Association Between Nursing Students' Self-Regulation and Online Learning Self-Efficacy

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Abstract

The COVID-19 pandemic has caused the suspension of face-to-face classes worldwide, which resulted in a shift to online learning. This presented a new challenge to students to improve their ability to complete tasks successfully and to direct their focus on acquiring knowledge and skills actively. Self-regulation (SR) and online learning self-efficacy (OLSE) are two important factors in online learning environments. SR allows learners to actively initiate and direct themselves, while OLSE refers to one's beliefs and confidence in their abilities to complete or engage in a specific task required of online learners. Several studies conducted in Asia revealed that college students have low to moderate SR. Meanwhile, there is little known information about self-efficacy (SE) in an online learning environment. Similarly, limited literature supports the results; however, other studies suggest a positive and significant relationship between SR and SE for learning. The objectives of the study were to determine and describe the association between nursing students' SR and OLSE Snowball sampling through social networking sites within Pampanga resulted in a sample of 166 nursing students. The results revealed that nursing students have moderate levels of SR (x = 54.75; SD = 10.60) and OLSE (x = 93.01; SD = 25.03). Pearson correlation coefficient revealed a statistically significant and strong positive association between nursing students' SR and OLSE (r = .60; p = < .00). Thus, the academic administration and nurse educators should explore the dynamics between the two variables and develop programs that may improve SR and OLSE.

Keywords: *online learning, self-efficacy, self-regulation, nursing students, undergraduate nursing, online survey*

Introduction

The COVID-19 pandemic has taken a massive toll on education systems around the world, affecting nearly 1.6 billion students in over 190 countries across the globe (United Nations, 2020). Although children are more protected from COVID-19, they could be sources of spread due to strong social contacts, such as those seen in schools (Abdulamir & Hafidh, 2020; Adler, 2020; Germann et al., 2019). Many countries are faced with the suspension of face-to-face classes and the shift towards an online learning environment. The Coronavirus Disease 2019, also known as COVID-19, first appeared in December 2019 and quickly gained the attention of scientists around the world. The first outbreak caused an epidemic with the sudden increase of cases, following into a pandemic when the spread was across several countries and affected many people (Centers for Disease Control and Prevention, 2020). Various countries implemented lockdowns to control and minimize the transmission of the virus. Needless to say, such pandemic-related restrictions affected the learning process.

In an online learning environment, students, to be successful, must act independently and control their learning without the physical presence of an instructor to facilitate learning. Self-regulation (SR) is one of the predictors of student performance, especially in an online learning environment (Delen & Liew, 2016). Self-regulated learners actively initiate and direct themselves to acquire

knowledge and skill rather than relying on others, such as professors, parents, or peers (Delen & Liew, 2018; Fadda, 2019). In the absence of face-to-face classes and synchronous meetings, students must monitor their actions and change their behaviors accordingly to learn. A student's self-efficacy (SE) is another factor that affects their performance. SE is an individual's perception of their ability to complete a task successfully (Bandura, 1997). Students who lack confidence in their ability to succeed in a course are predicted to exert less effort than those who believe they can succeed (Zimmerman, 2017).

The findings of the study will benefit the students considering that online learning self-efficacy (OLSE) and SR play an important role in enhancing students' performance in an online learning environment. Without the physical presence of instructors to facilitate learning and peers to influence activity, students must be able to initiate and direct their own learning. Thus, the study will significantly develop and improve students' independence in an online learning environment.

The literature has addressed different perspectives regarding SR and OLSE; however, few studies have investigated these concepts in nursing undergraduates, especially about the association of SR and OLSE. Hence, the objective of this study is to determine if there is an association between nursing students' SR and OLSE. The results of the study will be helpful for future researchers, nursing administrators and academic leaders, and the participants themselves in finding interventions to improve both SR and OLSE. Nursing academic leaders may use the results to enhance their curriculum and lessons to empower SR and OLSE among nursing students. Furthermore, the results can help students recognize opportunities to set goals and guidance in SR and OLSE.

Objectives

This project aimed to achieve the following:

1. Determine if there is an association between nursing students' SR and OLSE; and
2. Describe the association between nursing students' SR and OLSE.

Review of Related Literature

COVID-19

In December 2019, a group of patients was hospitalized with an initial diagnosis of pneumonia caused by a new strain of coronavirus (Naja & Hamadeh, 2020). The virus was named by World Health Organization (WHO) as 2019 Novel Coronavirus on January 12, 2020 and became COVID-19 on February 11, 2020 (Guo et al., 2020; Rothan & Byrareddy, 2020; Shereen et al., 2020; Velavan & Meyer, 2020; World Health Organization, 2020a). Coronaviruses are enveloped non-segmented positive-send RNA viruses, with sizes ranging "from 26 to 32kbs in length" (Guo et al., 2020; Shereen et al., 2020, p 2; Velavan & Meyer, 2020). On March 11, 2020, WHO (2020a) declared the COVID-19 outbreak a global pandemic as the novel coronavirus rapidly spread worldwide. Measures such as quarantine and isolation were implemented globally as an attempt to control the spread of COVID-19 (Atalan, 2020; Kaplan, 2020; López-Carral et al., 2020; Rothan & Byrareddy, 2020). Social distancing, staying-at-home rules, work-related travel restrictions, and mass gatherings prohibitions were also enforced (López-Carral et al., 2020).

Although children are found to be more protected from COVID-19, they can become the sources of spread due to intense social contacts among others in schools (Abdulamir & Hafidh, 2020;

Adler, 2020; Germann et al., 2019). COVID-19 transmission may likely be high within the school setting due to large groups gathering indoors for extended periods of time (Lewis, 2020). Thus, education has been affected, and the opening of schools has been delayed (Palatino, 2020). Because of the impact of COVID-19, governments began implementing measures to limit the spread of the coronavirus in March 2020, including school closures (Li & Lalani, 2020; UNICEF, 2021). The Coordinating Council of Private Educational Associations (COCOPEA) conducted a survey in which out of 500 schools that responded, there are 400 private schools at risk of closing by the end of August due to lack of resources to maintain operations (Bernardo, 2020). On the contrary, public and private higher education institutions (HEIs) can still regulate classes with the "new normal" setting in education since face-to-face interaction is prohibited. Under those circumstances, education officials suggested using online platforms for the school year 2020-2021 to continue the schooling of millions of students (Hedger, 2020; Hunt & Oyarzun, 2019; Kritz, 2020; Simbulan, 2020).

Online Learning

Online learning is a form of education that utilizes technological devices, tools, and the internet. Multiple challenges come along with the shift towards online learning. The most frequent challenges that students face in online learning are difficulty in adjusting learning styles, poor communication such as lack of clear directions from instructors, poor internet connection, and challenges in performing responsibilities at home while in online classes (Adedoyin & Soykan, 2020; Baticulon et al., 2020). Students' self-confidence in using the Internet may also affect their academic performance considering that online classes require them to accomplish their assigned activities and internet-related tasks autonomously (Chang et al., 2014; Compeau & Higgins, 1995).

Self-Efficacy

In an online environment, students must embrace change, efficiently aim for what they want to accomplish, and do what is achievable. Most people may acknowledge that performing these tasks is not easy. As a major component of Social Cognitive Theory, an individual's SE goes into how goals, tasks, and challenges are approached and how it centers on human functioning (Bandura, 1997; Grether et al., 2018). In line with this, SE is a person's confidence in accomplishing and succeeding in a particular task. SE beliefs are associated with how people think, behave, and feel (Bandura, 1997). SE plays a role in how one perceives themselves and whether one successfully achieves goals in life. According to Bandura, mastery experiences, vicarious experiences, social persuasion, and physiological and emotional states are the components of SE associated with people's beliefs in their ability to produce desired results. Mastery experiences refer to prior experiences a person has for a particular task. Bandura also added that developing a sense of efficacy through mastery is a matter of learning a skill or improving performance by practice. Vicarious experience, on the other hand, is having a role model to match that person's achievement, typically by imitation; when people seek positive role models who display an ideal level of SE, the role models are likely to transmit knowledge and teach observers skills and strategies that can be utilized in life.

According to Bandura (1997), in social persuasion, words strengthen people's belief that they have the necessary qualities for success; people verbally persuaded to do specific tasks are likely to be encouraged and motivated to succeed. The achieved success is measured by self-improvement rather than by triumph over others. Bandura also added that physiological and emotional states as the fourth source of SE, where individuals correlate their physiological and emotional conditions with their capabilities, so SE is either strengthened or lessened depending on the individual's mood.

Domain-specific SE is one of the three forms of SE (Grether et al., 2018). Domain-specific SE beliefs signify confidence in an individual's coping ability within a particular environment, such as home or work (Grether et al., 2018, p.132). An example is SE that involves academics—the belief of an individual in their competence to perform tasks (Schunk, 1991; Linnenbrink & Pintrich, 2002; as cited in Yeşilyurt et al., 2016). The beliefs of individuals regarding their academic SE affect their learning and how they will likely increase their success.

According to several studies, nursing students are more vulnerable to stressors and psychological disturbances than students in other programs because nursing education is a highly competitive environment that most likely will impair their academic and social performance (American Association of College of Nursing, 2017; Levett- Jones et al., 2007; Ulrich & Lathlean, 2007; Versaeval, 2014, as cited in Raymond & Sheppard, 2017; Shehadeh et al., 2020). In an environment with such high demands, nursing students must apply concepts such as SE to help them face tasks and challenges in their learning endeavors. Considering SE is related to the concept of self-control and the ability to regulate behaviors to accomplish goals; in a descriptive-correlational study, the academic achievements of students are affected because of SE and that of "environmental factors, family and peer support, as well as educational, personal, cognitive and social factors" (Farokhzadian et al., 2018, p. 7). Internal and external factors—academic responsibility, lack of financial means, social concerns, health-related concerns, university environment may contribute to psychological disturbances among university students that may consequently influence student academic satisfaction corresponding with their academic performance (Shehadeh et al., 2020).

Online Learning Self-Efficacy

In online learning environments, SE is a critical psychological component that directly impacts students' performance and satisfaction. (Yavuzalp & Bahcivan, 2020). OLSE is a domain-specific SE defined as one's beliefs and confidence in their abilities to complete or engage in a specific task required of online learners (Zhu, 2019; Zimmerman & Kulikowich, 2016). Many researchers of OLSE consider only the technological aspect of online learning, when in fact OLSE is a multidimensional construct that consists of five factors (Shen, 2013; Zimmerman, 2017). Students with high computer and internet SE experience greater satisfaction and commitment to their studies, allowing them to engage effectively during activities (D'Errico et al., 2018; Kirmizi, 2015; Lee, 2015). On the other hand, students with limited or inadequate computer skills may have lower SE to handle tools in a course management system and tend to be less motivated to learn and participate in activities, which results in a lessened likelihood of success (D'Errico et al., 2018; Kirmizi, 2015; Eastin & LaRose, 2000, as cited in Lee, 2015). Another factor of OLSE is one's SE to complete an online course (Zimmerman & Kulikowich, 2016). Furthermore, an area that must be considered in terms of OLSE is social interaction, which covers the last three factors, SE to interact socially with classmates, SE to interact with instructors in an online course, and SE to interact with classmates for academic purposes (Shen, 2013, p. 12). Successful online learners must possess self-directedness, the ability to use technology, communication skills, and time-management skills (Zimmerman & Kulikowich, 2016). Students with high OLSE are more likely to persist longer and exert more effort in their learnings and tasks, whereas students with lower levels of OLSE may be less likely to engage in their activities due to the lack of confidence (Zhu, 2019; Zimmerman, 2017). Multiple studies have been conducted on college students' OLSE, but very few exist within the context of nursing education. With online learning normalized and implemented, understanding a student's motivation and perceived OLSE is necessary to yield positive outcomes and experiences.

Self-Regulation

Without the physical presence of instructors, learners must manage their schedule and engage with their materials independently (Sansone et al., 2011, as cited by List & Nadasen, 2016). SR is key in supporting learner autonomy and is an essential factor in predicting student performance (Pintrich, 1995 & Azevado, 2005, as cited in Chen & Su, 2019; Delen & Liew, 2016; Lee, 2015; List & Nadasen, 2016). SR is conceived to be a dynamic motivational system related to goal setting and goal attaining strategies (Jakesova et al., 2016). It is the skill of controlling and regulating cognition, behaviors, actions, motivations, and impulsivity autonomously in academic skills and goal attaining (Jakesova et al., 2016; Zimmerman, 1986 & Pandero, 2017 as cited in Lai et al., 2018; Türkben, 2019). Self-regulated learners can facilitate their learning by monitoring their progress and modifying their behaviors accordingly (Delen & Liew, 2016; Fadda, 2019; Lin et al., 2016). The SR process consists of three phases: forethought phase, performance phase, and self-reflection phase. The forethought phase includes task analysis and self-motivation beliefs (Metsärinne, 2014; Türkben, 2019). Task analysis involves goal setting and strategic planning, which are greatly influenced by one's self-motivation beliefs. These beliefs include SE, outcome expectations, intrinsic value, and goal orientation (Türkben, 2019). To further "elevate goal setting, the activities and materials provided should not conflict with the learners' interests and preferences" (Bursali, 2018, p. 668). The second phase of SR, the performance phase, "includes self-control and self-observation. Lastly, the self-reflection phase contains self-judgment and self-reaction" (Metsärinne, 2014, p. 88). Self-judgement is concerned with an individual's evaluation of their performance and characteristics, while self-reaction is more concerned with internal evaluation and causal attribution and consists of self-satisfaction and adaptive and defensive processes (Türkben, 2019). Students must be aware of their cognitive function in learning, known as metacognition, as it facilitates successful learning (Bursali, 2018, p. 662). Students must be allowed to set goals and be guided in elevating their metacognitive awareness to become autonomous and good agents of learning (Bursali, 2018).

Self-Regulation and Online Learning Self-Efficacy

The variables of SE are said to have significantly meaningful correlations with SR, and both influence each other positively (Cho & Cho, 2017; Sungur & Tekkaya, 2006 as cited in Sen & Yilmaz, 2016; Tosuncuoglu, 2019). Self-regulated learning has been considered a comprehensive and holistic approach that influences SE and learning achievement (Yoon et al., 2014 & Zimmerman et al., 1996, as cited in Lai et al., 2018; Tosuncuoglu, 2019). Self-regulated learners are expected to have higher achievements and better outcomes, as they are more likely to develop high SE (Cho & Cho, 2017; Gurcay & Ferah, 2018). Likewise, SE is considered an important variable that promotes self-regulating behaviors (Lee et al., 2020; Tosuncuoglu, 2019).

Students with high SR and SE are more likely to reach the academic goals they have set for themselves, despite the difficulties they might encounter (Gurcay & Ferah, 2018). With this knowledge, education can be improved with consideration of students' actual motivations, rather than motivations imposed by educators that are meant to control the student's academic endeavors (Tosuncuoglu, 2019). It is important to understand the relationship between SR and SE to identify challenges regarding change and stasis in education (Tonsunguoglu, 2019). Despite the availability of online learning and the recent shift towards the new normal, a few existing literatures have identified whether there is an association between SR and OLSE.

Synthesis

The COVID-19 pandemic has greatly affected the educational system, forcing the "new normal" online learning upon students and teachers. With the shift into the new normal, setting goals, accomplishing assignments, and understanding the given material, may be complex challenges the students face. Nursing students may experience additional challenges as they are more vulnerable to stressors and psychological disturbances due to the highly competitive nature of nursing programs (American Association of College of Nursing, 2017, Levett-Jones et al., 2007, Ulrich & Lathlean, 2007, & Versaeval, 2014, as cited in Raymond & Sheppard, 2017; Shehadeh et al., 2020). This poses the question of whether nursing students can achieve academic goals and perform successfully on their own in the online learning environment. SR and OLSE are two important factors that predict student performance in the online learning environment. SR is related to goal setting and attaining, in which an individual can autonomously facilitate their learning by monitoring their progress and modifying their behavior accordingly (Delen & Liew, 2016; Fadda, 2019; Jakesova et al., 2016; Lin et al., 2016). In contrast, SE is an individual's perception of their capability to complete a task successfully (Bandura, 1997). Although there are existing studies on the association between SR and SE per se, only a few have been done on SR and OLSE among nursing students.

Methodology

Research Design

An analytical-correlational research design was utilized to examine the association between nursing students' SR and OLSE. No interventions occurred, nor did the researchers try to determine causation (Polit & Beck, 2011). The design has yielded one of the three possible results: a finding of no association, a positive correlation, or a negative correlation between nursing students' SR and OLSE (Tuckman & Harper, 2012).

Sample and Setting

The study involved nursing students aged 18 to 50 who were enrolled at Pampanga nursing colleges. Currently, two thousand and twenty-seven (2027) nursing students are attending the seven (7) nursing colleges in Pampanga (see Appendix C). OpenEpi.com (version 3.01) an open-access epidemiologic statistics software, was used to identify the sample size. A total of three-hundred twenty-four (324) nursing students attending colleges in Pampanga were yielded after factoring in a population of 2027 and hypothesizing a 50% frequency of outcome with a 95% confidence level (Dean et al., 2013).

Sampling Design

Since a sampling frame was not obtained due to the Data Privacy Act of 2012, respondent-driven sampling (RDS) was utilized. RDS is a method for drawing probability samples of "hidden" or "hard-to-reach populations" (Abdesselam et al., 2020, p. 6; Baraff et al., 2016, p. 5). RDS uses people's social networks, which underlies the hidden population, thus reducing threats to privacy as respondents might be asked directly for a list of contacts (Baraff et al., 2016). Sampling bias resulting from the non-randomness of the initial participants may be reduced by keeping track of the respondents' recruitment patterns and applying mathematical models to the recruitment process (Baraff et al., 2016; Hipp et al., 2019).

Instrument

Demographics

An online survey was used to obtain the participants' demographic information such as their age, gender, college major, college level (first year, second year, third year, or fourth year), and the institution they are enrolled in. The participants were asked to name the current dean of their department to verify that they attend the institution that they have listed. Among the correspondents, only nursing students 18 to 50 years old attending a college of nursing in Pampanga were included in the study.

Online Learning Self-Efficacy Scale (OLSES)

The Online Learning Self-Efficacy Scale (OLSES) is a 22-item scale designed to assess the OLSE of students with and without online learning experience (Zimmerman & Kulikowich, 2016). The tool is straightforward and simple; thus, students with and without an online learning experience can readily understand each item. It consists of three subscales: learning in the online environment, time management, and technology use. The respondents rated each of the tasks on the OLSES (see Appendix D) using a 6-point Likert-type scale, from 1 (could perform tasks poorly) to 6 (could perform tasks at an expert level). Zimmerman and Kulikowich (2016) examined evidence of convergent and divergent validity using correlational techniques. Results indicated that the measure was highly reliable in terms of internal consistency with a coefficient (Cronbach's alpha) of .987 (Yavuzalp & Bahcivan 2020). However, the tool also comes with a few drawbacks. The different psychological variables that can affect students' success together with SE perception were not identified on the scale as these are significant variables in university students' online learning environments (Yavuzalp & Bahcivan, 2020).

Short Self-Regulation Questionnaire (SSRQ)

The Self-regulation Questionnaire is composed of 63 items that assess the seven dimensions of SR proposed by Miller and Brown (1991, as cited in Carey et al., 2004): (1) information input, (2) self-evaluation, (3) instigation to change, (4) search for change, (5) planning for change, (6) implementation of strategies for change, and (7) goal attainment evaluation plan (Brown et al., 1999 as cited in Carey et al., 2004). SRQ can be particularly beneficial in the study of adolescent habits and within an education context. However, the instrument is composed only of students in secondary school. The author suggested including samples of adolescents who are not attending school or even those at risk of social exclusion (Pichardo et al., 2018, p 13).

Several studies have examined the SRQ's psychometric properties, yielding several factorial solutions that enabled the authors to propose a shorter version of questionnaire (Carey et al., 2004). According to the results, the short version of the Self-Regulation Questionnaire (SSRQ) is a viable alternative to the complete version (Pichardo et al., 2018). SSRQ is grouped into four factors: (1) goal setting, (2) perseverance, (3) decision making, and (4) learning from mistakes, which contain a total of 17 items scored in a Likert-type scale (see Appendix E) from 1 (strongly disagree) to 5 (strongly agree) (Pichardo et al., 2014). There is a high correlation between the SSRQ and the original SRQ, which supports the utility of the short version (Pichardo, 2014). The reliability of the items is interpreted as Cronbach's alpha with an acceptable internal consistency of $\alpha = .86$ for the total of questionnaire items (Pichardo, 2014). SR measured by the SSRQ contributes to the explanation of self-regulated learning (Goal setting and Learning from Mistakes) while remaining

independent from grades. Since this type of SR is more closely connected to daily life than the academic context, there is not much research on the relationship between general SR of behavior and academic performance (Pichardo et al., 2014, p. 2).

Data Collection

RDS, a combination of a non-probability chain-referral design with a statistical model was utilized for the data collection process (Lavrakas, 2008). The data collection process started with the initial participants who served as seeds for an expanding chain of referrals. A convenience sample of undergraduate nursing students (the initial participants who served as seeds) was selected from different Pampanga institutions. The questionnaire was posted on the official social media accounts to allow acquaintances and the respondents to share the post among their social networks. This further disseminated the questionnaire and gathered more participants to take part in the study. The seeds received uniquely numbered codes and were tasked to recruit at least 3 participants for the next wave. The corresponding wave of participants were given the same tasks, and so on until the desired sample size was met. The social networks and recruitment patterns of each participant were kept track of. Afterward, mathematical models were applied to the recruitment process to weigh the sample and compensate for the non-randomness of the initial participants (Baraff et al., 2016; Hipp et al., 2019).

After identifying the convenience sample, the initial participants received an invitation email and a hyperlink to the research instruments. The web-based software "Google Forms" was used in collecting data. Once the instrument was accessed, the survey administration software redirected the participants to the background and purpose of the study and the informed consent. The informed consent constitutes the voluntary nature of participation, the specific expectations regarding participation, and the potential costs and benefits (see Appendix B). The consent form did not obtain any identifying information of each participant such as their name or contact number. Information concerning the stored data samples during the study was included in the consent form. The collected data will be secured within five years for different purposes, which include: (1) Giving access to information among researchers studying the same field; (2) Making information available to people who want to learn relevant topics about the study, as long as the authors are properly cited; and (3) Paving the way for the study's improvement by providing information among the readers who may serve as their bases. The data will be stored in a hard drive and a Dropbox to ensure safety and to serve as backups in case of technical problems. Only the researchers of this study will be granted access to the information stored in the aforementioned portals. After five (5) years of keeping this information, the data's hard and soft copies will be permanently disposed of, including any information regarding the study participants.

Data Analysis

Microsoft Excel was used to subject the data to descriptive (frequency distribution, central tendency, and variability) and inferential statistics (Pearson's correlation coefficient). Frequency distribution was used to obtain an overview of the demographic profile of the respondents and the occurrence of scores in SR and OLSE. The average SR and OLSE scores were measured using the mean to describe whether nursing students have high SR and OLSE. On the other hand, the standard deviation described how spread out the data was from the mean. A high standard deviation value indicated a greater spread; therefore, the mean did not summarize the data well. To analyze the pattern and strength of the association between SR and OLSE, Pearson's correlation coefficient was used. The closer the coefficient is to 1.00, the stronger the positive,

or direct, association; the closer the coefficient is to –1.00, the stronger the negative, or inverse, association (see Appendix F). A hypothesis test of significance of the correlation coefficient was executed to determine whether the linear association in the sample data is strong enough to represent the association in the population data. The p-value was set at <.05 for determining the significance of the findings. If the test concludes that the correlation coefficient is significantly different from zero, then the correlation coefficient is "significant."

Ethical Considerations

The study was submitted to the Holy Angel University - Institutional Review Board for clearance. The participants assured of confidentiality, right to full disclosure, self-determination, non-maleficence, and justice. The nature of the study was disclosed to the participants, and they were informed that their participation was merely used for educational purposes. The findings of the study were shared with the participants before it was made public to allow them to examine the study themselves. An examination of nursing students' SR and OLSE may provide future researchers, nursing administrators, academic leaders, and the participants themselves insights into students' motivation, academic performance and expand knowledge about the two concepts. In adherence to the Data Privacy Act of 2012, the researchers had secured confidentiality and avoided data from being leaked by not requiring participants to include their names in any part of the survey. The data had no identifying information and were stored in a password-protected account. Participants were informed that participation is completely voluntary and that they can decline or withdraw at any time during the study. Moreover, to assure justice, the selection of participants was primarily based on research requirements considering the inclusion criteria and the objectives of the study.

Results

A total of one hundred sixty-seven (167) responses were collected from the online survey. Upon inspection, it revealed a duplicate entry and the researchers decided to exclude it from data analysis.

Table 1 lists the age, gender, college level, and institution of a total of one hundred sixty-six (166) nursing students who participated in the online survey. The majority of participants were age 18–20 (N=99; 60%), while sixty-five (65; 39%) were age 21-30, and two (2; 1%) were 31-40 years old. One hundred thirty-five (135; 81%) participants were female, thirty (30; 18%) male, and one (1; 1%) identified as non-binary. As for college level, thirty-five (35; 21%) were first-year students, fifty-two (52; 31%) were second-years, and the majority were third-year students (79; 48%). Examining the distribution of institutions, out of a total of 166 participants, the majority attended Holy Angel University (N=62; 37%), followed by Angeles University Foundation (N=44; 27%), Guagua National Colleges (N=27; 16), University of the Assumption (N=20; 12%), Our Lady of Fatima University (N=7; 4%), College of Our Lady of Mt. Carmel (N=4; 2%), and Systems Plus College Foundation (N=2; 15).

Table 1

Demographic Profile of the online sample of nursing students (N = 166)

	N (%)	Mean (=SD)
Age		**20.43 (=1.76)**
18-20	99 (60)	
21-30	65 (39)	
31-40	2 (1)	
Gender		
Female	135 (81)	
Male	30 (18)	
Non-Binary	1 (1)	
College Level		
First year	35 (21)	
Second year	52 (31)	
Third year	79 (48)	
Fourth year	0 (0)	
Institution		
Angeles University Foundation	44(27)	
College of Our Lady of Mt. Carmel	4(2)	
Guagua National Colleges	27 (16)	
Holy Angel University	62 (37)	
Our Lady of Fatima University	7(4)	
Systems Plus College Foundation	2(1)	
University of the Assumption	20(12)	

Table 2 shows whether nursing students have a high SR and OLSE, as well as how far the data is from the mean. The study included a total of 166 nursing students from Pampanga. The results revealed that nursing students have a moderate SR (x=54.75, SD=10.60) and OLSE (x=93.01, SD=25.03).

Table 2

SR and OLSE - Mean Scores

	M	SD
SR	54.75	10.60
OLSE	93.01	25.03

Note. N = 166; Highest Possible Score (HPS) for OLSE: 132; HPS for SR: 85

Table 3 shows the correlation among nursing students' SR and OLSE. Pearson correlation coefficient was used to examine the association between nursing students' SR and OLSE. The results indicated a strong positive association between nursing students' SR and OLSE (r=.60, p<.00). This implies that the Pearson's correlation coefficient r = .60 with N of 166 is statistically significant at 0.05 level. Thus, the null hypothesis that "there is no association between nursing

students' SR and OLSE" is not accepted. In other words, there is an association between nursing students' SR and OLSE.

Table 3

Pearson Correlation Between SR and OLSE

		SR	OLSE
SR	Pearson Correlation	1	0.59647645
	Sig. (2-tailed)		<0.001
	N	166	166
OLSE	Pearson Correlation	0.59647645	1
	Sig. (2-tailed)	<0.001	
	N	166	166

Discussion

The K to 12 program, which covers kindergarten and 12 years of basic education, was implemented in the school year 2012 to 2013. The first batch of high school students who underwent in the K to 12 program did not graduate until March of 2018 (Official Gazette, n.d., para 1) which explains the absence of fourth-year nursing students. The analysis revealed that the majority of the participants were female. This finding is supported by WHO (2020b), in which they reported that the nursing workforce is predominantly female. In South-East Asia, 89% of nursing personnel are female, while only 11% are male (World Health Organization, 2020b).

The data analysis results revealed that nursing students have a moderate level of SR. Students who have better SR could have better educational performance as it enhances emotion, SE, planning, and motivation to improve in an academic setting (Sahranavard et al., 2018). Some studies suggest that college students are effective self-regulators as they have great control of their own schedule and how they approach their academic tasks and learning, while others show that they are not (Peverly et al., 2003; Xiao et al., 2019). Several studies in Asia revealed that college students have low to moderate SR (Ajisuksmo & Vermunt, 1999; Chen & Lin, 2018).

According to the study of Chen & Lin (2018), there is a decrease in SR throughout the college span, which appears to be an ultimate problem among Taiwanese college students, including nursing students. It has been suggested that the dimensions of SR may differ depending on the participants' groups and culture (Garzón Umerenkova et al., 2017, Vosloo et al., 2013, as cited in Chen & Lin, 2018). Regardless, integrating SR skills into the learning processes makes students more independent and responsible for their learning (Sahranavard, 2018, para. 20).

The data regarding OLSE suggest that nursing students have a moderate level of OLSE. The online learning platform led people to many opportunities as today's learners have grown up under the influence of the internet, and the majority of the students are well familiarized with using technology that the learner's academic performance is influenced by learner's SE (Honicke & Broadbent, 2016). In the study of Alqurashi (2018), the results indicate that OLSE is a critical factor in student satisfaction and perceived learning in an online learning environment. Several studies have found that SE is an important predictor of learners' satisfaction in an online learning environment (Wang & Newlin, 2002; Lim, 2001, as cited in Hodges, 2008). Similarly, the results in

a study about the relationship between OLSE and student satisfaction indicate that the strongest predictor of a student's satisfaction in an online learning environment was SE to complete online courses and SE to interact with instructors (Shen et al., 2013). In this context, more studies are needed as there is little known information about SE in an online learning environment (Hodges, 2008). As found in the literature, studies about the role of SE in online education are focused on the technological aspects of SE in online learning (Kundu, 2020) such as learning management system (LMS) SE (Martin et al., 2010; Prior et al., 2016), internet SE (Kuo et al., 2014; Lin et al., 2013), computer SE (Pellas, 2014), digital media SE (Pumptow & Brahm, 2020) and many more.

The analysis revealed that nursing students' SR is significantly associated with their OLSE. In fact, the results show a strong positive association between nursing students' SR and OLSE. This finding supports the study results conducted on 780 undergraduates (sophomores and juniors) from the U.S. Naval Academy by Artino and McCoach (2008), in which their OLSE subscale was positively correlated with metacognitive SR. Due to the relatively little research conducted on the association between SR and OLSE, there is limited literature to support the results. However, other studies in the literature suggest a positive and significant relationship between SR and SE for learning (Agustiani et al., 2016; Cho & Shen, 2013 as cited by Cho & Cho, 2017; Sen & Yilmaz, 2016). Meanwhile, a study on African American students enrolled in two undergraduate-level online research courses revealed a positive and significant correlation between internet SE and SR (Kuo et al., 2020). Students with high SE engage more in setting their own goals, monitoring their learning, performing different learning strategies, and evaluating their own progress, all of which are components of SR (Duchatelet & Donche, 2019; Sen & Yilmaz, 2016).

As a matter of fact, the forethought phase of SR includes task analysis and self-motivational beliefs (Artino & McCoach, 2008). Self-motivational beliefs include SE, outcome expectation, intrinsic value, and goal orientation (Metsärinne, 2014; Türkben, 2019).

Limitations

While this study sought to explore nursing students' behavioral aspects of online learning, there are a few limitations worth noting. First, by means of sampling design, an attempt to execute RDS was made, but follow-up and monitoring of referrals proved to be difficult due to the current setup brought about by the pandemic. Under such circumstances, participants were identified using a snowball sampling technique. Second, reaching the suitable sample size for the study was not successful as the response rate is rather low among nursing students who could potentially make up the target sample group, and the online nature of the data collection disproportionately affects students with low socioeconomic status. Based on these factors, selection bias may occur, limiting the generalizability of the study findings. Lastly, cross-sectional studies have low internal validity, the causal inference might be difficult to obtain, and the results might not be the same in the subsequent years as the gathered information only represents what is going on at one point in time (Carlson & Morrison, 2009; Levin, 2006; Setia, 2016).

Conclusion

The objectives of this research were to determine and describe whether there is an association between nursing students' SR and OLSE. Nursing students in Pampanga were found to have a moderate level of both SR and OLSE. The study also revealed that there is a statistically significant and strong positive association between SR and OLSE. With that, the academic administration and nurse educators should explore the dynamics between the two variables and develop programs that may improve SR and OLSE.

Recommendations

Several limitations of the study were present, suggesting future research directions. To our knowledge, this is also the first paper done on the association between SR and OLSE, specifically among nursing students. Thus, further exploration on the topic must be done to expand the available literature and fill in the gaps within this particular phenomenon. Considering that more undergraduate and graduate degree programs have been offered online, replication of the study in a different group of participants either from a different region or from various regions, should be conducted. Doing so would not only allow a comparison of the association between SR and OLSE among various college students but also reveal how the levels of SR and OLSE vary between students in different programs. A time series may also be conducted to examine if the results are consistent over time. By conducting a time series, researchers can also explore what factors influence change among SR and OLSE. Since the current literature mostly focuses on academic SE, researchers may also include this variable in their study to compare how it differs from OLSE. Moreover, researchers can compare how the association between SR and academic SE differs from the association between SR and OLSE.

The results of this study may be beneficial to nurse educators, academic administration, and nursing students. Since the results reveal a strong positive association between SR and OLSE, the academic administration and nurse educators should explore the dynamics between the two variables. Moreover, the academic administration and nurse educators should also consider including activities that improve SR and OLSE. Some studies suggest that SR is positively related to and is one of the predictors of student performance (Delen & Liew, 2016; Kuo et al., 2020; Sahranavard et al., 2018). Students with high levels of SR can produce better educational outcomes (Delen & Liew, 2016; Sahranavard et al., 2018). Therefore, nursing students should develop an awareness of their SR and OLSE and actively participate in improving these variables.

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APPENDIX A

Study Instrument

I. Demographic

Age:_____
Gender: ( ) F ( )M
College Major:_____
College level: ( )1st year ( ) 2nd year ( ) 3rd year ( ) 4th year
Institution:
( ) Angeles University Foundation
( ) College of Our Lady of Mt. Carmel Guagua National Colleges
( ) Holy Angel University
( ) Our Lady of Fatima University
( ) Systems Plus College Foundation University of Assumption
( ) Other:
Dean of the department: _____

II. Online Learning Self-Efficacy Scale

	Perform tasks poorly	**Perform tasks below average**	**Perform tasks on average**	**Perfo rm tasks above average**	**Perform tasks eminently good**	**Perform tasks at an expert level**
1. Navigate online course material efficiently	1	2	3	4	5	6
2. Find the course syllabus online	1	2	3	4	5	6
3. Communicate effectively with my instructor via e- mail	1	2	3	4	5	6
4. Communicate effectively with technical support via e-mail, telephone, or live online chat	1	2	3	4	5	6
5. Submit assignments to an online drop box	1	2	3	4	5	6
6. Overcome technical difficulties on my own	1	2	3	4	5	6
7. Navigate the online grade book	1	2	3	4	5	6
8. Manage time effectively	1	2	3	4	5	6
9. Complete all assignments on time	1	2	3	4	5	6

	Perform tasks poorly	Perform tasks below average	Perform tasks on average	Perfo rm tasks above average	Perform tasks eminently good	Perform tasks at an expert level
10. Learn to use a new type of technology efficiently	1	2	3	4	5	6
11. Learn without being in the same room as the instructor	1	2	3	4	5	6
12. Learn without being in the same room as other students	1	2	3	4	5	6
13. Search the Internet to find the answer to a course-related question	1	2	3	4	5	6
14. Search the online course materials	1	2	3	4	5	6
15. Communicate using asynchronous technologies (discussion boards, e-mail, etc.)	1	2	3	4	5	6
16. Meet deadlines with very few reminders	1	2	3	4	5	6
17. Complete a group project entirely online	1	2	3	4	5	6
18. Use synchronous technology to communicate with others (such as Skype)	1	2	3	4	5	6
19. Focus on schoolwork when faced with	1	2	3	4	5	6
20. Develop and follow a plan for completing all required work on time	1	2	3	4	5	6
21. Use the library's online resources efficiently	1	2	3	4	5	6

	Perform tasks poorly	Perform tasks below average	Perform tasks on average	Perfo rm tasks above average	Perform tasks eminently good	Perform tasks at an expert level
22. When a problem arises ask questions in the appropriate forum (e-mail, discussion board, etc.)	1	2	3	4	5	6

III. Short Self-Regulation Questionnaire

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I usually keep track of my progress toward my goals	1	2	3	4	5
2. I have a hard time setting goals for myself	1	2	3	4	5
3. I have trouble making plans to help me reach my goals	1	2	3	4	5
4. I set goals for myself and keep track of my progress	1	2	3	4	5
5. Once I have a goal, I can usually plan how to reach it	1	2	3	4	5
6. If I make a resolution to change something, I pay a lot of attention to how I'm doing	1	2	3	4	5
7. I get easily distracted from my plans	1	2	3	4	5
8. I have a lot of willpower	1	2	3	4	5
9. I am able to resist temptation	1	2	3	4	5
10. I have trouble making up my mind about things	1	2	3	4	5
11. I put off making decisions	1	2	3	4	5
12. I have so many plans that it's hard for me to focus on any one of them	1	2	3	4	5
13. When it comes to deciding about a change, I feel overwhelmed by the choice	1	2	3	4	5
14. Few problems or distractions throw me off course	1	2	3	4	5
15. I don't seem to learn from my mistakes	1	2	3	4	5
16. I usually only have to make a mistake one time in order to learn from it	1	2	3	4	5
17. I learn from my mistakes	1	2	3	4	5

APPENDIX B

Sample Informed Consent

Sample Consent Form for the online survey

You are invited to participate in a web-based online survey on "Association between Nursing Students' Self-Regulation and Online Learning Self-Efficacy". This is a research project being conducted by Level III nursing students from the School of Nursing and Allied Medical Sciences of Holy Angel University: Monica L. Borja, Ericka C. Munsayac, Steffanie A. Serrano and Joergiana V. Silang. It should take approximately 10 minutes to 15 minutes to complete the prepared instrument through this Google form.

I. THE STUDY

An analytical-correlational research design will be utilized to examine the association between nursing students' self-regulation and online learning self-efficacy. The study needs at least three-hundred twenty-four nursing students currently enrolled in a college of nursing in Pampanga. The results of the study will be helpful for future researchers, nursing administrators and instructors, and the participants themselves in finding interventions to improve both SR and OLSE. Nursing education administrators and leaders may use the results to improve their curriculum and lessons in a way that empowers SR and OLSE among nursing students. Furthermore, the results can help students recognize opportunities to set goals and guidance in SR and OLSE.

II. PARTICIPATION

Your participation in this survey is completely voluntary. You may refuse to take part in the research or exit the survey at any time without penalty. You are free to decline to answer any particular question you do not wish to answer for any reason. You must also be 18 to 50 years old or older at the time of your involvement in the study. You must also identify as a student enrolled in the Bachelor of Science in Nursing in an institution in Pampanga. You must be currently residing in the Philippines.

III. DURATION

The data collection will be primarily confined to the completion of this survey form. If you decide to opt in, for follow up questions and interview, then the research will span six (6) months in total. The data, however,
will be kept five (5) years after the study has been published.

IV. BENEFITS

You will receive no direct benefits from participating in this research study. However, you will be provided the results of the study, so that you can examine them for yourself and gain insight of the association between self-regulation and online learning self-efficacy.

V. RISKS

The possible risks or discomforts of the study are minimal.

VI. CONFIDENTIALITY

Your survey answers will be sent to a link at Google Drive where data will be stored in a password protected electronic format. Google Drive does not collect identifying information such as your name, email address, or IP address. Therefore, your responses will remain anonymous. No one will be able to identify you or your answers, and no one will know whether or not you participated in the study. A Data Storage Policy is included in this informed consent form.

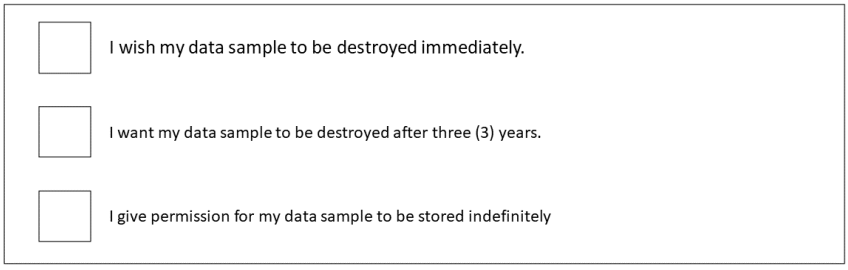
If you choose to provide contact information such as your phone number or email address, your survey responses may no longer be anonymous to the researcher. However, no names or identifying information would be included in any publications or presentations based on these data, and your responses to this survey will remain confidential.

VII. SHARING THE RESULTS

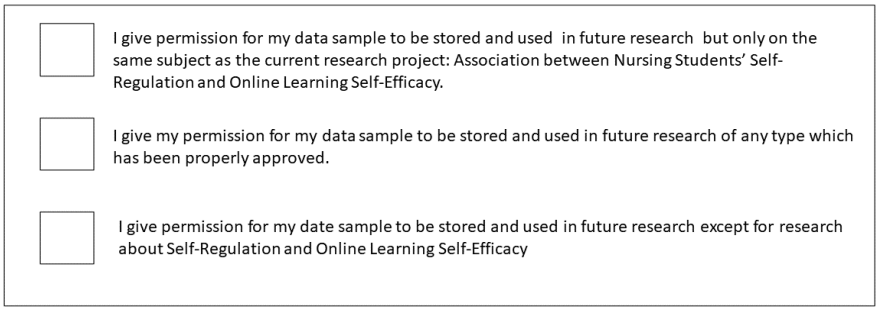
Nothing that you disclose today will be shared with anybody outside the relevant individuals, and nothing will be attributed to you by name. The knowledge that we get from this research will be shared with you and your community before it is made widely available to the public. Each participant can opt to receive a summary of the results. Following the distribution of summary findings, the results may be published in reputable journals so that other interested people may learn from the research.

VIII. CERTIFICATE OF CONSENT

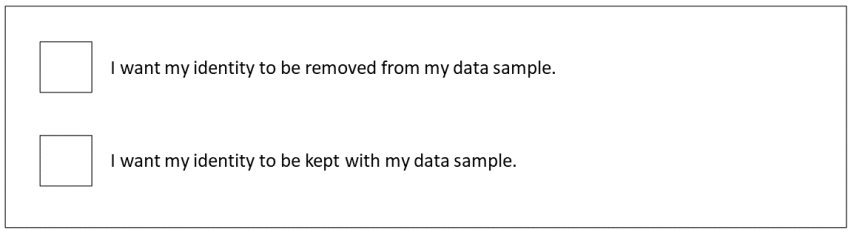
If any of the data, I have provided for this research project is unused or leftover when the project is completed (Tick one choice from each of the following boxes)



AND (if the sample is to be stored)



AND



If you have questions at any time about the study or the procedures, you may contact, Joergiana Marie V. Silang, via email at: jvsilang@student.hau.edu.ph

X. CONTACT INFORMATION FOR QUESTIONS ABOUT YOUR RIGHTS AS A RESEARCH PARTICIPANT

The Holy Angel University Institutional Review Board approved this research study:

Protocol Number: 2021-006-JVSILANG-OLSELFEFFICACY

You may contact the Holy Angel University Institutional Review Board if you have questions about your rights, concerns, complaints or comments as a research participant.

Holy Angel University
Holy Angel University Institutional Review Board Graduate School Office, 5th Flr
Peter G. Nepomuceno Center for Professional Development Bldg, Holy Angel University, Angeles City
Phone: (045) 888-8691 to 93 local 1534 Email: irb@hau.edu.ph

ELECTRONIC CONSENT: Please select your choice below. You may print a copy of this consent form for your records. Clicking on the "Agree" button indicates that

- You have read the above information
- You voluntarily agree to participate
- You are 18 years of age or older

I have read the information, or it has been read to me. I consent voluntarily to have my samples stored in the manner and for the purpose indicated above.

( ) Agree

( ) Disagree

APPENDIX C

Population and Sample Size of Student Nurses in Pampanga

School	Population
Angeles University Foundation	814
College of Our Lady of Mt. Carmel	48
Guagua National Colleges	97
Holy Angel University	203
Our Lady of Fatima University Systems Plus College Foundation	500
University of Assumption	134
Total	231
Sample Size: 324	2027

APPENDIX D

Online Learning Self-Efficacy Scale

OLSES item stems
1. Navigate online course materials efficiently
2. Find the course syllabus online
3. Communicate effectively with my instructor via e-mail
4. Communicate effectively with technical support via e-mail, telephone, or live online chat
5. Submit assignments to an online drop box
6. Overcome technical difficulties on my own
7. Navigate the online grade book
8. Manage time effectively
9. Complete all assignments on time
10. Learn to use a new type of technology efficiently
11. Learn without being in the same room as the instructor
12. Learn without being in the same room as other students
13. Search the Internet to find the answer to a course-related question
14. Search the online course materials
15. Communicate using asynchronous technologies (discussion boards, e-mail, etc.)
16. Meet deadlines with very few reminders
17. Complete a group project entirely online
18. Use synchronous technology to communicate with others (such as Skype)
19. Focus on schoolwork when faced with distractions
20. Develop and follow a plan for completing all required work on time
21. Use the library's online resources efficiently
22. When a problem arises, promptly ask questions in the appropriate forum (e-mail, discussion board, etc.)

APPENDIX E

Short Self-Regulation Questionnaire

SSRQ items with their factor	
Factor	**Item Statement**
F1	1. I usually keep track of my progress toward my goals. 2. I have a hard time setting goals for myself. 3. I have trouble making plans to help me reach my goals. 4. I set goals for myself and keep track of my progress 5. Once I have a goal, I can usually plan how to reach it. 6. If I make a resolution to change something, I pay a lot of attention to how I'm doing.
F2	7. I get easily distracted from my plans. 8. I have a lot of willpower. 9. I am able to resist temptation.
F3	10. I have trouble making up my mind about things. 11. I put off making decisions. 12. I have so many plans that it's hard for me to focus on any one of them. 13. When it comes to deciding about a change, I feel overwhelmed by the choice. 14. Few problems or distractions throw me off course.
F4	15. I don't seem to learn from my mistakes. 16. I usually only have to make a mistake one time in order to learn from it. 17. I learn from my mistakes.
F1, goal setting; F2, perseverance; F3, decision-making; F4, learning from mistakes	

APPENDIX F

Pearson's Correlation Coefficient Interpretation

Pearson's Correlation Coefficient Interpretation	
r value	**Interpretation**
≥ .70	Very strong positive relationship
.40 to .69	Strong positive relationship
.30 to .39	Moderate positive relationship
.20 to .29	Weak positive relationship
.01 to .19	No or negligible relationship
0	No relationship (zero correlation)
-.01 to –.19	No or negligible relationship
-.20 to -.29	Weak negative relationship
-.30 to -.39	Moderate negative relationship
-.40 to -.69	Strong negative relationship
≤-.70	Very strong negative relationship