A Study of Student Experience During the Pandemic in Trades Education at the College of New Caledonia

by

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Abstract

The abrupt shift to remote learning during COVID-19 disrupted people. Many teachers scrambled to learn to use online learning platforms and assemble online courses. Students were forced to do courses remotely. Despite these disruptions, as a college instructor I was interested in exploring what were some of the positive impacts of remote learning for college students, specifically those in Trades. For this research project I investigated this question: What practices, post pandemic, can be carried forward in online learning in the Trades? To elaborate: What are Trades students' experiences of online instruction during the COVID-19 pandemic? From these experiences, what can be carried forward in online learning to enhance learning and flexibility of delivery? I conducted seven semi-structured interviews with Trades students at the College of New Caledonia in Prince George, British Columbia. Student responses to interview questions were analyzed for themes. The findings reveal both positive experiences (self direction, economization of time, money and travel) and negative experiences (information and technical errors, life distraction, reduced hands on experience) of remote learning. The study shows that course delivery during the pandemic was sufficient in many ways and should continue to be enhanced, expanded, and explored in ways such as effective student-teacher communication, engaging instructional techniques, and hands-on alternatives.

Keywords: online learning; Trades; vocational; student; experience; pandemic

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Introduction

COVID-19 changed the world. For those of us working post-secondary education we were thrown into a situation of forced remote learning and scrambling to adjust has caused much angst and hardship experienced by both instructors and students. However, along the way everyone has learned from it. There are things both good and bad that everyone experienced. I am an instructor in the Trades Electrical program at the College of New Caledonia (CNC). As an instructor, I believe that there were some good things that came about. Things I liked were automatic marking and grading, recordings of sessions and lessons that can be rewatched, as well as readily accessible content, such as videos, power points and worksheets. My aim for this research project is to find out from the students' perspective what things we should keep and what we should discard in the Trades regarding online learning. The research has the potential to inform our Trades program of inclusion for those in different situations requiring remote or asynchronous learning and using an online platform in combination with face-to-face learning. I hope to help expand the reach and accessibility of the Trades program at CNC. A study by Karstensen and Oudmeyer (2020) concludes,

> Both teachers and students emphasise the opportunity for flexibility that the online programme provides. We see that the online programme attracts many students who would not normally have time or the possibility to complete the course of study if they followed the ordinary campus-based programme. (p.152)

Literature Review

I have sought out material on online education in the Trades sector. The articles I found were mostly from journals in vocational studies and many articles were centred around the COVID-19 pandemic. The goal of my literature research was to find out what has been happening in the Trades sector in relation to online learning during the pandemic. I looked at pre-pandemic material as well and I also drew literature from other disciplines outside of Trades. Also, while my own research is focused on student experience, there were a few articles of relevance that included instructor perspectives and I included them within this literature review.

It's not surprising from that many studies produced varying findings. The research findings related to learning during the COVID-19 pandemic varied, this may be influenced by culture differences, as the studies I found were done in different countries. In addition, there may have been variance in technological capabilities and educational infrastructure across each country, which has its own political and social limitations. Also, another variance may be in individuals, as each experience, action and effort is influenced somewhat by past and present experience. The literature yielded some common themes. I have grouped those themes into benefits and challenges.

The literature specific to the online transition during a global pandemic is still emergent as this was a unique during 2019-2022. I found much of the prior research on online learning in Trades during COVID-19 was done outside of North America. Perhaps this was due to North America perhaps being one of the last places to lock down. I am hoping to add to the research from a local perspective regarding our specific institution and also within North America.

Benefits

Economy

Economy is used to describe optimization of time and travel. Distance learning is economical for remote learners as no travel is required. Quesado-Pallares et al (2019) describe one benefit of online remote learning as overcoming of “time and space barriers”. On the benefits of flexibility of online learning, (Karstensen & Oudmayer (2020)

found consensus, citing “students do not need to travel to the university campus, but also because it is possible to present the content in a more flexible (asynchronous) way” (p.146). With the aspect of time, in relation to asynchronous delivery, (Quesado-Pallares et al. (2019) cite students “have the freedom to acquire learning whenever and wherever they have the opportunity to” (p.2). The geographical area that institutions can serve becomes almost unlimited providing institutions with an expanded market. In reference to the geographical reach, Karstensen and Oudmayer (2020) express, “In short, online study has helped us to achieve a larger geographical spread of students” (p.137).

Diversity

There is value in the diversity of delivery that comes with the inclusion of an online platform, in addition to face-to-face learning. “Online learning has been recognized as an effective way to improve the quality of teaching and to learn in vocational schools because of its variations in increasing student motivation, satisfaction, and interaction” (Syauqui et al., 2020, p.882). Students learn in different ways. Using a multitude of different media and techniques helps to meet a diverse array of learning preferences. Han et al. (2020) found: “When considering students’ favorite online teaching models, more than half of the students (accounting for 58%) preferred live broadcast for class. This was followed by the combination of the online learning platform and live broadcast (accounting for 31%), video recording (accounting for 28%), and the combination of the online learning platform and social media tools such as WeChat and QQ (accounting for 24%)” (p.74).

Online delivery can be as effective as face to face. “Studies comparing face-to-face teaching to online and/or blended learning reveals that no inherent features of any of the three teaching formats produce either better or poorer learning outcomes for students. What leads to one outcome over another is not the format itself but is circumstantial and context dependent” (Nortvig et al., (2018); Werhner, (2010) as cited in Karstensen & Oudmayer, 2020, p.142). It seems outcomes or results aren’t affected by whether a course is online or not, but by other factors.

Challenges

Engagement

With a lack of engagement, students may become less motivated to succeed. In a study on students' perspectives of online vs face to face learning, "Interaction was emerged as an important component that was expected to influence student participation in the online environment" (Ozkara & Cakir, 2018, p.938). The level of participation or student engagement is tied to interaction. Student engagement then can predict success. "Course completion therefore tends to be synonymous with student engagement, because students who are engaged in their studies are more likely to complete" (Yates et al., 2014, p.30). Han et al. (2020) found that "Through various interactions, student participation in online courses reached more than 90%, and 60% of teachers reported that the quality of online interaction was relatively high" (p.71).

Life Balance

The convenience provided by the time space barrier poses some problems. For example, freeing of time is quickly replaced by other things, as Gillis and Krull (2020) explained,

> Finally, anxiety is heightened; during COVID-19, students and faculty are concerned not just about technology issues but also health, financial (in)stability, and safety at home. Students may be working extra hours to support themselves and/or their family, taking on additional caregiving responsibilities at home, or experiencing uncertainty around their living situations (e.g., if they were unable to return home when campuses closed), among other concerns" (p.286).

Self Motivation

Learners who aren't inherently self motivated may struggle when required to learn on their own. Sangsawang (2020) suggested from her study with self regulated learning in vocational schools in Thailand: "Learners are satisfied with learning by themselves, but they still need to depend on instructors since they are accustomed to learning with an instructor in the classroom" (p.295). Karstensen and Oudmayer (2020) state:

> Dropout rates in online and distance education are higher than in campus. Furthermore, student satisfaction has been shown to be a very intuitive and straightforward variable that is positively associated with perseverance. Factors related to dropout rates do not always lend themselves to easy measurement, as these might include any number of factors from scheduling conflicts, family issues, and financial, to technical issues and academic integration (p.143).

Technology

Gillis and Krull (2020) identified technology access as a barrier for students in their study of student experience during the COVID-19 transition. They found "technology problems are particularly detrimental when students cannot seek out other solutions outside the house and most technology stores are closed" (p. 295) They also found inconsistent internet access and the inability to work in public spaces with internet to be an issue. Students may feel overwhelmed by having too much information in different places or too many communication channels. Karstensen and Oudmayer (2020) "found that the use of multiple platforms in 2017 created some confusion for students in that it was difficult to know where to find what" (p.140). Sangsawang (2020) identified "Lack of convenient access to technology, and low technological literacy" as barriers to online learning.

Training, technology and equipment access can be an issue for institutions transitioning to remote learning. Coolican et al. (2020) conclude in their study on remote learning in Brazil at technical colleges "teachers were required to adapt to different learning approaches but were not always able to access the technology necessary to engage in high-quality remote learning", (p.494). They also cite "a digital gap caused by lack of equipment, access to technology, and minimal training for education college teachers and student teachers", (p.491).

Hands on

Lack of hands-on learning was identified in many studies as a barrier to their success. "The analysis revealed that the switch to ERT [emergency remote teaching] impacted the teachers' ability to support hands-on competency development owing to inequitable student access to tools, materials and resources, all of which affected student motivation and engagement" (Code et al., 2020, p.419). Some vocational

colleges and high schools in China attempted to overcome this barrier, “Thirty-seven percent of the courses actively explored new training methods in the online environment, including online training, virtual reality simulation, home training, and real-life display in the workplace” (Han et al., 2020, p.71). In a study by Erliana et Al (2020) on vocational online learning during the pandemic, most of the participants viewed their experience negatively and didn’t want to continue with online learning. These views were largely due to internet access issues and of absence of hands-on skill building.

Teacher Workload

Teacher workload, combined with the effort of delivering online, can affect quality. In a study of teacher’s perspectives, Delcker and Ifenthaler (2020) found that “Meanwhile, the main difference teachers identified between online and on-site teaching was the stronger focus which the former method put on the teacher; teachers described online teaching as a lot more challenging because it is experienced as a very teacher-centred form of teaching” (p.132). Teacher-centred here means all the emphasis on assessment and information exchange is put on the teacher. As Cox and Prestridge (2020) concluded in their study with online vocational teachers, “Teachers reported that workload, for example, prevented them from enacting practices they perceived would be beneficial for student learning” (p.16).

The next section of this report describes in detail the research purpose and questions, the project background, and research methodology of this study.

Research Design

Research Purpose and Questions

The aim of this research project in exploring the student experience of online learning during COVID-19 in Trades programs at CNC is to enhance and optimize the flexibility and the learning experience of the students in the Trades programs. This project is intended to add to the research already done in the field of remote learning, and in particular to remote learning in Trades. My overarching research question is: What practices, post pandemic, can be carried forward in online learning in the Trades?

Project Background

Online learning has been around for a long time. Only a few Trades programs at CNC had embraced online learning prior to COVID-19. COVID-19 propelled everyone into it. My research was conducted in the Trades programs at the College of New Caledonia. My population is Trades students who have experienced online learning during COVID-19. The class sizes were reduced. However, many students did enrol as perhaps they went through bouts of unemployment.

The period of focus for this study was from Mar 2020 to Aug 2021, instruction varied during this period from complete lockdown and isolation with no lab time to some lab time and no face-to-face classes. As COVID-19 safety measures were implemented, lab time was allowed about halfway into that time period.

Methodology

This research project is exploratory in nature, so I used a qualitative design using semi-structured interview with nine semi-structured questions (Appendix A). The benefits of a qualitative approach are to truly “explore and understand the interactions, processes, lived experiences and belief systems that are part of individuals" (O’Leary, 2017, p.142) I constructed the questions within the interview guide based on what I was learning from the research literature on this topic. The questions I asked participants are: What online platform was used during your course(s)?; What kinds of learning strategies did you use during your course(s)?; Was there any hands-on learning that

occurred during your course(s)?; How did you feel about online learning during COVID-19?; What helped you to learn while using the online platform?; What hindered your learning while using the online platform?; What practices in the online platform would you like to see continue?; What suggestions do you have for instructors?: Anything else to add?

Participants

During March 2020 – August 2021 there was a total of 79 Trades classes in 14 different trade and subtrade categories for a total of 718 students. To avoid conflict of interest, 32 students who were in my courses were excluded from being invited to participate. Therefore, a total of 686 students were invited to participate in this study.

A third-party delegate was used to help recruit participants, given my instructor role at the College to ensure I was not overtly influencing students; the program administrative assistant sent out a mass email to included students (Appendix B, Appendix D). I incentivized participation with a 25-dollar gift card.

I anticipated having five to seven students to conduct the interview in the end after invitations were sent out. I was hoping for a diverse array of Trades classes, and I was pleased with the outcome. In the end seven students participated: one from each of the following Trades: electrical, carpentry, automotive, millwright, and heavy-duty mechanic; there were two participants from welding. Trades that weren't represented were plumbing, autobody, power engineer, cooking and occasionally run Trades classes like glazing.

Data Collection and Analysis

The interviews took place from December 2021 to January 2022, I wanted to do the interviews while the student remote learning experiences were still somewhat fresh. I used Zoom™ to record the interviews and transcribe them. I took notes on body language and emotional response after each interview. Each interview was recorded (with participants permission) and I transcribed each interview.

The questions (Appendix A) are intentionally very open ended in an effort not to stifle or direct the interviewees with specific questions, other than, on a rudimentary basis, what they found good and bad. The things they find good and bad can presumably be the basis for what is recommended to be carried forward, eliminated, or modified in practice.

After transcription, I took the responses and put them in a nine by eight matrix. The rows had the questions at the beginning. Participants headed the columns. The matrix was analyzed for themes using paper/highlighter technique and NVivo software. I made several theme trees, analyzing the matrix in different ways. First, I used an inductive approach deriving themes from the questions. Then I used a deductive tactic, letting my mind see what common themes emerged. I then deduced what singular and common themes emerged across the rows. “Common” means where a theme came up two or more times. “Singular” means a theme that came up only once. Next, I analyzed the matrix for themes singular and common down each column, to gauge importance of subjects that came up for individual respondents. Finally, I analyzed themes common across the entire matrix. Throughout the analysis, I was looking for significance in commonality and different perspectives in one-off themes. In the end I chose to use the themes common across the matrix. I also noted some significant singular themes from my analysis across rows. I ended up with six massive theme trees, reflecting the different analyses.

Ethical considerations

I asked permission from my administration to send out the invites. (Appendix D) The only personal emails I collected are the ones from students who responded to me. Those students who wished to participate filled out a consent form (Appendix C).

I kept information I collect and the identity of the participants completely confidential. I stored information on a password encrypted computer to ensure student confidentiality.

Any students requiring counselling from going through this process were shared support resources (Appendix E). These resources are mentioned in the letter of invitation and the consent form.

Limitations & Delimitations

This study was conducted during the global pandemic COVID-19, and as such, this may have influenced participation as many students were over extended and stressed. Only seven students were interviewed out of 719 Trades students who experienced online learning at CNC. Therefore, the findings of this study are not generalizable to other college students, or Trade student experience. In this study, not every trade was represented. Therefore, Trades students in other fields of study may have had different experiences.

The study was narrowed to be focused down to Trades at CNC. This narrowing of scope was intentional due to time allotted for this research and because of the direct implications of this research to my practice as a Trades instructor.

Researcher Subjectivity

My role in this research project is an interviewer of students who have experienced online learning in the Trades during COVID-19. This research project resonates from my own experience and frustration during COVID-19 as a teacher forced to use an online platform for delivery. A large part of learning in the Trades is hands on experience and I'm not sure that can be replaced fully in an online platform. However, perhaps with simulation or home projects we can achieve it or something close to it.

Posted content and recordings have the potential to allow students to attend asynchronously. My own bias though is that learners need to be self motivated. I am a self-motivated learner, but everyone is different.

The automated marking for tests eased the workload once set up. It did take a bit of effort and time to set up. I experimented with question design to make questions that change dynamically with new numbers every question. My initial motivation for creating the dynamic questions was to prevent student cheating. I then realized the dynamic questions could work well for student preparation and engagement. Teachers at CNC spent a lot of their own time to make the transition work to an acceptable degree. I found it challenging to be ready with a good product.

My interest in this research subject was precipitated by our recent COVID-19 crisis. I was slow to experiment with the online platform in the past personally for delivery as it took a lot of time, and it wasn't adopted by my department. During COVID-19 I was forced into doing it, as were my students. Students in the Trades have the option of not taking courses if it doesn't fit their life, and I know many refused to go during COVID-19. However, many still did attend, and I didn't have any options to postpone, as my income would also stop! There were many other institutions out there facing the same forced situation. `As the old adage says necessity is the mother of invention. Like myself, many were forced to learn quickly and adapt. I hope to retain the online platform to use in a blended style classroom.

Findings

I've narrowed down the themes into three broad categories by who or what has direct influence of the theme: instructor locus, student locus, and external locus. Common themes may appear in broad categories but with different contexts. Discussion around themes within each category comes down to what helped versus what hindered, which are two major questions to participants, and is an ultimate dichotomy to use to determine what practices students found helpful can be carried forward. Other questions asked to participants drew out responses which inferred help versus hindrance. I coded the participants into Participants M, T, F, K, L, J, and C to protect their confidentiality.

External Locus

Economization

The economization of travel, time and distance is universally beneficial. It's also somewhat out of anyone's control in terms of participation in online learning, as this was the only option for participation. There were periods where there was no face to face at all. Initially there was no lab time, but eventually that eased up once COVID-19 risk reduction measures were implemented.

Participant K expressed content for this remote option and indicated how behind the times we were, "And yes there's a lot of weird things where I've noticed that the pandemic seems to have streamlined …I don't have to go into a building where I had to before. And it's like, Well why was this an option all along?"

Participant J conveyed the convenience of this technology outside of the classroom.

> I mean our ability to connect and have study groups is in times where maybe it wouldn't have been convenient otherwise…to connect with my peers and collaborate on` stuff at like 8:30 at night…I feel helped me do better in my course than I would have otherwise.

Two students living in remote cities during their courses expressed their appreciation of this convenience aspect. "I personally really liked online learning. … not

having to live in Prince George for the whole six months, that helped me a lot. Spend less money on gas, spend less money on rent." (Participant M)

> So, it's a big chunk of change to go to school for six weeks. So, if they're able to stay at their own home and it saves them rent at that time, because they're usually paying rent and two spots. (Participant L)

Although this economization factor was beneficial, participants expressed the that online can't truly replace face-to-face.

> I think that overall, online learning is a huge adjustment from being in person. And when you're in person, you're much more engaged because online there's that screen in front of you … more engaging in a way just being in like the physical space of someone else talking. (Participant F)

The remote learning wouldn't be possible without technology to enable it.

Technology

Inherently having the technology in place to conduct the classes was helpful. Students who would have had to suspend progress were able to continue. People at the college were able to retain employment. Participant T voiced the reason for the decision to do online learning, despite trepidation of not knowing how it would be and despite expressing indifference for online learning, "I'm 50 years old, so I didn't want to keep pushing it, and pushing it, yet not knowing how long this COVID thing would last."

When asked talking about online platforms used, many participants expressed gratitude for various features of these. I will discuss this under instructor locus.

Sometimes students had connection issues but reported these were minor overall. "Sometimes the Internet would cut in and out, but other than that, everything was pretty good." (Participant L)

> So,the teachers who are presenting the course through zoom, their connections dropped out every so often, depends on who's in the house and then you know if they're aware of trying to eliminate people off their Wi-Fi and all that stuff. (Participant C).

There was no report of any technology to substitute for hands on learning.

Instructor Locus

Hands on

Experiential learning, I think is inherent in any trade but the decision to administer hands on during COVID-19 was mostly at the instructors' discretion. Students were lucky to have hands-on learning at all. Most had time in a lab on a campus. Participant M reported appreciation for doing projects external to the lab, "Yes, there was some in the in the laboratories there at the college. And we went to three different sites…I found that was that was really good to just seeing more real-world experience."

All but one interviewee had practical time on campus. Participant L attended when there was no hands on at all for the entire class. In addition, He/She lived in a remote community too far away to drive for such a short session. He/She was also working while attending school and reported acceptance with having just experience from at work, "It was neither here nor there. I mean, some of the hands on learning I've done at school, you could do that at work too, right? So, it's not the end of the world that you didn't get that."

Welding has perhaps less theory than other Trades and the tests to pass the trade are more practical than most. Typically, welding students are isolated from others in a booth when doing practical work. Because of the inherent isolation and the masks being worn, welders had an easier time with the practical portion. Participant K reports, "Yes, welding is kind of funny that way where it's almost a trade built for a pandemic. You're in your own booth … we're all enclosed, we're all in kind of our own areas."

Although there was lab time, students reported it was not enough. Participant J expressed,

> So once every week, or a couple of weeks, we would go into the shop for a day and do- try to do a project.… read about building spiral staircases for four days…do it in six hours… there wasn't alot of shop time available for a very hands-on trade. Kind of made it difficult.

Despite the carpentry shop being large and accommodating for workspace, when this student went to school, shop time was just being introduced at the instructor's discretion. The College was still very sensitive at that time about mitigating COVID-19 spread.

In automotive, they also have a large shop space and can accommodate many classes. Participant T describes the magnitude of the simultaneous classes,

> You put COVID restrictions on shop and you have five different classes. So there's first year, second year, third year and fourth year. Plus, there's a pre course to the first year called foundations and they got twice as many people in per class than what the individual years would have, so they're in the shop quite a bit.

He/She attended second third and fourth year during COVID 19. Participant T further explains the time and resource crunch imposed by COVID 19 restrictions

> That made the practical hard, because there's only so many demo products, we have such a big class and having a shorter time frame to do the practical.....But in second, third and 4th where we were really time constrained, there wasn't a lot of hands on because we were trying to work around all these restrictions which would basically put our timeframe back.

Participant C, who was in the heavy-duty mechanical Trades program, expressed discontent for lab work citing that it was too tedious. In addition, Participant C was going to work in the evenings. He/She said,

> You've got to go to the College, to do the practical side, take pictures, and then develop a PowerPoint that evening and almost hand it in…. Guys shouldn't have to spend six hours and then on top of that, you know, do essays and such.

The process the instructor used was to have the students do a PowerPoint and essay to explain what they did in the lab and why to demonstrate understanding. Although Participant C didn't like the tediousness of the process, He/She did mention how surprising the detail in the feedback was and expressed appreciation for having a rubric for the assignments. This was the only mention of a rubric in all the interviews.

Platforms

Zoom was recognized for some engaging facets. The drawing tool and the ability to draw with the whiteboard feature and engage as a group was found useful by Participant M,

> When the teacher would bring up a worksheet and then you could say, OK, draw this circuit on your computer, and then you could open it up

> to everybody…that to me helped a lot because it was pretty interactive in that sense.

Interaction with the drawing feature promoted engagement. In this case it was synchronous engagement, in a group with content and an interactive tool. Participant M reiterated this when asked what to see continue.

With video and all the interactive tools, instructors were praised for simulating a classroom environment using zoom: “Zoom was a good tool in that sense where It still felt like you were in a classroom and you could ask your questions and everything” (Participant M). When asked any other suggestions, Participant L had high praise for the instructor who reportedly simulated a classroom very well with cameras, screensharing and whiteboard feature, “I would tell them to follow (instructor), find out what he did. I think he had it set up pristine. It was awesome.”

Kahoot was a common tool to promote engagement. It is a website that hosts live quizzes, where participants compete against each other to respond quickly and correctly. It is fun way for students and teachers to measure learning. Kahoot was recognized as fun and engaging by those who mentioned it. “Alot of the guys falling asleep, but separating it with not a Moodle, but like a Kahoot kind of kept this lively.” (Participant C)

Moodle was recognized as acceptable and adequate for access of content. The test question capabilities of Moodle were appreciated by Participant M. When asked about seeing continue he/she replied, “I did like Moodle, the way the tests were organized... it wasn't all just ABCD. There was different ways you could make it more interactive and more in depth than just there's four options.”

The glitches of the Moodle set up were recognized as annoying by some students. This came down largely to platform mastery by instructors, who may have been barely sufficient from the crash course of using Moodle for the transition. Participant J stated, “Just being familiar with the basics of the platform…One of my instructors did run into some problems …just having a couple of core programs that work that you know inside out is pretty useful. “

Practice Tests

Many students described appreciation for having practice exams and question to access at any time. Participant K used practice exams to prepare for the ITA Red Seal exam, “I'd spend 10 minutes on the homework, get it over with, and then go and find a red seal practice exam or another practice exam… an hour every day… going through all the questions.” He/She recommended practice exams continue.

Participant J, in describing convenience of zoom, also described engagement with peers and the frequency of use of practice exams, “Normally it would be in person groups…we started just like a big zoom meeting where we would all go through practice tests… It was about an hour every other day.”

A hindering feature to some students was when answers to tests were wrong.

Participant K devalues the practice exams because of answer discrepancies, He/She states,

> There was one question that because I did the practice exams so many times… I knew by heart what answer it would be…none of them are the ones that I was given in the practice exam on Moodle... all those practice exams that I did, did not help as much as they should have.

Participant K noted some deficiencies with correcting answers,

> You could just tell that there hasn't been that much care put into these practice exams in some ways…my guess would be they've had multiple years of feedback from students saying, *Hey, there's wrong answers on here*, I don't think anyone cared enough to change anything.

He/She also wanted practice exams to continue despite this perception of lack of care.

Participant T describes the repetition of question banks as negative due to incorrect information, “Unfortunately, because of the way it was laid out, a lot of it was just repetition of a question bank. There was a lot of misinformation in the in book. It wasn't correct.” He/She later describes how other less experienced technicians in the course failed because of the mental block and confidence destruction of the confusion caused by the wrong information. He/She cites self experience and self sourcing of information for getting around that.

> I've got a lot of certifications in my life, so I kind of know how to do tasks. To me, that was in my benefit, … But there are other people that didn't pass, that should have passed because technically they're good technicians. …. They just thought that all the information that they would be given would be in the program, and not having to go outside the program to get the correct answers.

Schedule

The topic of schedule came up a few times, for both student and instructor locus. Schedule was never mentioned as hindering. Having a schedule and keeping people in the loop of where they need to be was important to Participant L, “But he kept us on a schedule too, right? He'd say, *you need to be here at this point* and so I made sure that I was actually ahead most of the time.”

Response Time and Communication

Noone reported response time as helping, only hindering when it was too long. Response time from instructors became an issue for some students. It was really concerning for Participant T, coupled with wrong answers to tests. The response time in correcting a wrong answer wasn’t sufficient for him/her and caused frustration by not being able to advance,

> Basically, the only issue that I had was instructor communication… I'm sending a message at 9:00 o'clock in the morning on a Thursday and I'm not getting a response until Monday noon the next week. So now you can't do anything in that subject until you got clarification that you're doing right.

Participant F had similar concerns,

> For online instructors, I think it's really important to make sure that their students know that they're available to help them, …I've definitely had some instructors who are very, very distant… and it takes like a very, very long time for them to get back to me, (started talking fast) and that's incredibly frustrating.

Participant F noticed a lack of engagement from instructor to student, in the form of checking on or monitoring students, “Life gets in the way. But I think the attentiveness is a huge part of helping students learn and paying attention to their students and stuff.” Participant M added to that with, “But I think reaching out to students would be

good…I'm fairly independent…but I could tell there was a few people that were struggling…I think having more communication would be good."

Student Locus

Learning Motivation and Self Advocacy

Some participants reported liking the self pace and aspect and would do this again out of necessity or if this option was available for their next class. Participant K was very content with reading material, self teaching at a pace that fits his/her life and practicing exams, despite the errors in practice exams. He/she iterated rarely ever having liked being in a classroom setting. Participant J liked the aspect that a person could work ahead, "having all the homework posted and not having to sit and do work in class x amount of time…do a solid block of work and then have free time to do what I wanted." He/She liked the release of a bunch material and the non-"micromanaging" of the teacher.

Participant M described being motivated by not wasting the effort. He/She didn't like losing money and is a self-described self learner. Participant L describes being driven by not wanting to repeat the exam, "I mean, I wrote for my red seal [exam] at the end of it, so failure was not an option. (laughs and smiles) So I didn't want to have to write it twice."

Some students experienced lack of learning motivation, tying to lack of engagement with a teacher. Although Participant F didn't do much online during COVID, He/She reflected on past experience in online learning, reporting motivational issues when having to learn alone. Participant C explained having to figure out labs by him/herself. This was demotivating and stressful to Participant C because they started in the afternoon and there was only two hours to get the assignments done each day. Participant L reported fear of not having an active teacher but was relieved when he/she found out how the online experience was.

Self advocacy stories that emerged were ones in which people suffered from perceived lack of it. When asked anything else to add Participant J mention that some of his/her peers didn't self advocate. He/She attributed that to social skill and the inability or perhaps unwillingness to reach out when they didn't understand something. As a result

these students fell behind, “But I think some of the students that couldn't be like, Hey, I'm struggling with this thing, or didn't have that sort of social skill to like reach out and kind of advocate themselves fell behind pretty hard. And it would really show when they came into the shop and they just said no idea.” He/She described them as being used to having more direction. Participant M tells about fellow students coming to him instead of going to the teacher when they have a problem. This was possibly because of fear of not wanting to look inferior. Participant T indicated that some of his/her peers failed because they didn’t seek correct answers to practice exams.

Student Collaboration

Some students mentioned group work in a few different aspects. When asked about learning strategies, Participant J mentioned starting a zoom study group that was used to go over practice exam almost on a daily basis. He/She explained also the convenience of using zoom for the study group, no matter what time after school, when asked about things to continue. Participant J also mention the fact that people could talk privately while class was occurring to not disrupt people, “if there was 16 of us sitting in class, we wouldn't be able to just have a loud conversation about what we were on without disturbing other people.” Participant M brought up interacting in groups using the zoom drawing feature, noting then engaging aspect. He/She also mentioned breakout rooms, saying that they were effective with the right people. He/She reported disengagement of some students after entering breakout rooms. Participant C said breakout rooms were a good way to break up monotony.

Learning Environment

While unavoidable that during the pandemic some of the learning students were doing was off campus, students noted that having control of where and how they studied was a benefit of remote learning during the pandemic. Participant C mentions how the learning environment can affect your ability to learn saying, “If you had a good office space and a good environment to learn I think you could absorb it all.” He/She also suggested, “maybe another monitor to kind of keep a word document open to put notes on.” Participant L reported spousal support to mitigate home distractions. He/She said the kids are older and the spouse took care of things when he/she had to focus.

While it's convenient to learn from home, for some students it poses distractions. When asked what hindered Him/Her, Participant M answered,

> Probably me mostly. Because it's online, I think what hindered me the most was that I didn't give as much care to it as I could have, because it wasn't in class. The attendance with zoom, you can turn on your computer and turn off your camera and go do whatever. So, I will admit I did that sometimes, but I tried not to. So, I think that it wasn't in my brain, it didn't seem as serious, because it's just, Oh, I'm at home and I can do whatever, I can turn off my camera and go play darts or play video games or whatever."

Participant C spoke of other people in his/her class being disturbed at home by dogs and family.

Workload and Schedule

A few participants found the workload hindering. As Participant C explained, "For this particular course, and this is the feedback I've also gotten from guys who continued on to second year, the mechanical course is ridiculous for how much they expect for assignments." Other participants found workload manageable following a schedule. Participant M reported that sticking to a schedule was beneficial, "Well, I stuck to the, the preferred school hours… I studied as best as I could between the end of zoom class and the end of 3:00".

Discussion

In Trades, the product of the hands-on work is the creation or alteration of some sort of physical structure. Thus, hands-on practice, and producing something physical is crucial. This stopped completely during the initial COVID-19 lockdown, but some in-person experiential learning was possible after spread reduction practices came in. The hands-on experience for most Trades during COVID-19 lockdown was reduced in depth, due to time and spatial constraints. However, having some hands-on experience is better than none. If given the need, instructors may have been forced to alternatives such as virtual reality. Sarwa et al (2021) developed a framework for demonstrating lab work remotely using a flipped classroom idea. Material is given asynchronously, analyzed, then a plan discussed synchronously, and finally a video recorded production is created. It seems one Instructor at CNC was using some form of this with having students create power points of lab work, although the lab work was done on campus as the physical components would be hard to find externally.

Technology and internet connection were reported issues for students. One participant in this study, in a very remote community, only had connection issues. Local participants expressed connection issues sometimes, but they were infrequent enough to carry on with minor disturbance. It depends on the infrastructure development. In a study done in Malaysia, Yeap et al (2021) found this to be the case, “Some students from rural areas may not enjoy Internet access or sufficiently good Internet access compared to their peers in urban areas. Hence, online learning will run a high chance of being left behind for those rural students” (p.1824). This may be more of an issue in `synchronous delivery than asynchronous.

Engagement is a driving force behind motivation and will help most people. It can mean engagement with material, other students or instructors. Some of the students preferred for the most part to engage with content at their own pace when it came to learning new material. Others liked partnership or collaboration in some form. The ability to work in groups in varying ways promoted engagement and enjoyability of learning for some students. This occurred more in the student locus. Ultimately the instructor sets the tone, stage or medium of engagement for the class during class time. Most of the themes linked with engagement in some form. Each student will prefer to engage in

different ways at different levels. Instructor's having a pulse on this is important to help on an individual bases. Yates et al (2014) describe the importance of this, "Key aspects of a student-focused approach include being flexible and proactive, and developing a sense of belonging amongst the students" (p.33). They cite the importance of instructor's reaching out to gauge progress rather than waiting for students to reach out to them. This reaching out helps to bridge student incompetence in self advocacy as well as gaps in response time. At CNC, time and workload of transition to online may have inhibited this to some degree.

Some students in this study were self motivated to asynchronously learn without direction. Some required instructor support. Gillis and Krull (2020), describe using "an asynchronous format using our institution's LMS [Learning Management System], which enabled more self-paced learning and created flexibility for student engagement." However, they further add, "Knowing the importance of consistency and clear organization, I kept deadlines for weekly assessments such as quizzes and forum posts, and I communicated deadlines each week via email and via the course" (p.288). Extensions to assignments were also granted with that made known before hand. In Trades that may be limited because of the time frame of the classes being 10 weeks or shorter, except entry level classes which may be 20 weeks or longer. Clear instructions and deadlines are important, synchronous or asynchronous.

Significance of Study

The significance of this study is to add to the knowledge out there right now about the successes and failures of online education in Trades during COVID-19, and implicitly in general. COVID-19 precipitated advancements, in remote communication, which is a big part of synchronous online delivery. There doesn't seem to be a lot of literature out there on online learning in Trades. The articles I did find that were trade specific were based mostly in countries outside of North America. This study adds to the North American perspective of research. The data gathered by the interview process may then be used to make online learning better in terms of reaching more learners, particularly in our Trades programs at CNC. I intend to try suggestions, augment practices that were positive and halt or modify practices that were deemed negative by the students.

Recommendations

The online learning that CNC miraculously put together in a short time served its purpose. To their credit, some instructors had already implemented online learning and were prepared to a large degree. Online learning has many benefits and is here to stay. Now that COVID-19 moves from a pandemic to being endemic- it is a virus that we will have to continue to respond to and consequently, remote and online delivery should continue to evolve for the Trades. CNC can continue to serve student needs within online content to facilitate program advances. Programs can continue to adopt online learning into normalcy and develop fully hybridized courses to utilize to adapt to student situations and preferences and be ready for another shutdown. Not everyone may want to hybridize but I think those who don't adapt will eventually be replaced by those who did. It's been a paradigm shift in learning and delivery.

CNC has already set up infrastructure for hybridized courses, however only in some classrooms. Instructors willing to use this setup should have classrooms outfitted with necessary technology. In order to prepare courses, the current curriculum development structure needs reform. Instructors may need additional curriculum development time and or perhaps assistants to help with tasks.

From a teacher's perspective, Zoom proved to be excellent for synchronous delivery and CNC had full access to such technologies. For example, Moodle was good for content storage and access of content. However, I found I never had the time to fully explore the capabilities and to optimize my course. I'm sure other teachers had the same experience. Professional development time may be used to fully explore our existing framework for online delivery. Also, investigations into different platforms for interactive and engaging properties should be conducted.

Engaging instructional and communication techniques are important. As such, we need to keep searching for and finding different ways to enhance these aspects. This could be through improvement of existing infrastructure or adoption of new technologies and methods.

Because of the easement in allowing students some lab time, many Trades instructors at CNC were not propelled to explore alternatives. We should explore

engaging ways of substituting real hands-on experience. Perhaps things like virtual reality, or video demonstrations. To address resource deficiencies for students, perhaps funding for lab materials or technology needed outside of the college could be implemented somehow.

Student needs and proactive communication on the part of the instructor should be a priority. Communication technologies and instructional techniques to promote student needs and timely and concise information exchange should be investigated and explored by those willing to deliver hybridized or online. Perhaps assistant teachers can be employed. Of course, this would all subject to financial decision making.

Future Research

This small-scale study has brought up many things to improve upon. As hybridized or online courses are conducted at CNC it's important to garner feedback for improvement. Taking lessons learned from this research. I would design a survey which can be conducted quickly during and at the end of courses. This survey may replace or fill in the missing picture of the other 711 students whose stories weren't told. It sounds like some of those that weren't self-motivated struggled, by the account of some respondents. It would be nice to hear the full spectrum.

Only part of half the story was captured. The other half would be to interview Instructors. Valuable input from the experience of the instructors can help to shape practice and the design of the survey. Also interviewing or asking the instructors about their experience could help them to reflect and improve.

Conclusion

Student experiences varied. Their experiences are influenced by past experiences and current living situations. Instructor approaches factored into those experiences. Some themes fell into categories of being helpful to everyone, helpful to only some, hindering to some and being helpful for some but hindering for others. Convenience of online learning, whether through time, travel or expense is a benefit of remote learning. Engagement in some form, whether with people, content or both is a requirement and seems to be embedded in every theme that emerged in this study. Engagement seems to be intertwined with motivation. Engagement must be a focal point for design of delivery. When students were engaged, they felt good about learning online. Instructor communication factors into engagement. When instructors connected with students or students connected with each other, this increased motivation. Some students appreciated self regulation, while others desired increased instructor support. Having a distraction free learning environment is beneficial.

Strategies and platforms used now are adequate for the various preferences of students. Repositories of videos, lessons, worksheets, and question banks for exam preparation are useful provided that the information is accurate. Video conferencing software for delivery with interactive features has worked well. With exploration of advancements and innovations and with continued use and assessment of online learning, it should theoretically get better.

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Appendix A. Interview Questions and Protocol

Questions

What online platform was used during your course(s)?

What kinds of learning strategies did you use during your course(s)?

Was there any hands-on learning that occurred during your course(s)?

How did you feel about online learning during COVID-19?

What helped you to learn while using the online platform?

What hindered your learning while using the online platform?

What practices in the online platform would you like to see continue?

What suggestions do you have for instructors?

Anything else to add?

Protocol

The protocol will be to record the interview via zoom, either in person or remotely, and transcribe the interview. I will be using the built-in voice to text feature of Microsoft OneNote for transcription.

Appendix B. Letter of Invitation

Participate in a Research Project:

A Study of Student Experience During the Pandemic in Trades Education at the College of New Caledonia

Greetings, you are being invited by Christien Goudreau, Med candidate, Faculty of Education, Simon Fraser University, to participate in a research project entitled **A Study of Student Experience During the Pandemic in Trades Education at the College of New Caledonia**, which encompasses the following:

Study Background and Procedures:

The main goal of the research project is to identify the key factors that help and hinder students completing their programs at the College of New Caledonia. This project aims to understand student experiences at CNC through one-on-one interviews with CNC Trades students who have taken an online course during COVID-19.

This project has undergone the ethical review process with Simon Fraser University and the College of New Caledonia. In addition, this project is deemed valuable to the Trades and Technology community at CNC.

As part of this project, you are being invited, as a current or former Trades student of CNC to participate in an interview that will last approximately 30-45 min and will conducted at a time and location that is convenient for you.

In the interview, you will be asked by Christien Goudreau about your experience as a student at CNC. Your identity and confidentiality will be respected in any final reports, presentations, and/or publications emerging from this research project.

The questions you will be asked during your interview will include:

a) What online platform was used during your course(s)?

b) What kinds of learning strategies did you use during your course(s)?

c) Was there any hands-on learning that occurred during your course(s)?

d) How did you feel about online learning during COVID-19?

e) What helped you to learn while using the online platform?

f) What hindered your learning while using the online platform?

g) What practices in the online platform would you like to see continue?

h) What suggestions do you have for instructors?

g) Anything else to add?

Given your permission, the interview will be recorded and transcribed, and a copy of this transcription will be sent to you. This interview is hosted by Zoom, a US company. Any data you provide may be transmitted and stored in countries outside of Canada, as well as in Canada. It is important to remember that privacy laws vary in different countries and may not be the same as in Canada.

The purpose of the recording is to analyze the wording to thoroughly understand student experiences in the hopes of developing resources and materials to improve The Trades and Technology program.

Benefits of Participation:

Participants will be contributing to a broader understanding of the diversity of Trades student experiences at CNC that aims to the future development and improvement of the Trades and Technology program. As a participant of this project, you can contact the lead researcher, Christien Goudreau, to receive a copy of the final research report.

Risks to Participants:

There are minimal risks to you as a participant in this study. However, the researcher of this project understands that in sharing your experiences you may have emotional responses and they want to acknowledge that in sharing your stories they have an inherent responsibility to ensure care and provide information on relevant support services to you. Counselling support is provided by the College of New Caledonia Health and Wellness department. They can be reached at (###)

or at xxx@xxx. Counselling support may also be provided through Community Counselling Centre at (###)

Remuneration/Compensation For participating in this study, you will be given a 25-dollar gift card.

Confidentiality:

Your identity and all records will be kept confidential any identifying information obtained will be kept confidential. You may refuse to participate or withdraw participation in this project at any time without consequence. Your involvement or non-involvement in this project is in no way related to or will impact your status at the College of New Caledonia. Refusal to participate or withdrawal from this study will have no adverse effects on your grades or evaluation in the classroom, course, or academic program. The data will be kept on a memory key or printed hard copy and all data will be stored in a locked filing cabinet in Christien Goudreau's office and any electronic files will be backed up on a password protected on a computer hard drive.

Contact for more information:

You may ask any questions you might have about the project with lead researcher Christien Goudreau. You may also contact Dr. Michelle Pidgeon, Faculty Supervisor.

Contact for concerns about the study: You may ask any questions or register any complaint you might have about the project at the SFU Office of Research Ethics.

Warm regards,

Christien Goudreau

Appendix C. Consent Form

Participate in a Research Project:

A Study of Student Experience During the Pandemic in Trades Education at the College of New Caledonia

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In the interview, you will be asked by Christien Goudreau about your experience as a student at CNC. Your identity and confidentiality will be respected in any final reports, presentations, and/or publications emerging from this research project.

The questions you will be asked during your interview will include:

a) What online platform was used during your course(s)?

b) What kinds of learning strategies did you use during your course(s)?

c) Was there any hands-on learning that occurred during your course(s)?

d) How did you feel about online learning during COVID-19?

e) What helped you to learn while using the online platform?

f) What hindered your learning while using the online platform?

g) What practices in the online platform would you like to see continue?

h) What suggestions do you have for instructors?

g) Anything else to add?

Given your permission, the interview will be recorded and transcribed, and a copy of this transcription will be sent to you. This interview is hosted by Zoom, a US company. Any data you provide may be transmitted and stored in countries outside of Canada, as well as in Canada. It is important to remember that privacy laws vary in different countries and may not be the same as in Canada.

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Risks to Participants:

There are minimal risks to you as a participant in this study. However, the researcher of this project understands that in sharing your experiences you may have emotional responses and they want to acknowledge that in sharing your stories they have an inherent responsibility to ensure care and provide information on relevant support services to you. Counselling support is provided by the College of New Caledonia Health and Wellness department. They can be reached at (###)

or at xxx@xxx. Counselling support may also be provided through Community Counselling Centre at (###)

Remuneration/Compensation For participating in this study, you will be given a 25-dollar gift card.

Confidentiality:

Your identity and all records will be kept confidential any identifying information obtained will be kept confidential. You may refuse to participate or withdraw participation in this project at any time without consequence. Your involvement or non-involvement in this project is in no way related to or will impact your status at the College of New Caledonia. Refusal to participate or withdrawal from this study will have no adverse effects on your grades or evaluation in the classroom, course, or academic program. The data will be kept on a memory key or printed hard copy and all data will be stored in a locked filing cabinet in Christien Goudreau's office and any electronic files will be backed up on a password protected on a computer hard drive.

Contact for more information:

You may ask any questions you might have about the project with lead researcher Christien Goudreau. You may also contact Dr. Michelle Pidgeon, Faculty Supervisor.

Contact for concerns about the study: You may ask any questions or register any complaint you might have about the project at the SFU Office of Research Ethics.

Warm regards,

Christien Goudreau

Appendix D. Third Party Consent Form

Appendix D- Third Party Consent Form

July 20, 2021

Re: Research proposal: A Study of Student Experience During the Pandemic in Trades Education at the College of New Caledonia.

I _____ consent to act as a third party to contact research participants on behalf of Christien Goudeau, MEd Candidate, Faculty of Education, SFU. I agree to send initial email invitations and follow up reminders, as directed by Christien Goudreau, for the purpose of recruiting participants for this research study. Invitations will be sent to Trades students who participated in online courses at CNC during COVID-19. The purpose of this study is to explore the perspectives of students who have experienced online courses during the pandemic in order to carry forward with best practices for the future.

Sincerely,

[Name of third party]

Email body

Hello,

You are receiving this email sent out by CNC on behalf of myself, Christien Goudreau, Med Candidate. COVID-19 was a challenging time for both student and instructor. We all learned a lot about online learning. I want to hear from you and about your learning experience during COVID-19. I am conducting a research project to find out what students who learned online during COVID-19 experienced. My goal is to improve the Trades program for the future. I believe that we can broaden the horizons of the program by encompassing an online platform for remote learners or perhaps learners who want to take a course outside of regular hours. If you are interested in participating in this study,

please respond to Christien Goudreau. The interview will be about 30-45 minutes and is composed of 9 questions. Selected participants will receive a 25-dollar gift card for their participation. Please see letter of invitation attached for more information.
Cheers,

Christien

Appendix E. Counselling Resources

SFU SIMON FRASER UNIVERSITY
ENGAGING THE WORLD

The College of New Caledonia, Health and Wellness department.
(250) 562-2131, ext. 5377
health@cnc.bc.ca

Community Counselling Centre
250-562-6690
https://communitycounsellingcentre.com