

College Students' Academic Online Engagement, Creative Self-Efficacy, Self-Regulation and Wellbeing During the Pandemic

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ABSTRACT

The COVID-19 pandemic forced students' learning to shift rapidly to an exclusively online environment. This led to an increase in issues such as anxiety and stress that may have negatively impacted student wellbeing. The present study was designed to investigate college students' creative self-efficacy, self-regulation, and online academic engagement in relation to their wellbeing during the COVID-19 pandemic. The study utilized a survey method to analyze data from 461 respondents, examining the academic, psycho-social, and demographic factors associated with changes in students' wellbeing during COVID-19. The results show that the changes in students' wellbeing during the pandemic were significantly and positively related to their engagement in e-learning, self-regulation, and creative self-efficacy. Students' engagement in e-learning and self-regulation was significantly changed by students' gender and academic grade levels. Race was a significant predictor of creative self-efficacy. Engagement in e-learning and self-regulation scores were highest among English Language Learners (ELL) students. Freshman students scored the lowest in creative self-efficacy. Compared to athletic students, non-athletes reported significantly higher engagement in e-learning, self-regulation, and creative self-efficacy. Discussions and recommendations are presented based on the results.

Keywords: Creative self-efficacy, e-learning engagement, self-regulation, wellbeing.

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1. INTRODUCTION

Online learning has grown increasingly common in the past two decades due to its convenience. It has been viewed as an effective approach for accommodating students in need of distance learning. At the same time, hybrid learning, including face-to-face, online, and self-paced, has also risen in popularity. An appropriate and systematic approach to blended learning leads to better student experiences and outcomes as well as more efficient teaching practices (Serrano *et al.*, 2019). But despite these advantages, face-to-face learning is still the primary method for teaching and learning in higher education.

The recent COVID-19 pandemic disrupted these traditional online, blended, and face-to-face learning and teaching practices and forced all learning to occur in isolated, online learning environments that may have

potentially impacted student wellbeing. Students' intention to use online learning was determined by several variables, including perceived enjoyment, experience, computer anxiety, and perceived creative self-efficacy (e.g., Naji *et al.*, 2020). The forceable shift from face-to-face to online learning has created wellbeing challenges for students as the interrelationship between their mental health and academic performance became more visible during such crises (Watermeyer *et al.*, 2020). Many studies associated poor mental health, anxiety, and depression with poor academic performance and attrition (e.g., Elmer *et al.*, 2020; Heim & Heim, 2021; Kaparounaki *et al.*, 2020; Mey & Yin, 2015; Stallman, 2010). Elmer *et al.* (2020) reported a significantly higher rate of student depression during the pandemic. Another study found that self-efficacy was one of the factors affecting online learning among college students during the pandemic (Sim *et al.*, 2020). Exclusive online



learning requires more self-regulation skills from students in order for them to achieve their learning goals. Increasing students' self-regulatory skills must be a central priority for online education, which can be achieved through curriculum structure and study rhythm, feedback, and provide opportunities (Boor & Cornelisse, 2021). A study focused on online academic engagement presented peer observation as a way to guide its participants' reflections on their own practice, support their collegiality with academic peers, and build their confidence and competence in the synchronous virtual learning environment (Andrew et al., 2021).

Before the pandemic, academic institutions did not always prioritize social and emotional learning. However, because of the obvious difficulties that have come to light as students struggle to adapt, it is clear that these skills have become more important than ever (Tunc et al., 2022). We designed a study to better understand how college students' wellbeing was affected by their non-cognitive personal skills, including self-regulation, self-efficacy, and academic engagement.

2. THEORETICAL FRAMEWORK

We used current literature on college students' wellbeing, self-regulation, self-efficacy, and academic engagement to form our theoretical framework for the current study.

2.1. Wellbeing

Seligman (2011) defined wellbeing in his PERMA framework with reference to five principles that each can be independently measured: positive emotion, engagement, meaning, positive relationships, and accomplishment (Seligman, 2011). Some researchers considered wellbeing from a domain-based perspective as the result of flourishing across different domains of life, including social, emotional, occupational, spiritual, physical, etc. (e.g., Diener & Biswas-Diener, 2011; Goodman et al., 2017; Lyons et al., 2012; Rath & Harter, 2010). In a school setting, wellbeing is an essential component of students' ability to function well in all life domains (Skrzypiec et al., 2016). Research showed that wellbeing enhances intrinsic motivation, decreases disciplinary problems, increases academic achievement, social interactions, and creativity, improves school satisfaction, and provides life-long advantages in health, work, and relationships (Bates & Boren, 2020; Bucker et al., 2018). Cameron (2012) found that inducing positive emotions enlarges cognitive perspectives and enhances the ability of individuals to attend to more information, make richer interpretations, and experience higher levels of creativity and productivity. The negative emotions caused by pandemics, such as COVID-19, would have the opposite effects on the cognitive perspective, creativity, relationships, and overall wellbeing of students.

2.2. Self-Regulation

Self-regulation, also referred to as self-management, is the ability to regulate one's emotions, thoughts, and behaviors effectively in different situations. This includes managing stress, delaying gratification, motivating oneself,

and setting and working toward personal and academic goals (CASEL, 2018). Self-regulation in online learning has been regarded as one of the fundamental factors affecting learning success in online environments (Cho & Shen, 2013). Recent literature has shown that self-regulation positively influences learning outcomes in online environments such as MOOCs (Lee et al., 2020). Emotional regulation helps students to exhibit pro-social behavior, which helps them to get along with peers and instructors as well as adjust to new learning environments (Furlong et al., 2013). The positive emotions have been positively associated with effort, self-regulation, and more sophisticated learning strategies, whereas anger, frustration, shame, anxiety, and boredom have been associated with lower performances and external regulation (e.g., Pekrun et al., 2011). In online contexts, D'Errico et al. (2016) indicated that positive emotions were commonly higher than negative emotions across different e-learning activities, particularly during synchronous activities with a teacher and peers. This finding suggests that asynchronous or isolated online learning could result in a less positive emotion toward learning, which in turn could cause less self-regulation and lower academic performance.

2.3. Creative Self-Efficacy

Self-efficacy is the belief in one's ability to succeed in achieving an outcome or reaching a goal. Self-efficacy reflects confidence in the ability to exert control over one's own motivation, behavior, and environment and allows students to become effective advocates for themselves (Bandura, 1997). Academic self-efficacy is a well-recognized construct in learning that has been found to be associated with wellbeing in educational settings (Chemers et al., 2001). Creative self-efficacy represents an important extension of the more general construct of self-efficacy (Tierney & Farmer, 2002). Creative self-efficacy is related to the effort and intellectual risk-taking necessary for creative expression and is connected with gender, socioeconomic status, and locality size (Beghetto, 2006; Karwowski, 2011). Research shows that, in order for students to successfully express their creative selves, they must be confident in their abilities to produce original and appropriate solutions to problems (Saygi et al., 2022). Students with higher levels of creative self-efficacy were significantly more likely to hold more positive beliefs about their academic abilities in all subject areas, more likely to attend college, and more likely to participate in after-school academics and group activities than students with lower levels of creative self-efficacy (Beghetto, 2006). Karwowski (2011) reported that socioeconomic status was a positive predictor of creative self-efficacy. The study found male students were characterized by higher self-efficacy than female students, and they also tended to overestimate their creative self-efficacy as predicted by abilities. On the other hand, females underestimated their creative self-efficacy. In this study, we examined both male and female students' creative self-efficacy in relation to their wellbeing during the COVID-19 pandemic, which resulted in a new addition to the literature. Kuo et al. (2020) reported that students' online self-efficacy was positively related to self-regulation at a significant level. This

relationship was also examined in the COVID-19 pandemic situation in this study. Zimmerman and Kulikowich (2016) also reported that students with a high level of online learning self-efficacy are more likely to be successful in online courses. The opposite would be true for less online learning self-efficacy, especially that caused by pandemics such as COVID-19, which are likely to result in less successful online learning.

2.4. Online Engagement

Academic engagement is a term most commonly used to describe a compendium of behaviors that involve student learning (Krause, 2005). Online engagement can be defined as a student's emotional, behavioral and cognitive connection to their study in the online context, and this connection has a direct impact on student success and achievement (e.g., Kahu et al., 2014). Online engagement in higher education has been shown to have a significant influence on student online learning outcomes. Correlation has been found between students' academic success and the resources accessed in online environments (e.g., Crampton et al., 2012). The institutional effect is one of the important elements that motivates and affects students' academic engagement. Lack of motivation is viewed as one of the key factors inhibiting online engagement (Hartnett et al., 2011; Mahande & Akram, 2021; Shih et al., 2013). A recent study that examined factors affecting the use of e-learning during the COVID-19 pandemic found that the perceived impact of factors such as motivation for online learning, self-efficacy beliefs about online learning, and self-directed learning online on readiness differ significantly between publicly offered courses and non-public courses (Naji et al., 2020). The study also showed that motivation impacts students' online engagement during a pandemic due to the institutional effect, as well as that a student's personality and social support can impact their engagement, wellbeing, and self-efficacy. Zheng et al. (2020) reported that students with a proactive personality strengthened their networks of relationships through online interaction during the COVID-19 pandemic. The study also reported that this social support improved the quality of online interaction for both proactive personalities and the networks of relationships among people. This aligned with a recent argument on why some students with demographic characteristics associated with lower completion rates are retained and do go on to successfully complete their studies, while similar others do not (Kahu & Nelson, 2018). The effect of gender, ethnicity, grade levels, and extra-curricular activities such as sports on students' online engagement, self-efficacy, self-regulation, and wellbeing during the pandemic needs to be further studied to provide a better understanding of the conceptual framework that supports academic engagement and leads to academic success and wellbeing.

2.5. Purpose of the Study

The purpose of this study was to investigate the correlation between college students' academic, creative self-efficacy, self-regulation, online academic engagement, and wellbeing during the COVID-19 pandemic, as well as

to determine if non-cognitive skills can predict college students' perceived stress and wellbeing during the pandemic. In addition, we compared the results by gender, grade level, athletics, and ethnicity.

The research questions are as follows:

H₁: How do college students' perceived creative self-efficacy, self-regulation, and online academic engagement scores explain their wellbeing and perceived stress scores?

H₂: How do these relationships that will be tested in H₁ change according to the ethnicity, gender, grade levels, and extra-curricular status of participants?

3. METHODS

To understand how college students' wellbeing was affected by the COVID-19 pandemic, we designed a survey to collect data on students' gender, ethnicity, grade level, and extra-curricular activities, as well as four sets of questionnaires that capture students' creative self-efficacy, self-regulation, online engagement, and wellbeing.

3.1. Participants

The participants of this study were college students from a private 4-year institution located in south central United States that hosts students from all over the world. The university comprised 1,067 students, including graduate, undergraduate, and English Language Learning (ELL) students. All students were invited to participate in the study, and 461 of them responded to the survey. Of this group, 62.04% were male, 37.74% were female, and one student identified as other. Demographically, 19.74% were African American, 31.89% were Asian, 13.02% were Hispanic, 26.9% were White, and 8.46% were identified as others. In terms of grade levels, 17.79% were freshmen, 9.33% were sophomores, 9.33% were juniors, 7.16% were seniors, 36.23% were master students, and 20.17% were English learners. Also, in this group, 23.43% identified as athletes, and 76.57% were non-athletes. We analyzed how these four factors, including gender, demographic, grade level, and athletic association, affected students' creative self-efficacy, self-regulation, academic engagement, and wellbeing.

3.2. Data Collection

This study collected data via an online survey. The first part of the survey collected data on gender, ethnicity, grade levels, and extra-curricular activities. Then, four sets of questionnaires were distributed to obtain data on students' creative self-efficacy, self-regulation, online engagement, and wellbeing. Participants were sent an online link along with an invitation letter and consent form. Student responses were then exported to the IBM SPSS for analysis.

3.3. Instrument

3.3.1. Demographic Questionnaire

The demographic questionnaire included questions asking about participants' gender, ethnicity, grade level (language school, freshman, sophomore, junior, senior, and graduate students), and extra-curricular activities (whether students participated in an athletic program).

3.3.2. Creative Self-Efficacy

A creative self-efficacy questionnaire was designed to capture students' perceptions of their strengths in areas related to social-emotional learning, such as creative ability, imagination and ingenuity, ability to cope with difficult situations, etc. Students were asked to respond to questions like "I know I can effectively solve even complicated problems" with Likert-scale responses from strongly disagree to strongly agree (Karwowski, 2012). This questionnaire was developed based on the work of Karwowski (2012) to fit this study. In the present sample, internal consistency (Cronbach's alpha) was 0.89.

3.3.3. Self-Regulation

The self-regulation questionnaire was designed to track students' emotional changes by comparing their self-perception from before and during the pandemic, as in the sample question, "I change my mind more often during COVID-19 than before". It was developed based on the PSELS student perception survey (Gehlbach, 2018). Internal consistency (Cronbach's alpha) was 0.73 in the present sample.

3.3.4. Academic Online Engagement

This instrument included twenty-five questions that were designed to capture students' perceptions of their e-learning engagement during the Fall 2020 semester. This questionnaire was developed based on the work of Lee et al. (2019), with adjustments to fit this study related to COVID-19. Questions like "I tried to solve difficult problems with other students when I encountered them in Fall 2020" were included in this instrument. The questionnaire was also sub-scaled into six categories under Psychological Motivation, Peer Collaboration, Cognitive Problem Solving, Interactions with Instructor, Community Support, and Learner Management to see if these sub-scales were significant predictors of changes in wellbeing. The internal reliability of the questionnaire was excellent (Cronbach's alpha = 0.971).

3.3.5. Wellbeing

The survey also included fourteen wellbeing questions that were designed to capture students' perceptions of changes to their feelings and wellbeing during the pandemic. This questionnaire was developed based on the Student Subjective Wellbeing Questionnaire (SSWQ) from Renshaw et al. (2015) and adapted to relate to students' experiences in Fall 2020. Some sample questions on the survey that were oriented to our research questions include, "I deal with problems better during COVID-19 than before" and "I feel better about myself during COVID-19 than before". Internal reliability was strong (Cronbach's alpha = 0.93).

We also added four additional stress/wellbeing questions to supplement the wellbeing questions, such as, "During COVID-19, how often have you felt that you were unable to control the important things in your life?". Because Cronbach's alpha level was low (0.437), it was not included in the analysis. We focused on the other four variables that had high reliability.

TABLE I: DESCRIPTIVE STATISTICS AND BIVARIATE CORRELATIONS

	<i>M</i>	<i>SD</i>	Self-regulation	Wellbeing	Creative self-efficacy
Self-regulation	24.42	6.76			
Wellbeing	54.52	18.33	0.412**		
Creative self-efficacy	31.71	7.11	0.273**	0.329**	
Engagement in e-learning	122.37	34.10	0.316**	0.394**	0.407**

3.4. Data Analysis

The questionnaire data was analyzed for each group (gender, ethnicity, grade level, and extra-curricular activities), and hierarchical regression analysis was performed to see if the demographic variables mentioned above, as well as self-regulation, creative self-efficacy, and engagement in e-learning, were significant predictors of changes in wellbeing.

Table I presents the descriptive statistics and bivariate correlations among major study variables. The skew and kurtosis values were within the range of -2 and $+2$ and were at an acceptable level of normality (George & Mallery, 2010; Hair et al., 2010). Because of the low internal reliability of stress, we focused on wellbeing as the major dependent variable. To test both research questions simultaneously, we added demographic variables (i.e., ethnicity, gender, grade level, and participation in athletics) in Step 1 and self-regulation, creative self-efficacy, and engagement in e-learning in Step 2. This model structure allows for both testing the impact of demographic variables and controlling for them to test the impact of variables in Step 2.

4. RESULTS

Hierarchical regression analyses indicated a low value of variance inflation factors (<2.67), showing a low threat of collinearity problem. The model was significant in both Step 1, $F(7, 452) = 2.77, p = 0.008$; and Step 2, $F(3, 449) = 52.27, p = 0.008$. Demographic variables explained 4.1% of the variance in wellbeing. Only gender and ELL status were significant variables in Step 1. After controlling for demographic variables, the variables added in Step 2 explained 24.8% of the variance. Self-regulation, creative self-efficacy, and engagement in e-learning were significant predictors of changes in wellbeing. Students with higher self-regulation, creative self-efficacy, and engagement in e-learning were affected less by COVID-19. In this model, ELL status was not significant, but gender (being male) was still a significant predictor. Changes in wellbeing were significantly different ($B = 3.57, SE = 1.70, t = 2.10, p = 0.04$) between male ($M = 55.02, SD = 18.61$) and female students ($M = 53.63, SD = 17.90$) (see Fig. 1). The details of model were presented in Table II.

Engagement in e-learning had six different subscales. To make sense of the findings related to engagement in e-learning, we replicated the same regression analysis, except we replaced the total engagement e-learning scores with individual subscale scores. As seen in Table III, only one of the subscales, community support, was a significant

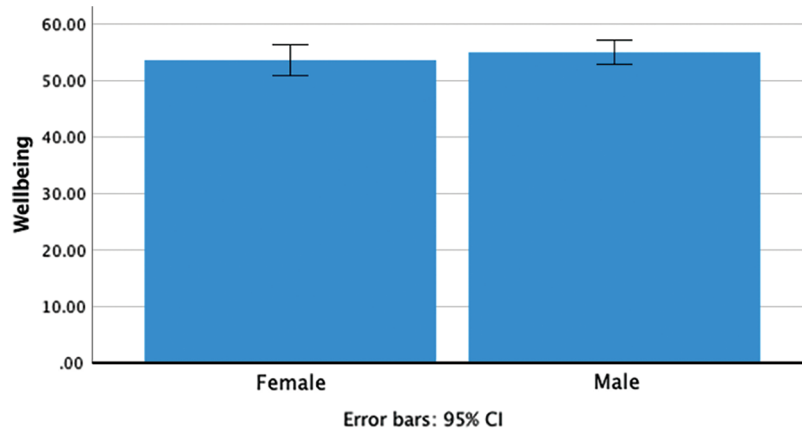


Fig. 1. Gender differences in wellbeing.

TABLE II: HIERARCHICAL REGRESSION MODEL PREDICTING WELLBEING

Model		<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	Tolerance	VIF
Step 1	Constant	50.72	2.61		19.46	<0.01		
	Ethnicity-Black	-0.84	3.45	-0.02	-0.24	0.81	0.38	2.65
	Ethnicity-Asian	1.15	2.31	0.03	0.50	0.62	0.61	1.63
	Ethnicity-Other	-2.52	3.01	-0.05	-0.84	0.40	0.70	1.44
	Grade-ELL	6.92	2.76	0.15	2.51	0.01	0.58	1.72
	Grade-Masters	1.77	2.39	0.05	0.74	0.46	0.54	1.86
	Athlete	-2.95	3.08	-0.07	-0.96	0.34	0.42	2.39
	Gender-Male	4.15	1.95	0.11	2.12	0.03	0.79	1.26
Step 2	Constant	1.27	4.68		0.27	0.79		
	Ethnicity-Black	-1.55	2.99	-0.03	-0.52	0.60	0.38	2.66
	Ethnicity-Asian	-0.21	2.00	-0.01	-0.11	0.92	0.61	1.64
	Ethnicity-Other	-3.90	2.60	-0.07	-1.50	0.13	0.69	1.44
	Grade-ELL	1.45	2.44	0.03	0.59	0.55	0.55	1.81
	Grade-Masters	-0.02	2.09	0.00	-0.01	0.99	0.53	1.90
	Athlete	3.63	2.73	0.08	1.33	0.18	0.40	2.51
	Gender-Male	4.04	1.69	0.11	2.39	0.02	0.79	1.27
	Engagement in e-Learning	0.15	0.03	0.28	5.77	<0.01	0.69	1.46
	Self-regulation	0.80	0.12	0.30	6.74	<0.01	0.83	1.21
Creative self-efficacy	0.40	0.11	0.16	3.51	<0.01	0.80	1.24	

predictor of changes in wellbeing during COVID-19. Other significant predictors in the previous model were significant in this model, too.

4.1. Exploratory Analyses

The analyses above addressed the research questions where changes in wellbeing during COVID-19 were the dependent variable. Next, we conducted exploratory analyses on differences in self-regulation, creative self-efficacy, and engagement in e-learning. The first set of analyses focused on gender, which was significant for engagement in e-learning, $t(458) = 4.67, p < 0.001, d = 0.45$. Female students ($M = 131.59, SD = 28.53$) outperformed male students ($M = 116.62, SD = 35.95$) in their engagement in e-learning. The gender effect was not significant on creative self-efficacy $t(458) = 1.94, p = 0.053, d = 0.19$, self-regulation $t(458) = 1.64, p = 0.102, d = 0.16$, and wellbeing $t(458) = 0.79, p = 0.432, d = 0.08$.

Race was significant for creative self-efficacy, $F(4, 456) = 2.87, p = 0.02, \eta^2 = 0.03$, self-regulation. $F(4, 456) = 5.45, p < 0.001, \eta^2 = 0.05$, and engagement in e-learning, $F(4, 456) = 14.18, p < 0.001, \eta^2 = 0.11$. When group

means in engagement in e-learning were examined, Asian students ($M = 133.41, SD = 27.14$) and White ($M = 126.71, SD = 31.82$) students were most engaged, followed by Hispanic ($M = 122.75, SD = 35.28$), Other ($M = 111.87, SD = 29.71$) and African American ($M = 102.87, SD = 38.96$) race categories. Concerning self-regulation, African American students' scores ($M = 21.89, SD = 7.08$) were lower than all other race groups, including Asian ($M = 25.98, SD = 6.19$), White ($M = 24.20, SD = 6.60$), Hispanic ($M = 24.78, SD = 7.22$), and Other ($M = 24.54, SD = 6.27$). Likewise, African American students reported lower creative self-efficacy ($M = 29.75, SD = 9.35$) than Asian ($M = 32.67, SD = 5.71$), Hispanic ($M = 122.75, SD = 31.57$), White ($M = 32.34, SD = 6.58$), and Other ($M = 30.89, SD = 5.65$) race categories.

When the degree status and grade levels were compared among ELL, freshman, sophomore, junior, senior, and master's levels, group differences were significant in engagement in e-learning, $F(5, 455) = 217.06, p < 0.001, \eta^2 = 0.16$; self-regulation, $F(4, 456) = 8.21, p < 0.001, \eta^2 = 0.08$, and creative self-efficacy, $F(4, 456) = 2.79, p = 0.02, \eta^2 = 0.03$. Engagement in e-learning was highest among ELL

TABLE III: REVISED HIERARCHICAL REGRESSION MODEL PREDICTING WELLBEING WITH INDIVIDUAL SUBSCALES OF ENGAGEMENT IN E-LEARNING

Model		<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	Tolerance	VIF
Step 1	Constant	50.72	2.61		19.46	<0.01		
	Ethnicity-Black	-0.84	3.45	-0.02	-0.24	0.81	0.38	2.65
	Ethnicity-Asian	1.15	2.31	0.03	0.50	0.62	0.61	1.63
	Ethnicity-Other	-2.52	3.01	-0.05	-0.84	0.40	0.70	1.44
	Grade-ELL	6.92	2.76	0.15	2.51	0.01	0.58	1.72
	Grade-Masters	1.77	2.39	0.05	0.74	0.46	0.54	1.86
	Athlete	-2.95	3.08	-0.07	-0.96	0.34	0.42	2.39
	Gender-Male	4.15	1.95	0.11	2.12	0.03	0.79	1.26
Step 2	Constant	2.67	4.70		0.57	0.57		
	Ethnicity-Black	-2.07	3.00	-0.05	-0.69	0.49	0.37	2.73
	Ethnicity-Asian	-0.45	2.00	-0.01	-0.23	0.82	0.60	1.66
	Ethnicity-Other	-3.77	2.62	-0.07	-1.44	0.15	0.68	1.48
	Grade-ELL	0.03	2.47	0.00	0.01	0.99	0.53	1.87
	Grade-Masters	-0.76	2.10	-0.02	-0.36	0.72	0.52	1.94
	Athlete	3.36	2.73	0.08	1.23	0.22	0.39	2.54
	Gender-Male	3.57	1.70	0.09	2.10	0.04	0.77	1.30
	Self-regulation	0.80	0.12	0.30	6.75	<0.01	0.82	1.22
	Creative self-efficacy	0.49	0.12	0.19	4.16	<0.01	0.74	1.34
	Engagement in e-learning-psychological motivation	0.22	0.14	0.12	1.55	0.12	0.28	3.64
	Engagement in e-learning-peer collaboration	0.16	0.16	0.07	1.00	0.32	0.33	3.02
	Engagement in e-learning-cognitive problem solving	-0.32	0.22	-0.13	-1.47	0.14	0.21	4.72
	Engagement in e-learning-interactions with instructor	0.18	0.32	0.03	0.56	0.58	0.52	1.93
	Engagement in e-learning-community support	0.77	0.25	0.22	3.05	0.00	0.31	3.26
	Engagement in e-learning-learning management	0.04	0.23	0.01	0.15	0.88	0.27	3.74

students ($M = 137.46$, $SD = 24.52$), followed by senior ($M = 130.00$, $SD = 30.12$), master's ($M = 129.37$, $SD = 27.37$), Freshman ($M = 103.38$, $SD = 41.66$), and junior students ($M = 100.09$, $SD = 32.68$). In self-regulation, freshman students had the lowest scores ($M = 21.90$, $SD = 7.63$), followed by Senior ($M = 23.33$, $SD = 6.46$), Sophomores and Juniors ($M_s = 24.02$, $SDs = 7.36$ and 5.81 , respectively), Master's ($M = 24.11$, $SD = 6.00$), and ELL students ($M = 27.94$, $SD = 6.20$). With creative self-efficacy scores, senior students had the highest scores ($M = 33.24$, $SD = 6.34$), followed by ELL ($M = 32.57$, $SD = 5.43$), master's ($M = 32.48$, $SD = 6.01$), Junior ($M = 30.84$, $SD = 7.09$), sophomore ($M = 30.42$, $SD = 6.99$), and freshman ($M = 29.67$, $SD = 10.18$).

Last, we compared athletes and non-athletes and found that non-athletes ($M = 129.56$, $SD = 29.74$) reported significantly higher engagement in e-learning $t(459) = 8.85$, $p < 0.001$, $d = 0.97$, than athletes ($M = 98.85$, $SD = 36.89$), higher self-regulation, $t(459) = 4.33$, $p < 0.001$, $d = 0.48$, ($M_s = 25.16$ and 22.00 , $SDs = 6.41$ and 7.30), and creative self-efficacy, $t(459) = 4.46$, $p < 0.001$, $d = 0.49$, ($M_s = 32.51$ and 29.09 , $SDs = 6.25$ and 8.93).

5. DISCUSSION

5.1. Planned Analyses

In this study, we examined the academic, psychosocial, and demographic factors associated with changes in students' wellbeing during COVID-19. Based on the correlation results, changes in students' wellbeing during COVID-19 were significantly and positively related to their

engagement in e-learning, self-regulation, and creative self-efficacy. When changes in wellbeing were regressed on these three variables, they were significant predictors of student wellbeing even after demographic variables were controlled.

Changes in students' wellbeing were associated with higher engagement in e-learning. Superior engagement in distance learning may have helped students feel better about themselves because it gave them a meaningful task to work on. Alternatively, it could be argued that students who were less influenced by COVID-19 were able to better engage in distance learning. Importantly, engagement in e-learning had different subscales, and when the same regression model was run with these subscales, only community support was significantly associated with positive changes in wellbeing. This finding points to the importance of the sense of community support in students' wellbeing (Berry, 2017; Conrad, 2005; Stubb et al., 2011). A holistic perspective on course design should not only focus on academic learning outcomes but also on social and emotional outcomes associated with the learning experience (Wang et al., 2012). The course activities then may be selected on the basis of the principle that students' academic and social-emotional needs are both important, and failure to address the latter may impede the former. In this regard, online learning tools such as discussion boards allow students to reflect on the course material, share their opinions with others, respond to others' thoughts and feelings, and connect with the instructor and peers on a more personal level. The absence of such tools in the course design may cause decrements in the social-emotional aspect of learning and student wellbeing. It is possible that COVID-19 caused loneliness and social isolation, and many students'

main social interaction was through connecting with their classmates. The presence of interactive e-learning tools and synchronous rather than asynchronous courses may have made a difference beyond academics.

Second, students' changes in self-regulation also predicted changes in wellbeing. Students with higher self-regulation scores reported more positive changes in wellbeing. Failure to regulate one's cognition, behavior, and emotions can lower wellbeing due to the feeling of loss of control over the environment (Skowron et al., 2003). Self-regulation in terms of goal abandonment and goal reengagement was related to wellbeing, and in higher education, this may take the form of withdrawing from a course, changing a major, and even altering career plans. The restrictions during COVID-19 could have challenged the students to change their typical lifestyles and adapt to new situations (Orkibi et al., 2021). Those who were able to accomplish it may have experienced greater wellbeing (Wrosch et al., 2003).

Relatedly, COVID-19 led to new problems that required new solutions. Creativity was needed at the individual, institutional, and societal levels. We found creative self-efficacy to be positively related to changes in wellbeing. Those students with a higher creative self-efficacy showed significantly more positive change. Their ability to cope effectively with challenges may generate a sense of wellbeing and protect them from surrendering to the changing situations and restrictions imposed by COVID-19 (Taman-aeifar & Motaghedifard, 2014). Creativity, then, could be a protective mechanism in the face of uncertainty and ambiguity, which have been the defining characteristics of the COVID-19 era (Orkibi et al., 2021). Supporting creativity at the institutional, staff, and student levels may facilitate better problem-solving in higher education institutions.

Our analyses of demographic differences revealed some interesting findings. In the regression model, male students had more positive changes in wellbeing than female students. The gender differences in wellbeing have already been documented in relation to COVID-19, and women were more vulnerable than men to experience higher anxiety and reduced sleep quality (Bigalke et al., 2020; Etheridge & Spantig, 2022; Giel & Derntl, 2021). Our findings reinforced the extant literature that female students are more vulnerable to diminished wellbeing during COVID-19. We also found that ELL students were better off than their other students. Contrary to the concerns of ELL students in K-12 (e.g., Kwakye & Kibort-Crocker, 2021), the sample of ELL students in the present study were international students whose patterns of crisis response could be different from the domestic students. Still, our findings present counter-evidence to the concerns around international students' wellbeing (Coffey et al., 2021; Firang, 2020; Humphrey & Forbes-Mewett, 2021).

5.2. Exploratory Analyses

In addition to the above analyses that addressed the research questions, we conducted some exploratory analyses to investigate if there are differences in engagement in e-learning, self-regulation, and creative self-efficacy.

In general, self-reported engagement in e-learning was lower for African-American and Hispanic students than for Asian students. These differences may stem from limited access to technology in racial and ethnic minorities (Bacher-Hicks et al., 2021; Domina et al., 2021; Friedman et al., 2021). Contrary to gender differences in wellbeing in favor of male students, female students were more engaged in e-learning, which is consistent with past research (Korlat et al., 2021). The gender effect was not significant on creative self-efficacy, self-regulation, and wellbeing. Males reported higher negative changes in wellbeing than females. This could be the direct result of male students' lack of engagement in online learning, which significantly differs between male and female students. This result also could be influenced by the fact that more male than female students (62.04% versus 37.74%) responded to the survey.

Race was a significant factor in changes in creative self-efficacy, self-regulation, and engagement in e-learning during the pandemic. Our study results show that Asian students and White students were the most engaged, followed by Hispanic, Other, and African-American race categories, which is aligned with previous research (Kahu & Nelson, 2018). African American students had the lowest engagement in e-learning, which resulted in negative changes in their wellbeing, whereas Asian students showed higher engagement in e-learning, which reflected the least negative changes in their wellbeing during the COVID pandemic. A similar pattern can be seen in the self-regulation and creative self-efficacy variables, where African American students reported lower self-regulation and creative self-efficacy than other race categories, which is consistent with previous studies (Kuo et al., 2020).

When the degree status and grade levels were compared among ELL, freshman, sophomore, junior, senior, and master's level students, group differences were significant in engagement in e-learning, self-regulation, and creative self-efficacy. Engagement in e-learning was highest among ELL students, followed by senior, master's, freshman, and junior students. This result aligned with a previous study that found ELL learners who read online were able to improve their reading comprehension more and outperformed the other groups (Rahimi & Behjat, 2011). In self-regulation, freshman students had the lowest scores, followed by seniors, sophomores, juniors, master's, and ELL students. Senior students had the highest creative self-efficacy scores, followed by ELL, master's, junior, sophomore, and freshman students. This result confirmed a previous study that identified freshmen at risk for low academic self-efficacy (May, 2013). The freshman had the lowest score across all three variables, which indicates that online learning during COVID has had a negative effect on their wellbeing.

Lastly, non-athletic students had significantly higher scores than athletic students on all three variables mentioned above, with a similar pattern. These results contributed to correlation results that the changes in students' wellbeing during COVID-19 were significantly and positively related to their engagement in e-learning, self-regulation, and creative self-efficacy. This is an interesting result because research indicates that student athletes are more resilient to any challenges they come up with during

their lives or education (e.g., Hurley, 2017), but we see a different story here. Whether the socioeconomic status of the athletes plays a role should be explored in future research.

Our results revealed that students' wellbeing was improved if they felt themselves to have a community supporting them, as seen in Table III. This is consistent with literature that suggests that a sense of community was a significant, direct predictor of online learners' engagement and, therefore, wellbeing (Vayre & Vonthron, 2017). In this study, if we look at results among athletes, about 23% of the total respondents were athletes. These were mostly male students who had been practising and participating in tournaments during the pandemic. Interactions with fellow students and student activities can affect the self-perception and communication skills of college athletes (Gayles & Hu, 2009). Being part of a team provides some kind of inherent community support, which was a significant predictor of wellbeing, according to our analysis. However, the online engagement scores of student athletes were lower than those of non-athlete students, even though they have a higher degree of community support. This can be further studied to understand athlete's wellbeing in relation to their online engagement. Also, female students, who made up 37.74% of the participants, outperformed this group in online engagement. The results suggest that there may be other factors influencing the lower wellbeing scores for females than males. This also can be further studied to understand female student's wellbeing in relation to their online engagement.

6. IMPLICATIONS

The results suggest it may be appropriate for classrooms to provide somewhat differentiated online course tasks and for male and female students during the pandemic to help with online engagement. African-American students consistently had the lowest scores in creative self-efficacy, self-regulation, and academic online engagement, which resulted in negative changes in their wellbeing during the pandemic. The university should consider providing extra resources that cater to low-performing groups, such as online resources that can engage online learning, tutoring, mentorship or learning communities, extra time for assignments, and audio or video learning materials.

Across all grade levels (freshman, sophomore, junior, senior, graduate students, and language department students), ELL students outperformed all other groups in creative self-efficacy, self-regulation, wellbeing, and online engagement, whereas the freshman had the lowest performance. The rest of the groups showed gradual increases in these areas with grade level. Perhaps the reason lies in the fact that lower grade level students are not used to online learning, as most of their courses are usually prerequisite courses that are taught face-to-face. Therefore, lower grade-level college students, especially freshmen, need the most attention or help from the instructors or support from university intervention programs during a time when learning must shift online. Intervention programs that help to promote a supportive learning environment for student

mental health can "play an important part in their wellbeing and ability to cope" (Chew-Graham et al., 2003). On the contrary, the language learners can be taught either online or face to face based on the results of the study, as they were the group least affected by the pandemic in terms of creative self-efficacy, self-regulation, wellbeing, and online engagement.

Non-athlete students outperformed student athletes on all four variables studied. The results seem to be aligned with ethnic performance in that the majority of athletes studied were African-American students. In addition to the recommendations given to ethnicity, the university needs to provide additional help through the athletic department, such as counseling, study hall, homework help, and so on, during a pandemic situation. Universities should continuously monitor students' engagement in online learning, creative self-efficacy, and self-regulation, especially during a crisis such as the pandemic, as these can be predictors of students' wellbeing.

7. LIMITATIONS AND FUTURE RESEARCH

62.04% of the participants were male and 37.74% were female. This disparity may have affected the finding that female students outperformed male students in creative self-efficacy and online engagement. 31.89% of participants were Asian students and 19.74% were African American students. Similarly, this disparity may have had some effect on the finding that Asian students outperformed African American students on all three variables, as well as wellbeing. This could also be the reason for the athletic (23.43%) and non-athletic (76.67%) participants' performances.

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