Journal of Educational Technology & Online Learning
Volume 7 | Issue 3 | 2024

JETOL
Journal of Educational Technology & Online Learning

# Online learning self-efficacy beliefs predict subjective well-being of college students during COVID-19 pandemic

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Suggested citation: Güçlü, M., Draganović, S. & Elen, M. A. (2024). Online learning self-efficacy beliefs predict subjective well-being of college students during COVID-19 pandemic. *Journal of Educational Technology & Online Learning, 7*(3), 334-345.

## Highlights

- Both male and female students perceived their ability to succeed in online learning similarly and reported comparable levels of well-being.
- Students' beliefs in their ability to fulfill online education requirements and their psychological health remained stable despite varying levels of anxiety and daily life disruptions caused by the pandemic.
- Students who believed they could manage their time efficiently for online education requirements exhibited better psychological functioning. This finding aligns with other studies highlighting the positive relationship between time management and psychological well-being.

**Article Info:** Research Article

**Keywords:** College students, COVID-19, Online learning, Self-efficacy, Well-being

## Abstract

Online learning self-efficacy is associated with significant psychological outcomes among college students. Nevertheless, research investigating self-efficacy among college students during COVID-16 pandemic is limited. The aim of the present study was to investigate the role of self-efficacy beliefs regarding online learning in predicting subjective well-being of college students. One hundred sixty-five college students were recruited for the study. Participants completed the Online Learning Self-Efficacy Scale (OLSES), the Subjective Well-Being Scale (SWBS), and a socio-demographic information form, which included items related to COVID-19 anxiety and the perceived impact of COVID-19 on daily life. Regression analyses showed that overall self-efficacy predicted subjective well-being scores. However, only the time management subdimension of self-efficacy significantly predicted subjective well-being. Our findings suggest that high levels of self-efficacy, particularly in time management, are associated with elevated levels of subjective well-being among college students. Interventions targeting self-efficacy in online learning environments may benefit college students with lower levels of subjective well-being during the COVID-19 pandemic.

## 1. Introduction

Recent technological advancements have altered the way information is transmitted and accessed. Online technologies, which have become one of the most widely used ways of accessing information, have increasingly started to gain a place in educational institutions, impacting teaching and learning methods. Similarly, online learning, which allows anyone to study from any location at their own pace, has been extensively utilized by college students during the COVID-19 pandemic (Aparicio et al., 2017; Ithriah et al., 2020). Additionally, self-efficacy is a key determinant of academic performance and supports students in successfully adjusting to different learning contexts (Hayat et al., 2020). In fact, self-efficacy is regarded as a critical psychological trait that can influence students' perceptions of their learning environments

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Doi: http://doi.org/10.31681/jetol.1513598
Received 10 Jul 2024; Revised 28 Sep 2024; Accepted 28 Sep 2024
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(Pajares, 1996). Therefore, it can be assumed that self-efficacy plays a role in students' performance in online learning environments.

## 2. Literature

Self-efficacy, from Bandura's usage, is defined as the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). It remains central to Social Cognition Theory (Bandura, 1977), which assumes that individuals with this belief have high self-efficacy. Conversely, individuals who are uncertain about their abilities and avoid challenging tasks due to fear of failure are considered to have low self-efficacy (Bandura, 1982). Furthermore, a strong sense of efficacy contributes to personal well-being and academic success (Bandura, 1997).

Self-efficacy beliefs can manifest differently in conventional (onsite) and virtual(online) classroom settings, as online education researchers distinguish between traditional classroom learning activities and online learning tasks (W. A. Zimmerman & Kulikowich, 2016). In the context of online learning, self-efficacy is a multidimensional term that encompasses three aspects: online learning, time management, and technology usage (W. A. Zimmerman & Kulikowich, 2016). Online learning self-efficacy refers to individuals' beliefs about their capacity to properly accomplish specific activities demanded of online learners (Bandura, 2012; W. A. Zimmerman & Kulikowich, 2016).

Self-efficacy is a well-established motivational concept that has been linked to particular behaviors (B. J. Zimmerman, 2000). For instance, students with high levels of online learning self-efficacy are more confident in completing online learning courses, managing their time efficiently, and using the necessary computer and web-based technologies (Shen et al., 2013; Zhou & Yu, 2021). These students are more likely to succeed academically (Ergul, 2004) and use technical resources more effectively, leading to better academic performance. Previous research has also identified a connection between self-efficacy, utilization of technical details, and academic success (Tella et al., 2007). Additionally, McGhee (2010) demonstrated a positive association between online technological self-efficacy and educational success among 45 college students. Artino (2008) found that college students with higher self-efficacy for computer-based learning were more satisfied with their learning experiences compared to students with lower self-efficacy. Bates and Khasawneh (2007) identified four variables that impact self-efficacy in the context of online learning: (1) prior success with online learning, (2) pre-course training, (3) educator feedback, and (4) online learning technology anxiety.

Online learners' anxiety is often related to factors such as lack of preparation for online courses, insufficient computer confidence or abilities, feelings of loneliness, and a lack of locus control due to online distractions (Abdous, 2019; Saadé et al., 2013; Zhou & Yu, 2021). During the COVID-19 pandemic, the technological dimensions of online learning played a crucial role in shaping students' self-efficacy. Platforms such as Zoom, Microsoft Teams, and Moodle facilitated online education by helping students feel more comfortable in online learning environments (Alameri et al., 2020). Research have shown that the perceived ease of use of these platforms significantly increased students' self-efficacy, and higher usability was positively correlated with greater confidence in using technology for learning processes (Bailey et al., 2022). Additionally, tools like breakout rooms on video conferencing platforms, such as Zoom, can replicate the dynamics of face-to-face interactions, allowing students to fulfill their learning-related responsibilities more comfortably, thereby enhancing their online learning self-efficacy (Chandler, 2016). Overall, the technological dimensions of these platforms not only facilitate remote learning but also contribute to students' self-efficacy in online learning.

Despite various definitions, subjective well-being is generally described as a person's cognitive and affective evaluations of their life (Edward Diener et al., 2002). Subjective well-being falls within the 'hedonic' perspective, which views well-being or happiness as primarily about maximizing pleasure and minimizing or reducing suffering. Furthermore, positive psychology research literature uses subjective well-being in variety of terms, including happiness, hedonism, life satisfaction, morality, and positive affect (Ed Diener, 1984; Proctor & Michalos, 2014, Diener et al., 2002; Heinitz et al., 2018). However, subjective happiness refers to a global and personal assessment of one's happiness or unhappiness (Lyubomirsky &

Lepper, 1999). According to these definitions, life satisfaction is the more cognitive component of subjective well-being (SWB), while subjective happiness is more affective (Strobel et al., 2011).

In this context, few studies have suggested an association between online learning self-efficacy and well-being, while findings have shown that general self-efficacy is a significant predictor of a person's well-being (Jin et al., 2020; Singh & Udainiya, 2009; Zhou & Yu, 2021). Likewise, Zhou and Yu (2021) reported positive associations between online learning self-efficacy and well-being among home-quarantined college students, particularly those who did not suffer from anxiety compared to those who did. While some empirical studies show gender differences in online learning self-efficacy and well-being (Chyung, 2007; Gebara, 2010; Shen et al., 2013) Hung et al. (2010) found no gender differences in online learning self-efficacy or online communication self-efficacy. Due to the mixed findings of previous research, further empirical investigation is required.

Since it is unclear what factors might be associated with subjective well-being during the COVID-19 pandemic, knowledge about online learning self-efficacy during this period is limited. Only a few empirical studies have investigated the predictors of online learning self-efficacy, especially during the COVID-19 pandemic (Zhou & Yu, 2021). Therefore, this study aims to examine the associations between online learning self-efficacy and subjective well-being among college students during the COVID-19 pandemic. The study also explores differences in online learning self-efficacy and well-being amongst university students based on gender; perceived COVID-19-related anxiety; and perceived impact of COVID-19 on daily life.

## 3. Methodology

### *3.1. Data Collecting Tools*

3.1.1. *Sociodemographic Form***:** A sociodemographic form was used to gather general information about the sample (education level, gender, age). The form also included questions regarding COVID-19-related anxiety and the perceived impact of COVID-19 on daily life. The question "How did you observe your anxiety level during the COVID-19 process?" (rated as 'no anxiety', 'low anxiety', and 'high anxiety') assessed the COVID-19-related anxiety. Another question, "To what extent has COVID-19 affected your daily life?" (rated as 'not at all', 'very little', 'somewhat', and 'to a great extent') assessed the perceived impact of COVID-19 on daily life. This form was developed specifically for the purpose of this study.

3.1.2. *Online Learning Self-Efficacy Scale (OLSES)***:** The original OLSES was developed by Zimmerman and Kulikowich (2016). The OLSES was designed to measure college students' self-efficacy perceptions in online learning environments (W. A. Zimmerman & Kulikowich, 2016). The original scale consists of 22 items and includes three subscales: learning in the online environment (10 items), time management (5 items), and technology use (7 items). There are no reversed items.

The scale items are rated on a 5-point Likert scale, ranging from (1) Completely Disagree to (5) Completely Agree, with higher scores indicating higher levels of online learning self-efficacy. The factor loadings of the scale items ranged from .85 to .92. The reliability and validity of the Turkish version of OLSES were conducted by Yavuzalp and Bahcivan (2020), who reported strong internal consistency (Cronbach's $\alpha$ = .98). In the Turkish version of OLSES, one item (item number 2) was removed after factory analysis, leaving the scale with 21 items (Yavuzalp & Bahcivan, 2020).

3.1.3. *Subjective Well-Being Scale (SWBS)*: The SWBS was developed by Dost Tuzgöl (2005). It was designed to measure the individuals' cognitive and emotional assessments of their lives (Özbiler, 2020). The scale consists of 46 items, covering various aspects: comparing one's life with their own past and with others; positive and negative emotions; goals; self-confidence; optimism; enjoyable activities; friendship relations; future outlook; family relationships; envy of others' lives; coping with life's difficulties; pessimism. It is a 5-point Likert scale, ranging from (1) Not Suitable at all to (5) Completely Suitable. The scale includes 26 positive and 20 negative evaluative statements about life satisfaction and positive and negative emotionality. The negative statements are reversed items (i.e., 2, 4, 6, 10, 13, 15, 17, 19, 21, 24, 26, 28, 30, 32, 35, 37, 38, 40, 43 and 45). The scores range from 46 to 230, with higher scores indicating

higher levels of subjective well-being. The reliability and validity check of the scale was conducted by Dost Tuzgöl (2005), who reported high internal consistency (Cronbach's α= .93).

### *3.2. Participants*

A total of 165 college students took part in the study (mean age = 24; 98 females). All data were obtained from Turkish college students in Turkey and Bosnia via an online form in March 2021, during a period when universities had switched to distance learning as part of COVID-19 measures. Participants were recruited through social media platforms (i.e.,WhatsApp, Telegram, Instagram, and Facebook groups). They had completed all of their courses online. Informed consent was obtained from the participants before the study, which included their right to withdraw from the study at any time without penalty. The inclusion criterion was being a college student. The study was approved by the Institutional Review Board of the International University of Sarajevo (24/05/2021; IUS-REC-01-921/2021), and official permissions were provided by the university directorates.

### *3.3. Data Analysis*

Statistical Package for Social Sciences (SPSS) version 23.0 was used to analyze the data. Descriptive statistics were used to calculate the mean, standard deviation, and frequency. One-way multivariate analysis of variance (MANOVA) was conducted to compare OLSES and SWBS scores based on COVID-19-related anxiety and the perceived impact of COVID-19 on daily life. Pearson's correlational analysis was used to examine the associations between overall OLSES scores, OLSES subscales, overall SWBS scores, and age. Finally, multiple regression analysis was conducted to explore the predictors of OLSES.

## 4. Findings

The mean age of the participants was 24.03 years (*SD* = 4.04). Analyses showed that 40.6% (n = 67) of the participants were males and 59.4% (n = 98) were females. In terms of COVID-19-related anxiety, 11.5% (n = 19) of the participants reported having no anxiety, 61.8% (n = 102) indicated having low anxiety, while 26.7% (n = 44) reported having high anxiety during COVID-19 pandemic. In terms of COVID-19's impact on daily life, 0.6% (n = 1) of the participants reported that their lives were "not at all" affected, 10.9% (n = 15) were affected "very little", 36.4% (n = 60) were affected "somewhat", and 52.1% (n = 86) were affected "to a great extent". In terms of scales used in the study, the overall mean of OLSES was 78.91 (*SD* = 13). Of the three subscales, the mean for Learning in the Online Environment was the highest (*M* = 37.47, *SD* = 6.83), followed by Technology Use (*M* = 24.03, *SD* = 4.00) and Time Management 14.41 (*SD* = 3.85). The mean for SWBS total score was *M* = 163.78 (*SD* = 25.63). Descriptive statistics for study variables are presented in Table 1.

**Table 1.** Results of Descriptive Statistics

| | Variables | Full sample | | |
|---|---|---|---|---|
| | | Mean | *S.D.* | Count (%) |
| Demographic and background information | *Age* | 24.03 | 4.04 | |
| | *Gender* | | | |
| | Male | | | 67 (40.6%) |
| | Female | | | 98 (59.4%) |
| | *COVID-19-related anxiety* | | | |
| | No anxiety | | | 19 (11.5%) |
| | Low anxiety | | | 102 (61.8%) |
| | High anxiety | | | 44 (26.7%) |
| | *Impact of COVID-19 on daily life* | | | |
| | Not at all | | | 1 (0.6%) |
| | Very little | | | 18 (10.9%) |
| | Somewhat | | | 60 (36.4%) |
| | To a great extent | | | 86 (52.1%) |

| | | | |
|---|---|---|---|
| Independent variable | *OLSES Total Score* | 78.92 | 13 |
| | Learning in the Online Environment | 37.47 | 6.83 |
| | Time Management | 17.41 | 3.85 |
| | Technology Use | 24.03 | 4.00 |
| Dependent variable | *SWBS Total Score* | 163.78 | 25.63 |

*Notes for Table 1.* OLSES: Online Learning Self-Efficacy Scale. SWBS: Subjective Well-Being Scale

An independent-samples t-test was conducted to determine whether there is a difference in OLSES and SWBS scores between males and females. The results indicated a non-significant difference between male (M=77,91, *SD*=14.70) and female (M= 79,62, *SD*= 11,73) participants in terms of OLSES scores, $t(163) = -0.830$, $p = 0.408$. Similarly, results indicated a non-significant difference between male (M=160,44, *SD*=23,66) and female (M=166,07, *SD*=26,78) participants in terms of SWBS scores, $t(163) = -1.38$, $p = 0.167$.

Two one-way Multivariate Analysis of Variance Analyses (MANOVA) were conducted to examine the main effects of perceived COVID-19-related anxiety levels and perceived impact of COVID-19 on daily life. Results revealed that there was no significant main effect of perceived COVID-19-related anxiety levels on OLSES and SWBS scores ($F(8, 318) = 0.601$, $p = 0.777$; Wilks' $\lambda = 0.970$, $\eta^2 = 0.015$). Also, there was no significant main effect of perceived impact of COVID-19 on daily life on OLSES and SWBS scores ($F(12, 418) = 0.917$, $p = 0.306$; Wilks' $\lambda = 0.917$, $\eta^2 = 0.029$).

A Pearson correlation analysis was used to reveal the relationship between total OLSES score, subscales of OLSES, and total SWBS score. Total OLSES score was positively correlated with total SWBS score. In addition, total SWBS score was found to be positively correlated with all three subscales of OLSES, namely, learning in the online environment, time management, and technology use. Correlation analyses are displayed in Table 2.

**Table 2.** Descriptive Statistics and Correlations for Study Variables

| Variable | *N* | *M* | *SD* | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| 1. OLSES-Total | 165 | 78.92 | 13 | — | | | | |
| 2. Learning in the Online Environment | 165 | 37.47 | 6.83 | .95** | — | | | |
| 3. Time Management | 165 | 17.41 | 3.85 | .8** | .68** | — | | |
| 4. Technology Use | 165 | 24.03 | 4 | 0.84** | 0.74** | 0.48** | — | |
| 5. SWBS-Total | 165 | 163.78 | 25.63 | 0.39** | 0.36** | 0.37** | 0.30** | — |

*Notes for Table 2.* OLSES-Total: Online Learning Self-Efficacy Scale-Total Score. SWBS-Total: Subjective Well-Being Scale-Total Score
**$p < .01$.

A simple linear regression was used to predict total SWBS scores based on total OLSES scores. Total OLSES scores explained a significant, albeit small, amount of the variance in total SWBS scores, $F(1, 163) = 30.791$, $p < .001$, with an $R^2$ of .159. The regression coefficient ($B = 0.78$, $p < .001$) indicated that a one-point increase in overall online self-efficacy corresponded, on average, to an increase in subjective well-being of 0.78 points. Results from simple linear regression analysis are presented in Table 3.

**Table 3.** Simple linear regression statistics with SWBS-Total as the outcome variable and OLSES-Total as the predictor variable.

| Dependent Variable | Predictor | *B* | *SE B* | *β* | *t* | *p* |
|---|---|---|---|---|---|---|
| SWBS-Total | OLSES-Total | 0.78 | 0.14 | 0.39 | 5.54 | $p < .001$ |

*Notes for Table 3.* OLSES-Total: Online Learning Self-Efficacy Scale-Total Score. SWBS-Total: Subjective Well-Being Scale-Total Score

Moreover, a multiple regression was run to predict total SWBS scores from three subscales of OLSES: learning in the online environment, time management, and technology use. The overall model explained a statistically significant, albeit small, amount of variance in total SWBS scores, $F$ (3, 161) = 10.847, $p <$ .0001, $R^2$ = .168. Time Management subscale was a significant predictor of total SWBS scores ($B$ = 1.62, $p < .05$). The regression coefficient ($B$ = 1.62, $p < .05$) indicated that a one-point increase in time management dimension of online learning self-efficacy corresponded, on average, to an increase in subjective well-being of 1.62 points. However, learning in the online environment ($B$ = 0.47, $p$ = .33), and technology use dimensions ($B$ = 0.62, $p < .05$) did not significantly contribute to the model. Results from multiple regression analysis are presented in Table 4.

**Table 4.** Multiple linear regression statistics with SWBS-Total as the outcome variable and Subscales of OLSES as the predictor variables.

| Dependent Variable | Predictors | *B* | *SE B* | *β* | *t* | *p* |
|---|---|---|---|---|---|---|
| SWBS-Total | Learning in the Online Environment | 0.47 | 0.48 | 0.12 | 0.97 | $p = .33$ |
| | Time Management | 1.62 | 0.65 | 0.24 | 2.47 | $p = .01$ |
| | Technology Use | 0.62 | 0.68 | 0.09 | 0.90 | $p = .36$ |

*Notes for Table 4.* SWBS-Total: Subjective Well-Being Scale-Total Score

## 5. Discussion

This study aimed to assess the associations between self-efficacy beliefs regarding online learning and subjective well-being among college students during the COVID-19 pandemic. Furthermore, it examined whether online learning self-efficacy and well-being differed based on participants' gender, perceptions regarding COVID-19 related anxiety and the perceived impact of COVID-19 on daily life.

Our results indicate that no gender differences exist in online learning self-efficacy or subjective well-being. This can be interpreted in two ways: (a) males and females do not differ in their perception of their ability to successfully perform online learning tasks; and (b) males and females report similar levels of well-being and do not differ in how they evaluate it. Although the literature shows mixed results regarding gender differences in academic self-efficacy, several studies conducted during COVID-19 found no gender difference in academic self-efficacy (Bhati et al., 2022; Hutasuhut et al., 2021; Sen et al., 2021) or in the effect of gender on career self-efficacy (van Esch et al., 2021). The lack of difference between males and females in online learning self-efficacy may be explained by Tang et al. 2021's claim that gender differences decreased during COVID-19 as students were required to learn more independently in online environments.

Also, regarding the mean age of our participants (M=24.03) we note that they are individuals born in the digital era, often referred to as having "digital DNA" or being part of the iGeneration. These individuals are adept at using a wide range of computer- and web-based technologies, regardless of gender (Prensky,

2001). When considering variables impacting online learning self-efficacy, such as prior success with online learning and pre-course training (Bates and Khasawneh, 2007) , the iGeneration tends to be successful, hence the lack of gender differences in our findings. Online learning also provides the opportunity for recorded lessons, which allows students to revisit lectures, take better notes and prepare more effectively for their courses. This personalized approach in asking questions and receiving feedback may reduce anxiety and increase self-efficacy.

While studies show that anxiety in online learners is mainly caused by factors such as lack of preparation for online courses, insufficient computer confidence, feelings of loneliness, and a lack of control due to online distractions (Abdous, 2019; Saadé et al., 2013; Zhou & Yu, 2021), self-efficacy, on the other hand, moderates and positively influences how individuals cope with stress and challenges (Bandura 1997).

Regarding the non-significant differences between males and females in terms of subjective well-being, this finding contrasts with some studies that have suggested females experienced worse well-being during COVID-19 (i.e., Cheikh Ismail et al., 2021; Clabaugh et al., 2021). However, it aligns with studies that found no significant difference between males and females in terms of well-being and happiness (Rania & Coppola, 2021). This indicates that, in our sample, both males and females reported similar levels of well-being during COVID-19. Considering that the COVID-19 virus posed the most severe health risks for adults over 60 with pre-existing chronic diseases, the younger generation was relatively safer and less affected. Since the vast majority of our participants are young, we found no significant difference, with both groups reporting similar levels of well-being.

At the same time, online learning self-efficacy and subjective well-being levels in our sample did not differ based on COVID-19 related anxiety or perceived impact of COVID-19 on daily life. This indicates that participants' beliefs about their ability to meet the demands of online education and their psychological health remained similar, regardless of the level of COVID-19 anxiety or its perceived impact on their daily lives. Considering the time when this study was conducted (well into the second year of pandemic), it is possible that students had adapted to pandemic conditions over time, leading to a gradual decrease in their anxiety levels regarding COVID-19. This pattern has also been observed in other studies worldwide (Fancourt et al., 2020). Similarly, a study that collected data on COVID-19-related anxiety over six months in 2020 reported a decline in anxiety and suggested that this decrease may reflect the resiliency of individuals (Gallagher et al., 2021)

One of the key findings of the present study was that overall online learning self-efficacy played a crucial role in students' subjective well-being. This result aligns with previous studies (García-Álvarez et al., 2021; Sabouripour et al., 2021; Zhou & Yu, 2021), which have suggested that self-efficacy is a protective factor for mental health during COVID-19 (García-Álvarez et al., 2021; Wen et al., 2021). As the findings show, college students with greater confidence in their ability to meet the demands of online learning are more likely to have a higher quality of life, greater life satisfaction, and a more positive mood overall. In other words, students' beliefs in their online learning abilities may contribute to improved psychological health during COVID-19.

COVID-19 pandemic with its effects and aftermaths was a highly stressful period that required significant adjustment and the development of new resources. Self-efficacy is a key personal resource —a belief that one can not only cope with the health threat posed by COVID-19 but also adjust to the stress of the "new normal" and succeed in an online education environment (Bandura, 1997). During stressful situations, personal resources like self-efficacy tend to be conserved and protected, which in turn leads to improved well-being and psychological health (Hobfoll 1989; Hobfoll and Schuman 2002). Given that our sample consists of iGeneration students —who spend a significant amount of time online and frequently use technology for various purposes (Prensky, 2001) —it is no surprise that they are highly skilled in these areas. Research in India and Saudi Arabia suggests that students prefer online and recorded lectures and videos (Ibrahim et al., 2022; Muthuprasad et al., 2021) and view online education as advantageous due to the flexibility it offers (Bast, 2021) and the opportunities for growth it provides (Altuwairesh, 2021).

Naturally, the iGeneration tends to be highly efficient in the use of technology and online education, so it is unsurprising that the self-efficacy scores of our participants were high. Our findings also show that self-efficacy is a valuable personal resource for students, helping protect their psychological health and improve their wellbeing.

Furthermore, in terms of self-efficacy factors, we found that only time management played a significant role in subjective well-being. This means that students who believe they can efficiently manage their time for the requirements of online education experience better psychological functioning. This relationship between time management and psychological well-being supports previous studies in this area (Juniarti & Regina, 2022; Macan et al., 1990; Mattern et al., 2019; Ryerson, 2022; Yadav et al., 2020). For instance, Ryerson's study showed that decreased psychological health was correlated with poorer time management skills among college students during the COVID-19 pandemic (Ryerson, 2022). Additionally, our findings align with other studies that have found psychological well-being to be negatively impacted by procrastination (Bu et al., 2021; Duru & Balkıs, 2017).

While our study focused on a sample of Turkish college students, the findings may have broader implications for students worldwide. Previous research has demonstrated that self-efficacy levels differ between collectivistic and individualistic cultures, with cultural emphasis on individual versus collective achievements playing a significant role (Bonneville-Roussy et al., 2019). However, due to the widespread adoption of online learning during the COVID-19 pandemic, these cultural factors may have had a reduced impact on self-efficacy in online education. For example, a study investigating university students' use of online learning during COVID-19 found that student samples from four different countries (USA, Mexico, Turkey, and Peru) displayed similar levels of self-efficacy (Aguilera-Hermida et al., 2021). This suggests that the standardized nature of online learning during the pandemic could have contributed to a leveling effect, where students from diverse cultural backgrounds developed comparable levels of confidence in managing online education. As a result, our findings on self-efficacy in online learning, although based on a Turkish sample, may be relevant to students in a variety of global contexts. To further explore the generalizability of our findings, future studies could investigate the role of these cultural factors in online learning self-efficacy among college students. Examining whether cultural differences in self-efficacy are less pronounced in online settings could provide valuable insights into how global educational practices are evolving in the wake of the pandemic.

## 6. Implications and Limitations

The findings of this study have important implications for implementing psychoeducational interventions aimed at improving online learning self-efficacy to enhance students' psychological health and well-being. In line with the conservation of resources theory, interventions can be designed to equip students with the necessary resources, such as mastering the skills required in online learning, to promote well-being. These interventions may specifically focus on time management skills and potentially on preventing procrastination behaviors among college students. Research has shown that academic procrastination decreases psychological well-being during COVID-19 (Arifiana et al., 2020). When students are equipped with time management skills, they are expected to manage their time effectively, avoid procrastination, and be less distressed by approaching deadlines, thereby improving their psychological functioning.

Moreover, the integration of educational technology can play a crucial role in enhancing these interventions. Online learning platforms and learning management systems can be utilized to design workshops that focus on improving both time management and online communication skills. These platforms allow students to access resources at their convenience, which can further improve their sense of autonomy and self-efficacy in online environments. Educational technologies can also facilitate peer interactions through features like breakout rooms, which foster collaborative learning, and enhance student engagement, ultimately boosting their confidence in using these tools for academic success. To support this, universities should leverage data analytics available through these platforms to track student engagement and self-efficacy levels. By utilizing tools that monitor student performance and participation,

academic advisors can offer tailored interventions, ensuring that students remain proactive and confident in their use of educational technologies. This approach will not only help mitigate procrastination but also foster a sustainable improvement in students' psychological well-being.

Several limitations of this study need to be addressed. First, this study utilized self-report questionnaires, which may have been affected by social desirability bias, meaning participants may have provided socially acceptable answers. Second, the study's cross-sectional design makes it difficult to draw causal inferences. Future studies can employ longitudinal research designs to better delineate the effect of online learning self-efficacy on subjective well-being among college students.

The type of device that college students use to engage in online learning may affect learning efficiency (Szymkowiak et al., 2021). Therefore, future studies investigating online learning self-efficacy could incorporate survey items related to type of device used in online learning. This could provide further insight into how device type affects online learning self-efficacy. Despite limitations, one strength of this study is its contribution to the COVID-19 literature by investigating the relationship between online learning self-efficacy and subjective well-being levels among Turkish college students.

## 7. Conclusions

The aim of the current study was to investigate the interrelationships between self-efficacy beliefs in online learning and subjective well-being among college students during the COVID-19 pandemic. The study also examined whether online learning self-efficacy and well-being differ based on participants' gender, perceptions of COVID-19 related anxiety, and the perceived impact of COVID-19 on daily life. The findings suggest that higher levels of general self-efficacy, particularly self-efficacy beliefs regarding time management in online learning settings, predict higher levels of subjective well-being. Finally, this study adds to the COVID-19 literature on online learning by providing insight into the interrelationships between online learning self-efficacy and subjective well-being levels of Turkish college students.

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