Online self-regulated learning, academic performance, and well-being of Senior High School Students in the NCR: A mediation analysis

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Abstract

The Philippines abruptly shifted from traditional to emergency remote education in response to the threats brought about by the COVID-19 pandemic. Emergency remote education is an umbrella term to refer to online learning. Literature on traditional learning suggests that self-regulation correlates positively with well-being, which suggests that students who are autonomous in their learning activities tend to be satisfied with their lives. Research also suggests that academic performance mediates this relationship, which suggests that students tend to become satisfied with their lives when they achieve successful learning outcomes. This research explores the relationship between online self-regulation, academic performance, and well-being of 379 senior high school students from selected public and private schools who hold classes using the online learning modality in the National Capital Region (NCR) using a quantitative approach specifically the explanatory cross-sectional design. The participants completed the online survey on self-regulated learning and well-being (i.e., Online Self-Regulated Learning Questionnaire and Satisfaction With Life Scale), while their academic performance was based on their self-reported third quarter grade point average. Results showed that online self-regulated learning predicted well-being, however,

academic performance did not mediate the positive relationship between online self-regulated learning and well-being. Our findings suggest that, in the context of online learning, senior high school students who regulate their learning may experience satisfaction with their lives even if they do not achieve academic success.

Keywords**:** academic performance, mediation analysis, online self-regulated learning, well-being

Background of the Study

The COVID-19 pandemic has drastically changed the educational landscape in the Philippines shifting from face-to-face classes to emergency remote education. Emergency remote education is an umbrella term to refer to distance education, remote learning, online learning, and blended learning (Bozkurt et al., 2020; Rotas & Cahapay, 2020). According to Widodo and associates (2020), this sudden shift in the learning modality from face-to-face to online learning can take a toll on students learning. Consequently, this requires students to be independent, self-regulated, and in control of their learning.

Self-regulation simply refers to an individual's ability to organize a set of plans toward a certain goal and create a set of strategies on how to achieve these goals (Wang, Yang, & Li, 2021). According to Pelikan and associates (2021), self-regulation or self-regulated learning has been known to contribute to successful learning in both settings either traditional or online learning. Hence, students who can manage well with their studies produce favorable learning outcomes as compared to those who cannot (Widodo et al., 2020). Popescu, Tătucu, and Dobromirescu (2021), in their qualitative study, have identified self-regulation as one of the several factors that can affect students' learning process and well-being.

Well-being pertains "to the extent to which a person believes or feels that his or her life is going well" (Nima, Cloninger, Persson, Sikström, & Garcia, 2020, p. 2). This is also being referred to as happiness (Bailey & Phillips, 2016) and being satisfied with one's present life situation. There is a positive relationship between self-regulated learning and well-being as some recent studies would suggest (Morosanova, Fomina, & Bondarenko, 2021; Wang et al., 2021). However, Popescu and associates (2021) noted that the well-being of students in online learning was lower as compared with the students in the traditional setup.

The connection between self-regulation and well-being through academic performance is empirically supported by Wang and associates (2021). They suggest that students who self-regulate to accomplish good grades promote personal enjoyment. However, it remains unanswered whether this explanation is applicable in the context of online learning. To the best of our knowledge, we have not found any in the current body of literature that provides empirical support to this claim. Thus, this study aimed to explore the relationship between online self-regulated learning, academic performance, and well-being of senior high school students in the National Capital Region who are holding their classes using the online learning modality. Moreover, this study took a small step in response to the call of the United Nations Development Programme (UNDP) for

its Sustainable Development Goals particularly in the area of well-being and quality education.

Conceptual Model and Operational Framework

This research is anchored on the framework of self-regulated learning based on the social cognitive theory. This theory explains that "human behavior is extensively motivated and regulated by the ongoing exercise of self-influence" (Bandura, 1991, p. 248). It specifies the potency of human agency, which suggests that an individual is not passive that can be controlled by the environment or circumstances but rather active in initiating judgments and actions relative to one's personal beliefs.

Since online learning is relatively new and there are plenty of questions that need to be explored and explained, for instance, self-regulation in the context of online learning. In line with this, Barnard and associates (2008) developed a short form of the *Online Self-Regulated Learning Questionnaire* based on the instrument created by Zimmerman in 1998 depicting self-regulated learning as a multifaceted construct.

Moore (as cited in Barnard et al., 2008) stated that in online learning both teacher and learner are disconnected by space and in some instances by both space and time. In effect, this generates a psychological distance between teacher and learner. He identified three clusters of variables that determine the strength of this psychological distance in the teacher-learner relationship, which include dialogue, structure, and learner autonomy. Moore's learner autonomy can be likened to the ability of the learner's self-regulation from the social cognitive perspective (Barnard et al., 2008, p. 2). Put succinctly, psychological distance theory suggests that "learners who are more autonomous or self-regulated appear to be more comfortable in online or distance programs than learners who are less autonomous or self-regulated" (Barnard et al., 2008, p. 2).

Self-regulated learning or sometimes called academic self-regulation is defined as "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features of the environment" (Pintrich, 2000, p. 453). According to Widodo and associates (2020), independent learners who are capable of planning, monitoring, and evaluating their progress in their studies achieve successful learning outcomes. Thus, we hypothesize:

H1. *Online self-regulated learning positively predicts the academic performance of senior high school students.*

Self-regulation is associated with well-being (Hofer, Busch, & Kartner, 2011). Baumeister and Vohs (2003, p. 213) have stated that 'the ability to self-regulate is an integral component of mental and physical well-being" because self-regulation allows individuals to hold on and remain to be motivated even if they suffer a setback. According to Firoozabadi, Uitdewilligen, and Zijlstra (2018), when individuals possess a higher level of self-monitoring this may suggest that they can regulate their thoughts as well as their emotions which could lead them to find solutions to their problems. If they experience progress in their efforts, this would eventually lead to a feeling of fulfillment or happiness. The study by Park, Edmondson, and Lee (2012) reported that an increase in the freshmen college students' abilities to self-regulate was associated with better personal adjustments. With all these empirical pieces of evidence in the literature, we therefore hypothesize:

H2. *Online self-regulated learning positively predicts the well-being of senior high school students.*

Subjective well-being has three factors and these are positive affect, negative affect, and life satisfaction. The first two constitute the affective domain while the last is the cognitive domain of the construct (Diener, Emmons, Larsen, & Griffin, 1985). The affective domain evaluates a person's feelings and emotions as experienced in his or her life, while the cognitive domain evaluates a person's life in general terms concerning his or her ideal self (Nima et al., 2020).

Noddings (2003, p. 1) suggested that ''happiness and education are, properly, intimately connected.'' Adolescent students consider school as a major part of their life because most of their time is being spent here to prepare themselves for their future adult roles, academic achievements like grades are significantly and positively correlated with their well-being (Tian, Wang, & Huebner, 2015). In this study, senior high school students' well-being is measured only in the cognitive domain. Hence, we hypothesize:

H3. *Academic performance positively predicts the well-being of senior high school students.*

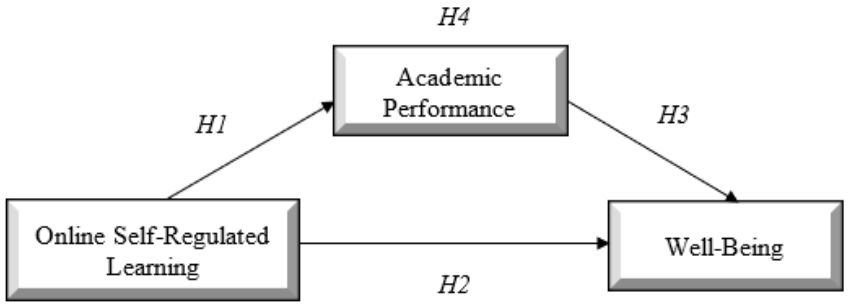
The study by Sheldon and Kasser (1998) indicated that college students, who at the end of the term, reported that they have successfully advanced themselves towards achieving their goals, described to have experienced improvements in their mood as compared to their mood at the start of the school term. However, in the extant literature, the study of Wang and associates (2021) is the only empirical study to date that provides the relationship between self-regulation, academic performance, and well-being, which explains the mechanism of how academic performance mediated the effect of self-regulation on students' well-being in the context of face-to-face education. In this study, we

explore whether this explanation is still valid in the context of online learning. Therefore, we hypothesize:

H4. *Academic performance mediates the positive relationship between online self-regulated learning and the well-being of senior high school students.*

Figure 1.

Proposed mediation model



The proposed mediation model presented in Figure 1 is adapted from the work of Wang and associates (2021). To wit, online self-regulated learning has a direct effect on academic performance and well-being. Further, the positive relationship between online self-regulated learning and well-being is mediated by academic performance. This implies that academic performance will explain the relationship between online self-regulated learning and well-being. While Wang and associates' model provides empirical support to the intermediary function of academic performance on the relationship between self-regulated learning and the well-being of students in the context of face-to-face learning, we, the researchers, explored applying this model in online learning environment. To the best of the researchers' knowledge, there is no empirical support regarding the applicability of this explanation in the context of online learning in the current literature. Therefore, this is the gap in the literature that this research hopes to fill in.

In connection with the United Nations Development Programme's (UNDP) Sustainable Development Goals specifically in the promotion of good health, well-being, and quality education, this study aimed to explain the structure of relationships between online self-regulated learning, academic performance, and well-being of senior high school students in the National Capital Region.

Specifically, this study sought to answer the following questions:

1. What are the level of online self-regulated learning, academic performance, and well-being of the selected senior high school students?
2. Does online self-regulated learning predict the academic performance of senior high school students?
3. Does online self-regulated learning predict the well-being of senior high school students?
4. Does academic performance predict the well-being of senior high school students?
5. Is the relationship between online self-regulated learning and well-being mediated by the academic performance of senior high school students?

Methodology

Research Design

This study used a quantitative approach specifically the explanatory cross-sectional design (Johnson, 2001). This study empirically tested the researcher's hypothesized mediation model of online self-regulated learning, academic performance, and well-being based on the previous empirical findings and theoretical considerations to determine its model fit (Johnson & Christensen, 2020).

Participants

A total of 379 male and female senior high school students who hold classes in online learning in the National Capital Region (NCR) participated in the study. The criterion for selecting the specific schools that served as research samples was any public or private senior high school institutions situated in the NCR that hold classes using the online modality that agreed to participate in this study. The sampling method for selecting the students in the respective schools used in this study was convenience sampling, which means that those students who were willing to participate in the study were included.

Procedures

Ethical approval was first secured from the university's Research Ethics Board before the conduct of the study. We also requested permission to administer the survey from the schools' administrators. The online survey was conducted using Microsoft Forms. A written consent form was obtained from all participants before the administration of the questionnaires, assuring them of the anonymity as well as the confidentiality of information. The participants were also requested to indicate their third-quarter grade point average. Data were analyzed using SPSS version 26 and PROCESS macro for SPSS.

Measures

Online Self-Regulated Learning Questionnaire (OSLQ). This scale, which was devised by Barnard, Lan, To, Paton, and Lai (2009) measure students' use of self-regulated learning strategies in either online or blended learning environments. It is composed of 24 items with six dimensions namely; goal setting, environmental structuring, task strategies, time management, help-seeking, and evaluation. For this study, only the composite score of this scale was used for the analysis. The reliability estimates for the sample based on Cronbach's alpha is .89. Hence, this indicates that the scale has good reliability.

Academic Performance. The academic performance of the participants, which were senior high school students, was based on their self-reported third-quarter grade point average.

Satisfaction With Life Scale (SWLS). This scale was devised by Diener, Emmons, Larsen, and Griffin (1985). This assesses the psychological well-being of the participants. The measure is composed of five items (e.g., "The conditions of my life are excellent") to which participants indicate their agreement using a scale from 1 (strongly disagree) to 7 (strongly agree). The reliability estimates for this sample based on Cronbach's alpha is.80. Thus, this suggests that the scale is reliable.

Data Analysis

Preliminary data analyses were performed before the main analysis. These include descriptive statistics: means, standard deviation, skewness, kurtosis, and bivariate correlations. Reliability estimates of the measures were determined using Cronbach's alpha coefficient.

The hypothesized relationship between online self-regulated learning and well-being as mediated by academic performance was analyzed using the PROCESS macro for SPSS, which is a computational tool for conducting mediation and conditional process analysis with observed variables (Hayes, 2018). Specifically, this simple mediation analysis was conducted using PROCESS model 4. PROCESS like SEM can produce estimates of both direct and indirect effects, the advantage of PROCESS over SEM is that the former can be used even with a small number of participants and even with a non-normal sampling distribution because the estimates of the indirect effects are based on bootstrapping methods (Hayes, 2018).

Results and Discussion

The results of the descriptive statistics including means, standard deviations, and bivariate correlations are presented in Table 1. Even though PROCESS does not require normal sampling distribution, skewness and kurtosis were still computed. The following are the computed values: for online self-regulated learning the skewness (-1.022) and kurtosis (2.662); for academic performance the skewness (-1.104) and kurtosis (2.465); and for well-being, the skewness (-0.395) and kurtosis (0.020). These sets of values suggest that sampling distributions for these variables are all normal.

Regarding the results of the mean scores for the key variables, the mean scores for online self-regulated learning and well-being fall slightly below the median. This implies that the participants have a slightly below-average level of online self-regulated learning as well as a slightly below-average level of well-being. In terms of academic performance, participants' mean scores are high since the passing grade is 75, which indicates a high-level academic performance. Concerning the degree of variability of the scores, although the scores in all of the key variables appeared to be relatively dispersed, online self-regulated learning is found to have the most widely dispersed scores.

Table 1.

Means, Standard Deviations, and Bivariate Correlations for All Variables

Variable	*M*	*SD*	1	2	3
1. Online Self-Regulated Learning	122.11	19.96	-	0.101	0.352**
2. Academic Performance	89.89	4.75		-	-0.047
3. Well-Being	15.86	4.12			-

**. Correlation is significant at the 0.01 level (2-tailed).

Concerning the results of the bivariate correlations, online self-regulated learning is significantly positively related to well-being, but not academic performance. Moreover, academic performance does not correlate to both online self-regulated learning and well-being.

Based on the results, it appears that most but not all of the selected senior high school students in the NCR who participated in this study are considered to possess a limited capacity to plan, monitor, and evaluate their learning progress in the online modality. That being said, they are still inclined to require much guidance from their instructors to get through with their school-related endeavors.

Possibly, these students are not yet well-accustomed to this type of instructional environment as Appana (2008) argued that face-to-face or traditional education promotes passive learning. Apart from that, these students, as well as teachers, were taken by surprise by the abrupt change in the modality of learning instructions from face-to-face to online learning due to the COVID 19 pandemic such that everyone is ill-prepared. It was noted that online learning "is about surviving in a time of crisis with all resources available" (Bozkurt et al., 2020, p. 2).

Regarding the academic performance of the participants, most of the selected senior high students from the NCR remarkably performed well in their studies. Albeit these grades are self-reports, we assume that these are reliable because according to Sanchez and Buddin (2016), self-reported grades are fairly reliable estimates for use in educational studies.

The participants' well-being that was measured is based only on the cognitive domain, therefore, descriptions of the affective domain such as feelings and emotions are not part of this study. The cognitive domain provides us with information on how people evaluate their life as experienced at the moment about their standards or ideals. Understandably, most of these senior high school students are not so satisfied with their lives at present since everyone is still in a difficult situation brought about by the pandemic. Possibly, this case is similar to what Popescu and associates (2021) have observed in their study that the well-being of students in online learning tends to be lower in contrast to the face-to-face learning setup.

The summary of the results of the PROCESS analyses is presented in Figure 2, which provides the graphical representation of the results of the mediation model with unstandardized path coefficients, and confidence intervals. Based on the given unstandardized coefficient, the direct effect of online self-regulated learning on well-being is significant. Hence, this supports our second hypothesis (H2) that online self-regulated learning positively predicts the well-being of senior high school students. However, based on the unstandardized coefficient in the link between online self-regulated learning and academic performance, no direct effect has been noted. This shows that the first hypothesis (H1) that online self-regulated learning positively predicts the academic performance of senior high school students is not supported by the sample data. While there is a body of literature that suggests a significant positive relationship between self-regulation and academic performance, there are also studies that propose otherwise. For example, Li, Ye, Tang, Zhou, and Hu (2018, p. 1) argued that "not all self-regulated learning strategies exerted the same influences.

Using an invalid strategy may waste the limited psychological resources, which will cause the ego depletion effect".

Figure 2.

Results of Mediation Model

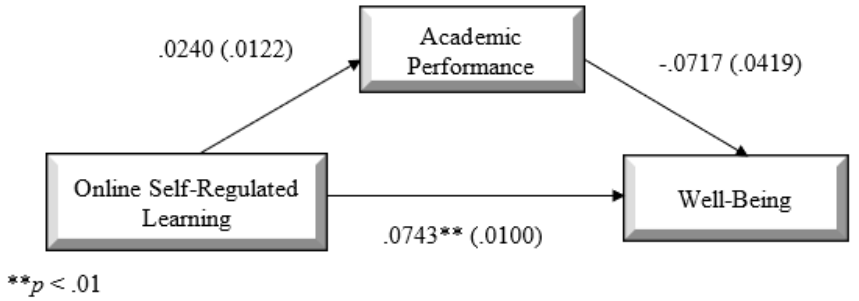


Figure 2. Online self-regulation failed to indirectly predicts well-being through its relationship with academic performance, *b* = -.0007, *SE* = .0016, 95% CI [.0057, .0004]. Unstandardized coefficients are shown with standard error in parentheses.

Furthermore, academic performance is shown to have no direct effect on well-being, suggesting that the third hypothesis (H3), which states that academic performance positively predicts the well-being of senior high school students, is also not supported by the sample data. In testing for mediation, Baron and Kenny (1986) recommended that the independent variable must predict the mediator and at the same time the mediator must predict the dependent variable. As regards the results, academic performance does not establish significant links with online self-regulated learning and well-being. According to Demming, Jahn, and Boztug, (2017, p. 83), "the significance of the indirect effect is inferred from the confidence interval of its bootstrap distribution. If the confidence interval does not include zero, one can be statistically confident that the effect is different from zero." Looking at the confidence interval values, we can affirm that the result is not significant. Hence, the fourth hypothesis (H4), which states that academic performance mediates the positive relationships between self-regulation and well-being of senior high school students is not supported by the sample data.

Conclusions, Recommendations, and Implications

Our findings generally do not support the hypothesized model adapted from Wang and associates (2021), which demonstrated that academic performance mediates the relationship between online self-regulation and well-being in the traditional learning setup. It can be argued that these

contradictory results to some extent may explain the disparity in the dynamic relationship between self-regulation, academic performance, and well-being of the participants in the two learning modalities, which are traditional and online learning. Based on the evidence put forward by this study, we are compelled to believe that in the context of online learning, senior high school students who regulate their learning may experience satisfaction with their lives even if they do not achieve academic success.

While this study tried to provide empirical evidence regarding the interrelationships between online self-regulated learning, academic performance, and well-being among selected Filipino senior high school students, some of the limitations identified are believed to have undermined the strength of the claims being offered. Hence, we provide suggestions on ways of improving this for future research.

First, this study used a cross-sectional design in determining the relationship between online self-regulation, academic performance, and well-being. Therefore, the temporal precedence of these variables was not guaranteed to be precise since these variables were collected at the same time points. Future researchers should consider conducting a longitudinal research design to address this concern.

Second, is the use of self-report measures as the exclusive sole data-gathering procedure. Future research should consider a mix of methods involving observations and interviews with students would provide greater breadth and depth to the study.

Lastly, to be able to increase the generalizability of our findings to the senior high school student population in the country, since the samples in this study were taken from the NCR, future research should attempt to replicate and expand the scope by including senior high school students from other parts of the country outside of the NCR.

An implication of this research to the learning theory and practice is that it provided explanations of how self-regulation, academic performance, and well-being operate differently in the context of online education. This constitutes more reasons to explore more on the novelty of this type of education set-up to help senior high school students to flourish in their online education towards the achievement of the sustainable goals of good health, well-being, and quality education.

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