Student Engagement in Synchronous Video Meetings:

Exploring Changes in Instruction

by

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Bachelor of Arts, University of Victoria, 1988

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We acknowledge with respect the Lekwungen peoples on whose traditional territory the university stands and the Songhees, Esquimalt and WSÁNEĆ peoples whose historical relationships with the land continue to this day.

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Abstract

One of the challenges educators face in teaching is maintaining student engagement in lessons, activities and assignments. In the classroom, teachers employ a variety of strategies intended to gain and maintain students' attention and engagement with the material or subject being studied. In a face-to-face environment, a teacher may utilize partner and group work, or check in with students while surveying the class, among other strategies. However, when face-to-face instruction is not possible, educators must navigate an unfamiliar environment from which to instruct and engage. The recent educational climate in a viral pandemic has forced educational institutions to include online synchronous and asynchronous methods of instruction. As a result, instructors have had to rethink ways to gain and maintain student engagement in the new medium. This project explores ways to both adapt teaching strategies that are successful in increasing student engagement in the classroom to synchronous video meetings, as well as investigate new strategies that may only apply or become possible within a synchronous video meeting environment.

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Acknowledgements

This journey does not get completed in isolation. Supports, whether physical, emotional, spiritual, or psychological, must be in place to get to the end, because without them, the path becomes that much harder. I like to use the Japanese phrase, “Otsukare sama deshita,” which roughly translates to “Thank you for your tiredness.” It is said to others in appreciation for the tireless efforts those people bring. It is one of the keys to understanding the Japanese mindset of grace and humility. So I say, “Otsukare sama deshita” to:

- My wife, Julie, who knew exactly what I was going through, having just completed her own Master’s. My sounding board, my muse, my empathetic ear…
- Dr. Valerie Irvine and Dr. Michael Paskevicius, our co-supervisors – this cohort is now in the history books as one of the COVID cohorts. The traits you already possessed of flexibility, adaptability, understanding, and a sense of humour were amplified to keep us all, and me in particular, afloat.
- My cohort, who put up with my selection of hats and occasional undressing during class. I wish we could celebrate together, but maybe it will have to be a vaccination/graduation celebration.

Dedication

My dad only went to school up to grade six in Japan. He grew up at a time when education was a luxury for his family, and in spite of that, he made his way to Canada, struggled through the War, learned English, started his own business, got married and raised a family. My dad was smarter than I am in so many ways, and his perseverance and hard work to give me and my siblings a better life, allowed me to pursue a path to university that he was never able to do.

We often don't voice our appreciation to our parents in time for them to hear it. Luckily, my dad was there when I received my Bachelor of Arts. I was the first on my dad's side of the family to graduate from university, and while he is not here as I receive my Master's, I know he would be proud.

Chapter One: Introduction

Education has, for centuries, been conducted generally in the same manner. That is, with a teacher or mentor giving instruction to the student. In the 20th century, Ralph Tyler (1949) developed a four-step process of delivering curriculum which was widely adopted as the model for teaching and learning in school. This process was a way to break down learning into measurable outcomes. This view relied on the scientific method of experimenting with certain factors of curriculum and instruction to achieve the learning outcomes that the teacher desired. What was missing in the equation was the learner. In this method, a teacher would for example, decide that the students needed to learn how to add and subtract. The teacher would then teach the methods for adding and subtracting, then give students addition and subtraction problems to solve, then mark their answers, and allow them to see their mistakes to learn for the next time. While this is a good factory model of producing students who can follow instructions, what was missing was consideration for the students themselves. That is, to understand what factors may affect how a student does on a particular assignment on a particular day, such as problems at home, or lack of sleep, or lack of nutrition.

As time progressed into the later parts of the 20th century, research into curriculum and instruction began to focus on the student. Studies began to look at areas such as student engagement. Fred Newmann (1981) examined high school dropouts to find out why they disengaged from school. Gary Natriello (1984) further looked at disengagement and what led to students' absenteeism, discipline problems, and low-level participation. Jeremy Finn (1989) began to focus on involvement in school, and its connection to withdrawal from school. While the predominant research was focused on disengagement, the implications of the research

suggested not only ways to mitigate the disengagement, but to suggest ways to promote engagement.

The relevance that this research has to the current education model is that while student engagement remains an area of concern in the classroom setting, in the year 2020, education has had to shift from in-class teaching and learning, to include remote teaching and learning where learners engage from home. All the struggles to maintain student engagement that teachers encountered with in-class teaching shifted to the remote teaching milieu, which were exacerbated by the literal and figurative disconnection that remote teaching and learning encompassed. The challenge became how to maintain student engagement when students were physically distant and, in some cases, without video to see visual cues.

While this was not an entirely new challenge, as remote learning is not new, and is not new to the K-12 level of education, the new challenge was that this was not being applied only to the students on the periphery who, for a variety of reasons, could not attend the traditional brick and mortar schools. This new environment was for every student, regardless of choice, and this affected students around the world, not only in one country, region, city, or school (Bozkurt et al., 2020). It became immediately apparent that maintaining student engagement was not easy during a lockdown from a pandemic. The shift to remote teaching not only added an extra layer to supporting student engagement, but so did the new mode of instruction, which became either synchronous or asynchronous instruction, including video, audio, and a digital system for providing access to resources and tracking progress, such as Google classroom.

One of the lessons learned from the lockdown was that there was wide disparity among students regarding digital equity. That is, some students had reliable internet access, and some had little to no internet access. Some students had a laptop or device with a physical keyboard,

some had only a cell phone on which to do work. Some did not have a cell phone at all. This lack of digital equity compounded the difficulty for students to become engaged, not only because of internal motivation, but because of the lack of proper devices on which to work, or bandwidth, or individual privacy in the home. In my singular anecdotal case, as the days progressed, student engagement decreased quickly, and in many cases, past the point of recovery. This prompted me to examine why and how this was happening and led me to a research problem.

Research Problem

The research problem is to seek ways to increase student engagement in the online synchronous video environments for learners who are enrolled in brick-and-mortar high schools, but who are participating remotely. This area of research in the high school realm has, up until recently, not been a matter of concern because the proportion of classes conducted in this manner has been traditionally very low. However, with the coronavirus pandemic shutting down schools around the world in the spring of 2020, for many jurisdictions, education was forced to be conducted wholly or mostly online. The result was that in order to see students as a group from both the teacher's and the students' homes, some type of synchronous video meeting had to be employed. In theory, this could be a vibrant replacement of face-to-face education. In practice, different issues worked against the idea that synchronous video meetings could effectively replace face-to-face instruction. Some deficiencies are easy to measure – for instance, attendance; some deficiencies are difficult to measure – for example, peer connections or group attachment or atmosphere.

Rationale

The rationale for focusing on this problem is that given the state of the world in the midst of the coronavirus pandemic, we may again move towards education online, or a mixture of in-

person and online education in blended classrooms. Teachers must look towards making the online education experience as interesting and interactive as in-class education. Certainly, the direction that education is moving in, is towards a more individualized approach to learning, and education online is a viable alternative that aligns with that approach. While there is a lot of research that has been conducted to look at online education and synchronous video lessons at the higher education level, little has been done in the K-12 setting. The relevance of conducting research focused on the K-12 population of students is that teaching strategies that may be used with older students may not work with younger students. While it is a generalization, putting is simply, the maturity that a university student has towards studying is not the same as a 15-year-old student in grade 10, or an 8-year-old in grade 3. This applies not only to online education, but to in-class education as well. How an undergrad class may be conducted in university is not the same as an English 9 class, or a grade 4 elementary school class. As a result, studies that focus on higher education students may not be relevant to K-12 classes. To that end, looking at ways to engage students in the K-12 online education atmosphere cannot be easily transferred from data gathered from studies conducted on university or college students. That does not mean that those studies are not relevant or useful, but it speaks to the fact that more research needs to be done at the K-12 level.

Professional Journey

My area of focus is at the high school level, specifically in the subject areas of English Language Arts and Japanese Language. The significance of this topic to my teaching areas is not directly tied to them, but as the topic applies to the engagement of my students, regardless of the subject area, it is significant.

My professional journey as it applies to this topic has not been in a straight line. Far from it, I felt for many months that I was trying to fit a square peg into a round hole. I struggled to reconcile my approach to teaching with the dictates of the Master's program as indicated in the title of the cohort: *Mathematics, Science, Social Studies and Educational Technology Project based option MEd*. Not only was I not in any of the three subject areas listed in the title, but I have not been a huge proponent of increased use of technology in the classroom. When I have reflected on what I feel is important to my pedagogy, I certainly include methodology, knowledge of my subject areas, and connection to students. However, above all, I have realized that student engagement is what matters most to me. Of course, student engagement can overlap with many other areas of focus, including the aforementioned methodology, knowledge, and connection. Earlier research has shown that humans learn when they are engaged in what they are learning (Newmann, 1981). What does it mean to be "engaged"? Sorting out how to define "engaged" and examine the parameters around how it can be measured is of primary importance. Engagement has been defined as "the student's psychological investment in and effort directed toward learning, understanding, or mastering the knowledge, skills, or crafts that academic work is intended to promote" (Newmann, 1992, p. 12). Having a working definition about what it means to be engaged, allows us to be able to measure how it may increase or decrease.

As the focus of the Master's cohort is "Technology and Innovation in High School," the challenge I faced was to connect my passion around engagement with my interest in technology. The difficulty is that I view technology often to be a barrier to engagement rather than a facilitator. So how would I be able to reconcile how technology connects to engagement in a *positive* way? This is what I struggled with for the first year of my Master's coursework. Of course, I have incorporated technology in my classes, using laptops and tablets, and occasionally

cell phones. I use a document camera and LCD projector and access the internet via my school computer to show videos. I also use Google classroom to assign work, or assistive technology for students with learning exceptionalities, as well as use online websites such as Quizlet and Pixton as tools for assignments and studying. Mine is not an issue with technology, but with its place in the classroom.

The question remained: how can I use technology to support engagement, connection, and a sense of community? In the spring of 2020, life changed dramatically to alter how education was delivered. The coronavirus, COVID-19, forced people around the world to change how day-to-day life was managed. Schools were closed and students were restricted from attending the physical buildings. Teachers were forced to create curriculum and lessons that could be delivered from their homes and accessed by students from theirs. While this transition was sudden, teachers, students and parents adjusted to the new reality that school-aged children would be finishing the school year remotely; that is, through assignments and lessons delivered online. For each teacher, the delivery model was different: some utilized synchronous video meetings; some used recorded video lessons; and others posted assignments and lessons all in document form asynchronously.

Before getting to the stage of participation, students had to become digitally connected. That is, to have internet access and to have the hardware and software to connect. For some, those three issues were not resolved. This issue of equity was a societal issue that could not be resolved by me. Many schools, including ours, offered students and families a school laptop on loan. This resolved the hardware and software issues, but schools could not help to resolve any internet access issues that a family might have. In the end, constructing a website to help teachers engage students in synchronous video settings will only be beneficial if students have reliable

internet access and a functioning device on which to work. I recognize that students who do not have access to basic internet connectivity prevent any of the website tools to be of any use.

Equity issues aside, all teachers were limited to connecting to students either through email or Google classroom (or some other learning management system); through a synchronous video platform such as Zoom, Microsoft Teams, Google Meet, or some other video platform; or an asynchronous video method, recorded and posted for students to watch at a time of their choosing. Personally, I tried all three methods of delivery. Of course, I posted assignments on my Google classroom just as I would have photocopied on paper and handed out. I also hosted Zoom synchronous meetings at a scheduled time each week. Finally, I recorded video lessons of myself covering topics using the screen share option to visually show students webpages or writing on a virtual whiteboard.

Each method came with certain advantages and disadvantages over the others. Advantages for teaching via Google classroom are that students can check in at any time (as well as parents, if given permission) to see assignments, due dates, marks, and grades. With options for direct messages, students and teachers can comment on assignments for clarifications. With the Google suite of programs, teachers can store files on Google drive, and then can attach as resources or assignments, as well as use it collaboratively to have multiple users accessing a single document, all organized under a class populated by the teacher. Of the disadvantages for using Google classroom, one is that it is an increased reliance on internet access and the hardware needed to use the Google classroom suite of apps. As well, students are challenged to have the self-discipline to check their school account frequently.

Using a synchronous video platform is the closest a teacher can get to in-person teaching. It is live, so asking questions and getting answers is in real time, without the delay of text

responses. By enabling audio, a teacher can hear responses, which may be crucial for something like a language class. With video, a teacher may see facial expression and non-verbal communication, which can also be very beneficial for observing technique, relaying eye contact or emotion. The idea that communication is in real time gives a better sense of community in that everyone can hear and comment similar to typical in-person conversations. A limitation that synchronous meetings have is that generally the practice is that only one microphone should be enabled at one time to have clearer communication. When multiple microphones are enabled, any extraneous noise in the background of one person can cut off the speaker's microphone. This challenge can result in very stilted conversations, as people start to talk over or cut off each other when communicating. Another limitation is that users can disable their video. While this may help in cases of privacy concerns such as other people appearing in the background, or the microphone picking up background conversation, or pictures or objects that can be seen, it serves to distance that user from connecting via their image. It would be equivalent to a teacher teaching to a room full of students who all wore dark sunglasses, or who tilted their binders up in front of their faces.

An alternative to synchronous video that has been employed frequently are asynchronous video lessons. In this scenario, a teacher records a lesson via video, makes it available to learners online, who can then access it whenever they have time, rather than having to keep to a predetermined synchronous meeting time. The advantage over synchronous is as stated: students have more freedom to watch the lesson when it fits their schedule, not the teacher's or school's. Students may pause, rewind or slow down the audio as necessary to aid in comprehension and to give themselves time to process information that may be more difficult in the synchronous setting. A disadvantage is that with freedom comes responsibility. That is, without a schedule to

adhere to, students may never watch the video lesson. It becomes very easy to put off watching the video and not ever get the benefit of the lesson.

None of the three methods outlined are perfect, but they can be combined to deliver education in the best way if faced with no in-person education. While the three delivery methods have different benefits, the synchronous video lessons became my focus in relation to teaching a language class like Japanese. For much of learning a language, being able to speak to students and listen to them in live conversation is extremely valuable. Thus, conducting a language class solely through Google classroom or through asynchronous video would not be able to reproduce conversation. In researching my topic, I encountered a major stumbling block. I was able to look at three important factors that addressed my topic: student engagement, synchronous video meetings, and K-12. The problem is that research that combines all three factors is sparse. Finding two of the three is not difficult. That is, there is plenty of research on engagement in synchronous video meetings, but not in K-12 (Buelow, 2018; Kumar & Sundar, 2018). There is also plenty of research on engagement in K-12, but not with synchronous video meetings. (Finn, 1989; Hagborg, 1994). Finally, there is research on synchronous meetings in K-12, but not specifically related to student engagement (Tovine, Fleetwood et al., 2019; Newman et al., 2008).

At the same time, since March 2020, with much of the world shut down because of the COVID-19 pandemic, most in-person education switched to remote learning, from K12 through higher education. Suddenly, research was being conducted on the new educational reality, and what the ramifications held. As a result, new emergent research is happening, looking at the three factors I was targeting. Now, the research regarding engagement in synchronous video meetings

in K-12 is beginning to be published. Compiling data and getting results will be ongoing over the next few years.

Project Design

The project design is to create a web resource for teachers. The goal is to provide teachers access to lesson plans, ideas, and resources to use to aid in increasing student engagement in synchronous video meetings. As we move globally through the oncoming waves of coronavirus, and other potential pandemics, it has become apparent that this will likely not be an anomaly, but the norm. With that in mind, online remote learning will increase rather than decrease even when a vaccine for the COVID-19 coronavirus is secured. Teachers around the world will be conducting classes through computer screens, and a resource such as this will be more relevant as time passes.

Literature Search Methods

The literature search was conducted using the University of Victoria Libraries search engine and scholarly databases (e.g., ERIC, PsychoInfo). Google Scholar was used only in situations in which a particular article could not be found in the university library collection. The main search terms included, “engagement,” “synchronous,” and “K-12.” As well, “student engagement” and “participation” were used in place of “engagement.” Additionally, as the term “synchronous” is a more recent word, searches included, “video,” “blended,” “online,” and “remote.” A replacement for “K-12” was “high school,” especially as it pertained to my teaching environment. Criteria for inclusion were to address the three main factors keeping in mind that some terms changed over time in the research.

Chapter Two: Literature Review

Introduction

The intent of this literature review is to examine what has already been studied about student engagement and how it applies to synchronous video meeting settings in high school classes. Further, it is to look forward to what needs more study after examining how student engagement looks in synchronous video meetings in high school. The question to be addressed is: How can a teacher increase student engagement in high school classes when conducted in the remote, synchronous video delivery of education?

To that end, the direction this will take is first, to examine the literature to identify what the term "student engagement" means in terms of the school setting. Second, to look at the similarities between engagement in the classroom and engagement in remote, synchronous video meetings. Finally, to see how synchronous video meetings can address student engagement in ways that in-class instruction may not. The present course that education is taking will likely see an increased amount of synchronous video meetings as a means of conducting classes, and it will become more important for teachers to know how they may adapt their lessons to accommodate this modality. For many teachers who are accustomed to face-to-face instruction, teaching in a synchronous video setting can embody many of the same techniques used to increase student engagement in the classroom. However, synchronous video meetings also pose unique challenges as well as opportunities for increasing student engagement by including new options for instruction and classroom management that are not present in face-to-face interactions.

Theoretical Framework

On the topic of student engagement, there are different theoretical angles from which to approach it. While some of the seminal work on engagement comes from Jeremy Finn (1989) and his Participation-Identification model, for the purposes of this literature review focus, it does not encompass the approach taken here. Finn explains disengagement by proposing that students' participation in school activities that leads to successful school outcomes will result in positive identification, which in turn leads to more participation (Finn). This is a variation of operant conditioning, which rewards selected behaviour and increases the likelihood that the behaviour is repeated. Michael Furlong (2008) suggests that Bronfenbrenner's Ecological Systems Theory is best suited to describe engagement. Furlong states that "students are engaged because of what students do in the classroom" (p. 365). While there is merit and application of engagement with the Ecological Systems Theory, Bronfenbrenner himself updated and shifted his theory to change some of the focus, as well as add to it and rename it the Bioecological Model of Human Development (Bronfenbrenner & Morris, 2006). Bronfenbrenner's model would explain engagement as the result of the student interacting with and being influenced by, the outer layers of family, school, community, and world over time.

The focus of this literature review is the examination of the precursors to the participation-identification model; that is, what it is that leads a student to participate. For this, the approach that Jennifer Fredricks et al. (2004) has taken, although without a named theory, is more in line with this literature review. Fredricks identifies the term engagement by describing it as an overarching construct – "engagement can be thought of as a 'meta' construct" (p. 60). Looking at three categories: behavioural, emotional, and cognitive engagement. From these three perspectives, a student's level of engagement may be examined based on the techniques

employed to try to increase the engagement. This approach might add a third term in front of Finn's participation-identification model, such as Activity-Participation-Identification model. In this way, participation (or engagement) may be examined by the application of the activity.

Fredricks acknowledges that there is some overlap between the three aspects of engagement, and that there would be degrees of each that address a student's level of overall engagement. The literature review will look at engagement through this lens to see into which of the three categories the studies fall. This also becomes relevant when attempting to describe suggestions for increasing student engagement in synchronous video meetings. That is, in the same manner, under which category of engagement do the suggestions fall? The importance of having this background information is that teachers would need to decide what type of engagement is being addressed, and then to incorporate the type of activity that would produce the appropriate engagement.

Student Engagement: In the Classroom and in Synchronous Video Meetings

Within the topic of student engagement is the inherent question of measurable outcomes. First, how can engagement be measured? Second, if engagement can be measured, does increased engagement lead to positive outcomes such as academic success or increased school attendance? The importance of addressing these questions is to consider the relevance of directing a teacher's time and attention on student engagement if, as a variable, it does not affect student grades, attendance, or other measurable outcomes. Anecdotally, most teachers may say that there is a positive correlation between student engagement and grades. This assumption must be borne out in fact, and not be left to conjecture. As this review of research shows, student engagement affects more than just grades – attendance and social interactions can be positively correlated with engagement (Finn, 1989). At the same time, do student engagement outcomes

need to be noticed immediately? That is, besides measuring an increase in grades as a result of increased engagement, can increased engagement be a predictor of future job income or job satisfaction? Are there aspects of engagement that speak to more longitudinal study outcomes?

Before any of the questions on measuring engagement can be addressed or answered, it is of primary importance to present a working definition of the word "engagement." Wehlage (1989) describes educational engagement as:

> the psychological investment required to comprehend and master knowledge and skills explicitly taught in school. This investment is indicated by various observable forms of student effort that demonstrate attention to, and involvement in, schoolwork. Levels of engagement are indicated when students answer questions, discuss issues, write papers, complete homework, and perform tasks in a laboratory or at a work site. Engagement can also be indicated by student reports of interest in, and valuing of, completing school tasks. Engagement requires intention, concentration, even commitment by students, but it is not generated by students alone. As with school membership, the degree of engagement is highly dependent on the institution's contribution to the equation that produces learning. Engagement is the result of interaction between students, teachers and curriculum. (p. 177)

Fredricks et al. (2004) point out that research on engagement can be categorized by three points of view: behavioural engagement; emotional engagement; and cognitive engagement. Behavioural engagement may be measured by observing what the student does; that is, based on behaviour. In this way, participation in an activity may be empirically measured and categorized through observation as engagement. As for emotional engagement, measurement includes the degree of involvement in an activity, class, or school. As Fredricks et al. state, this "encompasses

positive and negative reactions to teachers, classmates, academics, and school" (p. 60). Cognitive engagement includes thoughtfulness and effort, especially the "willingness to exert the effort necessary to comprehend complex ideas and master difficult skills" (Fredricks et al., p. 60). These three descriptors of engagement are vital to our interpretation of the word "engagement" and understanding through which lens we compare in-class versus synchronous video meetings.

Yonezawa et al. (2009) propose three additional components to Fredricks's pertaining to engagement: setting, identity, and critical youth voice. Setting refers to not only the physical, but the social and relational setting. Identity is described as the fluid sense of self that a student has. Critical youth voice includes having students play an active role in the shaping of their education. Improvements in all three components result in increased student engagement, and Yonezawa et al. emphasize critical youth voice over the setting and identity.

Historical Context of the Research on Engagement

Research into student engagement historically focused on how it affected drop-out rates and attendance (Newmann, 1981). Taken from the negative point of view of disengagement, research examined *a posteriori*, what were the causes of students dropping out of school. The use of the term "engagement" was not used in early studies ostensibly covering engagement. Like Newmann, Wehlage and Rutter (1986) examined "at-risk" students and referred to "alienation" and student "commitment to the program." The findings showed a negative correlation between students being at-risk and feeling a sense of alienation, and commitment and engagement in school. Wehlage and Rutter applied the social bond theory (Hirschi, 1969; Ren, Kraut and Kiesler, 2007) that postulated four parts to a person's social bond to societal norms – attachment, commitment, involvement, and belief – to the school setting. Wehlage and Rutter describe the four parts of social bond theory as school membership. As Fredricks later categorizes, the four

parts of school membership fit into the headings of behavioural (involvement, commitment), emotional (attachment), and cognitive (belief) engagement.

In addition to the work by Wehlage and Rutter as well as Newmann studying engagement as a means of addressing increasing drop-out rates in American high schools, and by association, decreasing delinquency, Jeremy Finn (1989) continued to focus on engagement through his participation-identification model. This model is described as focusing "on students' 'involvement in schooling,' with both behavioral and emotional components" (p. 117). Finn further describes the participation-identification model, stating it "emphasizes the importance of a youngster's 'bonding' with school; when this does not occur, the likelihood of problem behavior, including leaving school before graduation, is increased" (p. 118). From these models, engagement amounts to students' connections to school, whether it is the teachers, peers, extracurricular involvement, or the school subjects. By inference, their studies focused on drop-outs and how students whose connections were low, had higher rates of dropping out of school.

Berliner and Rosenshine (1976) introduced the idea of academic engaged time, which was quantified as time allotted for time in a subject area, multiplied by the percentage of student time engaged on that topic. They further describe the measurement process:

> The variable called active learning time -- synonymous with engagement, attention, and on-task behavior -- can be easily coded. Every time a student is apparently on-task during a teacher's allocated time for a lesson, a stopwatch can be run. When the student is apparently off-task (looking out the window, going to the rest rooms, doodling, talking, etc.), the observer can stop the watch. Recently, in a suburban school, a typical child's active learning time was clocked during 45 minutes of seatwork (learning decoding skills in a workbook). The child was engaged with the learning task 3-1/2 minutes. During a

> subsequent teacher-led, small-group session for developing reading skills, the child was apparently engaged during 20 of the 25 minutes allocated. (p. 19)

While this description is with primary-aged students, the formula is not limited in application to that age group. However, Berliner and Rosenshine do not refer to any grades studied higher than grade five. Presumably, students at the high school level would have higher levels of engaged time.

The idea of engagement may not address what Wehlage and Rutter viewed as school membership, which included his term of attachment. As well, in this usage, engagement may be synonymous with active participation. In early research on engagement, the underlying assumption was that engagement was determined as behavioural engagement.

As indicated in the examination of the historical context of studying engagement, research by default focused on student engagement in the classroom setting. After defining the term "engagement" and examining its theoretical background, it is the aim of this section to compare the strategies that have led to increased engagement in the classroom. In addition to teaching methodology that connects with student engagement, there are inherent demographic factors that affect engagement that must also be taken into consideration. Research has found that mitigating factors such as socio-economic status (SES), ethnicity, family make-up, and living in a city that put a student at higher risk of disengagement (Wehlage & Rutter, 1986). Any recommendations that come from the research must include an awareness of the student demographics.

Much of the research into engagement focuses on the at-risk population of students. Since theories such as the participation-identification model (Finn, 1989) and the Check & Connect intervention model (Christensen & Reschly, 2010) have been used primarily to measure their

effectiveness among the at-risk student population, can the models be applied to the general population of student with equal success? Part of this is addressed by Reschly and Christianson (2012) in an article in the *Handbook of Research on Student Engagement*. They state initially that Check & Connect has been used for students with learning and behavioural disabilities, but that future research was to be partly including "assessing the efficacy of Check & Connect with a general education population in three large urban school districts" (Reschly & Christenson, 2012, p. 9). That research is ongoing and has yet to be published.

Using the three types of student engagement as listed by Fredricks, the following studies will be examined based on how they identify within the type of engagement. The first will be behavioural engagement, then emotional engagement, and finally cognitive engagement.

Behavioural Engagement

Fredricks describes behavioural engagement in three ways:

- Positive conduct – including following rules and adhering to classroom norms
- Involvement in learning and academic tasks – including effort, persistence, concentration, attention, asking questions, and contributing to class discussion
- Participation in school-related activities – including athletics or school governance

The first two points can be seen in the classroom and will thus apply to this section. Starting with positive conduct, this can easily be observed once a teacher establishes what rules are in place, as well as identifying the classroom norms. If, for example, a rule is that students are expected to stop writing when the teacher is talking, this is easy to monitor as a sign of engagement. As for classroom norms, if the norm is to write assignments in pen, then measuring students' adherence to this rule is again, easily measured.

When examining the second aspect, involvement in learning, a teacher may look at an example of effort as a student who is deliberate in his or her attempts to do an activity in class. The other terms, such as persistence, concentration, and attention are all part of the aspects of effort. From a teacher's point of view, measuring behavioural engagement may look like a teacher keeping a running tally of which students asked questions, or time spent working on an activity. As a result, this may be measured as a quantification of that type of engagement.

The third aspect – participation in school-related activities – falls outside the bounds of the classroom, and thus is not considered here.

Behavioural Engagement in the Classroom. Robert Marzano (2007) has devoted much of his research on student motivation as well as on the teaching profession, included in his book, *The Art and Science of Teaching*. He breaks down his model of attention and engagement into four basic questions:

1. How do I feel?
2. Am I interested?
3. Is this important?
4. Can I do this?

Within the context of Fredricks's types of engagement, the first two fall under emotional engagement; the third question is cognitive, and the fourth question is behavioural. As behavioural engagement would be measured by more objective parameters such as eye-contact, or verbal commentary by students, the question, "Can I do this?" addresses the observable behaviour that propels the student forward.

Marzano (2007) also breaks down the difference between his focus on engagement and Fredricks et al.'s and Reeve et al.'s focus as he refers "to students attending to the instructional

activities occurring in class" (p. 99). Marzano is looking directly at a teacher's behaviour and influence on a student's engagement and lists five areas where teachers can increase student engagement: high energy; missing information; self-system; mild pressure; and mild controversy or competition.

High energy not only includes student energy, such as physical activity, but a teacher's energy, as well as the energetic pace of the lesson. High teacher energy or pacing affects student engagement by transference; that is, the energy from the teacher or the level of activity in the lesson is reflected in the student's own enthusiasm in the activity. In practical terms, this may look like a Physical Education teacher participating in the game or activity that the students are doing. As for pacing, teacher may monitor a high-energy activity such as a game, and transition to a new activity when the students' energy begins to wane. It is not important to try to maintain high energy throughout a lesson, but to build in effective transitions both leading up to the energetic activity and giving students time to positively disengage.

Missing information relies on the trait of human curiosity to solve problems or complete a puzzle. A teacher may give a student a task to complete with vital pieces left out. In most classrooms, teachers use missing information activities to engage students' interest. This aspect overlaps with cognitive engagement in that the activities tend to rely on a mental engagement rather than a behavioural engagement. At the same time, the missing information may take the form of solving of a physical puzzle, using manipulatives. It also may be seen in fill-in-the-blank exercises, word-searches, riddles, or pair work which involves getting information from a partner.

Self-system is described as two parts of the self: the "I" self, and the "me" self (McCaslin et al., 2006). The "I" self is higher-order thinking, and the "me" self is more task and domain

specific. As McCaslin explains, the ‘me” self can get in the way of the “I” self. An example may be that the “I” self has an interest in playing the piano, but the “me” self does not like playing scales to practice. In the classroom, this may present as a teacher looking to make the tasks themselves connected more to the higher-order thinking. In an English class, for example, rather than looking at learning grammar as a separate process, it may be embedded in reading a novel, to see how a writer uses grammar techniques.

Mild pressure is stated as “the right level of intensity and for the right duration of time” (Marzano, 2007, p. 102). This is based on the acknowledgement that too much pressure creates anxiety, which decreases the potential for learning (Jensen, 2005). To increase attention and achievement, Good and Brophy (2003) looked at increasing the rate at which students respond. As a classroom practice, a teacher may choose a student randomly to answer a question, which increases attention, but may also increase anxiety in the unpredictability of who is chosen; or a teacher may choose a student based on a predictable pattern of next person to the left, or behind, which may lessen anxiety about who is chosen while still maintaining attention. The pressure then may be milder.

Mild controversy or competition refers to what Jensen (2005) refers to as “engineered controversy” such as that in a debate. Competition is described also as mild competition. That is, what might be referred to as “friendly competition.” Manzano qualifies competition to say that it should not involve causing embarrassment for losing teams or individuals. This is connected to the previous factor of mild pressure; something that is too competitive will increase pressure to perform, which leads to lower performance and enjoyment. Classroom activities that employ mild controversy are as listed above, debates, but also may take the form of voting on true/false statements, or written responses to moral dilemmas. Mild competition may be more collaborative

than competitive, so individuals may be working together towards a common goal, or the competition is dependent partly on the adversary's cooperation. In a class, this may look like a whole class assignment to present to the school, or two students quizzing each other on information for an upcoming quiz, and recognition going to the partner who answered most correctly.

Behavioural Engagement in Synchronous Video Meetings. Synchronous video meetings are different from students being in the classroom, but the issue of student engagement remains constant. The techniques of maintaining student engagement in the classroom largely translate to synchronous video meetings. This section describes the research on student engagement as it applies to online, synchronous video meetings. While most research on teaching in the synchronous video meeting environment is at the higher education level, there will be acknowledgement of possible differences as they may apply to high school students.

Araya et al. (2018) examined student engagement in synchronous video tournaments in interschool competitions and found that students who engaged in synchronous video tournaments as part of a post-test follow-up to a hands-on activity they participated in, did significantly better than students who did not participate in the tournament. Further, they compared scores against a group who did a face-to-face tournament from the previous year and found that the synchronous students did better than the face-to-face students as well. This study was conducted with grade four students using a "strategy based on student collaboration and social mechanisms to increase engagement…Such a strategy depends heavily on communication technology in order to link different classes and schools synchronously" (p. 86).

As noted in the study, Araya et al. describes the teacher's role as more of a coach. While this is conducted using synchronous video, it is a class's video link with another class's video

link. This distinction alters the idea of synchronous video meetings, as it is more of a blended synchronous model of in-class instruction and synchronous video – the class is all together in the classroom, but they broadcast their video to another class which they see on a monitor. Nonetheless, the idea of collaboration and teamwork in a synchronous environment to produce engagement, but also positive academic results, suggests that adapting that to a fully synchronous video environment may yield similar results. An example would be to play a version of the dictionary game, in which one player introduces a word that no one knows, and each other player must create a definition of the word that sounds like it could be real. The goal is for each player to convince the others to vote for his or her definition as the real one while also trying to decide which is the actual definition. In a synchronous video setting, this could be accomplished by each player responding via private message to the initial player for him or her to be able to read them aloud for everyone. To create more collaboration, players may be put into breakout rooms to decide on a definition together.

Emotional Engagement

As Fredricks et al. (2004) state, "Emotional engagement refers to students' affective reactions in the classroom, including interest, boredom, happiness, sadness, and anxiety" (p. 63). The source of the emotions may come from a student's feelings towards the subject content, peers, or the teacher, so attribution is difficult. In much the same way that there is overlap between behavioural, emotional, and cognitive engagement, so there is overlap between emotional engagement when it is attached to content, peers or the teacher. Some of the emotions such as happiness and sadness may be objectively observed to measure the engagement, however some indicators such as anxiety or boredom may be more difficult to objectively measure. As well, since these indicators are observable, one might put these into the behavioural engagement

category. Under self-reporting, emotional engagement may be measured from the student's point of view. Taken as a continuum of the presence or absence of emotion, acknowledging emotion in the classroom disregards whether the emotion is positive or negative. That is, happiness and sadness are both the presence of emotion, and thus are equally measured. Of course, the goal of increasing engagement in the classroom is not to target negative emotions such as sadness, but in the case of a student's reaction to a sad section of a short story or poem, it may be seen as an appropriate indication of emotional engagement. As indicated in other sections, a teacher may increase emotional engagement by playing games, or have students do a self-directed project such as an inquiry project.

Mihaly Csikszentmihalyi introduced the idea of "flow," which addressed what he termed "optimal experience" Csikszentmihalyi (1990). Csikszentmihalyi uses the word "happiness" in reference to optimal experience. In achieving happiness, a person experiences "flow." Csikszentmihalyi describes this as when, "attention is freely invested to achieve a person's goals because there is no disorder to strengthen out or no threat for the self to defend against…In flow, we are in control of our psychic energy and everything we do adds order to consciousness" (p. 3). This definition may apply to emotional engagement as a descriptor of a student's interest in that the emotional engagement is so strong that the student loses track of time and space.

Krystina Finley (2006), through the National Center for School Engagement (NCSE), created a survey to measure school engagement, the Student School Engagement Survey (SSES) using Fredricks's three categories of behavioural, emotional, and cognitive engagement to survey three schools in three different states in the United States. The statements were drawn from eight other data sources. Figure 1 shows the statements divided by type of engagement. The goal was to create a survey that would be able to correlate engagement with attendance and achievement

measures. In terms of emotional engagement, it was related to English and Math grades at one site. Although the results varied among the three schools, the general conclusion was that the survey had high reliability, and some validity (in two of the three sites). The SSES is seen as a useful tool for assessing student engagement, but because of its small sample size, needs more usage to check its validity (Finley, 2006).

Figure 1

Statements in the Emotional Engagement Section of the Student School Engagement Survey (SSES).

Emotional Engagement

Sixteen items fit this category.

19a	When I first walked into my school I thought it was Good….Bad.
19c	When I first walked into my school I thought it was Friendly….Unfriendly.
19d	When I first walked into my school I thought it was Clean….Dirty.
22c	I am happy to be at my school.
22d	The teachers at my school treat students fairly.
22f	I like most of my teachers at school.
22m	The discipline at my school is fair.
22o	Most of my teachers care about how I'm doing.
22p	Most of my teachers know the subject matter well.
22r	There is an adult at school that I can talk to about my problems.
22s	I respect most of my teachers.
22v	Most of my teachers understand me.
23d	I feel excited by the work in school.
23f	My classroom is a fun place to be.
23u	I enjoy the work I do in class
23w	I feel I can go to my teachers with the things that I need to talk about.

Note: From Finlay, K., "Quantifying school engagement: research report," Denver, CO: National Center for School Engagement, Partnership for Families & Children, 2006.

Emotional Engagement in the Classroom. As indicated in the previous section on behavioural engagement, Robert Marzano et al.'s (2011) model of attention and engagement included four questions. The first two: "How do I feel?" and "Am I interested?" fall under the

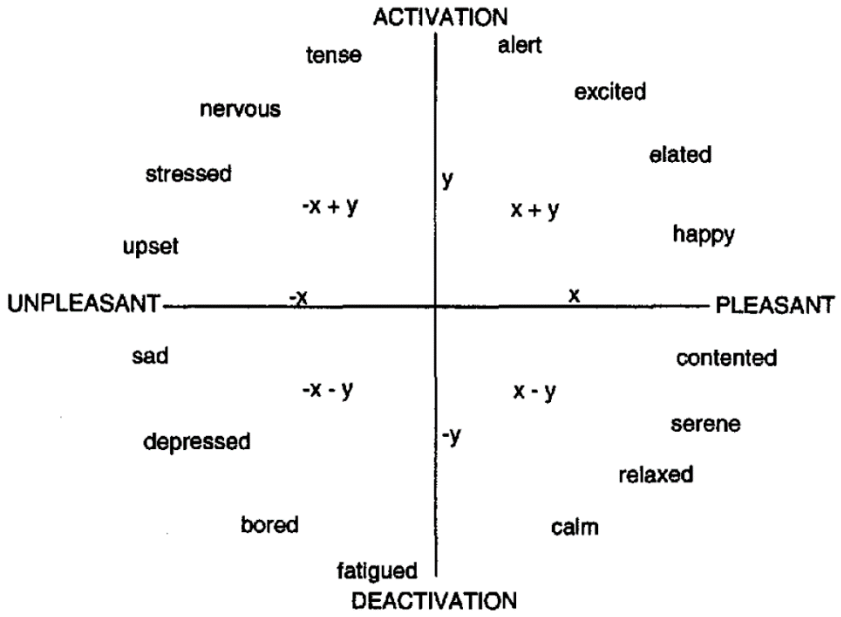
category of emotional engagement. In addressing the first question, Marzano et al. (2011) considers three aspects that influence emotional engagement in the classroom: students' energy levels, a teacher's positive demeanor, and students' perceptions of acceptance. Of the three aspects, students' energy levels are influenced by the level of activity in the classroom, including a lively pace and physical movement. As for a teacher's positive demeanor, Manzano et al. suggests that through enthusiasm and intensity as well as humour, a teacher maintains student engagement. In the third aspect, students' perceptions of acceptance, Marzano et al. explain that both teacher support and peer acceptance greatly impact student engagement, both positively and negatively. The question, "Am I interested?" follows from the first in that students may respond positively to "How do I feel?" and yet not be engaged because they have no interest in the activity. Ulrich Schiefele (1999) describes two kinds of interest: situational and personal, or individual. Situational interest is a short-term dependency on what is happening in the moment that is of interest, whereas personal interest is intrinsic to the person's more long-term affinity to a topic. These two questions relate to emotional engagement and can be addressed in the classroom by a teacher through enthusiasm, but in the case of the second question, the enthusiasm may only supply situational interest and not personal interest. In that case, a teacher would need to connect to the students' independent interests as they might connect to the topic at hand. Inquiry projects are designed to address this focus on personal interests to increase engagement.

Feldman et al. (1998) described emotion as an interaction between valence and activation. That is, degrees as plotted on an x and y axis of a graph. Along the x-axis is valence, which varies from unpleasant (negative) to pleasant (positive); along the y-axis is activation, varying from deactivation (negative) to activation (positive). Figure 2 breaks down the emotions

attributed to the four quadrants. In the application of this division of emotion as it applies to engagement, the terms “activation” and “engagement” are used synonymously. Thus, the graph would be relevant as a measure of engagement for only the upper half of the y-axis (i.e. for activation/ engagement only). Utilizing this description of emotional engagement, whether the emotion is pleasant or unpleasant, it is measurable in terms of degree of activation/ engagement. Conversely, disengagement, or deactivation, may be measured along the same pleasantness axis, dependent on the degree of disengagement.

Figure 2

Semantic structure of affect.



Note: From Feldman Barrett, L., & Russell, J. A. (1998). Independence and bipolarity in the structure of current affect. *Journal of Personality and Social Psychology*, 74(4), 967–984.

In the classroom, emotional engagement has been measured by Connell and Wellborn (1991) using the Rochester Assessment Package for Schools (RAPS). Included are self-reporting statements such as “When I’m (This student is) in class, I feel (this student appears)…The descriptors include bored, interested, discouraged, happy, and angry” (p. 55). Figure 2 shows

descriptor statements for emotional engagement. While some of the descriptors in both Feldman et al.'s graph and in the RAPS statements may be observable behaviours, others would only be measurable via self-reporting of inner emotions. As such, increased student engagement in the classroom may only be measured by having students fill in a survey after the class. Additionally, Connell and Wellborn state that a teacher's engagement affects the students' engagement, as students and teachers are "embedded" in the social context both within and beyond the classroom. This is similar to Bronfenbrenner's Bioecological Model of Human Development (Bronfenbrenner, 2005). Skinner and Belmont (1993) also examined the mediating factor of both student perception of the teacher's behaviour towards the student, as well as the teacher's perception of student motivation. For many teachers and researchers, increasing emotional engagement requires variety in instruction and activity to reach every student on some level of emotional engagement.

Fredricks et al. cites Connell and Wellborn when indicating that "teacher support has been correlated with emotional engagement in a primarily White middle-class sample" (Connell & Wellborn, year, as cited in Fredricks et al., 2004). Kristy Cooper (2014) followed up on this by examining teaching practice on student engagement and found that "perceptions of teacher care had the strongest correlation with engagement (r = .59)" and among teaching practices, teacher care and understanding had the strongest correlation (r = .76) (p. 377). Similarly, Klem and Connell (2004) found that "Students who perceive teachers as creating a caring, well-structured learning environment in which expectations are high, clear, and fair are more likely to report engagement in school" (p. 270).

Emotional Engagement in Synchronous Video Meetings. In a synchronous video environment, student emotional engagement can be measured using the same measurement tools

as in the classroom, however by its "distant" nature, video makes it more difficult for a teacher or a student to establish the same relationship that may happen in the classroom. For example, a teacher in the classroom may walk around and stop for 10 seconds to chat with a student one-to-one while others are working. This brief private chat helps to establish what Connell and Wellborn (1991), and Skinner and Belmont (1993) attribute to increased student engagement; that is, the student's perception of the teacher's behaviour towards him or her. In the synchronous video environment, this cannot happen as spontaneously without all other students hearing what is being directed to only one student. There is a private chat option in the synchronous video environment which can replicate a one-on-one interchange, although this can be a cumbersome exercise for the teacher. An overriding difference that affects the synchronous video environment is the idea that once in the video "room," the teacher is "on." This means that unless there is the understanding of all involved, there is no work time included so that there may be extended periods of silence while students do written work. In the classroom, this would be the time that a teacher would establish a connection with the students through immediate feedback, and encouragement, which would increase the students' emotional engagement. If a synchronous video meeting were to build in work time, then the teacher may be able to make the same connections, which would in turn, increase emotional engagement. Additionally, the use of small group and one-to-one meetings, as well as asynchronous methods such as direct messages or recorded video may support emotional engagement.

Cognitive Engagement

Fredricks defines cognitive engagement as connected to two different literature foci (school engagement, and learning and instruction): "One group specifically highlights a psychological investment in learning; another targets cognition and emphasizes strategic

learning" (Fredricks et al., 2004, p. 63). From this definition, student engagement in the classroom presents in different ways. From the former aspect of psychological investment in Fredricks's definition, engagement includes, as described by Connell and Wellborn (1991), flexible problem solving, active coping with failure, attention, preference for hard work, and independent work styles and judgement (see Figure 2.3, Connell & Wellborn, 1991). From the latter aspect of cognition and strategic learning, engagement is described as students who

> use metacognitive strategies to plan, monitor, and evaluate their cognition when accomplishing tasks (Pintrich & De Groot, 1990; Zimmerman, 1990). They use learning strategies such as rehearsal, summarizing, and elaboration to remember, organize, and understand the material (Corno & Madinach, 1983; Weinstein & Mayer, 1986). They manage and control their effort on tasks, for example, by persisting or by suppressing distractions, to sustain their cognitive engagement. (Corno, 1993; Pintrich & De Groot, 1990). (p. 64)

Cognitive Engagement in the Classroom. As it applies to cognitive engagement in the classroom, a teacher would look to choose activities that present enough of a challenge to activate what Connell and Wellborn (1991) see as individual students' problem solving, active coping with failure, attention, preference for hard work, and independent work styles and judgement. This requires a teacher to know where each student lies on those measures and adequately and accurately give those students the right amount of cognitive challenge. From a practical standpoint, this would be difficult for a teacher to monitor and ascertain. Further, designing an activity that would be flexible enough to personalize to a student's levels of the previously listed measures would require much one-on-one time between the teacher and the student. As for strategic learning, a teacher would need to explicitly teach the strategies of

rehearsing, summarizing, and elaborating to be assured that students were accessing those strategies.

Marzano's question, "Is this important?" addresses the area of cognitive engagement. Robert Marzano and Jana Marzano (2010) illustrate a hierarchy of goals similar to Maslow's Hierarchy of Needs (Maslow, 1943) in that at the lower levels are the goals around subsistence such as food, comfort, and shelter. Above those are short-term goals, log-term goals, and longer-term goals. Marzano and Marzano state that students operating at the higher levels of the hierarchy are more engaged. Thus, a teacher who targets a student's higher-level goals will increase engagement. As a result, a teacher who gives cognitively challenging tasks helps students to perceive classroom activities as important.

An example of a strategy for increased cognitive engagement in the classroom would be to make an activity useful beyond the walls of the classroom. For example, making a podcast or a video that could be shared with an online audience. In this case, students, having been taught the strategies of rehearsing, summarizing, and elaborating, and who have learned about privacy and copyright rules, may work through the school engagement and strategic learning aspects of cognitive engagement to have a product that individually cognitively challenges them. In this way, students would use strategic learning to accomplish the task, as well as employ aspects of psychological investment to address both parts of cognitive engagement.

Cognitive Engagement in Synchronous Video Meetings. J. Lynn McBrian, Rui Cheng and Phyllis Jones (2009) examined the use of synchronous online classrooms at the higher education level to assess engagement and found that students who participated less in face-to-face classroom environments participated more in synchronous online interactions. This relates to increased cognitive engagement, as it addresses attention, independent work styles and

judgement. The complicating factor in the study was that there was only audio in the synchronous online classrooms, as indicated by comments such as “Talking through the microphone really helped me to collect my thoughts, knowing that I could only express myself verbally. It also made me feel more in control of how I communicated my ideas because a large group of people weren’t staring at me, and this made me more confident in how I expressed myself.” (McBrien, Cheng & Jones, 2009, p. 10). The lack of video increased participation and cognitive engagement in some cases, however for others there was “Lack of interaction between peers and instructors” (p. 11).

Cognitive engagement in the synchronous video environment would not differ much from the classroom. That is, activities that challenge students’ mental processes can easily be done in-class and in synchronous video settings. For example, if an activity were to have students solve a word puzzle, a teacher may put students in pairs in the classroom. In the synchronous video environment, a teacher may put students into breakout rooms in pairs to work together.

Student Engagement: In the Classroom vs. In Synchronous Video Meetings

Synchronous video meetings have brought with them both new opportunities for teachers and students, and limitations in relation to student engagement. Many techniques that a teacher might use in the classroom can easily transfer to synchronous video meetings. As previously noted, having students do pairwork or groupwork using “breakout” rooms closely replicates the same in the classroom. There are some in-class techniques that do not transfer easily, such as informal one-to-one chats within the learning environment. Francescucci and Rohani examined this comparison in a higher education setting (Francescucci & Rohani, 2018). In their study, they referred to synchronous video meetings as “virtual, interactive, real-time, instructor-led (VIRI)”

online learning, coined by Francescucci and Foster (2013) and in the classroom instruction as "F2F" or face-to-face. One of the aims of their study was addressed in the second of their research questions: "Do students achieve the same level of engagement in a VIRI course compared with students who take an F2F Course?" (Francescucci & Rohani, 2018, p. 63). The results of the study concerning engagement showed that "with the exception of *expected participation* at the start of the fall 2016 semester for Instructor A, all other statistically significant findings of engagement appear to suggest that it is always the control (F2F) group that appears to be more engaged on a number of factors depending on instructor and/or semester" (Francescucci & Rohani, 2018, p. 65).

While there is evidence to suggest that engagement in the classroom is easier to achieve than in synchronous video meetings, there are also techniques that are unique to synchronous meetings that are more difficult to reproduce in the classroom for increasing student engagement. While these may be alterable to the classroom, they may require so much adaptation as to not merit the preparation needed. An example is that in the synchronous meeting environment, both the teacher and the students can add digital filters to their video images. As a result, the teacher and students may, as an example, choose to have a digital cat placed on their heads. In terms of engagement category, this would speak to emotional engagement, as it would increase how alert or excited the students may get. This option would be more difficult in the classroom, as each student would have to possess a hat or accessory to bring to school to wear, which would highlight inequities if a student had nothing to bring in. If a teacher were to have students make hats, there would be significant time and money spent by the teacher to buy the material, and for students to make the hats.

Another unique advantage that synchronous video meetings possess is the ability to quickly randomize groups for “breakout” sessions, in which students are placed in a virtual room to discuss a topic or to collaboratively work on a problem. Synchronous video programs allow a teacher to select “random” and the program divides the class instantly into groups, with numbers in the groups determined by the teacher. This task in much more cumbersome in the classroom, especially with larger classes, as the teacher must use a selection process, such as by counting out, or a deck of cards, or slips of paper.

Examining the effectiveness of synchronous video meetings in terms of student engagement must consider the contextual circumstances. A separation must be made between information gathered pre-2020 and the global COVID-19 pandemic and that gathered during 2020. This distinction is important to make because measuring engagement in synchronous video meetings under the circumstances of the pandemic must include the effects of the world outside of the school on a student’s engagement. Lassoued, Alhendawi, and Bashitialshaaer (2020) identified four categories of obstacles in the shift to distance learning in higher education in the Middle East: personal (self-imposed), pedagogical, technical, and financial obstacles. As noted previously, measurement of student engagement in synchronous video meetings during the pandemic of 2020 must be mitigated by these four obstacles. Table 1 shows the responses to an open question, “in your opinion, what are the obstacles preventing achieving the quality of distance education?” grouped according to themes.

Table 1

Obstacles to achieving the quality of distance learning under the Corona pandemic

Obstacles Category (Groups)	Obstacles	Professors Repetition (n = 100)	Students Repetition (n = 300)	Overall Repetition (n = 400)	Overall Percentage (%)
Personal obstacles (self-imposed obstacles)	1-The weak motivation of students to distance learning.	65	112	177	44.3
	2-The difficulty of students' understanding of some subjects in the absence of classroom interaction.	60	175	235	58.8
	3-Get used to face-to-face learning.	61	95	156	39
	4-Some professors are not convinced of the usefulness of distance learning.	20	39	59	14.8
	5-Lack of willingness to implement the distance learning system.	69	105	174	43.5
Pedagogical obstacles	1-Difficulty learning some applied courses and remotely oriented work.	18	47	65	16.3
	2-The lack of clarity of the methods of remote evaluation.	47	48	95	23.8
	3-Lack of preparing the university community (administration, professors, etc.) to deal with distance learning.	64	0	64	16
Technical obstacles	1-Weak internet flow (speed).	80	156	236	59
	2-Security and confidentiality of data and information.	66	63	129	32.3
Financial and organizational obstacles	1-The lack of capabilities to communicate remotely (devices, internet, Apps, etc.).	82	155	237	59.3
	2-Lack of training in the use of technology.	71	69	140	35
	3-Multiple electronic media and the absence of uniform controls between all.	52	42	94	23.5
	4-The home environment is not suitable for distance learning.	46	60	106	26.5

Note: Reprinted from *Education* Sciences 2020, 10, 232 by Lassoued et al., 2020.

Lassoued et al. identified personal obstacles indicated by both students and teachers: for students there was weak motivation to distance learning, and for teachers, some indicated that they were not convinced of the usefulness of distance learning. While not indicated specifically in the statement of weak motivation, what is inferred is the emotional and psychological strain that the pandemic created in daily life, as well as how this affected families and the ability of students to concentrate in their home environment. Further, pedagogical obstacles would indirectly affect student engagement. In this case, the ability of a teacher to transfer an effective in-class lesson to a synchronous setting would influence student engagement. Technical obstacles are self-explanatory, as both teacher and student would be affected by the technology

available to meet and learn online. A student or teacher with limited internet bandwidth at home (or none at all), would mean that accessing lessons or a synchronous video meeting would be difficult, if not impossible. Finally, financial and organizational obstacles impact engagement because of digital inequity. A student or teacher with no access to a fully functional digital device, or whose home circumstances makes it difficult to attend to a synchronous video meeting (because the pandemic has changed familial responsibilities), will negatively affect engagement.

The greater impact that the pandemic made on student engagement may have differed if a student or teacher were to have chosen synchronous video meetings, rather than to have had them imposed upon them. As well, sufficient warning of a new system of online learning may have helped all to prepare accordingly, both pedagogically and psychologically. In that light, finishing the school year online in the Spring of 2020 in terms of student engagement was predictably problematic. However, those institutions who started the Fall of 2020 online would have had both the students and teachers psychologically prepared for the "new normal." As a result, any conclusions to be drawn from information gathered on student engagement in the Spring of 2020 must be examined with the overarching spectre of the pandemic included.

Summary

In examining the challenges of maintaining student engagement in synchronous meetings in the K-12 classroom, what has become clear is that many strategies that a teacher employs in-class can be adapted to the synchronous video meeting setting. Engagement as a tool can be measured in both settings. At the same time, the synchronous video meeting setting affords some unique advantages and challenges. While many at the higher education level, and some at the high school level, had already adopted synchronous video meetings prior to 2020, the courses that adopted the new teaching and learning environment were done voluntarily. However, as the

coronavirus pandemic of the Spring of 2020 spread, educational institutions from kindergarten to higher education around the world were forced to adapt to online learning. Teachers and students had to reimagine their courses without the face-to-face option. The results of this shift meant that teachers had to find new ways to keep student engagement as high as they would in the classroom. What became clear was that student engagement became more difficult to maintain in the synchronous video environment. Students gradually began to turn off their video feed, which removed eye contact and body language from the behavioural engagement measure. Attendance also began to waver as students did not log in to the video meetings. The question that arose from the experiences of the Spring of 2020 was, "How can we improve the synchronous video meetings so that student engagement is high?"

Moving forward, as the education system may in the future, begin to employ synchronous video meetings as part of "regular" classes, more study will be needed to determine the best uses of synchronous video meetings to engage students in high school.

In the end, the larger question is: Why does this matter? What is the end goal of increased student engagement? Is it, as Finn and others have addressed, decreased drop-out rates? Is it increased graduation rates, or simply achievement? Most studies on engagement that cover different ages do not use longitudinal data. That is, graduation rates are not measured by the student, but by the school. The school data may see a rise in graduation rates year-on-year, but that does not specify the individual students who benefited (or did not) from the increased engagement measures. Some longitudinal data suggests that it is difficult to isolate the changes of engagement in students between grades 7 and 11 based on the circumstances (teachers, peers, school) or their developmental stage changes (Wang & Eccles, 2011).

It might be expected that students who are aligned with the goals of schooling will

> subsequently be engaged in their work environments, leading to success in the labour market. In the case of extreme levels of student disaffection from school, several studies have suggested that disaffection and truancy in particular are associated with marital problems, violence, adult criminality and incarceration. (Baker, Sigmon and Nugent, 2001, as cited in Willms, 2003, p. 56)

The inference is that increased student engagement in school, whether in the classroom or in synchronous video meetings, will lead to success in other areas of a student's life. As Bronfenbrenner notes in his bioecological model, the interactions between the different spheres of a person's world affect how the person develops, and increased engagement in school presumably positively affects the student's development post-high school.

It is clear that with a dearth of studies focusing on methods of increasing student engagement in synchronous video meetings in high school, this is an area that needs further study. The coronavirus pandemic became the impetus for many studies to focus on student engagement because educators struggled with keeping students attached to their learning while students were at home. Until educators and students around the globe were forced to pivot to remote, online education, the issue of student engagement in synchronous video settings was a very small portion of the educational landscape. Now that researchers see that the pandemic is now in its second year, and that this may be just a training ground for future reactions to pandemics, it becomes more important to study student engagement from the synchronous video setting perspective.

Chapter Three: Website for Student Engagement

Website Creation

This project is a result of, and follow-up to, the focus of the Literature Review; that is, as praxis. The website takes the ideas from in the pivot from in-class instruction to remote learning in 2020.

The website contents are attached as a pdf using the Chrome browser plugin, GoFullPage. Video files are mp4 format.

Sakiyama_Dale_MEdProject_2021_002.pdf

Sakiyama_Dale_MEdProject_2021_001.mp4 (example of work that can be done by students)

Sakiyama_Dale_MEdProject_2021_002.mp4

Sakiyama_Dale_MEdProject_2021_003.mp4

Sakiyama_Dale_MEdProject_2021_004.mp4

Sakiyama_Dale_MEdProject_2021_005.mp4

Sakiyama_Dale_MEdProject_2021_006.mp4

Sakiyama_Dale_MEdProject_2021_007.mp4

Sakiyama_Dale_MEdProject_2021_008.mp4

Sakiyama_Dale_MEdProject_2021_009.mp4

Sakiyama_Dale_MEdProject_2021_010.mp4

EngagED website URL: https://dalesaki.opened.ca/

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Chapter Four: Conclusion

Summary of Learning

All research is a product of its time. This may also be extended to life in general, but in personal terms, this statement is extremely relevant for the time period between the beginning of the Master's program in July 2019, to the end in April 2021. It may be argued that nothing in recent memory has impacted the local, national, and global community in such a short time as has the coronavirus in past two years. The coronavirus pandemic not only significantly altered education, from kindergarten to post-secondary, but all aspects of day-to-day living. The impact cannot be overstated. As such, the impact on the Master's program and my personal learning has been undeniably complete.

Regarding the Master's program itself, from the very beginning (including how the first two classes, EDCI 515 and EDCI 568, were conducted), this has been, as observed by others in the cohort, a huge dose of pedagogical professional development. From learning the specifics around the Freedom of Information and Protection of Privacy Act, (FOIPPA) and how that impacts students in the classroom, to looking critically at research and its validity and reliability, the introduction to the Master's began not with a toe dipped in, but a full plunge.

The progression from learning about literature reviews, to the topics of open education, digital literacies, examining curriculum, and learning design, there have been insights gained that have both reinforced some of the good things we are doing in the classroom, as well as challenged us to re-examine other things we are doing. All the topics have impacted me in different ways, but what has been particularly impactful have been issues around privacy and universal design, as well as open education and open learning, and curriculum and its use. In this

digital age and the increased use of learning and teaching online, being aware of student privacy and information has become of primary importance. In the not-so-distant past, putting student work on display in the classroom was limiting its exposure to only those in the school. Now, the potential is global exposure, and with that comes larger responsibilities around sharing personal information. This greatly influences a teacher's vetting process when it comes to website access, and student "sign-up" to a variety of websites used for learning. As for open education and open learning, the effects of limited access to educational material are felt more acutely when as an educator, I am trying to use an online tool such as Google Meet, and because my school district has not signed an agreement for access to advanced options, I cannot use the application fully. Likewise for Microsoft Teams. For public school students, within the constraints of a school budget, they are given access to all material without having to pay. Regarding the focus on curriculum, the philosophical challenge of deciding what curriculum means and how it should be applied to me in my classroom, was an enlightening process. I realized that after reading Ted Aoki's article (Aoki, 1985), that I appreciated more of the importance of the teacher in the dynamic between the teacher, the student, and the curriculum. With Ted Aoki in mind, the seeds in my journey towards a project idea began to germinate.

Upon reflection, my project idea really started during the first two classes of the Master's in July 2019. To have begun by having half of the cohort together in a physical classroom and the other half live via synchronous video was, unbeknownst to us at the time, a harbinger of things to come. Besides the courses' content, I was intrigued by and curious about, the delivery method. Again, I did not know at the time, but that curiosity was eventually going to be the driving force behind my entire Master's.

During the first two courses of the Master's program, I was paying as much attention to how Dr. Irvine and Dr. Thom conducted the classes, as the content of what we were learning. The combination of both in-class participants plus live, online synchronous video participants fascinated me. At the time, I observed that I felt that there was an advantage for those of us who were there in-class. From my anecdotal position, I felt that there was a certain lack of spontaneity being on video; that while it was not a conscious act, those speaking in-class commanded primary importance. At the same time, I acknowledged some excellent benefits, including the ability, through technology, to be put into a small-group activity that included both in-person and online participants. This truly felt like a glimpse into the future of education: a mix of in-person and remote learning in one class.

From the fall of 2019, we transitioned to fully online courses via a different platform (Zoom) than what we had previously been using (BlueJeans). This predated the pivot that education was soon to experience six months later, which unintentionally prepared those of us who had not done remote teaching before, for the new look of education in March 2020. The lessons I absorbed by watching how Dr. Irvine, Dr. Thom, and eventually Dr. Paskevicius, conducted our synchronous video meetings, allowed me to incorporate things like breakout rooms and sharing information through the chat when I eventually had to conduct my own classes the same way.

My experiences with synchronous video lessons, both as a student in the Master's courses, and as a teacher during the remote teaching of spring 2020, led me to bring my Master's project into focus. As a student in the Master's courses, I made it a point to be actively engaged in the classes, whether they were in-person or on video. That is, to participate in discussion, to ask questions that were relevant to me, and to really think about the topics at hand. To be the

kind of student I loved to have in my own classes: not necessarily the brightest, but at least engaged. During my own turn at remote teaching, I directly experienced how important student engagement (and disengagement) affected my teaching and the lessons. Naturally, as happened with most teachers, I began to wonder how I could increase student engagement in these synchronous video meetings. When the school year wrapped up in June and the Master's courses began in July, it occurred to me that while I was struggling to find a direction for my Master's project to go in, I had without being aware of it, been already pointing in a direction. This was a marriage between my deep interest in student engagement, and the use of technology in education via online synchronous video lessons.

Having a project direction and arriving at an actual project idea was not straightforward. I defaulted towards a website, as it seemed the most logical way to present my information, but I did not factor in the aspect of relearning how to navigate the constructing of the website. I was clear in my own mind that the purpose was to provide educators who were concerned about student engagement – especially in the synchronous video environment – with some suggestions on what could be done. I have now constructed a website that addresses engagement both in the classroom and in synchronous video meetings.

With the understanding that educators are busy and less likely to read pages of academic documents for professional development, a website with shorter, more focused, "tips and tricks" would be more attractive. Embedded in the statement about praxis is the linguistic approach of balancing the text and language between formal and casual. On the one hand, being too formal can equate to being dry and uninspiring, but more trustworthy. On the other hand, being too casual can be seen as condescending and folksy, and thus with less merit. Finally, in a "meta" way, I have been keenly aware that creating a website on student engagement should be

engaging for the educator to access. I have tried to put my personal stamp on the videos I have included, although still in a muted sense. As well, in a "meta" moment, I have included videos using the Zoom platform recording feature to describe using Zoom and its features.

Reflections on Growth

Implications of the Research

Research on the topic of engagement, like many general terms, is vast. Also like many general terms, there are many related terms such as "motivation," and "participation," and "effort." The implications of having a general term with many synonyms is that many of the studies on engagement that I examined were not aligned with what my particular focus was. For example, Jeremy Finn, one of the leading researchers cited and whose model was frequently referenced, focused more on disengagement and school dropout rates than engagement (Finn, 1989). Once I had narrowed my focus on first identifying a definition of engagement, two key researchers came up: Jennifer Fredricks and Robert Marzano. The key distinction was Fredricks et al (2004) dividing engagement into the three categories of behavioural, emotional, and cognitive engagement. This allowed me to clearly identify what engagement would look like under those three headings. Robert Marzano, while not directly using Fredricks et al.'s divisions, posed questions that could fit under them.

As for the research affecting my practice, by explaining Fredricks's three divisions of engagement, I sought out either activities that I already did in the classroom or tried during the remote teaching period that fit into the three types of engagement.

In the field of study on student engagement, my research notably tried to tie together the older research on in-class student engagement with the recent research on student engagement in the synchronous video environment. With such an emergent issue as global remote learning that

suddenly thrust engagement into a 21st century context, the field of study on synchronous video learning especially as it applies to K-12, is in its infancy. My research highlights both this understandable lack of data, and the need for more.

Research and Findings and the Learning Context

One of the most important questions in any type of research is, "How does this translate into practice?" I have categorized the sections covered in the literature review with an example in the learning context for each.

- Behavioural Engagement: classroom – according to Fredricks et al., behavioural engagement is demonstrated by what a student's actions are in the classroom. This may be seen as participation in an activity, so that may easily be seen to measure.
- Behavioural Engagement: synchronous – to observe participation as a form of behavioural engagement in the synchronous setting requires video and/or audio enabled, or at the minimum, chat. In my Japanese language class in April 2020, I had students perform dialogues in Zoom, with part of the mark allocated towards visual gestures, which required their video to be enabled.
- Emotional Engagement: classroom – Marzano poses the questions, "How do I feel?" and "Am I interested?" which align with Fredricks et al.'s category of emotional engagement. Sometimes this is equated with "effort." It is not enough for students to just participate, but to care about what they are doing. In the classroom, this often can be seen in the focus of attention or observable behaviour such as facial expressions or verbal exclamations. An example is when I have had students make a game (board game, trivia game, or physical game) that encompasses the storyline of the novel, *Lord of the Flies*, they also know that they will have to play and explain their own games to others in the class. I

have had students adapt the game “Capture the Flag” to Lord of the Flies, and the participation level, involvement, and effort in each side trying to win is extremely high.

- Emotional Engagement: synchronous – in the synchronous video setting, having students putting in an effort became a struggle, but one key strategy guaranteed higher effort than others: using breakout rooms. The reasons are speculative but can be seen in contrast to whole-group meetings. One reason is the relative privacy of having a one-on-one interaction, which does not allow for one student to remain disengaged. The privacy may also allow for students to be more frank with one other person than in a large group, which naturally tends to bring out more emotion.
- Cognitive Engagement: classroom – this aspect deals with the thought processes involved with engaging in an activity. That is, how much is the student being intellectually challenged in the activity? As Connell and Wellborn (1991) refer to learning strategies such as rehearsal, summarizing, and elaboration to remember, students are actively cognitively engaged. In the classroom, I have my Japanese language class students use flashcards with a partner to help them remember characters in writing of the hiragana script. They are all given a handout with drawings paired with the characters as a mnemonic device to help in their strategies to remember the characters. They are free to use or not use the handout as an option. In addition to that, I share some basic information on the study of human memory that George Miller (1956) produced that revealed that humans on average can remember seven items of a list, plus or minus two. Of course, there are specifics to this statement that alter the actual number recalled, but I use the information to demonstrate that most people would have a difficult time trying to remember a list of 20 items, as an example. The strategy I given them is to start with a

small list (as few as 2 items) and work upwards only adding more as the list can be repeated at least twice. This is not a new technique, but as a cognitive strategy, many students do not realize that sometimes it is not what they are trying to remember, but how they are trying to remember it.

- Cognitive Engagement: synchronous – in the synchronous video setting, cognitive engagement can be similarly achieved as in the classroom. The use of breakout rooms can be useful in giving students problems to solve in teams, and when back together as a whole group, sharing out their solutions. In the classroom I have given students pairs of students a sheet with story puzzles to solve. They work together to come up with the solution and get a prize if they are right. While this activity does not count for marks, they are cognitively engaged in working out solutions by talking through their logic. This can easily be transferred to synchronous breakout rooms.

Recommendations for Future Research and Practice

More Research

While research on student engagement has a long history, research on student engagement as it applies in the synchronous video environment is very recent, especially as it applies in the kindergarten to grade 12 (K-12) levels. There is good reason for this, as prior to 2020, the only education conducted in this fashion was to accommodate a small percentage of the school-aged population who could not, for a variety of reasons, attend school in-person. As a result, the breadth of the use of synchronous video lessons was not wide enough to warrant significant research attention. After the global shutdown of in-person education happened in the spring of 2020, the issues arising from conducting remote teaching through synchronous video

lessons became more prominent and wide-spread. As such, the body of research on student engagement in the synchronous video environment only began to build from March 2020 onward. Adding to the relative dearth of published research is that conducting research in general with K-12 aged students requires more layers of permissions, and thus makes the process more cumbersome. The resulting "perfect storm" is that the two issues of recency and subject-use have made the topic of student engagement in synchronous video meetings wanting of research.

Policy and Practice Recommendations

In looking towards policy recommendations for future research, when dealing with subjects who are minors, there is limited leeway in altering policy. There are strict research ethics policies in place that must be adhered to before a study may be conducted, and as such, waiving those policies would not be possible. The result of the warranted strict ethics policies of research regarding minors is that there are comparatively fewer studies with that demographic, and studies using older subjects may have validity issues when trying to make conclusions based on how subjects reacted to specific measures. In the case of focusing on student engagement in the classroom, ethics restrictions have not significantly hampered studies being conducted because the field has decades of time to examine articles. However, in the case of examining engagement in the synchronous video environment, the studies that have been conducted have overwhelmingly been with students in post-secondary classes, with students who are of the age of majority.

In practice, teachers poll students all the time, but as this information pertains to publishing the data, it must remain as anecdotal evidence, or used by the individual teacher to guide his or her own practice. On a daily basis, teachers experiment with new teaching methodology, activities and assignments, so trying different ways to engage students when in the

synchronous video environment falls under the category of regular practice. As most teachers also know, what works for one group may not work for another. This is not only one of the biggest frustrations in teaching, but also one of its greatest joys. Predictability in student reaction is the death of creativity in the teacher. A recommendation in practice is to establish a personal learning network (PLN). In the area of high school student engagement in synchronous video meetings, a recommendation for practice is to create a questionnaire that students may respond to anonymously to give feedback on both what would engagement look like to them, as well as what worked and what didn't work for them during the remote learning of the spring of 2020.

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