POST-PANDEMIC READINESS OF SENIOR HIGH STUDENTS IN LEARNING EARTH AND LIFE SCIENCE

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Abstract

This research aimed to investigate the senior high school students' level of readiness in learning Earth and Life Science after the pandemic. It also sought to determine whether students' readiness is correlated to their academic performance in Science. The respondents of the study were 300 grade 11 students representing the different tracks from the five Senior High Schools of Bais City Division. The researcher utilized the descriptive–correlational method, used a validated questionnaire, and employed percent, weighted mean, Chi-square, and Spearman's Rank-order Correlation Coefficient. The findings of the study revealed that students' readiness in both academic and personal readiness is "high" and that their first-quarter academic performance in Earth and Life Science of the academic year 2022-2023 after the pandemic is on the "Very Satisfactory" level. Additionally, the results indicated a significant correlation between the students' academic performance and their personal and academic readiness. Moreover, the study highlighted that the female students manifested higher personal and academic readiness than their male counterparts.

Keywords:*Post pandemic readiness, academic readiness, personal readiness, academic performance*

1.0 Introduction

The COVID-19 pandemic has significantly affected education throughout various disciplines. The limitations of online instruction, along with the use of hybrid and remote education, have disrupted students' learning experiences, particularly in the field of science. As students transition back to in-person learning, it is crucial to assess their readiness to learn the subject in a post-pandemic world.

The epidemic has had a substantial impact on the Philippine educational system as well. To secure their safety, students were forced to shift to distance learning. However, this has made their learning experiences, especially in science, more challenging. Studies have shown that the transition to remote learning has negatively affected Filipino high school students' motivation

and attitudes towards science education and has brought concerns regarding their readiness to learn science effectively in the future. Consequently, the Department of Education has implemented limited face-to-face classes, using the School Safety Assessment Tool for COVID-19, at a few selected schools. Nonetheless, Malipot (2022) claims that face-to-face instruction was difficult for both students and professors, particularly in complex subjects like science. The 2019 TIMSS study additionally shows that Filipino students historically do poorly in math and science (Mullis, I. V. S., Martin, M. O., Foy, P., Kelly, D. L., & Fishbein, B., 2020). Moreover, the National Center for Education Statistics discovered that test results for technological competence remained consistent, indicating that there has not been any progress in this area.

Several studies have examined the readiness of students and its relationship to their academic performance, which is important because it can identify factors that may affect a student's ability to succeed in their academics. Studies have also shown that the readiness of students includes factors such as motivation, self-regulation, and prior knowledge and has a significant impact on academic achievement (Beckmann et al., 2021). By understanding how these factors contribute to student performance, educators, teachers, and instructors can develop strategies and interventions that better support students and improve their chances of effective learning. This is one of the reasons why conducting research relevant to student readiness and its relationship tostudents' academic performance is imperative so that educators can develop effective teaching practices and ensure effective learning.

Given the above premise, the researcher of the current study saw it crucial to investigate the students' readiness for face-to-face modality in learning science following the pandemic period. However, there is a scarcity of research on this topic, particularly in the Philippine setting. As a result, the researcher felt more motivated to investigate how ready Filipino students are for post-pandemic learning in Science. Bais City schools participated in the pilot testing of the limited face-to-face learning modality and were granted permission to fully deploy face-to-face classes at the start of the SY 2022-2023, making Bais City students an excellent focus of this study. During the first quarter of the face-to-face classes, the researcher focused particularly on student readiness and its relationship to their academic performance in Science.

2.0 Method

Data and Respondents

The study was conducted in five Senior High schools under the Division of Bais City, Negros Oriental. These schools offer different academic tracks, including Humanities and Social Sciences (HUMSS), Accountancy, Business and Management (ABM), and General Academic Strand (GAS).

One of the schools where the study was conducted was the Senior High School-Stand Alone, which is located in the city center and is considered the main campus. The school offers all of the aforementioned tracks. The other schools involved in the study were Okiot National High School, located 4.5 kilometers outside the city; Javier Laxina Memorial High School, situated more than 3 kilometers outside the city in Barangay Cabanlutan; and Sto. Thomas High School, located in Barangay Manlipac, 11 kilometers away from Bais City. These three campuses offer the HUMSS tracks. The last school, Tangculugan High School, is situated 4.2 kilometers outside the city and offers two academic tracks: GAS and HUMSS.

The respondents of the study were the 300 Senior High School students enrolled in different tracks of the participating schools during the first quarter period of the academic year 2022-2023. They were a mixture of students from rural and urban Grade 11 curricula The study dwells primarily on the respondents' readiness to learn Earth and Life Science, a subject that the respondents have in common except for the STEM strand since Earth and Life Science is not included in their curriculum.

To ascertain the precise number of survey respondents, Yamane's formula was used, and stratified sampling technique was utilized.

A questionnaire created by the researcher was employed during the study. The questionnaire's initial section asks about the student's profile, which includes information like age, sex, family income, and senior high school specializations.

The second part of the questionnaire covers the post pandemic readiness of students, which includes their personal and academic readiness.

To confirm the questionnaire's content validity and to check whether the items are relevant to the specific concerns of the study, the questionnaire was validated by three experts in the fields of research and science. The suggestions provided by the experts, who possess extensive qualifications including masters and doctorate degrees in science education and are experienced principals, were thoughtfully considered during the revisions of the questionnaire.

A pilot test or dry run was also done among 30 Grade 11 STEM students from Bais City National Science High School who

were not part of the respondents of the study. The reliability of the items was then evaluated using the Cronbach's alpha test, which is deemed to be most appropriate for survey research wherein items are not graded right or incorrect and each item may have different responses (McMillan & Schumacher, cited by Paulsen, 2017). To confirm the items' internal consistency and dependability, the results were computed. A value of 0.70 is regarded as satisfactory, while higher values of alpha are preferred.

The results of the Cronbach's Alpha coefficients indicate that all values—emotional (0.788), social (0.849), physical (0.887), motivation and engagement (0.873), goal orientation (0.794), Persistence and Self-Efficacy (0.896)—are higher than 0.70, which clearly shows the reliability of all items.

Throughout the duration of the study, ethical considerations were given utmost importance and were strictly followed. In particular, the principles of self-determination, confidentiality, and anonymity were upheld to protect the rights and privacy of the respondents who voluntarily participated in the research. Informed consents were given to the students through their class advisers one week prior to the survey to ensure that they had ample time to review and understand the purpose and procedures involved in participating in the study. Their personal data were kept confidential through the use of anonymized codes instead of their real names. Furthermore, measures were taken to ensure that the data collected were used only for research purposes and would not be disclosed to any third party without the participants' explicit consent. These ethical safeguards were consistently observed and monitored to ensure the integrity and trustworthiness of the study's findings.

The researcher carefully incorporated all significant comments and recommendations provided by the panel members during the design hearing, resulting in a revised questionnaire. After the Graduate School of Foundation University approved the study, a request letter outlining the research purpose, along with a copy of the revised questionnaire, was sent to the Office of the Schools Superintendent of Bais City Division. Upon approval, a letter of request was submitted to the senior high school principals, requesting the favor of providing the school list of their earth and life science teachers and/or class advisers. The researcher had a clear plan for data collection and analysis. She personally assisted in distributing the questionnaires to ensure that accurate responses were gathered and clarifications were provided to the respondents. The data were analyzed for patterns, trends, and

relationships between variables. Statistical methods were then used to ensure reliability and validity.

Statistical Treatment of the Data

The tools used by the researcher in analyzing the data are the following:

Percent. This was used in presenting the students' academic performance in science.

Weighted mean. This was used in getting the extent of students' post pandemic readiness in terms of personal readiness and academic readiness.

Mean. This was used in obtaining the extent of the students' academic performance in earth science during the first quarter period after the pandemic.

Spearman Rank Correlation Coefficient. This was utilized in identifying the degree of relationship between (a) the academic performance of the students in earth science during the first quarter period after the pandemic and their post pandemic readiness; and (b) the profile (age and family income) of the students and their post pandemic readiness. This test was also applied since one of the data was measured in ordinal scale.

Chi-square. This was used in identifying the relationship between the profile (sex and strand) of the students and their post pandemic readiness. This test is applicable since the profile variables are in nominal scale.

Measures

Dependent variable. The academic performance of students in the first quarter after the pandemic

Independent variable. The post pandemic readiness of students in terms of personal and academic readiness serves as the primary independent variable while the students' profile, like age, sex, monthly family income, SHS strand, serves as the secondary independent variable.

3.0 Results and Discussion

Post Pandemic Personal and Academic Readiness of the Students in Learning Earth and Life Science

Table 1 presents a summary of the students' personal and academic post-pandemic readiness for learning Earth and Life Science. The average weighted mean of the students' personal readiness, according to the data gathered, is 5.83, indicating a "high" level of readiness. Personal readiness encompasses social, emotional, and physical readiness. The individual weighted means for these three components are 5.77 for emotional readiness, 5.88 for social readiness, and 5.85 for physical readiness, all of which indicate "high" levels of readiness. Also, as seen by the average weighted mean of 5.8, the students' post-pandemic academic readiness for studying science is "high." The findings also imply that students' readiness levels in terms of motivation and engagement

are "high" with a weighted mean of 5.86. Goal orientation is likewise at a "high" extent with a weighted mean of 5.78, and perseverance and self-efficacy are similarly "high" with a weighted mean of 5.77.

The findings revealed that the students' levels of academic and personal readiness for learning science in person during the post-pandemic are both "high." These findings are an indication that the students are emotionally stable, socially confident, and physically healthy, which are all important factors for overall well-being.

Moreover, the findings show that the students are ready for both their personal and academic goals. According to Thorndike's Connectionism theory, readiness is determined by an individual's level of preparedness in various areas. This theory emphasizes that individuals learn best when they are ready and willing to learn.

The personal readiness of the students is shown in their high ratings on emotional, social, and physical readiness. This suggests that the students are emotionally secure, socially connected, and physically ready to engage in learning. These traits can be vital for students to excel academically, as they provide a firm foundation for learning.

Academically, it can be seen from the data that the students demonstrate high levels of motivation and engagement, goal orientation, persistence, and self-efficacy. These factors are crucial to academic success, as they inspire students to actively participate in learning, set goals for themselves, and endure challenges.

However, it is crucial to note that readiness is not a fixed trait. Individuals' readiness to learn can change over time, depending on a range of factors such as their environment, experiences, and personal circumstances. Thus, while the current results are encouraging, it is important to continue to monitor the readiness of students over time to ensure that they remain ready and engaged in their learning.

Students' progress depends on their post-pandemic readiness, which may be influenced by their sex and demographic information (Rugutt&Chemosit, 2020). Students are eager to resume their pre-pandemic lifestyles once universities reopen, demonstrating a high level of post-pandemic personal preparation, particularly on a social level (Lim &Regencia, 2022).

Prijambodo and Lie (2021) found that students are highly motivated and persistent in their learning despite the sudden transition in the learning modes. It is important to recognize the impact of changes in the education system on students' motivation and persistence and provide them with the support they

need to succeed. Building a positive relationship between teachers and students is also crucial in fostering motivation and persistence. Education professionals can assist students in overcoming any learning challenges and maintaining their academic success by offering individualized support and resources.

Table 1. *Post-pandemic Readiness of the Students (n = 300)*

Areas	$w\bar{x}$	Verbal Description	Extent of Readiness
Personal Readiness			
Emotional Readiness	5.77	Agree	High
Social Readiness	5.88	Agree	High
Physical Readiness	5.85	Agree	High
Overall	5.83	Agree	High
Academic Readiness			
Motivation and Engagement	5.86	Agree	High
Goal Orientation	5.78	Agree	High
Persistence and Self-Efficacy	5.77	Agree	High
Overall	5	Agree	High

Academic Performance of the Students in Earth and Life Science (n =300).

Table 2 presents the academic performance of the students in learning Earth and Life Science during the first quarter of the academic year 2022-2023, when the first face-to-face classes were implemented right after the pandemic. Data revealed during the first quarter that out of 300, 44.67% of the student respondents obtained an "outstanding" performance rating, which runs from 90 to 100 percent, and 24.33% received a "very satisfactory" performance rating, which ranges from 85 to 89 percent. Additionally, 19.67% percent of the students received "satisfactory" ratings on tests with scores between 80 and 84 percent while 11.33% of the students' obtained ratings that range from 75 to 59 percent, indicating a "fairly satisfactory" performance. The sum of the data shows that, with an average rating of 87.63%, the students' academic achievement in Earth and Life Science during the first quarter of the academic year 2022-2023 is "very satisfactory."

The COVID-19 pandemic has had a significant impact on students' academic performance worldwide, including those studying Earth and Life Sciences. According to a study by Adeoye and Adebiyi (2021), the disruptions to traditional classroom learning brought on by the pandemic have created serious problems for students, including decreased motiva-

tion, difficulty concentrating, and elevated stress and anxiety levels.

Moreover, the change to distance learning has resulted in additional challenges such as limited access to laboratory resources and less opportunities for hands-on learning, both of which are essential in the Earth and Life Sciences. According to a survey conducted by Asefa et al. (2021) on Ethiopian university students, the transition to distance learning resulted in a considerable negative impact on academic performance in the Earth and Life Sciences.

The pandemic has, nevertheless, had a positive impact on students' academic achievement. For instance, it has brought out the importance of Earth and Life Sciences in comprehending and responding to planetary crises like pandemics and climate change, which may have raised student interest and motivation in these fields.

In addition, academic success depends on student's readiness, both personally and academically. To support students who are highly ready, Satrianta et al. (2022) emphasized the need for customized learning strategies during the pandemic and highlighted the significance of having a conducive learning environment and services supplied by schools. Academic readiness, as described by Ramadhani and Sagita (2022), is the capacity to handle challenges and adjust to changes; thus, when students possess such qualities, they are more likely to succeed.

Table 2. *Academic Performance of the Students in Earth and Life Science (n =300)*

Rating	Verbal Description	Frequency	Percentage
90% - 100%	Outstanding	134	44.67
85% - 89%	Very Satisfactory	73	24.33
80% - 84%	Satisfactory	59	19.67
75% - 79%	Fairly Satisfactory	34	11.33
Total		300	100.00
Mean = 87.63 (Very Satisfactory)			
sd = 6.21			

Table 3 reveals the data identifying the relationship between the post- pandemic readiness and academic performance of the students. Considering their personal readiness, the data indicate that only the following personal readiness variables are significantly related to the students' academic performance: social readiness ($p = 0.000 < \alpha = 0.05$); and physical readiness ($p = 0.000 < \alpha = 0.017$).

Meanwhile, the data also show that the following academic readiness variables are significantly related to the students' academic performance: motivation and engagement ($p = 0.004 < \alpha = 0.05$); goal orientation ($p = 0.001 < \alpha = 0.05$); and persistence and self-efficacy (p

= 0.006 < α = 0.05). This suggests that the higher the students' readiness in these enumerated areas, the greater their academic performance.

Findings show that social readiness, physical readiness, motivation and engagement, goal orientation, persistence and self-efficacy are positively correlated with academic performance. This means that students who are socially and physically ready, are motivated, have a clear goal, and are persistent and self-sufficient tend to perform better academically. On the other hand, emotional readiness does not significantly correlate with academic performance.

The current results suggest that schools should focus on enhancing social and physical readiness, motivation, goal orientation, persistence, and self-efficacy among students to improve academic performance.

Academic readiness refers to student's preparedness to acquire academic knowledge, while personal readiness is their emotional, psychological, and cognitive preparedness to learn. According to Marais et al. (2019), academic readiness is an important factor that influences student success in higher education. Results found that students who had high levels of academic readiness were more likely to perform well in their studies and complete their degrees. Similarly, Cheng et al. (2020) posited that personal readiness was a significant predictor of academic achievement, and students with personal readiness were more likely to be motivated to learn and to persist in their studies.

Table 3. *Relationship between the Post Pandemic Readiness and Academic Performance of the Students (n = 300)*

Variables Correlated to Academic Performance	r_s	p-value	Decision	Remark
Personal Readiness				
Emotional Readiness	0.107	0.065	Fail to Reject H_{o1}	Not Significant
Social Readiness	0.256	0.000	Reject H_{o1}	Significant
Physical Readiness	0.137	0.017	Reject H_{o1}	Significant
Overall	0.180	0.002	Reject H_{o1}	Significant
Academic Readiness				
Motivation and Engagement	0.180	0.004	Reject H_{o1}	Significant
Goal Orientation	0.159	0.001	Reject H_{o1}	Significant
Persistence and Self-Efficacy	0.119	0.006	Reject H_{o1}	Significant
Overall	0.166	0.039	Reject H_{o1}	Significant

Table 4 displays the data identifying the relationship between the profile of the students and their post pandemic readiness. Of all the profile variables, only the sex of the students

has p-values that are less than the level of significance (0.05). These are 0.002 for personal readiness and 0.007 for academic readiness. These figures warrant the rejection of the null hypothesis. This result means that the sex of the students is significantly related to their post pandemic readiness. This further connotes that their sex can account to their post pandemic readiness. Furthermore, the values of the weighted means signify that female are more ready than their male counterpart.

The study's notable result that there is a difference between male and female in terms of personal readiness raises the possibility that there are significant gender-related differences in how people approach education and learning, and this may call for further research. This result is in line with earlier studies that tackle the impact of gender on academic achievement.

The result confirmed that of Eccles et al. (2019) who concluded that female high school students demonstrate higher levels of academic motivation, self-regulation, academic achievement, emotional and behavioral self-regulation, self-esteem, and overall well-being compared to male students. Wu et al. (2020), in the Chinese reading and math success tests, also observed that female pupils outscored males. Correspondingly, Santrock and Halonen (2019) discovered that female students outperformed male students in academic tasks requiring attention to details and memorization. In addition, according to Alghamdi et al. (2020), women have higher levels of self-control over men, which may contribute to their superior learning outcomes.

On the other hand, Cadalso and Dela Torre (2022) maintained that age, family income, and strand did not affect senior high school students' academic performance or preparation for college. This result is similar to Palardy's (2019) findings that age is not a significant indicator of academic achievement; however, this does not necessarily mean that older students have higher levels of academic persistence or are more likely to complete their academic careers.

The result also demonstrates no significant relationship between family income and either personal or academic readiness, which implies that these factors are not strong predictors of readiness for learning, at least within the population studied. These research findings are in line with some studies that have shown no significant relationship between family income and academic achievement (Sirin, 2019). However, there are also other studies that have exposed that students from low-income families face challenges when it comes to academic achievement. According to Reardon (2019),

the achievement gap between students from low- and high-income families has grown over time.

Furthermore, findings revealed no significant relationship between the strand and either personal or academic readiness. Correspondingly, Areepattamannil (2019) found no significant relationship between academic achievement and strand among secondary school students. Nonetheless, other studies have discovered that this strand does have an impact on academic achievement. Nugroho and Wijaya's (2019), for example, found that the science and social studies strands had a significant impact on academic achievement among Indonesian high school students. Raiput et al. (2020) and Khalid (2021) also noted that age, socio-economic status, and academic strand may not significantly affect readiness.

Table 4. *Relationship between the Profile and Students' Post Pandemic Readiness (n = 300)*

Profile and Learning Behavior	Computed Value	p-value	Decision	Remark
Personal Readiness				
Sex	$x^2 = 12.81$ male: $w\bar{x} = 5.68$ (High) female: $wx = 5.95$ (High)	0.002	Reject H_{o2}	Significant
Age	$r_s = 0.000$	0.992	Fail to reject H_{o2}	Not significant
Family Income	$r_s = 0.013$	0.834	Fail to reject H_{o2}	Not significant
Strand	$x^2 = 2.63$	0.093	Fail to reject H_{o2}	Not significant
Academic Readiness				
Sex	$x^2 = 9.99$ male: $wx = 5.67$ (High) female: $wx = 5.90$ (High)	0.007	Reject H_{o2}	Significant
Age	$r_s = 0.076$	0.188	Fail to reject H_{o2}	Not significant
Family Income	$r_s = 0.004$	0.944	Fail to reject H_{o2}	Not significant
Strand	$x^2 = 1.83$	0.768	Fail to reject H_{o2}	Not significant

Level of significance = 0.0

4.0 Conclusion

The pandemic brought about drastic changes in all aspects of life and immensely affected the mindset of young learners. Students are faced with a lot of challenges that influence their personal and academic readiness to go back to school and their flexibility and emotional stability also affect their overall performance. As such, students who are better prepared for the challenges of the pandemic are more likely to perform better academically in the post pandemic time, regardless of their age, family monthly income and strand in the Senior High School.

Students' adaptability to the new normal is greatly dependent on the teacher's effort in creating a fa-

vorable learning environment that provides varied learning collaborative opportunities, which, in turn, promote a sense of community where students can establish the feeling of connectedness and social presence.

Overall, the study's findings can enlighten educators as to the development of improved strategies and interventions to enhance students' readiness for learning science in a post-pandemic setting. This undertaking emphasizes the importance of personal and academic readiness factors in fostering effective learning outcomes, particularly in the context of a rapidly changing and uncertain world.

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