**Mental Health and Academic Performance**

"Mental illness" refers collectively to all mental disorders. Mental illnesses affect the way people think, feel and behave, often in combination. Mental illnesses can have a profound impact on people's quality of life and can limit their ability to work, learn, and participate in social, work, and educational activities. Mental illness is a broad term that includes disorders with specific genetic, social, psychological and biological factors known as the determinants of health (DoH; PHAC, 2016; 2020). In 2016, one-quarter of post-secondary students in Canada reported having been diagnosed or treated for at least one mental health condition in the last 12 months, with anxiety and depression being the most common (American College Health Association, 2016).

**Mood & Anxiety Disorders**

Mood disorders are characterized by elevated or depressed moods, resulting in alterations in the way a person thinks, feels, and behaves (Government of Canada, 2006; PHAC, 2016). The prevalence of mood disorders among Canadians between the ages of 18-34 years was 11.7% in 2019 (Statistics Canada, 2021). It is estimated that 12.6% of Canadians over the age of 14 will experience a mood disorder at some point during their lifetime (Pearson et al., 2018). Major depressive disorder, bipolar disorder, dysthymic disorder and perinatal depression are the four main types of mood disorders (PHAC, 2016).

Anxiety is a normal response to stress and can be helpful in certain situations (i.e., acute stress enhances performance). What differentiates anxiety disorders (i.e., anxiety or nervousness) is the intensity and impact of feelings (Anxiety Canada, n.d.; Centre for Addictions and Mental Health (CAMH), 2012a). Anxiety disorders can be characterized by persistent feelings of apprehension, worry and fear that affect thoughts, feelings, emotions and physical health (PHAC, 2016). Statistics from the World Health Organization (WHO), indicate a 12-month prevalence rate of 11.7% for college students (Auerbach et al., 2018). The main types of anxiety disorders include: phobic anxiety disorders, panic disorders, social anxiety disorder, specific phobia (e.g., spider phobia), obsessive-compulsive disorder, agoraphobia and panic disorder (PHAC, 2016).

**Influences on Academic Performance for Students with Mental-Health-Related Challenges**

Mental health challenges and subsequent academic performance issues experienced by students with mental-health-related disabilities studying online have been connected to potential factors driving from learning theories, the relationship between mental-health-related symptoms and academic performance, and learning design.

**Opportunities to Improve Academic Performance**

**Mental Health Continuum Model**

Healthy-promoting universities and colleges influence their students' mental health during their daily operations and academic mandates (Okanagan Charter, 2015). Positive mental health is the capacity of people to feel, think and act in ways that enhance enjoyment in life and allow them to deal with life's challenges (PHAC, 2014). The Mental Health Commission of Canada (MHCC) has integrated the mental health continuum model (MHCC, 2018) into its full spectrum of mental health. The model provides a broad representation of the range of wellness. The continuum allows individuals to identify indicators of declining or poor mental health in themselves and others, stresses that individuals can move bi-directionally along the continuum, and teachers appropriate actions at each point along the continuum (MHCC, 2018). This model can be useful for course designers, instructors and students with or without a diagnosed mental disorder. The action items listed under the "healthy" and "reacting" points on the continuum are practical from the perspective of mental health promotion and learning design. For example, courses can be designed to break larger assignments and concepts into "chunks," which aligns with what we know about scaffolding (Reiser & Tabak, 2014) and mental-health promotion.

**Universal Design for Learning (UDL)**

The UDL framework was created in the 1980s, widely adopted and recently revised (Centre for Applied Special Technologies, 2021). UDL is an effective philosophy, framework and set of principles for creating and delivering course materials to diverse classes of students (i.e., students who improve the learning process for all students (Kapp, 2017; Hall, Meyer & Rose, 2012). Developed based on research focused on the nature of learning, the framework principles and the learning design principles for each student (e.g., engaged to stimulate critical thinking skills (i.e., inhibitory control, working memory and cognitive flexibility) are impacted by mood and anxiety disorders. The model for course designers, instructors and students with or without a diagnosed mental disorder. The action items listed under the "healthy" and "reacting" points on the continuum are practical from the perspective of mental health promotion and learning design. For example, courses can be designed to break larger assignments and concepts into "chunks," which aligns with what we know about scaffolding (Reiser & Tabak, 2014) and mental-health promotion.

**Mental Health Promoting Learning Designs**

Given how fundamental executive function skills are to learning, and how the core executive function skills (i.e., inhibitory control, working memory and cognitive flexibility) are impacted by mood and anxiety disorders, we have the opportunity to design learning environments that impact elements that impair executive functions and enhance elements that support them. While educators do not have complete control over the learning environments in which they teach, they do have some degree of influence on design elements (e.g., assessment tasks, learning activities, course content). For example, to reduce the demands on working memory (to preserve or promote reasoning, problem-solving and attentiveness), logistic elements (e.g., number of assessment tasks, learning activities, course content) should be optimized (see Table 1). To reduce cognitive flexibility demands and preserve or promote problem-solving and goal achievement, minimize “the unexpected” by minimizing the number of assessment tasks, learning activities, course content. For example, to reduce the demands on inhibitory control, break up large assignments into smaller tasks and limit superficial information from course sites. To promote development of the core executive function skills, thereby reducing the impact of mental-health-related symptoms, create online learning environments where students develop confidence through social inclusion and supportive and regular feedback. While possible, scaffolding through progressive cognitive challenges and integrate physical activity into learning activities. Table 1 illustrates possible linkages between common online-learning engagement activities and mental-health-related mental performance issues.

**Executive Functioning Consideration**

Executive functioning encompasses cognitive processes involved in three inter-related skills: working memory, inhibitory control and cognitive flexibility (Diamond & Ling, 2016). From these, other executive functions are built, such as problem-solving, controlled attention, fluency, abstract thinking, reasoning, metacognition, self-regulation, planning, and sequencing complex activities (Chan et al., 2008; Diamond & Ling, 2016; Hamm & Árdal, 2009). Executive functions allow a person to plan for the future, reflect on the past, complete tasks in a timely manner, sustain effort over time, manage emotions and effectively socialize with others (Centre for ADHD Awareness Canada [CALCAC], 2001; Gilbert & Burgess, 2008; O’Bourke et al., 2018; Parker & Boutelle, 2009).

**Healthy Built Learning Environment**

Given the complex and intersecting influences on students within online learning environments, we would benefit from learning from disciplines that take a macro-view of environments. Within the field of public health, the concept of “healthy built environment” is embraced. The “built environment” refers to human-made or modified physical surroundings in which people live, work and play (BC Centre for Disease Control [BCCDC], 2020). This concept is worth considering for the design of future online learning environments. According to the literature, a key factor in the success of healthy-built environment initiatives is shared understanding of the important influence that our environment has on population health, and the role each stakeholder has to play (BCCDC, 2020). With some minor revisions to the framework definition of the healthy built environment, there is an opportunity to use this to inform our learning designs. A key factor in the success of healthy-built learning environment initiatives is that of leveraging the design and implementation so that our environment has on population health, learning, and the role each stakeholder has to play.

**Conclusions**

Canadian university students are reporting significant impacts of mental-health-related issues on their academic performance (ACHA, 2016), with anxiety (32.5%), depression (20.9%) and stress (42.2%) being the most common causes. As more students continue to study online (either by choice or by necessity), it is imperative that educators, learning design and learning-design professionals understand the assets, needs and challenges of their students, as well as the full range of opportunities afforded by the tools and technology at our disposal. Through careful consideration of assets and challenges, we can choose the appropriate technology, design the most engaging online communities, draw from the most relevant pedagogy and facilitate the best learning outcomes. The global pandemic presents an unprecedented opportunity for those working in the field, not only to understand the limits and possibilities of online learning, but also to propel the field forward. My research will capitalize on this unique set of circumstances to advance our understanding of learning design for optimal mental health. Drawing from foundational concepts about learning, design and mental health promotion, I summarized key factors of mood and anxiety disorders in relation to potential challenges and opportunities within online learning environments.