From Crisis to Resilience: Pandemic Perspectives on College Student Experiences, Motivation and Self-Regulated Learning

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Received: 18 October 2023 Accepted: 3 July 2024

The short-term effects during the transition to emergency remote teaching at the onset of the COVID-19 pandemic on college students are well-studied. The present study investigated the ongoing impact of the COVID-19 pandemic on students enrolled in undergraduate classes (e.g., pandemic experiences and their impact on basic psychological needs, metacognitive learning strategies, and motivation regulation). The survey was administered at a 4-year university in the Southeastern United States during fall 2022. The majority of participants (N = 590) were women (82%), white (56.6%), not Hispanic or Latinx (93.4%), and health profession majors (58.1%). Results indicated that mental health, academic, and social experiences during the pandemic predicted students' basic psychological need satisfaction. In turn, basic psychological need satisfaction predicted metacognitive and motivation regulation strategies. Qualitative analyses revealed that students perceived the pandemic's influence as positive and negative. These findings highlight the variety of student experiences during the pandemic.

INTRODUCTION

Since 2020, the SARS-CoV-2 virus, responsible for COVID-19, has afflicted over 101 million individuals worldwide, resulting in a death toll exceeding 1 million in the United States alone (Centers for Disease Control and Prevention Covid Data Tracker, 2024; World Health Organization, 2024). Initially, the focus was on COVID-19's potentially lethal physiological manifestations, but healthcare providers subsequently identified longer-term and post-COVID conditions (Centers for Disease Control and Prevention, 2024). While research has indicated that a diagnosis of COVID-19 itself does not directly induce mental health deficits (Bourmistrova et al., 2022), living through the pandemic has led to a notable surge in clinical depression, anxiety disorders, and post-traumatic stress disorder (Xiong et al., 2020). This heightened psychological distress was particularly evident among specific demographic groups, including females, individuals with pre-existing psychological conditions, those with inadequate income, individuals under 40, and students (Xiong et al., 2020; El-Monshed et al., 2022). Each group experienced increased psychological distress during the pandemic for distinct reasons: females encountered significant upheavals in employment and childcare responsibilities (Bateman & Ross, 2020), while college students, who were already susceptible to mental health disorders like anxiety, depression, phobias, and eating disorders prior to the pandemic (Oswalt et al., 2020), faced additional stressors unique to their collegiate experience. Approximately 75% of college students reported psychological distress, depression, or anxiety attributed to academic pressures, financial concerns, health issues, and relationship dynamics (Karyotaki et al., 2020; Saleh et al., 2017).

The Impact of the COVID-19 Pandemic

Previous studies have explored aspects of students' learning at the onset of the pandemic, which included the transition to "emergency remote teaching" (Bozkurt & Sharma, 2020) and the implementation of physical distancing requirements. Our study aimed to investigate the ongoing impact of the pandemic on two distinct domains: students' mental well-being and their motivation and self-regulated learning.

Influence on Mental Health

Research suggests that the pandemic negatively impacted students' psychological well-being and self-determination (Randall et al., 2022). A longitudinal 2019-2020 study examining college students' mental health and functioning during the height of the pandemic indicated a significant increase in reported depression and anxiety compared to pre-pandemic rates of these disorders. This negative impact was attributed to the high degree of uncertainty, disruption to daily life, and economic impact (Zimmermann et al., 2021). At the end of the spring 2020 semester, first-year college students reported significantly more difficulty with externalizing behaviors such as maintaining emotion regulation and other forms of "acting out" and with attentional skills such as concentration (Copeland et al., 2021). When students' pandemic-specific anxiety was assessed daily, the highest levels were seven times higher than the highest non-pandemic anxiety levels in the same population of students. In addition, feeling anxious about the pandemic was associated with a greater desire to engage in risky behaviors (Kleiman et al., 2020). Some longitudinal studies also indicated that psychological distress related to the pandemic is a persistent and lasting problem (Hamza et al., 2021; López Steinmetz et al., 2021).

Further, students exhibited mood and emotion regulation variability in response to the stress and uncertainty associated with the pandemic. While students utilized some appropriate or adaptive mood and emotion regulation strategies such as acceptance, calming, reappraisal, problem-solving, and social sharing, they also reported engaging in maladaptive strategies such as rumination, experiential avoidance, catastrophizing, lack of clarity, self-blaming, and other-blaming (Lohani et al., 2022). Before the pandemic, a meta-analysis examining emotion regulation strategies in youth revealed that using adaptive strategies less frequently and employing maladaptive strategies were also more often linked to symptoms of depression and anxiety (Schäfer et al., 2017).

Evidence has also suggested a link between students' mental health and academic performance. Clabaugh et al. (2021) measured students' academic concerns, perceived stress, emotional well-be-

ing, locus of control, and perceptions and behaviors related to the pandemic. The findings revealed a positive correlation between stress levels and the belief that their academic futures were at risk. Higher stress levels were also associated with a higher likelihood of withdrawing from classes (Clabaugh et al., 2021). Students reported that the change to emergency remote teaching had adverse effects on their learning (69.1%), career preparation (67.1%), feeling a part of the community (66.9%), and grades (55.8%) (Supriya et al., 2021).

Pandemic-related mental health challenges were particularly prevalent among minoritized students. Although this was beyond the scope of our study, it is crucial to recognize that the pandemic disproportionately affected certain demographic groups. Students of color reported significantly higher stress levels and uncertainty regarding their academic futures than white students (Clabaugh et al., 2021). Sexual and gender minority students reported relatively high psychological distress levels and a 32% increase in alcohol use. Further, participants who reported increased use of alcohol were significantly more likely to report higher levels of psychological distress (Salerno et al., 2021).

The Pandemic's Influences on Motivation and Self-regulated Learning

One way that researchers have characterized students' motivation in the classroom is through the lens of self-determination theory (Ryan & Deci, 2000). Self-determination theory suggests that individuals have three psychological basic needs (i.e., autonomy, competence, and relatedness). The satisfaction of these three needs determines motivation and functioning within a particular context (Ryan & Deci, 2000). Autonomy need satisfaction is characterized by individuals feeling that they have control over their environment, competence need satisfaction is exemplified by individuals' feeling capable in a particular context, and relatedness need satisfaction includes individuals' feeling connected to those around them. Context is hugely important to psychological need satisfaction, thus students' need satisfaction varies between contexts.

An outcome of the satisfaction of needs is students' engagement in a particular context (Ryan & Deci, 2000). For example, the extent to which the three basic needs are satisfied may determine the types of learning strategies a student implements in the classroom (Langdon et al., 2024). Frameworks of self-regulated learning conceptualize the strategies students may implement in the classroom as connected to different aspects of themselves and their environment (Pintrich, 2004). As students engage in academic tasks, they are able to implement strategies to control their cognition, behavior, motivation, and context. In turn, students' self-regulated learning has been connected to learning and achievement (Dent & Koenka, 2016). The lens of self-determination theory and self-regulated learning may provide researchers with a more thorough understanding of how the pandemic continues to influence students' class engagement.

Not only did the pandemic present challenges to students' mental health and academic performance, but it also created a learning environment (i.e., remote learning) that required students to implement specific skills. Research with college students enrolled in undergraduate classes during the pandemic documented relationships between the skills critical for academic success and resilience to adversity during remote teaching, such as motivation and self-regulation (Zamroni et al., 2022) and suggested that these skills were lacking among students (Aini et al., 2020). However, the specific nature of these relationships within the context of remote teaching is less clear, as some studies suggested that motivation facilitated self-regulated learning (Zamroni et al., 2022), while others found that self-regulated learning facilitated motivation (Li et al., 2022).

A large majority of college students reported having a decreased ability to focus, decreased motivation for education, and increased stress levels during the pandemic, while just under half of the sample indicated they had reduced confidence in their academic abilities (Usher et al., 2021). A longitudinal examination of students' perceived self-regulation and intrinsic motivation in relation to autonomy, competence, and social relatedness revealed that the satisfaction of these needs was positively correlated to both self-regulated learning and intrinsic motivation (Pelikan et al., 2023). At the onset of the pandemic, students reported less enjoyment and curiosity related to their achievements than pre-pandemic. (Corpus et al., 2022). Additionally, due to social isolation, the shift to remote teaching, and restrictions on their daily routines, students' experiences of autonomy, competence, and social relatedness were diminished (Means et al., 2020; Gonzalez-Ramirez et al., 2021; Tasso et al., 2021). A lack of motivation was associated with low retention in college and lower academic achievement (Corpus et al., 2022; Pelican et al., 2023), while students' lack of choice (e.g., diminished autonomy) of course formats (face-to-face vs. online) during the pandemic influenced both their actual and perceived learning (Gurung & Stone, 2023).

Taken together, it is clear that the transition to remote teaching during the pandemic negatively affected students' academic performance: they experienced increased mental health problems and decreased satisfaction with basic psychological needs, supported self-regulated learning, and motivation.

CURRENT STUDY

Context is pivotal in shaping the applicability of pedagogical practices in SoTL (Felten, 2013; Friberg, 2018). The scholarly context is integrated throughout the manuscript, but we would like to focus on two local contexts for this study.

Faculty Learning Community context

This study stems from a 2022 Faculty Learning Community (FLC) focused on the Scholarship of Teaching and Learning (SoTL) at our institution intended for instructors new to SoTL. As participants in the FLC discussed their teaching experiences and shared current challenges in the classroom, a common issue emerged: the perception that the COVID-19 pandemic has altered college students' learning. Viewing this as an "invitation to scholarly investigation," akin to Randy Bass's argument advocating for teachers to explore issues that "matter most to them," the FLC opted to develop a collaborative SoTL project (Bass, 1999). Many faculty members new to SoTL wish to enhance the classroom environment for their own students to facilitate effective learning (Larsson et al., 2020), so they often pursue a "what is" type of SoTL project. "What is" constitutes one of the foundational questions in SoTL, seeking to elucidate meaningful aspects of students' learning experiences (Hutchings, 2000). Furthermore, the group believed that the focus of this study aligns well with SoTL Grand Challenge number 2: "how to encourage students to be engaged in learning." (International Society for the Scholarship of Teaching and Learning, 2023).

Institutional context

The study was conducted at a public, 4-year comprehensive university in the Southeastern United States. The state never imposed a state-wide mask mandate and was among the first to lift the lockdown measures during the COVID-19 pandemic. A more detailed account of the institutional response was published before (Maurer, 2022). However, it is worth mentioning that a return to in-person learning (with a campus-wide mask mandate and reduced class sizes to allow for 6 feet of social distancing) was imposed in fall 2020. By spring 2021, the institution returned to pre-pandemic functioning (no masks and social distancing required in the classrooms with pre-pandemic class sizes) and instructors had no choice over the modality of their classes (online, hybrid, or in-person).

Purpose of the study

To help the FLC participants understand the experiences of our students related to the ongoing effects of the pandemic on learning, the study was designed to 1) examine the ongoing effects of the pandemic in our own classrooms and 2) collect systemic data on the pandemic's ongoing impact on students' need satisfaction and self-regulated learning. To investigate these two areas, we employed a multiple methods approach. We asked the following specific questions about college students enrolled in undergraduate classes:

1. **What are students' perceptions of the ongoing COVID-19 pandemic experiences and impact at our institution?**
2. **How did the COVID-19 pandemic experience influence students' need satisfaction and self-regulated learning at our institution?**

We hypothesized that the reported financial impact, mental health impact, academic impact, and social ties resulting from the pandemic would predict autonomy, competence, and relatedness. In turn, we hypothesized that autonomy, competence, and relatedness would predict metacognitive strategies and motivation regulation.

METHODOLOGY

Participants

All participants were college students enrolled in undergraduate classes at a large comprehensive university in the Southeastern United States. Recruitment targeted 812 students across 13 undergraduate classes (see Table 2). While 699 students opened and completed parts of the survey, the analyses only included students who answered 93% or more of the survey questions. Thus, our final sample consisted of 590 students. The majority of participants were women (82%), white (56.6%), not Hispanic or Latinx (93.4%), juniors (41.9%), and sophomores (25.3%), enrolled in more than 12 credit hours/semester (55.8%), represented health profession majors (58.1%), worked > 20 hour/week (38.5%), and < 20 hours/week (23.7%) in addition to taking classes, and had a GPA above 3.0 (59.2%). See complete demographic information in Table 1.

When comparing the participants in this study to the population of students enrolled in undergraduate courses at this university, we found our sample to be similar in terms of race/ethnicity. During Fall 2022, 58% of students were White, 26% were Black or African American, 8 % were Hispanic, 5% were two or more races, 2% were Asian, and 1% did not report their race/ethnicity. American Indian/Alaskan Native and Native American/Pacific Islander made up under 1% of the population. The university does not collect gender; instead, they report out the sex of students. Thus, their measure does not align perfectly with our measure. That being said, 58% of students enrolled in undergraduate courses at this university were female and 43% were male.

Procedures

The project was reviewed and approved by the Institutional Review Board. A link to an online anonymous survey in Qualtrics (https://www.qualtrics.com/) was distributed to students via an announcement by the course instructors on the university learning management system. The announcement targeted 812 students across 13 undergraduate classes taught by eight instructors participating in the FLC on SoTL at our institution (See course level, descriptions, format, and enrollment in Table 2). All students received extra credit in each class if > 75% of the class participated in the survey. The announcement with the link to the survey was available to students from November 1 to November 18, 2022.

Measures

Participants completed a survey to measure the following broad dimensions: COVID-19 experiences and impact, course satisfaction, degree commitment, basic psychological need satisfaction, self-regulated learning, and demographic information. The survey took about 23 minutes to complete. All instruments, except for the COVID-19 experience instrument, used a 5-point Likert scale. Students reported their agreement with statements on a scale ranging from 1 (strongly disagree) to 5 (strongly agree).

COVID-19 Experiences

We administered eight items intended to capture students' proximity to COVID-19 throughout the pandemic, adapted from Conway et al. (2020). Students selected one answer among "yes," "no," or "Prefer not to answer" in response to each item. A complete list of items and students' responses can be found in Table 3.

COVID-19 Impact

To capture the influence of the COVID-19 pandemic on students' lives, we administered four subscales adapted from Conway et al. (2020). This measure was initially developed to capture people's experiences during the height of the COVID-19 pandemic. To ensure that this scale was appropriate for the context of our study, we modified the survey language so that the items were easy for students to understand. In addition, we modified the time period that items focused on to fit the aims of this study. The COVID-Financial subscale comprised three items and assessed whether the pandemic influenced students' finances. For example, students were asked to report their agreement on items such as "The Coronavirus (COVID-19) pandemic has impacted me negatively from a financial point of view (e.g., loan repayment, household bills)." This scale demonstrated adequate reliability ($\alpha = .77$). The COVID-Academics subscale included three items measuring the pandemic's influence on students' academic experience. This subscale demonstrated good reliability ($\alpha = .77$). An example item from the COVID-Academics subscale was "The Coronavi-

Table 1. Student Demographics (N = 590)			
Baseline characteristic	**%**	**Baseline characteristic**	**%**
Gender		**Job / Workload**	
Women	82.0	Working more than 20 hrs/wk	38.5
Men	14.4	Working less than 20 hrs/wk	23.7
Genderqueer or non-binary	0.8	Not employed	37.1
Transgender	0.3	Other	0.7
Prefer not to answer	2.4	**Parents' Education**	
Ethnicity		Some high school or did not graduate from high school	5.1
Hispanic or Latinx	6.6	Graduated from high school or earned a GED (General Educational Development)	28.0
Not Hispanic or Latinx	93.4	2-year degree, i.e., Associate degree or Vocational degree	14.4
Race		4-year college or university degree	26.9
White	56.6	Graduate or professional degree (e.g., Master's, Ph.D., M.D., J.D.)	22.2
Black or African-American	33.4	Don't know	2.9
American Indian or Alaska Native	0.5	Other	0.5
Asian	1.4	**High School Graduation Year**	
Native Hawaiian or Pacific Islander	0.2	Prior to 2015	10.0
Biracial	5.4	2015 - 2019	24.1
Multiracial	0.7	2020	19.7
Other	1.9	2021	36.3
Class Rank		2022	9.5
Freshman	10.7	**Self-Reported GPA**	
Sophomore	41.9	Not sure	4.1
Junior	25.3	0.51 - 1.00	0.0
Senior	18.3	1.01 - 1.50	0.8
Post-Baccalaureate	3.2	1.51 - 2.00	3.7
Other	0.7	2.01 - 2.50	10.2
Course Load		2.51 - 3.00	22.0
Less than 12 credit hours	16.6	3.01 - 3.50	30.2
12 credit hours	27.6	3.51 - 4.00	29.0
More than 12 credit hours	55.8		
College			
Education	15.9		
Science and Mathematics	11.5		
Health Professions	58.1		
Business	0.3		
Engineering and Computing	3.7		
Behavioral and Social Sciences	2.2		
Arts and Humanities	0.7		
Public Health	1.4		
Other / Don't know	6.1		

rus (COVID-19) pandemic caused me to change my course plan." The COVID-Mental Health subscale used three items to measure students' well-being during the pandemic, and it demonstrated adequate reliability (α = .81). Students reported their agreement to statements that focused on the influence of the pandemic on their mental health, such as "The Coronavirus (COVID-19) pandemic has impacted my psychological health negatively." The final subscale, COVID-Social Ties, assessed students' connections with others throughout the pandemic. This scale comprised six items and demonstrated good reliability (α = .85). An example item included in the social ties subscale was, "I am satisfied with my academic relationships with my professors/teachers since the beginning of the pandemic."

The instrument also included one open-ended question to explore students' opinions about the impact of the pandemic on their learning experience: "In at least one sentence please describe how the COVID-19 Pandemic has impacted your learning experience." Responses to the open-ended question were entered into an Excel spreadsheet and divided among two researchers for separate coding. The researchers involved in qualitative data analyses have extensive experience in coding. Thematic analysis (Braun & Clarke, 2006) was chosen as a method due to its flexibility and interpreting patterns in qualitative data. We used an inductive coding approach, meaning themes were developed based on students' responses (Saldaña, 2013). If a statement held true for different categories, it was placed into multiple categories. The qualitative analyses also included the total number of statements in each category. Member checking, peer briefing, and maintaining records of the thematic process was used to ensure the trustworthiness and rigor of the findings.

Self-regulated Learning

We assessed two different aspects of students' self-regulated learning. Students' use of metacognitive strategies was assessed using ten items from the Motivated Strategies for Learning Ques-

Table 2. Targeted Courses (taught either online or face-to-face by the researchers)		
Course Level /Subject /Format /Credit Hours Catalog description	**Enrollment in each section**	***n***
1000 / Physics Class / Face-to-Face /4		
An introductory course which will include electrostatics, electric current and circuits, and electromagnetism, and may also include optics and modern physics. Elementary algebra and trigonometry will be used. Laboratory exercises supplement the lecture material.	52	44
2000 / Math Class / Face-to-Face / 3		
This course is an Area F introductory course for early childhood education majors. This course will emphasize the understanding and use of the major concepts of numbers and operations. As a general theme, strategies of problem solving are used & discussed in context of various topics. This course is also part of the program of study for middle grade majors.	13 18	24
2000 / Health Communication Class / Online / 3		
Introduces students to fundamental communication principles, focusing on developing the skills required to effectively present and convey professional and health-related information to diverse audiences. The course focuses on oral skills, written skills, organizational skills, and communication skills involving new technology and media.	28	18
2000 / Physics Class / Face-to-Face / 4		
An introductory course which will include material from mechanics, thermodynamics, and waves. Elementary differential calculus will be used. This course has a laboratory component that requires a lab kit.	45	26
2000 / Physics Class / Face-to-Face / 4		
An introductory course which will include electrostatics, electric current and circuits, and electromagnetism, and may also include optics and modern physics. Elementary calculus will be used. Laboratory exercises supplement the lecture material.	16	13
2000 / Kinesiology-Biology Class / Online / 3		
A two semester sequence in which human anatomy and physiology are studied using a body systems approach, with emphasis on the interrelationships between form and function at the gross and microscopic levels of organization. Course content includes: basic anatomical and directional terminology; fundamental concepts and principles of chemistry and cell biology; histology; the integumentary, skeletal, muscular, and somatic nervous systems and special senses.	142 135	225
2000 / Kinesiology-Biology Class / Online / 3		
A two semester sequence in which human anatomy and physiology are studied using a body systems approach, with emphasis on the interrelationships between form and function at the gross and microscopic levels of organization. This course is a continuation of XXXX and includes the endocrine system, autonomic nervous system, cardiovascular system, the lymphatic system and immunity, the respiratory system, the digestive system and metabolism, the urinary system, fluid/electrolyte and acid/base balance and the reproductive systems.	146	129
3000 / Health Class / Face-to-Face / 3		
Designed to study the basic principles and practices underlying the organization and administration of a coordinated school health program including the relationship to current child health status. Assessment and planning of developmentally appropriate health instruction, examination of health education curricula with content focus on the following health topics:nutrition, consumer health, environmental/community health, disease prevention, sexuality and substance use education will also be addressed.	22	9
3000 / Health Class / Hybrid / 3		
Provides the student with the knowledge, skills, and resources to develop a philosophical position and curricular materials consistent with that position and with state and national guidelines.	21	3
3000 / Speech Sound Disorder Class / Hybrid / 3		
Etiology, characteristics, classification, assessment, and treatment of speech sound disorders. This course is reserved for students majoring in communication sciences and disorders. The prerequisite courses for this course are typical speech and language development and phonetics. Students are expected to enter the course with a strong foundational understanding of typical speech and language development as well as phonetics and the International Phonetic Alphabet (IPA).	45	35
3000 / Health Class / Online / 3		
Develops the elementary classroom teacher's ability to organize and implement a developmentally appropriate health and physical education program for students. Emphasis will be placed upon teaching strategies and methodologies.	46 40	44
4000 / Nutrition Class / Online / 3		
Basic concepts of nutrition as a major component to the enhancement of health.	29	11
5000 / Math Class / Face-to-Face / 3		
The evolution of algebraic concepts through the curriculum will be followed by how algebra is related to other areas of mathematics and real-world applications. For Early Childhood and Middle Grade majors only.	14	9

Table 3. Students' Experiences during COVID-19 (*N*=590)			
Item	**Yes**	**No**	**Prefer not to answer**
I have tested positive for Coronavirus (COVID-19) since the beginning of the pandemic.	49%	48%	3%
I have had Coronavirus-like symptoms but did not test positive for Coronavirus (COVID-19) at any point since the beginning of the pandemic.	41%	55%	4%
I have been sick with something other than the Coronavirus (COVID-19) since the beginning of the pandemic.	64%	33%	3%
I know someone who has tested positive for Coronavirus (COVID-19) since the beginning of the pandemic.	88%	8%	4%
I have been in close proximity (i.e., closer than 6 feet) to someone who has tested positive for Coronavirus (COVID-19) since the beginning of the pandemic.	74%	22%	5%
I know someone who has had Coronavirus-like symptoms but did not test positive for Coronavirus (COVID-19).	75%	21%	4%
I have been in close proximity to someone who has had Coronavirus-like symptoms but did not test positive for Coronavirus (COVID-19).	69%	26%	5%
I have a family member or a friend who lost their life to Coronavirus (COVID-19).	30%	64%	5%

tionnaire that focused on students' use of strategies to plan, monitor, and reflect on their learning strategies in class (Pintrich & De Groot, 1990; Pintrich et al., 1991). For example, students reported their agreement to the following statement, "In this class, while working on my course materials, it is easy for me to stay focused." The Motivated Strategies for Learning Questionnaire and, more specifically, the metacognitive strategies subscale was developed with the intent of assessing aspects of students' engagement in self-regulated learning (Pintrich & De Groot, 1990). Since its development, this scale has been widely used to measure students' metacognitive strategies (e.g., Wolters & Benzon, 2013). In the present study, this scale demonstrated good reliability (α = .86).

Motivation regulation, or students' strategies to control their motivation for academic tasks, was assessed using the eight-item Brief Regulation of Motivation Scale (Example item: "In this class, it's easy for me to make myself study, even if I would rather be doing something else."; Kim et al., 2018). This scale was developed with the explicit intent to capture college students' engagement in motivation regulation strategies. Since its development, researchers have relied on this scale to assess motivation regulation strategy use (e.g., Kim et al., 2020). This scale demonstrated acceptable reliability (α = .89). The language of both scales was modified to emphasize the particular class in which students were enrolled.

Basic Psychological Need Satisfaction

We assessed students' basic psychological need satisfaction (i.e., the need for competence, autonomy, and relatedness) using revised items from the Self-determination Measure for College Students (Jenkins-Guarnieri et al., 2015). Modifications ensured that students in both online and face-to-face courses could accurately complete the items. We also modified the language to focus on a particular class rather than in school generally. Competence, or students' capability in their course, was assessed using six items. An example item aimed at assessing competence was, "In this class, my instructor tells me I am good at what I do." This subscale demonstrated good reliability (α = .66). The subscale used to measure autonomy included four items that assessed students' feelings of control in their classroom. For example, students reported their agreement to the following item: "In this class, I understand the purpose of my class requirements." This scale demonstrated adequate reliability (α = .86). Finally, relatedness, or students' connections to other class members, was assessed using seven items. An example item from this scale was "In this class, my instructor respects and values students." The Self-determination Measure for College Students was developed with the intent of assessing college students' need satisfactions. In addition, prior research has relied on this scale to evaluate psychological basic need satisfaction (Graham & Vaughan, 2022). This scale demonstrated good reliability (α = .90).

Degree Commitment

Students' intentions to persist to degree completion were assessed using a four-item subscale from The College Persistence Questionnaire (Davidson et al., 2009). This questionnaire was developed based on literature on student retention. The authors provided evidence that this questionnaire and, more specifically, the degree commitment schedule was a valid way to assess students' commitment to receiving a college degree (Davidson et al., 2009). An example item from this scale was, "At this moment in time, I am certain that I will earn a college degree." This scale demonstrated good reliability (α = .89).

Course Satisfaction

Students' perceptions of their learning experiences in their course was assessed using an eight-item scale (Gaffney & Gaffney, 2016). This scale was developed with the intent of assessing students' satisfaction in their courses and has been used successfully in prior research (Gaffney & Gaffney, 2016). Students reported how much they agreed with items such as "I was pleased by the variety of activities we had in this class." Analyses suggested that this scale demonstrated good reliability (α = .91).

RESULTS

Quantitative Results

As an initial step in data analysis, we calculated descriptive statistics for all study variables (see Table 4). All variables were relatively normally distributed. The skewness of all study variables fell within a range of -1.50 to 0.57, and the kurtosis of all study variables fell within a range of -0.97 to 1.99.

Means and Standard Deviations

To better understand our participants' experiences in their current courses and their degree commitment, we examined the mean scores of the course satisfaction and degree commitment (i.e., the value that the student attaches to earning a college degree, including both their intentions and estimated likelihood or certainty that a degree will be achieved) scales. Students tended to report a reasonably high level of course satisfaction in the target course (M = 4.03, SD = 0.79). In addition, students indicated that they agreed or strongly agreed that they would complete their degree programs (M = 4.53, SD = 0.69). The majority of students (70%) reported that they were able to choose the delivery format (online or face-to-face) of their classes and tended to report agreement that the format chosen suited their needs (M = 4.17, SD = 1.00) and positively impacted their learning (M = 4.08, SD =0.96).

Examination of the mean scores of the pandemic impact variables provided insights into students' pandemic experiences. Students tended to report that they neither "agree" nor "disagree" that COVID-19 impacted them financially (M = 3.07, SD = 1.01) or affected their mental health (M = 2.92, SD = 1.00). Students also tended to disagree that the pandemic impacted their academics (M = 2.34, SD = 1.04). It is interesting to note that within the subscale, students tended to disagree that the pandemic caused them to fail a class (Item M = 2.47), change their course plan (Item M = 2.40), or change their major (Item M = 2.15). Finally, students tended to report fairly high levels of social support during the pandemic (M = 3.79, SD = 0.79).

To better understand students' pandemic experiences, we calculated the percentage of students who reported "yes," "no," and "prefer not to answer" on each item pointing to the proximity of COVID-19 to participants (see Table 3). These results indicated that almost half of the students (49%) had tested positive for COVID-19 at some point during the pandemic, 88% of students reported knowing someone who tested positive during the pandemic, and a portion of students reported the death of a friend or family member due to COVID-19 (30%).

Examination of the mean scores of students' reported use of metacognitive strategies (M = 4.01, SD = 0.66) and motivation regulation strategies (M = 3.75, SD = 0.79) indicated that students tended to report implementing self-regulated learning strategies in their target course. In addition, students reported that their

need for autonomy (M = 4.34, SD = 0.73), competence (M = 3.63, SD = 0.65), and relatedness (M = 4.00, SD = 0.77) were satisfied in their target course.

Bivariate Correlations

To better understand the relations between study variables, we conducted bivariate correlations (see Table 4). Notably, students' reported financial impact of COVID-19 was not significantly correlated with any study variables except other COVID-19 impacts. Students who reported that COVID-19 impacted their finances also reported that it impacted their mental health (r = 0.42, p < 0.001), academics (r = 0.27, p < 0.001), and social ties (-0.28, p < 0.001).

Similar trends were found when comparing other COVID-19 impact variables. Students who reported that COVID-19 impacted their mental health also reported that COVID impacted their academics (r = 0.35, p < 0.001) and their social support (r = -0.43, p < 0.01). We also found a relationship between COVID-19 impact and students' course experiences. The impact of COVID-19 on mental health was related to students' reported metacognitive and motivation regulation strategies, where students who reported that COVID-19 had a greater influence on their mental health were less likely to use metacognitive strategies (r = -0.14, p < 0.01) and motivation regulation strategies (r = -0.11, p < 0.01). Students who reported that COVID-19 impacted their mental health also tended to report less autonomy need satisfaction (r = -0.12, p < 0.01), less course satisfaction (r = -0.13, p < 0.01), and less degree commitment (r = -0.11, p < 0.01).

Students who reported that COVID-19 impacted their academics also reported that COVID-19 influenced their social ties (r = -0.34, p < 0.01). In addition, students who reported that COVID-19 impacted their academics tended to report less use of metacognitive strategies (r = -0.15, p < 0.01), less use of motivation regulation strategies (r = -0.11, p < 0.01), less autonomy need satisfaction (r = -0.20, p < 0.01), less competence need satisfaction (r = -0.13, p < 0.01), and less relatedness need satisfaction (r = -0.08, p < 0.05). Students who reported that COVID impacted their academics also reported lower course satisfaction (r = -0.18, p < 0.001) and less degree commitment (r = -0.28, p < 0.001).

Students who reported stronger social ties during the pandemic also reported increased metacognitive strategies (r = 0.32, p < 0.001) and motivation regulation strategies (r = 0.33, p < 0.001). Stronger social ties were also associated with autonomy satisfaction (r = 0.38, p < 0.001), competence satisfaction (r = -0.38, p < 0.001), and relatedness satisfaction (r = 0.37, p < 0.001). Students who reported stronger social ties also reported greater course satisfaction (r = 0.33, p < 0.001) and greater degree commitment (r = 0.39, p < 0.001).

There was a strong connection between reported metacognitive strategies and motivation regulation strategies, indicating that students who used more strategies to regulate their metacognition also reported implementing strategies to increase or sustain their motivation (r = 0.69, p < 0.001). Students' reported use of self-regulated learning strategies (i.e., metacognitive strategies and motivation regulation) was also associated with reported need satisfaction. Students who reported implementing more metacognitive strategies also reported great autonomy satisfaction (r = 0.47, p < 0.001), competence need satisfaction (r = 0.44, p < 0.001), and relatedness need satisfaction (r = 0.35, p < 0.001). Similarly, students who reported implementing motivation regulation strategies also reported greater levels of autonomy need satisfaction (r = 0.44, p < 0.001), competence need satisfaction (r = 0.47, p < 0.001), and relatedness need satisfaction (r = 0.37, p < 0.001). Both metacognitive strategies and motivation regulation strategies were related to course satisfaction and degree commitment, as well. Students who reported greater metacognitive strategies also reported greater course satisfaction (r = 0.49, p < 0.001) and degree commitment (r = 0.36, p < 0.001). Similarly, students who reported greater motivation regulation strategies also reported greater course satisfaction (r = 0.47, p < 0.001) and degree commitment (r = 0.30, p < 0.001).

Students' satisfaction of their basic psychological needs were related, as well. Students who reported great autonomy need satisfaction also reported greater competence need satisfaction (r = 0.59, p < 0.001) and relatedness need satisfaction (r = 0.63, p < 0.001). Also, students who reported greater competence need satisfaction reported greater relatedness need satisfaction (r = 0.58, p < 0.001). Need satisfaction was also correlated with course satisfaction and degree commitment. Specifically, autonomy need satisfaction was positively correlated with course satisfaction (r = 0.58, p < 0.001) and degree commitment (r = 0.46, p < 0.001), competence need satisfaction was positively correlated with course satisfaction (r = 0.64, p < 0.001) and degree commitment (r = 0.39, p < 0.001) and relatedness satisfaction was positively correlated with course satisfaction (r = 0.46, p < 0.001) and degree commitment (r = 0.38, p < 0.001). Finally, course satisfaction and degree commitment were associated with one another, where students who reported greater course satisfaction learning also reported greater degree commitment (r = 0.44, p < 0.001).

Path Analysis

As a final step in our quantitative analysis, we conducted a path analysis using Mplus 8 (Muthen & Muthen, 2020). We examined the relationship between students' reported COVID-19 impacts on motivation and self-regulated learning. We hypothesized that the reported financial impact, mental health impact, academic impact, and social ties resulting from the pandemic would predict autonomy, competence, and relatedness. In turn, we hypothesized that autonomy, competence, and relatedness would predict metacognitive strategies and motivation regulation. To evaluate the model fit, we used the fit indices cutoffs specified by Hu and Bentler (1999). Our initial model did not demonstrate acceptable fit ($\chi 2(11)$ = 501.25, p < .001, *CFI* = 0.64, *TLI* = 0.03, *RMSEA* = 0.28, *SRMR* = 0.15). To respecify the model, we reviewed the correlation residuals and allowed the three basic needs (i.e., autonomy, relatedness, and competence) to correlate with one another. This model demonstrated acceptable fit ($\chi 2(8)$ = 28.32, p = .0004, *CFI* = 0.99, *TLI* = 0.95, *RMSEA* = 0.07, *SRMR* = 0.03). All significant pathways are shown in Figure 1. The social impact of COVID-19 predicted reported autonomy (β = 0.39, p < .001), competence (β = 0.43, p < .001), and relatedness (β = 0.43, p < .001). The academic impact of COVID-19 predicted autonomy (β = -0.1, p = .02). The mental health influence of the pandemic predicted competence (β = 0.10, p = .03). Our path analysis indicated that approximately 16% of the variance in autonomy was explained by COVID-19 academics and COVID- 19 social ties (R^2 = 0.16). Similarly, 16% of the variance in competence was explained by COVID-19 mental health and COVID-19 social ties (R^2 = 0.16). Lastly, 15% of the variance in relatedness was explained by COVID-19 social ties (R^2 = 0.15).

Table 4. Bivariate Correlations of Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11
1. COVID Impact– Financials	1										
2. COVID Impact– Mental Health	.42***	1									
3. COVID Impact– Academics	.27***	.35***	1								
4. COVID Impact– Social Ties	-.28***	-.43***	-.34***	1							
5. SRL– Metacognitive Strategies	0.00	-.14**	-.15***	.32***	1						
6. SRL– Motivation Regulation	0.04	-.11**	-.11**	.33***	.69***	1					
7. Need Satisfaction–Autonomy	-0.06	-.12**	-.20***	.38***	.47***	.44***	1				
8. Need Satisfaction– Competence	-0.02	-0.07	-.13**	.38***	.44***	.47***	.59***	1			
9. Need Satisfaction– Relatedness	-0.01	-0.08	-.08*	.37***	.35***	.37***	.63***	.58***	1		
10. Course Satisfaction	-0.04	-.13**	-.18***	.33***	.49***	.47***	.58***	.64***	.46***	1	
11. Degree Commitment	-0.03	-.11**	-.28***	.39***	.36***	.30***	.46***	.39***	.38***	.44***	1
Mean	3.07	2.92	2.34	3.79	4.01	3.75	4.34	3.63	4.00	4.03	4.53
Standard Deviation	1.07	1.00	1.04	0.79	0.66	0.79	0.73	0.65	0.77	0.79	0.69
Cronbach's Alpha	.77	.81	.77	.85	.86	.89	.86	.67	.90	.91	.89

Note. SRL stands for self-regulated learning. All items were measured on a five-point scale, thus the means are out of five-points.
*** $p < .001$, ** $p < .01$, * $p < .05$

When considering the impact of basic need satisfaction on self-regulated learning strategies, we found that students' feelings of autonomy predicted motivation regulation ($\beta = 0.22$, $p < .001$) and metacognitive strategies ($\beta = 0.31$, $p < .001$). Similarly, competence predicted motivation regulation ($\beta = 0.32$, $p < .001$) and metacognitive strategies ($\beta = 0.26$, $p < .001$). Relatedness did not significantly predict motivation regulation or metacognitive strategies. Findings indicated that 20% of the total variance in metacognitive strategies was explained by satisfaction of autonomy and satisfaction of competence ($R^2 = 0.20$) and 20% of the variance in motivation regulation strategies was explained by satisfaction of autonomy and satisfaction of competence ($R^2 = 0.20$).

Qualitative Results

Participants provided 504 responses to the open-ended question about their COVID-19 pandemic experiences. The thematic analyses revealed seven final themes and included impact on: a) academic experience, b)study adjustment, c)social aspect, d)mental health, and e)finances. In addition, 50 statements indicated that the pandemic had f)no effect on learning experiences, and 65 statements were placed in an "other" category. In the following sections, we provide an overview of each theme, report on the number of statements that aligned with each theme, and provide exemplar quotes.

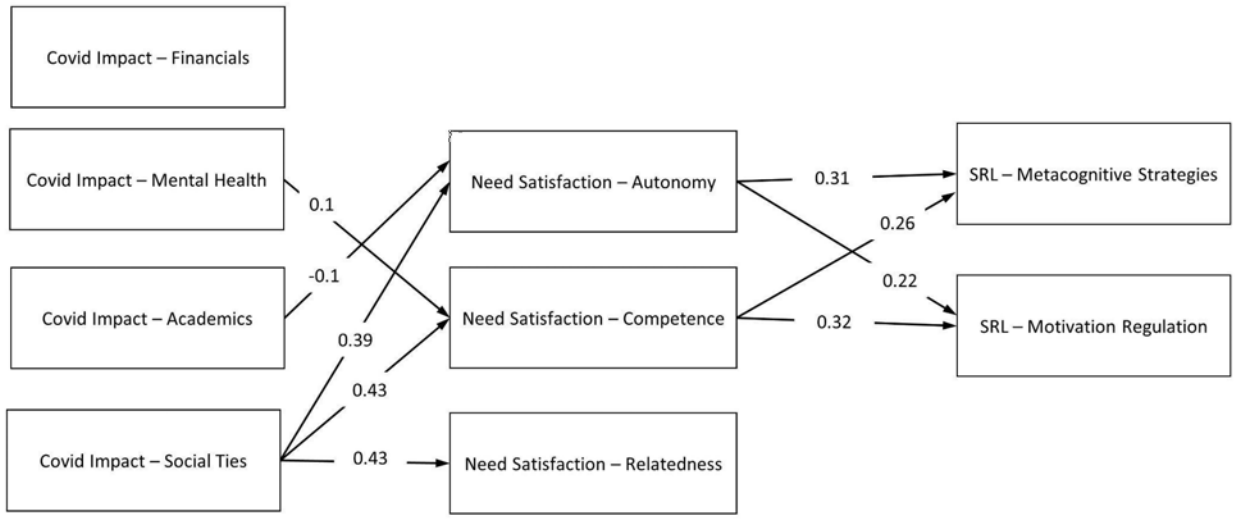

Figure 1. Path Analysis of COVID-19 Impacts, Psychological Need Satisfaction, and Self-regulated Learning.
Note. Only statistically significant pathways are shown in this figure.

a) Academic Experience

Participants identified academic experience (henceforth "academics") as the category most affected by the pandemic. Students provided a total of 345 statements: 233 statements identified the pandemic as having a negative impact, 78 statements indicated a positive impact, 22 statements noted both a negative and positive impact, and 12 statements were placed into the "other" category.

Negative Impact (233 Statements)

Most statements indicated that the pandemic had a negative impact on students' academic experiences. Responses indicated that the shift to remote and online learning was difficult and felt ineffective; the academic performance saw a decline; the motivation to study decreased; students missed in-person interactions with peers and professors, which affected engagement and understanding of course material; and that the overall negative impact on well-being affected academic experiences. Statements included:

> The COVID-19 Pandemic has impacted my learning by not being able to attend class in person. I am a face-to-face learner and I feel like I struggled a lot more than I would have done without the pandemic.
>
> The COVID - 19 pandemic has hindered my learning experience a little bit just because I didn't feel much motivation to get up and do work sometimes, especially with being online.
>
> The COVID-19 Pandemic impacted my learning because classes went virtual and I felt like I didn't have to try so hard so I didn't
>
> It has lowered my gpa and caused me to learn bad study habits.
>
> COVID-19 has impacted my learning by making it harder to get in contact with teachers faster.
>
> There are several professors that I would have loved to have more of an option to interact with in class, but couldn't due to online learning.
>
> The pandemic has impacted my learning experience by ruining my freshman year. All my classes were online or on Zoom. My roommate at the time got the virus and ended up staying in her hometown. Thus, I never met or had a roommate. Also, since all my classes were online, I failed two classes because some classes are extremely hard to do online. All my four years in high school, I never failed a class. Now I failed two classes and am a semester behind and I blame it on the pandemic!

Positive Impact (78 Statements)

Some students indicated that the shift to emergency online learning during the pandemic led to various academic and personal growth experiences. Responses indicated that the online format allowed for self-paced learning and flexibility; encouraged them to adapt to online environments and become comfortable with virtual learning; showed students that there are other ways to learn, except face-to-face learning; improved their focus and time management and expanded their learning opportunities because it allowed them to continue their education while balancing other responsibilities such as work and family. Statements included:

> It taught me that I do better learning at my own pace rather than in face to face situations.
>
> It made my learning experience more dynamic and flexible because I have options to take courses online when I have a strenuous schedule.
>
> COVID-19 pandemic has impacted my learning experience by now being used to taking online classes and learning from an online course.
>
> It has given me more options of learning.
>
> I had to adjust to learning material online vs face-to-face. By making this adjustment I learned that I am better at working/learning online.
>
> Since the beginning of the pandemic I feel there has been more opportunity for more online learning than before and this is beneficial to me in order to maintain my full-time position in both work and school. I am able to work without interruption during the week as I am able to work in the evenings/weekends in order to complete class work.
>
> COVID made me realize I learn better online and by myself because I learn in different ways than others. At the beginning of the pandemic when high schools were shutting down, they moved our classes online and it made me realize I liked it better, so now I do not like going to face-to-face classes everyday.
>
> It showed me how you can learn online. It showed me that there's more than one learning style & ways to teach or learn. I feel like it impacted my learning experience positively.
>
> The pandemic has helped me focus even more on completing my degree and staying focused on my classes with A's or B's.

Both Negative and Positive Impacts (22 Statements)

Some students indicated the dual effect of the pandemic on their learning experience. At first, many reported a negative effect due to challenges with remote classes, lack of motivation, and missed in-person interactions. At the same time, students felt that transitioning to online learning presented some benefits. Statements included:

> The COVID-19 Pandemic initially had a negative impact on my learning experience. I did not thrive with the Zoom meetings, as I find it hard to self-regulate and stay motivated when there are distractions at home, even when I could put a desk in my guest bedroom and close the door. I missed having in-person class discussions, and I transferred to [institution] in the middle of the pandemic, so I didn't get a chance to make connections like I would have been able to if all classes were face-to-face. However, like many students, I have overcome these struggles, learned to self-regulate, made friendships and connections, and committed myself even more to my studies. Without these challenges, I wouldn't have pushed myself harder to be at the point I am now, and I am proud of my progress and current standing.
>
> It has impacted my learning experience in a good and bad way. The good in it is that with classes I can go at my own pace and still be able to keep up with the class and not struggle to move too fast. The bad is losing relationships with friends because of not talking or seeing them as much.

> The COVID-19 pandemic has impacted my learning in good and bad ways. It gave me an opportunity to kind of not be as stressed with school and go to work. However, not being in a classroom setting sometimes made me miss the social aspect of school. I wanted to attend school events, participate in organizations, go on club conferences, and also just have a better understanding of school. Sadly due to COVID I missed out on all of this.

b) Study Adjustment (42 Statements)

In this category, we identified 42 statements. Many students mentioned that the pandemic forced them to adapt to online learning. Students had to figure out how to study effectively and independently. Initially challenging, they eventually became better at handling online classes, developing new study habits, and finding effective ways to learn at their own pace. Some discovered that they performed well in online classes and found that the experience during the pandemic taught them the importance of time management, self-discipline, and finding better ways to understand and retain course materials. Statements included:

> I think it has impacted me in a good way because it has allowed me to learn on my own and at my own pace.

> COVID-19 helped me learn that I actually do very well in online classes, if not better in online then in person classes.

> Taught me to adjust to new learning styles

> It has made me become more adaptable with learning. However instead of actually retaining information I feel like I just know how to pass classes.

> The COVID-19 pandemic has affected my learning experience by making me have to relearn how to learn. Learning online versus in class is very different.

c) Social Aspect (42 Statements)

In this category, we identified 42 statements. Many students indicated that the pandemic exacerbated their existing social challenges or created new ones. It made socializing, forming new relationships, and interacting with people more difficult. Using online platforms for classes and limited in-person contact led to struggles connecting with peers, professors, and classmates. Some mentioned missing out on important social experiences like prom and graduation. At the same time, the pandemic prompted some students to reflect on their goals and priorities and reevaluate their chosen career paths and academic pursuits, leading to positive shifts in their education trajectory. Statements included:

> I'm already not a very social person. The pandemic made it 10x worse. I don't know how to socialize with people that I don't know.

> Starting college, it's already hard meeting people and coming to a city where you don't know anyone. The pandemic made meeting new people and starting new relationships very hard.

> Because of the pandemic, I was removed from the public school system at the beginning of my junior year of high school. I was never able to attend Prom or a formal high school graduation.

> COVID-19 encouraged me to take another break in the pursuit of my degree as well as some personal health issues. It allowed me time to reevaluate my degree decision and realize I was going after it because everyone had told me that is what I chose and not because it was the degree I actually wanted to have. I switched my degree path and school in fall of 2021 and have been much happier in my pursuit of higher education and have found great friends here at [institution].

> I pretty much missed out on 2 1/2 years of high school because of the pandemic and I feel like I was robbed of a normal high school experience and it caused me to lose social ties with a lot of my peers.

d) Mental Health (20 Statements)

In this category, we identified 20 statements. Many students reported experiencing heightened levels of depression, anxiety, and stress due to the pandemic. These mental health challenges often led to a loss of motivation, focus, and confidence in academic pursuits. Social isolation contributed to feelings of uncertainty, difficulty concentrating, and reduced academic performance. Students' statements collectively highlight the profound influence of the pandemic on mental well-being and how it has, in turn, affected various aspects of the learning process, ranging from motivation and focus to the overall academic performance. Statements included:

> I got depressed and couldn't get help so my grades fell behind.

> The pandemic made me lose confidence and motivation to do almost anything.

> COVID intensified my already existing depression, making my focus in school difficult

> The COVID-19 Pandemic forever changed me mentally thus affecting my academics. I am suffering the consequences of it till this day and it shows through my academics.

> It has affected my mental health immensely (depression, anxiety disorders) which have in turn made it very difficult for me to focus and stay motivated on school.

e) Financial Impact (12 Statements)

In this category, we identified 12 statements**.** The pandemic caused financial difficulties for some respondents such as job loss or changes in employment status. This in turn, affected their ability to support themselves and their families. The need to manage financial constraints while pursuing an education was a significant challenge. Some students had to work more hours due to the pandemic, leaving them with little time for sleep and homework after classes. The demanding schedules made it problematic to balance work and academic responsibilities. Statements included:

> I had to start working full time because of the pandemic and struggled because I had to take my classes online. I was very used to in person and structured classes and had to change completely due to my financial hardships and the pandemic restrictions.

> I have moved to all online classes so I can pay for school due to the fact that I lost HOPE while we were in the pandemic.

> Because of COVID I have had to work double my hours, leaving little to no time to sleep after classes let alone do the homework assigned.

> It has had an impact on my personal life financially. I was not able to keep my job due to having a special needs child whom I needed to ensure was good throughout the pandemic.

f) No Change (50 Statements)

In this category, we identified 50 statements**.** For a large number of students, the pandemic did not seem to have a reported impact on their learning experience. Statements included:

> COVID-19 has not impacted me in my personal life or learning experience.

> It has not impacted my learning, only revitalized my wanting to finish my pursuit of a degree.

> It did not impact it negatively or positively.

DISCUSSION

The study set out to explore students' perceptions of their ongoing pandemic experiences and impact and its effects on need satisfaction and self-regulated learning. Our data was collected later in the pandemic (fall 2022) when students already had a chance to return to in-person learning for most of their classes at our institution. Unlike many studies on the effect of the pandemic, we focused on the ongoing impact and explored both need satisfaction and self-regulated learning together. We also pursued a multi-methods approach, unlike previously mentioned studies that focused either on qualitative (Sharaievska et al., 2022) or quantitative (El-Monshed et al., 2022) methods. Finally, this study gave us an opportunity to explore our students' experiences across multiple disciplines, and examine if the local context supports or contradicts previous findings. Ultimately, we were interested in gaining a deeper understanding of students' experiences to inform our own teaching. Findings point to the far-reaching ongoing effects of the pandemic on college students enrolled in undergraduate classes at our institution.

Students' Experiences during the Pandemic

Findings highlight that COVID-19 impacted the majority of students in our sample. Notably, 49% reported testing positive for COVID-19, 88% reported knowing someone who tested positive, and 30% reported losing a family member or friend to COVID-19. The standard deviation for each of the pandemic impact subscales was low, indicating that students tended to report similar financial, mental health, and academic impacts. Interestingly, our qualitative findings indicated some variation related to students' experiences throughout the pandemic. While students' responses confirmed the negative effects of the pandemic on mental health and academic experiences (Randall et al., 2022; Zimmerman, et al., 2021), few statements pointed to the financial impacts of COVID-19. The latter finding could be explained by the transitory effect of financial difficulties during lockdowns that eased once the community abolished lockdown measures.

Previous research has revealed that various mental health disorders may become lasting issues, including anxiety disorders and panic disorders (Iqbal et al., 2020). Although our students reported effects on their mental health, these effects were not prevalent among their qualitative responses. This may be because students who had longer-term impacts on their mental health did not persist at our institution and, thus, were not captured in our sample. However, other studies (Charles et al., 2021) show that by Fall 2020, students' mood disorder symptoms, perceived stress, and alcohol use had returned to their pre-pandemic levels.

In addition, in some cases, students did not report any effect of the pandemic on their learning, and some viewed the transition to online learning positively. For example, students noted that the shift in course modality allowed them to focus more on their studies and access materials at their convenience. These students actually found online learning preferable to a more traditional face-to-face experience. Also, it seems the pandemic prompted individuals to adapt and develop new study strategies. This progress supports previous studies that reported positive effects and reactions to the pandemic experience (Bozkurt & Sharma, 2020; Sharaievska et al., 2022) but also indicates that the pandemic did not have a homogenous effect on students.

Our qualitative findings indicated that students found the transition to emergency remote teaching difficult and missed the in-person interactions, discussions, and relationships with peers and professors, all fundamental to traditional learning. These results support previous findings highlighting students' difficulties during the initial transition to online learning (Sharaievska et al., 2022). At the same time, students' mean scores on the COVID-19 social impact scale indicated that they were generally satisfied with their relationships and social ties during the pandemic, including relationships with their professors. Such relationships may have protective effects and mediate the negative effects reported by students. This finding contradicts previous studies indicating either the dissolution of ties or no change in ties among some populations (Bertogg & Koos, 2022).

The qualitative findings indicated that students' pandemic experiences varied, highlighting that students had different paths during the pandemic and may require individualized instructional approaches. These instructional approaches cannot be one-size-fits-all; instead, they should align with the specific challenges that students face. As instructors, we might not be privy to the unique challenges of each of our students, but we can utilize high quality teaching strategies to provide universal support for their learning. For example, the implementation of trauma-sensitive teaching practices may address multiple specific challenges simultaneously (Garrity, 2022). Future research should continue to work to disentangle the impact of the pandemic, ways to identify individual students who are most in need of support services, as well as to capitalize (and reinforce) the resiliency practices learned during the pandemic.

The Influence of the COVID-19 Pandemic on Need Satisfaction and Self-regulated Learning

In general, quantitative findings indicated that students' pandemic experiences influenced students' reported psychological need satisfaction. Students who reported that the pandemic negatively influenced their mental health also reported greater perceptions of competence in their classes. Students who reported that the pandemic negatively influenced their academics reported decreased perceptions of autonomy in their classes. Finally, students who reported greater satisfaction with their social relationships during the pandemic reported greater autonomy, competence, and relatedness. During data collection in Fall 2022, approximately a year and a half had elapsed since the onset of the pandemic. The significant influence of mental health, academic challenges, and strained social connections on students' funda-

mental psychological needs underscores the continuing impact of the pandemic on students' learning. In addition, these findings provide insights into our understanding of self-determination theory and self-regulated learning theories.

Empirical studies have emphasized that the COVID-19 pandemic and quick transition to online learning negatively influenced students' motivation and self-regulation (Usher et al., 2021). Research has also highlighted that students perceived self-regulated learning processes, such as time management, particularly challenging during the pandemic (Han et al., 2023). Similarly, Hensley et al. (2022) found that students described less self-efficacy and decreased engagement in their coursework during the transition to remote learning. Our findings expand on these earlier studies by demonstrating the continued role students' experiences throughout the pandemic may play in shaping their in-class motivation and self-regulated learning. More specifically, students' reported mental health, academics, and strained social ties resulting from the pandemic influenced their need satisfaction in the classroom.

It is noteworthy that the financial impact of COVID-19 was not significantly related to autonomy, competence, or relatedness. This observation suggests that although students were affected financially by the pandemic, this impact may not endure to the same extent as the effects on mental well-being, academic performance, and social connections. Alternatively, it is plausible that the financial ramifications of COVID-19 exert an influence on other facets of students' collegiate experiences that were not measured by the current study. Given the widespread financial strain experienced by numerous students and their families during the pandemic, it may be necessary to examine how these financial pressures intersect with and potentially shape other dimensions of college students' academic experiences.

Findings also highlight the influence of factors outside of the classroom on psychological need satisfaction. Although college instructors likely have a considerable influence on the satisfaction of students' basic psychological needs via instructional approaches and assignments (Hensley et al., 2021), they are not the sole influencers on students' psychological need satisfaction. The prior experiences that students bring into the classroom, in this case, COVID-19 experiences, may also influence students' perceived satisfaction of psychological needs.

Both autonomy and competence positively predicted students' use of metacognitive strategies and motivation regulation. Because satisfaction of competence of autonomy and competence is central to adaptive motivational beliefs, the strong connection to self-regulated learning was not surprising. Relatedness did not significantly predict students' use of metacognitive strategies or motivation regulation strategies, thus indicating that satisfaction of relatedness may be less critical than satisfaction of autonomy and competence for engagement in self-regulated learning. These findings add to the growing body of work emphasizing the connection between need satisfaction and students' implementation of learning strategies (Langdon et al., 2024).

IMPLICATIONS AND FUTURE DIRECTIONS

The COVID-19 pandemic has had a profound impact on postsecondary institutions and students worldwide. As colleges and universities grappled with the sudden need to adapt to remote learning and navigate unprecedented challenges, the response from college instructors varied, reflecting the diverse approaches within and across institutions. However, despite this variability, emerging research suggests common trends that persisted throughout the pandemic's various stages and across international contexts.

As we continue to elucidate the impacts of the pandemic, it is imperative to investigate how they influence students' academic experiences and outcomes. In particular, investigating these impacts in different places by different people at different times (Friberg, 2018) will provide a more nuanced cross-cultural understanding of the pandemic effects, thus allowing researchers to develop more effective interventions to support students. Exploring these impacts within diverse educational settings will shed light on the challenges faced by students from different socio-economic backgrounds, cultural contexts, and geographic regions and can develop targeted interventions to address the specific needs of different student populations. Moreover, investigating the long-term consequences of the pandemic on higher education will provide valuable insights into how institutions can adapt teaching methodologies, enhance support services, and foster resilience among students and faculty alike.

While it is beyond the scope of this study, previous research has also highlighted the influence of the pandemic on teachers in a variety of ways. Some of those include: stress and burnout, lack of support and feeling overwhelmed, challenges of virtual instruction and increased workloads (Sokal et al., 2020; MacIntyre et al., 2020; Kim & Asbury, 2020). Because the college instructor contributes immensely to whether students' basic psychological needs are fulfilled, conducting additional studies on their experiences during the pandemic may also be important. It would be interesting to explore whether there are any lasting influences of COVID-19 on faculty members and to what extent these experiences influence their instructional approaches, relationships with students, and their ability to provide personalized support to their students.

Future researchers should continue to expand on these findings to explore the persistent influences of the pandemic on students' classroom experiences. In the present study, students reported on their self-regulated learning and motivation in a single classroom, but it would be interesting to compare students' self-regulated learning and motivation more generally across multiple classes.

LIMITATIONS

When interpreting and generalizing the demographics of the sample should also be taken into account. This sample was primarily composed of women pursuing majors related to the health professions. Future research should explore the ongoing impact of the pandemic within other populations of students. This is especially relevant given reports on how the pandemic disproportionately influenced particular communities (Xiong et al., 2020).

Finally, there may be limitations to using self-report surveys focused on students' experiences. In particular, it could be that students misremembered details related to the influence of the pandemic. Students may also have included different details if open-ended items had been phrased to relate to specific aspects of students' learning experiences or lives. Of course, in the present study, our goal was to capture students' *perceptions* of the influence of COVID-19; thus, self-report surveys were in line with our research questions. However, it is still essential to recognize the limitations of this data collection approach.

CONCLUSIONS

Findings from the present study indicate that the COVID-19 pandemic has persistent impacts on college students. However, there is some evidence that these experiences varied between students. Researchers should continue to explore the influence of the pandemic on college students and, in turn, best practices to provide support based on students' COVID-19 experiences.

ACKNOWLEDGEMENTS

This project is a result of a year-long Faculty Learning Community on SoTL. We thank our Faculty Center for the opportunity to be a part of it.

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