

CHAPTER TWELVE

The Impact of COVID-19 on Postsecondary Students

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ABSTRACT

While the COVID-19 pandemic has been an uncertain and challenging time for everyone worldwide, it has been an especially unstable situation for students attending postsecondary education. During the pandemic, postsecondary schools have switched from in-person learning to online learning, leveraging videoconferencing platforms such as Zoom for class discussions and lectures, and other online platforms for assessments and modules if they weren't already using an online Learning Management System (LMS) for this. Graduate students also needed to modify their theses and recruitment methods to account for new government-mandated regulations. This chapter explores how online learning can incorporate Malcolm Knowles' adult learning theory, how it applies to postsecondary students and different types of learners, how the online learning format affects each type of learner, and the impact that adopting online platforms could have on post-secondary learning in the future.

Keywords: postsecondary students, adult learning theory, COVID-19 pandemic

INTRODUCTION

While the COVID-19 pandemic has been an uncertain and challenging time for everyone worldwide, it has been an especially unstable situation for students attending postsecondary education. In March 2020, after the World Health Organization declared the COVID-19 outbreak to be a worldwide pandemic, there was a significant change in learning structure for postsecondary students to prevent the risk of infection inherent to face-to-face learning. Postsecondary schools have switched from in-person learning to online learning, leveraging videoconferencing platforms such as Zoom for class discussions and lectures, and other online platforms for assessments and modules if they weren't already using an online LMS for this. Graduate students also needed to modify their theses and recruitment methods to account for new government-mandated regulations. This chapter explores how online learning can incorporate Malcolm Knowles' adult learning theory, how it applies to postsecondary students and different types of learners, how the online learning format affects each type of learner, and the impact that adopting online platforms could have on post-secondary learning in the future.

Dealing with Unknown Factors

As the COVID-19 outbreak reached pandemic status in March 2020, all nine Canadian provincial and territorial governments announced a state of public health emergency and subsequently issued lockdown orders (Vogel, 2020; Goldenberg et al., 2021). This included travel bans and limitations, allowing only essential travel, e.g., providing essential health care and economic services and maintaining supply chains (Government of Canada, 2021). Travellers were

required to undergo quarantine for 14 days after crossing the national border. Travel deemed as non-essential includes tourism, recreation, entertainment, visiting family, or attending a funeral. With that said, it is up to the discretion of the border officer to assess the rationale for the trip and the permissibility for entry into Canada. These travel restrictions have had severe effects for international for postsecondary students, preventing them from visiting home, or stranding them overseas.

Meanwhile, in response to the provincial lockdowns, postsecondary schools had to move classes entirely online with little preparation, though provincial governments did offer financial assistance for this.

Social Gathering Restrictions

At the beginning of the pandemic, all Canadian provinces implemented similar social gathering limitations, with limits of no more than ten for indoor settings. As time went on, restrictions have been eased and public spaces such as libraries have begun to open and allow students to book study spaces, with certain safety guidelines still being followed and regulated by staff. For example, the University of Toronto's Environmental Health and Safety department created COVID-19 general workplace guidelines for students and faculty members gathering on campus (University of Toronto – Environmental Health and Safety, 2021). This includes a requirement to wear surgical masks in public shared spaces and to isolate at home if experiencing symptoms similar to COVID-19. Other postsecondary schools have adopted comparable guidelines on returning to campus, including the University of Alberta (2021), and the University of Saskatchewan (2021).

Adoption of Online Learning Formats

To facilitate the transition to online learning, postsecondary schools have adopted videoconferencing platforms such as Zoom and others, made freely available for faculty and students to join and host meetings with others, including for classes. This allows students to ask questions and actively participate in class discussions, despite being at home attending class virtually. Adaptations also include changes to the syllabus to adapt course material for online learning. Both students and instructors have been understanding regarding the technical roadblocks commonly encountered when getting online learning setting up and running, attending class on time, and dealing with internet connectivity issues (Gelles et al., 2020).

Modifications have also been made to courses in terms of the use of class-time for students. Some classes have implemented an asynchronous portion of the lecture using pre-recorded video for students to review before attending synchronous class sessions, which are mostly used for question and answer periods and discussions. Without a common location to meet, most students needing to collaborate on group projects have also moved to an online format amidst the pandemic (Gallagher & Palmer, 2020), with meetings held virtually on videoconferencing platforms.

Some postsecondary schools did transition from a fully online classroom environment to a hybrid model when the first wave of the pandemic declined in the Summer and Fall of 2020 in Ontario and in other provinces in Canada (Government of Canada, 2020a). The hybrid classroom style was available for mostly graduate programs with smaller class sizes where students could safely physically distance themselves from one another indoors, wearing masks all times. The availability of this style of learning was uncommon in undergraduate courses with a larger class

size due to not having enough physical space to accommodate its students with adequate physical distancing.

Thesis Projects

Graduate students completing thesis projects and conducting research were also heavily affected by the pandemic. Many research projects slowed down at the beginning of the pandemic to await clarity on how these guidelines would impact their research plans. Most had to modify their plans to adapt to the rules and regulations set by the government and the Research Ethics Board. For many, their original method of recruitment and sampling were not aligned with social distancing guidelines (Dorn, 2020), and they had to change their recruitment procedure to an online format if possible. Graduate faculties sent out surveys to graduate students to explore challenges with conducting their thesis research projects and offered to facilitate meetings with students and supervisors to explore alternative strategies.

Most projects have also moved to an online method of data collection, mostly through survey platforms for quantitative methods and videoconferencing software for qualitative methods like interviews and focus groups (Saber, 2020). Research facilitators and students have needed to learn how to recruit through an online format and how to facilitate online interviews and focus groups (Dos Santos Marques et al., 2020). This has been a steep learning curve for most graduate students as most did not have prior experience with qualitative study facilitation in-person; so in addition to learning how to co-facilitate with peers and problem-solve to engage participants in enriching discussions, they had to do so in a virtual setting with the challenges that includes such as unstable internet connectivity. For example, qualitative studies often use semi-structured

interviews that is led by the facilitator, and a common technique used is active listening, eye-to-eye contact, and picking up on participants' facial reactions—all of which are difficult in an online format and poses a new challenge for student facilitators.

Another barrier to virtual recruitment was the need to establish trust with research participants. Many student theses were on topics directly related to health in vulnerable populations, including sensitive topics such as weight, aging, food insecurity, mental health, addiction and finances (Tapp, 2020). Originally, many of these students had planned to spend time in clinics, homeless shelters, and other community sites to engage with potential participants and develop a sense of familiarity (Ratneswaren, 2020). Without this opportunity to establish a therapeutic relationship and trust between the researcher and participant, many participants were not even aware of the research project until a virtual interview, which may have negatively impacted recruitment, participation, and the attrition rate, (Krouse, 2020; Ratneswaren, 2020; Tapp, 2020). These are all factors that graduate students had to account for during their thesis projects, and many students had to work closely with their supervisors to develop mitigation strategies for these problems.

Theory / Principles of Andragogy Applied to Online Learning

Malcolm Knowles is commonly known as “the Father of Andragogy.” His andragogical process model of the eight principles of adult learning relates to how adults learn differently from children, and it is commonly used in many educational programs, especially in medical and health-related fields (Abela, 2009). The eight principles of this model for learning and how they can be applied to online learning are detailed in this section.

1. Preparing the learner

Adult educational models assumed a high degree of responsibility for learning to be taken by the adult learner. Especially in the andragogical and learning project models, the systems are built around self-directed learning. Self-directed learning describes a process in which individuals take the initiative (with or without the help of others), in diagnosing their learning needs, formulating learning goals, identifying resources for learning, choosing and implementing learning strategies and evaluating learning outcomes (Knowles, 1975). When implementing andragogy, a brief explanation of proactive learning should be provided to the student, as well as identification of the skills and experiences of the learner (Knowles et al., 2015). Then, the instructor should find opportunities for the learner to practice proactive learning to comprehend their role and be able to participate. This is commonly incorporated in the synchronous portion of classes when time is allocated for class discussions.

2. Establishing a climate conducive to learning

Environmental factors, such as quality of interpersonal relations, are extremely important in determining learning outcomes (Knowles et al., 2015). A climate favourable to learning also includes organization, so there should be set structures, policies, and procedures in place for each unit of a course. Ensuring that the learner has access to a wide variety of resources are also necessary to promote learning (Knowles et al., 2015), for example the availability of professors during office hours has been found to increase motivation and knowledge retention (Matua et al, 2014). Clearly defined goals, careful explanation of expectations and opportunities, openness of

the system to inspection and questioning, as well as honest and objective feedback also sets a *mentally healthful* climate, and reduces high anxiety levels that can block learning (Knowles et al., 2015). In online classrooms, the first lecture is often dedicated to reviewing the syllabus and answering questions, to ensure the expectations of both students and the professor are clear and the appropriate learning environment is set (Leduc, 2011).

3. Creating a mechanism for mutual planning

One feature of educational practice that severely distinguishes pedagogical learning from the andragogical is the role of the student in planning their own learning (Knowles, 1990). According to Asadzaker et al. (2015), individuals are more committed to a decision or activity in direct proportion to their involvement in, or influence on, its planning and decision making. This is evident in many forms of asynchronous online learning as the student is able to determine when learning occurs. It is also important to note that not all online classes are asynchronous, and not all asynchronous learning use a highly self-directed approach.

4. Diagnosing the needs for learning

The learner's own perception of what they want to achieve and how much effort they want to put into it is the starting point in building a learning model (Bastable, 2013). According to Knowles et al. (2015), the most important factor is how getting students to diagnose their own needs changes their mindset. When learners understand how gaining knowledge or skills improves their performance, they have more determination and view the material as more personal, which will make it easier to apply their experience and skills to similar situations in the future (Knowles

et al., 2015). During online classes with asynchronous elements, students are expected to have reviewed pre-lecture materials and come prepared for the sessions with questions and actively engage in activities to apply their knowledge to real-world examples.

5. Formulating program objectives (content), that will satisfy the above learning needs

According to Knowles (1984), learners should participate in formulating their own learning objectives, which should be precise, measurable, and observable (Bastable, 2013). Knowles listed three conditions that needed to be met when formulating program objectives: (1) the replication of main curriculum elements, (2) tasks become more complex as time goes on, and (3) the learning material should be useful, realistic, and linked with the student's learning goals (Knowles, 1984). It is important for students to develop active learning strategies from the beginning, in order for them to become comfortable with self-directed learning and need minimal prompting from the preceptor. According to the andragogical theory, it is essential for the learner to be involved in planning their learning objectives, since they will be less likely to oppose learning if they freely select objectives that are relevant to their learning needs (Knowles et al., 2015). This can apply to online learning as students will set individualized learning objectives throughout the delivery of the course, and work with peers in group projects to set group objectives (Brindley et al., 2013).

6. Designing a pattern of learning experiences

Knowles et al. (2015) state that a frequent pattern of proactive learning experiences is essential for learners to embrace the educational content and enhance their self-directed learning. By being more comfortable with the transition to online learning, students may find that past

experiences with online courses will ease their anxiety of navigating a new technological environment and build positive learning experiences in the future (Roddy et al., 2017).

7. Conducting these learning experiences with suitable techniques and materials

The andragogical model involves recognition of problem areas by the learners through self-diagnostic procedure, choosing appropriate formats for learning, designing experiential learning using the specified methods and materials, and placing them in order according to the learners' readiness for each (Knowles et al., 2015). In the online learning environment, professors can post pre-lecture materials on a shared student platform for students to have access to examine and review prior to synchronous classes (Moravec et al., 2010).

8. Evaluating the learning outcomes and re-diagnosing learning needs

Evaluation of the program and of the learner is an extremely important part of learning and occurs simultaneously with self-reflection. Knowles et al. (2015) proposed four types of evaluation: reaction, learning, behaviour, and results. Reaction evaluation is used to understand how students are reacting to the program in terms of positive and negative emotions. Learning evaluation involves gathering data about the skills and techniques gained to evaluate what the student has learned during the course (Knowles et al., 2015). Behaviour evaluation determines whether the learner will utilize and apply the knowledge and skills they acquired (Knowles et al., 2015).

Each of the four types of evaluation are required for quality control and improvement, and is important for the learner, preceptor, and program director to review. The evaluation process

helps learners understand their strengths, weaknesses, and areas of improvement (Lemos et al., 2014), allowing them to work on their learning gaps and set higher learning outcomes for the future. This is consistent with a traditional classroom setting in which students will submit assignments, and professors will return them graded with comments on how improve (Carter et al., 2014; Evans, 2013).

Online Learning

Online education has been offered increasingly more often in high schools and postsecondary schools in the past decade (National Center for Education Statistics, 2012), long before the pandemic. There is evidence from this period suggesting both beneficial and detrimental effects of online learning on the ability of students to retain knowledge and achieve associated learning outcomes. Means et al. (2013) found that very little was known about how online learning affects students' achievements at the point they conducted their research. Earlier research showed online learning provides increased autonomy and independence on how students learn with the corresponding methods used (Berge & Clark, 2005; Tallent-Runnels et al., 2006), which aligns with Knowles adult learning theory which outlines that adults want to be involved in their own learning, and should control what, when, and how they learn (Knowles, 1975). We will now explore the strengths and weaknesses of Knowles' theory as applied to online learning in postsecondary schools.

Strengths

A certain form of asynchronous online learning allows students to be given readings and

pre-recorded lectures to review prior to the synchronous class time, which will include a question and answer period and activities to facilitate the reading materials. The goal of this approach is for students to be able to identify their own learning needs and topics of difficulty, and allow opportunities to discuss these with the instructor during class time. This corresponds with an andragogical approach, since it improves the accuracy of self-assessment by allowing the learner to identify their own learning gaps and verifying these with the preceptor (Knowles et al., 2015).

Using Knowles' andragogical theory, online learning for postsecondary students can be based on self-directed learning. One advantage of this type of learning is that proactive students who take the initiative in learning tend to have better knowledge retention than students who wait passively to be taught, and are better able to apply this knowledge to similar real-world situations (Knowles, 1975). Proactive learners enter into learning with greater motivation and are able to set an individualized pace, allowing students to repeat confusing material until it is mastered fast learning students to move onto other materials (Clark et al., 2005; Tallent-Runnels et al., 2006). Research indicates that this learning process provides a deeper understanding of the course material creates a stronger sense of purpose and autonomy (Davis & Davis, 2000), builds confidence, fosters creativity, and sparks deeper interest in learning (Clark et al., 2005).

With this format of online learning informed by Knowles' theory, students gain confidence by allowing them to identify their own needs and knowledge gaps and take control of their learning (Gureckis & Markant, 2012). Learners acquire a variety of transferable cognitive skills with this approach, such as planning how to approach a problem, assessing whether learning goals have been met, and re-planning based on this evaluation, which enhance learning and the ability to apply knowledge in the future (Gureckis & Markant, 2012).

There is an opportunity to apply this andragogical approach in postsecondary online courses in health education clinical fields, such as nursing clinical rotation programs, such as medical school, social work, occupational therapy, and physiotherapy. One reason for this is that self-directed learning is already popular in the healthcare field and required for ongoing learning (Mamary & Charles, 2009).

Lastly, while by nature this learning format is more reliant on technology and digital infrastructure, there are external funding sources within provincial governments to support postsecondary schools and students to improve online education and the technological tools available for it.

Weaknesses of Online Learning and Andragogy

One significant weakness in Knowles' theory is that it is based on observation and experience rather than on research (Levett-Jones, 2005). This means that we cannot empirically verify whether learners are motivated by grades, rather than by internal reasons as Knowles suggested (Sogunro, 2015). When developing the theory, no measurement tools were utilized to evaluate the andragogical principles for validity and functionality (Holton, Wilson, & Bates, 2009).

Regarding the online format, past research has suggested that adults can have negative experiences with it, because it lacks the critical reflection that is required in an adult learning process and neglects to acknowledge the numerous ways of understanding and learning (Cercone, 2008). This is one of the weaknesses of online learning. According to Bork and Rucks-Ahidiana (2013), postsecondary students who find online, self-directed learning challenging are those who

tend to procrastinate and/or are not skilled in self-directed learning. These students may suffer in performance and knowledge retention.

Another drawback of the online format is its reliance on technology. In order to facilitate smooth delivery of a synchronous online session, a stable internet connection is required, which some students may not have access to (Clark et al., 2005). And besides access, students who are not technologically proficient may have difficulties managing online education (Clark et al., 2005), as they may spend an inordinate amount of time troubleshooting and have less time to prepare for synchronous sessions.

Students with learning disabilities, language barriers, and hearing problems may view online learning as a detriment to their ability to learn (Cavanaugh et al., 2013), and special frameworks or guidelines will need to be implemented to keep these students engaged and promote fairness and equality in classrooms. Moriña (2019) found that students with disabilities need enhanced motivational and emotional support from professors to develop a sense of belonging within students and a better learning experience.

Finally, another limitation with this approach is that postsecondary students are not prepared for such a significant transition to a self-directed, fully online format with synchronous and asynchronous elements, because this not commonly used prior to the pandemic (Dhawan, 2020; Pokhrel & Chhetri, 2021). According to Sahoo (2016), this lack of readiness for self-directed learning indicates a need to work on developing these skills early on in postsecondary learning. Postsecondary learners' lack of readiness for the transition to online learning negatively impacts their confidence and ability to learn.

Types of Learning Styles

Learning styles theory asserts that all learners are different in learning ability and preferences, and that matching these preferences to suitable teaching methods and learning environments can dramatically enhance students' learning (Kozhevnikov et al., 2014). This is commonly used in education despite recent articles questioning the validity of the idea of learning styles for having no empirical evidence that this “matching instruction” improves learning (Newton & Salvi, 2020). Despite this lack of evidence, research and media coverage has shown that belief in the use of Learning Styles theory is high amongst educators and self-reported use by students (Newton & Salvi, 2020).

In a study examining the different types of learning styles, Awla (2014) concluded that there are three types: cognitive, personality, and sensory. Cognitive learning style describes information processing of the learner, and can be further broken down into analytical, global, field dependent and independent, impulsive, and reflexive learning (Awla, 2014). Personality learning style describes how learners incorporate psychology into learning, and examine one's interests, motivating values, and past experiences (SUNY Cortland, 2016). These learners can be described as extroverted, introverted, random-intuitive, concrete sequential, and closure-oriented (Awla, 2014). Sensory learning style is most commonly used and researched within the field of education, with literature spanning from kindergarten to postsecondary classrooms (Arbuthnott & Krätzig, 2015). It describes a particular reliance on material being presented via certain sensory modalities (e.g. visual, kinesthetic / tactile, auditory) to most effectively learn (Awla, 2014; Scott, 2010). In this section, we will examine how online learning is experienced by visual, kinesthetic/tactile, and

auditory learners in the postsecondary setting.

Visual Learners

Visual learners learn by seeing to understand a concept, for example through the use of diagrams, photographs, overhead projectors, reading texts, or PowerPoint slides (Arbuthnott & Krätzig, 2015). Learners of this type are the least impacted by the transition to online learning, because this type of material (slides, videos, etc.) is already well suited for it and may become even more relied on than in the traditional classroom. Asynchronous online delivery allows visual learners to understand the materials before the synchronous sessions, and provides time for them to identify knowledge gaps, which aligns with Knowles' adult learning theory. Some visual learners may also be introverted and prefer to study alone, which can be an advantage of the online format as it can reduce the social anxiety experienced with in-person classrooms (Rapanta et al., 2020).

Auditory Learners

Auditory learners prefer to hear lecture material and verbal participation with peers to facilitate learning and knowledge retention (Arbuthnott & Krätzig, 2015). They learn best from asking questions, engaging in discussion, and repeating information out loud (Kilcoyne & Habig, 2016), which are severely diminished by the transition from face-to-face to online learning, especially in undergraduate classes with large class sizes. In addition, auditory learners with unstable internet connections and other challenges with technology may find learning difficult as this can diminish opportunities for synchronous discussions. Auditory learners therefore face a

particular challenge when transitioning to an online format.

However, auditory learners in graduate programs may not be as heavily impacted by the transition due to smaller classroom sizes. Professors in graduate programs often incorporate student-led facilitation activities in the syllabus, which provides opportunities for auditory learners to interact with peers and actively engage in discussions during synchronous sessions (Bates, 2018; Bell & Federman, 2013). In addition, lectures will typically be recorded to be viewed and listened to asynchronously or for review, which auditory learners can take advantage of (Bell & Federman, 2013).

Tactile/Kinesthetic Learners

Tactile learners learn best by physically doing, and need to feel and touch to learn (Penn Foster College, 2016). They prefer classroom demonstrations of a concept rather than reading it or hearing it explained, and benefit greatly from participating in fieldwork outside the classroom (Penn Foster College, 2016). Of the three types of learners, tactile/kinesthetic learners are the most impacted by the transition to online learning because it is much more difficult to learn without any opportunities for “hands-on” learning experiences (Wiley Education Services, 2018). Demonstrations over videoconferencing are less effective and more difficult for professors due to physical spacing issues and the limited field of view of the webcam. There are, however, ways to mitigate this by using high quality video streaming (e.g. YouTube videos) that show the illustration and incorporate this within the asynchronous or synchronous portions of the class, using virtual simulations and interactive study aids to facilitate learning for tactile learners.

For students completing lab work for science courses, it is difficult to perform experiments

using online platforms only, and the implementation of group fieldwork outside the classroom setting has been cancelled due to social distancing regulations. This is a major drawback For tactile learners, and they may need to work harder than visual and auditory learners to find simulations and video streaming to better understand the class materials (Penn Foster College, 2016).

The Impact of Online Learning

The long-term effects of the transition to online learning platforms in postsecondary students is not yet known, as it has been less than two years since the onset of the COVID-19 pandemic, and there had not been much published research in this area prior (Means et al., 2013). At the beginning of the forced transition to online platforms in March 2020, many students disliked it, as it was very different from the typical experience of exclusively in-person schooling prior to their postsecondary education. Many students struggled with the transition mid-semester and had to learn a new way of self-directed learning and learning at a distance (Armstrong-Mensah et al., 2020). However, as time has continued, many students have become accustomed to using online technology and now find it less daunting to learn online after over a year of using online platforms (Government of Canada, 2020a).

According to Nguyen (2017), students' discussions with peers and interactive learning activities (e.g., student-led teaching sessions) have a significant impact on student learning outcomes in regards to retaining knowledge and being able to apply learning to real-world cases (Ibrahim & Al-Shara, 2007). Professors try to incorporate interactive activities that facilitate all three types of learners (Kharb, 2013; Rapanta et al., 2020). However, a challenge with online learning has been facilitating such activities using this format, and subsequently, the negative

impact on knowledge retention and knowledge application for students without these interactions (Bawa, 2016).

All in all, the short-term and long-term effects of online education on postsecondary students is an area for further research, as is postsecondary students' attitude and beliefs about it, as this can also affect learning outcomes (Díez-Palomar et al., 2020; Gorard, 2012; Kleebua & Siriparp, 2016; Metsärinne & Kallio, 2015).

SUMMARY

The transition to a fully online learning platform at the beginning of the pandemic in March 2020 has been difficult for postsecondary students. Classrooms have adopted the use of videoconferencing lectures to continue with learning at a distance. This style of learning has in many cases led to a more complete adoption of the principles of Knowles' theory of adult learning. This theory emphasizes the unique characteristics of adult learners given their unique past experiences and can be applied to online educational courses. Given the learning needs and knowledge gaps identified by postsecondary students, they have the opportunity to learn at their own pace and be the driver of their education. In order to allow students to participate fully in their learning, apply skills to real-world situations, and facilitate knowledge retention, all eight of Knowles' andragogical principles should be incorporated to online classroom settings.

Online learning that incorporates self-directed methods informed by Knowles' principles has numerous benefits for students, such as fostering their motivation, developing their confidence, and enabling them to fully participate in active learning. However, drawbacks inherent to online learning still exist, as it lacks in-person demonstrations and simulations that tactile learners depend



on, lacks valuable in-person peer discussions, and necessitates a stable internet connection in order to be fully immersed in learning. With new and emerging forms of postsecondary online learning, more research is needed to evaluate its value, examine its short-term and long-term effects, and to implement new strategies to better replicate the successes of traditional face-to-face learning.

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