offers the potential to support learners across the spectrum of individual student abilities, which relates back to the UDL framework (Williams et al., 2013). Furthermore, Edyburn (2010) adds that assessment of problem-based learning aligns with UDL outcomes as both seek to measure students' individual understanding as a result of engaging in their learning. This supports

implementing problem-based learning as it has a greater focus on student-centered learning when compared to teacher-centered instruction.

At first glance, implementation of problem-based learning may seem simple in the blended learning modality; particularly within a flipped learning model where students interact with digitized resources asynchronously and engage with activities during synchronous instruction (Y. Chen et al., 2014). However, there are several factors which should be considered before transitioning to a problem-based learning approach. Savery (2006) recommends open-ended questions allowing for more than one method to work through the problem. Additionally, educators need to provide guidance around collaboration within the student groups (Savery, 2006). While students are working collaboratively towards their solution, Schmidt et al. (2011) found that soft scaffolds, in comparison to hard scaffolds, improved student's understanding of the concept and ability to formulate solutions. Moreover, Savery asserts that importance should be placed on the transferability of the skills students are using and gaining from problem-based learning approaches. Schmidt et al. found that the educator's familiarity with the subject had a positive impact on student learning. Savery noted that access to resources across multiple disciplines was an asset for students' developing a widely applicable understanding of the concept. In this regard, educators would require access to professional development that integrates specific course mastery and problem-based learning approaches to support the educator's understanding and increase their confidence in implementing problem-based learning.

Facilitation

Teacher Presence

Teacher presence is crucial within a face-to face classroom whereby presence may be commonly understood as the teachers daily planned activities and interactions with students. Burgess (2018), a practitioner in the field of education, noted that the physical space creates an environment in which it is arguably easy to create a presence, as those who are "fully immersed in the moment [have] a special type of intensity that resonates with great power in the classroom, regardless of the activity" (p. 18). Designing and constructing engaging learning environments face-to-face is more natural than through a screen, as "online learning creates unique challenges since teachers are not physically present" (Journell, 2015, p. 88). Equally important within an online environment, teaching presence becomes more complicated in its definition and execution. Within a CoI framework, teaching presence is described as "course design and organization, discourse facilitation, and direct instruction" (Dixson, 2015, p. 146). The design and organization process includes components that create a clear course structure: scheduling, guidelines, presentations, videos, and audio (Richardson et al., 2012). Course facilitation includes activities connected to student-student and teacher-student communication (Richardson et al., 2012). Direct instruction includes the instructor's sharing of knowledge as a content expert, scaffolding, checking for understanding, assessment, and descriptive feedback (Richardson et al., 2012). Teacher presence online has specifically been connected to asynchronous aspects like "announcements on the homepage of the course delivery system, e-mails to students [and] discussion forums in which the instructor interacts (Dixson, 2010, p. 8). Synchronous aspects may include whole group instruction, one-to-one meetings, and chats which contribute to engagement (Dixson, 2010). In connection to CoI, Garrison and Anderson (2003)

noted that teacher presence has "the purpose of realizing personally meaningful and educationally worthwhile learning outcomes" (p. 29). Garrison and Vaughan (2008) added further to the definition noting that teaching presence "is the means by which to bring together social and cognitive presence in an effective and efficient manner" (p. 24). Arguably the most important factor in engaging students, teacher presence is "integral to the learning process online, as the more "visible" [teachers] are, the greater the chance that students will be successful" (Journell, 2015, p. 88). Armellini and De Stefani (2016) noted that teacher presence ranked higher than peer presence with regards to student satisfaction. Within CoI, teaching presence has been noted as a role of integral importance with regards to its creation and maintenance (Armellini & De Stefani, 2016). Students participating in online CoI, expect to see a strong teaching presence (Garrison & Vaughan, 2008). Within blended learning, face-to-face interactions can "enhance connectedness and satisfaction" (Garrison & Vaughan, 2008, p. 25). When students are moving between synchronous and asynchronous communication, teaching presence connects the two and creates a sustainable CoI in the blended learning modality (Garrison & Vaughan, 2008).

While the importance of teaching presence is clearly established, the implementation of it "is an essential and challenging responsibility, especially in a blended learning environment where students are not always in direct contact" with the teacher (Garrison & Vaughan, 2008, pp. 24–25). Teachers may struggle with the changes needed to run a blended class as they are more time consuming (Whiteside et al., 2016). In turn, this may lead to a lack of immediate feedback, a common student complaint (Güzer & Caner, 2014). Further complicating matters when it comes to teacher presence is "the reality that in many instances, online instructors are teaching courses that were designed by someone else" (Richardson et al., 2016, p. 82).

In the research, there are contrasting findings with regards to student perception of teacher presence, perhaps indicating a lack of consistency between online learning environments. Güzer and Caner (2014) analyzed Chen and Jones's (2007) study and explained that students were dissatisfied with the ambiguity in instruction; however, students in Chandra and Fisher's (2009) study described the instructions as easy to follow and accessible. While technology can be used to enhance communication, Yen at al. (2018) found a lack of teacher involvement in the online courses whereas Güzer and Caner's literature review found that incorporating technology facilitated teacher-student interaction. It is plausible that these differences may be the result of a lack of knowledge of how to use the technology (Francis & Shannon, 2013) or a lack of time (Whiteside et al., 2016). These differences may also reflect the variety of experiences students may receive from one course to another, likely no different than the variety of experiences students may encounter in any mixture of educational experiences whether they be online or face-to-face.

Increasing teacher presence in online courses can be achieved in a few ways. Solutions proposed to help increase time for teacher presence are strategies like implementing more formative and self-assessment of mastery learning (Francis & Shannon, 2013; Pratt & Kovatcheva, 2018; Vaughan, 2014). Kay et al. (2019) also notes that the inclusion of active learning strategies can increase teacher presence. Crucially, as many educators do not have the training to construct an effective teaching presence, a simple solution may be increased training (Yang Wang & Liu, 2020). One other solution proposed is the use of artificial intelligence (AI). There are many reported positives to the uses of AI education within the literature (Zanetti et al., 2019). One noted positive of AI is the immediate feedback a student and teacher would receive using it (Feathers, 2019). AI can provide feedback on group discussions and speed up

assessment, thereby giving teachers more time with students to focus on developing other necessary skills and/or more time to plan learning opportunities for students (Francesc et al., 2019). Within the online realm, it could be argued that the implementation of AI would be beneficial as it could potentially act as a teacher: giving feedback, identifying which students need help, and/or designing individualized pathways for students based on their needs. Given these characteristics, AI may be a natural fit for blended and online learning, as it may fill in the gaps left by the lack of an online teacher presence. When and if AI is included, it must be included thoughtfully as there are many inherent risks associated with its use: system flaws and incorrect feedback (Feathers, 2019), the inability of AI to detect the nuances of spoken language (Zanetti et al., 2019), inherent bias (Feathers, 2019), and issues with privacy and ethics (Andrejevic & Selwyn, 2019; Tuomi et al., 2019).

Teacher presence, its importance established in the literature as well as being an integral part of CoI may be the key to creating engaging online learning and, as such, should be a carefully planned and implemented component. It may be that the key to creating strong teacher presence, ultimately comes down to resources, time, and training.

Community and Collaborative Learning Environments

The most important factor in learning environments are the people, those who teach, learn, collaborate, and interact with one another (Harvey & Daniels, 2015). Burgess (2018) found that "students will do amazing things if you can design a class and environment that is positive and empowering" (p. 138). Therefore, teachers play a vital role in the creation of supportive, collaborative, and engaging learning environments (Harvey & Daniels, 2015). Blended learning, as a modality, often reflects the course organization, more so than student learning (Norberg et al., 2011). Positive and safe learning environments are constructed through a sense of

community, building rapport, and encouraging students to interact with peers (Güzer & Caner, 2014), an integral part of CoI. A collaborative learning environment, when facilitated by teachers, will result in meaningful learning where students feel valued (Vaughan, 2014). Infusing these social constructivist ideals can create extraordinary and engaging learning environments.

Harvey and Daniels (2015) discuss that to become engaged, thoughtful, and collaborative learners, students must first have ownership of their learning. In traditional models of education, students "come in as very passive learners expecting to be entertained" (Klenner-Moore, 2011, p. 63); however, success of blended learning is dependent on students actively engaging with the course and being independent learners (Paniagua & Istance, 2018). Boelens et al. (2017) noted that blended learning should "focus on stimulating students' motivation and providing tasks that require mental effort" (p. 11) in order to make students active participants in their education. Additionally, the promotion of community is valuable in both face-to-face and online learning environments, which requires thoughtful management, and intentional communication (Donovan et al., 2014).

Arranging classroom furniture, decorating walls with colourful images, and adding other sensory elements to the space can promote active learning and increase student engagement (Harvey & Daniels, 2015). Being part of a community is a continual learning process, and Harvey and Daniels (2015) suggest that educators model the skills they want to see in their students, such as engagement, collaboration, and contribution. Trying to replicate a face-to-face class in an online format is a mistake educators make when they are unaware that online and blended learning have different theoretical bases (Journell, 2015). Furthermore, Journell (2015) asserts that it is not best practice to "simply [transfer] what works in the classroom to an online

format" (p. 87). Educators should aim to establish flexible and engaging online learning environments, while providing structure and guidance for students (Journell, 2015).

Donnelly (2010) notes how interpersonal and social interactions are critical components of online learning environments. Moreover, "two-way communication between learners and instructor(s) is also important in the online component of blended learning environments" (Boelens et al., 2017, p. 4). Unfortunately, a common misperception of online learning is that students are at a computer completing large amounts of written work in isolation (Journell, 2015). In addition, the faceless instructor marks the assignments asynchronously, but otherwise has very little connection with their students (Journell, 2015). This should not be the case in online learning environments, as it is vital that students have interaction with their peers and teachers in online courses (Akcaoglu & Lee, 2016; Güzer & Caner, 2014; Journell, 2015). This is why social constructivism and CoI are commonly discussed for online learning, as this theoretical basis provides guidance around incorporating student-student and teacher-student interactions (Garrison et al., 2000). A key component of online learning environments is finding a balance between flexibility and structure, as it has been noted by Journell (2015) that completing work 'anytime' for students is not always supportive of learning as a process.

Numerous studies supported that, when students had a feeling of belonging to a class community, it increased their engagement in learning (Curtis & Lawson, 2019; Dixson, 2015; Donnelly, 2010; Güzer & Caner, 2014; Zepke & Leach, 2010). Dixson (2010) declared that "clearly the path to student engagement, based on this data, is not about the type of activity/assignment but about multiple ways of creating meaningful communication between students and with their instructor – it's all about connections" (p. 8). The literature overwhelmingly suggested including synchronous meetings in some form to boost engagement

and build community in online learning, specifically the act of seeing peers and their teacher (Hege, 2011; Journell, 2015; Simon et al., 2014). Synchronous online learning functions similarly to traditional brick-and-mortar classrooms, as these interactions or classes with teachers and students are regularly scheduled. This element generally involves video in conjunction with some form of instant communication, as Journell (2015) found that synchronous text-based communication tends to move too quickly for comprehension. Both synchronous and asynchronous approaches have advantages and face challenges, but communication among students, and between students and teachers is key to creating engaging learning environments (Journell, 2015).

Establishing a sense of community encounters some hurdles in the transition from traditional classroom to online learning environments. A pivotal component online is to create social learning opportunities to alleviate the isolation students feel and start to build community (Alivernini & Lucidi, 2011; Dixson, 2010). Asynchronous online learning has the flexibility of no daily schedules, as all learning activities are accessed by the student at their own pace, to be completed within a time frame (Journell, 2015). This flexibility can be advantageous for students, however it can create a disconnect between students and their peers, as well as their teachers. Discussion forums are a tool that many online educators employ to help create connections between students (Akcaoglu & Lee, 2016; Hege, 2011), however Journell (2015) found that students may be uncomfortable initiating these asynchronous conversations. Hege (2011) noted that a dedicated ‘community building’ discussion board allowed students to introduce themselves and connect about non-course related interests. Akcaoglu and Lee (2016) proposed setting up small group discussion boards to alleviate the pressure and make students more comfortable with contributing.

Online learning environments have great potential to meet the needs of diverse learners by using the recommendations of UDL. Harvey and Daniels (2015) discuss how "classrooms, materials, curriculum goals, and outcomes – can be designed to provide or deny access to learning" (p. 113). Furthermore, UDL principles guide learning environment design to be accessible to all students (CAST, 2018b; Katz et al., 2018). This means educators support student understanding by utilizing a variety of presentation tools to communicate concepts as well as providing students with alternatives for accessing information (Harvey & Daniels, 2015; Katz et al., 2018). Differentiated, personalized learning has the ability to help alleviate issues around equality as students can learn in the manner that best suits their individual learning needs (CAST, 2018b). The potential of online learning environments to create increasingly personalized learning could not only improve success for struggling students, but could also allow for personalized learning that challenges all students. In general, research has shown that with more personalized learning, student engagement increases (Pratt & Kovatcheva, 2018).

Everything in the learning environment is important and can play a role in increasing student engagement. Therefore, teachers need to intentionally control their environment, smooth out transitions, and ensure resources are available to students (Burgess, 2018). Students who are deeply engaged with their learning in face-to-face classes are more likely to engage in their learning outside of class (F. H. Wang, 2019). Additionally, motivation improved when students perceived course content as useful, which in turn increased engagement with asynchronous course content (Alkış & Temizel, 2018). It is important that educators design their learning environment in a way to support and engage each student.

Learning environments are only as effective as teachers design and prepare them to be, which is why educators should base their design on learning theory that is specific to the

modality they are teaching in, such as CoI for online learning (Garrison & Vaughan, 2008). Collaborative learning environments can challenge students' "thinking and push [them] to places [they] might not have reached without the support of [their] peers" (Burgess, 2018, p. 170). Group work should not be avoided, despite there being more challenges in online learning environments as "working collaboratively is an essential part of the learning process" (Journell, 2015, p. 97). When students are divided into small groups, educators can create a culture of differentiated learning, where peers collaborate and co-construct understanding through investigation (Harvey & Daniels, 2015). The social presence and sense of community creates a comfortable space for students to communicate with peers and better connect with the online learning environment (Journell, 2015).

Burgess (2018) observed that a "positive learning environment is critical for higher-order thinking to take place" (p. 31). Therefore, education can no longer focus on content retention, but rather aim to develop skills such as "flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility" (Donovan et al., 2014, p. 163). Building online learning environments require educators to establish infrastructure, think about objectives, create engaging assignments, provide feedback, develop valid assessments, and evaluate the flexibility of the environment (Harvey & Daniels, 2015; Journell, 2015). Formatting online learning environments can be a source of frustration, as teachers need to ensure every component of the course is available and organized (Journell, 2015; Ni Shé et al., 2019). Additionally, having resources available to students does not guarantee learning, and as students need to demonstrate more of their learning since the teacher is not present to witness their understanding, written assignments may become boring and repetitive (Journell, 2015). Burgess (2018) found that "ideas are great, but

implementation is the key to results" (p. 44), unfortunately, very few educators have been trained to build or teach in online learning environments (Journell, 2015).

Students also face challenges when interacting with online learning environments. Greene et al. (2015) found that many students "lack the knowledge and skills necessary to navigate, find, and integrate online information into coherent understanding" (p. 89) in order to complete academic tasks. Some students also demonstrate insufficient skills in organization, time-management, and motivation, which can contribute to weak participation rates in asynchronous online components of blended learning (Akyüz & Samsa, 2009; Boelens et al., 2017; Norberg et al., 2011). Greene et al. confirm that "students who are novices in an area are particularly disadvantaged when asked to learn on their own with computers" (p. 90). Güzer and Caner (2014) found that the "absence of immediate feedback and synchronicity" (p. 4599), as well as poor internet connection, were some issues students faced in online learning. Donnelly (2010) found that frequent change in learning environments required by blended learning "may cause confusion regarding the learning outcomes and make students unable to select and use appropriate cognitive activities" (p. 354).

Burgess (2018) recognized that obstacles and barriers in the learning environment can affect student engagement due to a loss of momentum. Journell (2015) agrees that teachers can construct their learning environment in any way they choose, removing obstacles and promoting community. For example, colour scheme, font size, and background visuals can all impact online learning environments (Journell, 2015). It is important that educators integrate personal passion, build community, and construct their environment to provide the students with ways to actively engage with their learning (Journell, 2015).

Chapter Three: Engaging Online Learners

A printer-friendly PDF version of *Engaging Online Learners: Integrating Community of Inquiry and Active Learning* has been uploaded to UVicSpace. This document was uploaded in April 2021 and contains the original version as it appeared on that date. Included within the *Engaging Online Learners: Integrating Community of Inquiry and Active Learning,* the following infographics: Details and Functions of Design and Formatting, Passive and Active Learning, Tips and Practices for Teacher Presence, and Active Learning Applications have been uploaded separately to UVicSpace.

Current editions will be updated and made available through our Sway resource, Engaging Online Learners: Integrating Community of Inquiry and Active Learning (https://sway.office.com/37uTtu5XxczZHKEn). This resource also includes a quick introduction explaining how to use the resource. Current editions will be maintained in the following formats:

Engaging Online Learners [web accessible document]

Engaging Online Learners [printer-friendly PDF uploaded to UViCSpace]

Engaging Online Learners

Created by Rhyanon Logan-Goyette, Leanne Huston, Rochelle Smith, & Jerry Chien

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Chapter Four: Reflection

A video file (LoganGoyetteR_HustonL_SmithR_ChienJ_MedProject_2021_Reflections_004.mp4) has been uploaded separately within UVicSpace.

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Appendix: Boolean Search Terms

- “active learning”
- “active learning strategies” AND “engagement” AND “online”
- “barriers” AND “blended learning”
- “blended learning” AND “active learning”
- “blended learning” AND “design”
- “blended learning” AND “engagement”,
- “blended learning” AND “engagement” AND (“high school” OR “secondary school” OR K-12)
- “blended” AND “engagement” AND (“high school” OR “secondary school” OR K-12)
- “blended learning” AND “flipped classroom”
- “blended learning” AND “flipped classroom” AND (“high school” OR “secondary school”)
- “blended learning” AND “learning design” and “engagement”
- “blended learning” AND “problem-based learning”, “Challenges” AND “blended learning”
- “collaboration” AND “engagement” AND “high school”
- “community building in education” AND “high school” OR “K-12”
- “community” AND “relationship” AND “engagement”
- “distributed learning environments”
- “educational engagement strategies”
- “E Learning” AND “engagement”
- “engagement” AND “blended learning”

- “engagement in high school”,
- “engagement in secondary school”
- “engaging students” AND “online learning”
- “flipped classroom”
- “flipped classroom” AND “engagement” AND “online”
- “hybrid learning” AND “engagement”
- “inquiry based projects” AND “engagement” AND “online”
- “inquiry in education”
- “inquiry” AND “engagement” AND “online”
- “learning environment” AND “engagement”
- “learning online”
- “online engagement”
- “online learning” AND (“secondary” OR “high school” OR “K-12") AND “design”
- “online pedagogy” AND “engagement”
- “student attitude” AND “engagement”
- “student engagement”
- “student motivation” AND “engagement”
- “teacher presence” AND "community”
- “teacher presence” AND “student engagement”
- “universal design for learning”
- “universal design for learning” AND “engagement”