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Self-directed Learning Readiness and Perceived Social Support as Determinants of Students' Attitudes toward Science in Distance Learning

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***Abstract*—** During the modular distance learning due to the COVID-19 outbreak, students have consistently perceived science as a difficult subject and struggled to work on their modules independently, and some developed anxiety toward learning science. Most of the students also relied on the help of their parents and older siblings for the facilitation of learning and guidance in answering their modules. These circumstances lessen their positive attitudes toward science learning. This quantitative study sought to investigate whether self-directed learning readiness and perceived social support determine the student's attitudes toward science in distance learning. The regression analysis was employed to identify the level of association between the two independent variables and the dependent variable. Self-directed learning readiness and perceived social support both have significant relationships with students' attitudes toward science in distance learning. However, only perceived social support has been proven to be a determinant of students' attitudes toward science in distance learning. The study's findings may assist in planning appropriate interventions and activities that will be appropriate to the needs of the students regarding self-directed learning and perceived social support for the improvement of the modular distance learning implementation.

***Keywords*—** MAED-Teaching Science, perceived social support, self-directed learning readiness, students' attitudes toward science in distance learning, Philippines.

I. INTRODUCTION

Multiple studies revealed the effect of the pandemic on students' attitudes toward learning Science subjects. The sudden shift in the delivery of instruction affects the teaching-learning process and, in turn, affects the students' overall academic performance [13]. With these, an in-depth study of students' attitudes toward science is a significant concern, as recent studies have shown that it positively correlates with academic achievement in science [17].

Moreover, a study conducted in Spain, revealed that teachers handling Science subject have expected a drop in students' performance in science during academic years when the COVID-19 pandemic continues to cause an increase in the number of cases. One of the reasons is linked directly to students' attitudes toward science. Students lack interest in studying alone, other students cannot quickly grasp the topics on their own, and others are still dependent on the guidance of the teachers [33].

While the study conducted by Pribadi and Susilana [27] stated that students have low academic performance in science subjects in dealing with modular distance learning, which directly connects to their anxiety, boredom, loneliness, and lack of interest in learning and studying science.

It was found that self-directed learning readiness positively correlates with students' attitudes toward science. Since students' attitudes toward science positively correlate with academic achievement [17] it can be inferred that self-directed learning readiness is directly linked to academic achievement. In a recent study by Mahlaba [19] it was stated that self-directed learning is one of the skills that help students in their academic progress. It also hugely impacted academic success during the pandemic, with schools in many countries resorting to distance learning. Moreover, perceived social support and students' attitudes toward science have been found to correlate with each other. The findings of the research conducted by Rice et al., [30], presented that learners who experience more social support for science from parents, teachers, and friends have more positive attitudes toward science and a higher feeling of their competency in this subject. That is why many students are experiencing academic stress and losing interest in their subjects due to not physically engaging mainly with school friends and teachers during the pandemic [16].

Implementing modular distance education in public schools has become a significant challenge for the students of the New Bataan District, Davao de Oro. The students have consistently perceived science as a difficult subject and struggled to work on their modules

independently, and some developed anxiety towards learning science. During the pandemic, most of the students relied on the help of their parents and older siblings for the facilitation of learning and guidance in answering their modules. These circumstances lessen their positive attitudes toward science learning. Hence, there is a need to address the means of cultivating students' attitudes toward science in this kind of modality.

Further, the researcher has not come across a study seeking to assess the significant relationship between self-directed learning readiness and perceived social support to students' attitudes toward science. With this, a research gap is being established. Also, based on the scenarios stated above, the researcher finds an urgent need and action to investigate how self-directed learning readiness and perceived social support influenced the students' attitudes toward science in distance learning.

II. METHODOLOGY

This study utilized a quantitative, non-experimental research design. Quantitative research allows researchers to use numbers in statistical tests to guarantee that the findings have a statistical link and to explain the findings with numbers [35]. Non-experimental research is either descriptive or correlational, meaning that it is either describing a situation or phenomena as it is, or documenting the relationship between two or more variables, all without the researcher's interference [28]. In this study, descriptive and correlational design were used between and among variables. Regression analysis was also performed which provides a straightforward way to examine functional relationships between variables [4]. Additionally, the "statistical significance" of the results, estimated relationships, or the degree of assurance that the association exists were assessed in this study.

The participants of this study were Grade 10 students from the four (4) public secondary junior high schools in New Bataan District, Davao de Oro, who are officially enrolled in the School Year 2022-2023 and experienced learning in a modular learning delivery mode. The respondents in this study were chosen using a stratified random sampling method. Each School was used to create strata. The Slovin's formula (n = N / (1+Ne2), where "n" refers to the sample size, "N" refers to the population size, and "e" refers to the margin of error, was used to obtain the number of respondents from the given population of 640 grade 10 students. Based on the computation, 247 sample respondents will be required for the conduct of the study. Thirty-two (32) respondents were chosen from School A, forty-seven (47) respondents from School B, fifty-six (56) from School C, and one hundred-twelve (112) from School D.

III. RESULT AND ANALYSIS

Level of Self-directed Learning Readiness

Presented in Table 1 is the level of self-directed learning readiness on the basis of learning with intention, open-mindedness, characteristics of self-discipline, characteristics of self-management, and desire to learn. The total mean, which is characterized as high, is 4.069. This means the Grade-10 students' self-directed learning readiness in science distance learning is evident.

This claim can be linked to the study of Mahlaba [19] which stated that one of the skills that students need to master during the COVID-19 pandemic, where most students are in distance learning, is self-directed learning, which enables students to take control of their learning by identifying their own learning needs, setting their own learning goals, and using personalized learning strategies to achieve those goals and monitor their progress. In effect, self-directedness substantially impacts the development of students' inquiry and critical thinking skills in a blended distance learning environment, for it gives them a better understanding of the subject owing to the repeated usage of course materials and allows them to make their judgments about the learning process [32].

Among the five indicators, open-mindedness has a very high descriptive equivalent, implying that the open-mindedness under students' self-directed learning readiness in science distance learning is very much evident. This result is parallel to the findings of the study of Plews [26], which found that students' strong open-mindedness results from the environment of distance learning, which encourages them to share their opinions when necessary.

The second indicator, which gains the second highest mean, is the desire to learn, which posted a mean of 4.166, with a verbal description of high, indicating that this indicator in science distance learning is evident. These findings are consistent with those of Grande et al. [10], who found that subjects with a high level of desired interest in learning proved more prepared and eager to engage in the subject. Students are becoming more self-reliant and learning-focused.

Another indicator is learning with intention, with a mean of 3.999 and a descriptive equivalent of high, implying that learning with intention in science distance learning is also evident. The result has come to agree with the study of Rabin et al. [29], who inferred that students with a clear intention and goal for learning are more likely to continue their education despite difficulties in pursuing their education, such as in distance learning.

The next indicator is the characteristics of self-discipline which posted a mean of 3.902, described as high. It also indicates that the characteristics of self-discipline in science distance learning are evident. This result is supported by the study of Muksin [23], stating that students must develop self-discipline to succeed in distance learning, for it significantly affects academic performance.

Lastly, the characteristic of self-management got the lowest mean of 3.847. However, it is also described as high, which means the characteristic of self-management in science distance learning is evident. This agrees with the findings of the study of Chávez-Miyauchi et al. [5] which stated that although students encountered time management issues during distance learning, they were more committed to their studies when working at their own pace and managing their own time.

Level of Perceived Social Support

Table 2 below shows the level of perceived social support - from parents, teachers, classmates, close friends, and people in school. The overall mean is 3.908, with a verbal equivalent of highly extensive. This implies that social support is often observed. This concord with the result of the study of Huang et al. [11], who stated that perceived social support has a great positive correlation with students' well-being. That is, timely and sincere social support from significant others (such as family, friends, and teachers) in instrumental, informational, or emotional forms can help students deal with challenges in life.

On the other hand, the indicator my teacher(s) got the highest mean of 4.133 with a descriptive equivalent of highly extensive which implies that support from the teacher is oftentimes observed. The result conformed to the propositions of Villegas-Puyod [36] that support from teachers also comforts and assists students in developing a sense of enthusiasm and self-motivation in completing their academic work and encourages them to adopt various learning strategies to increase their knowledge of the subject matter.

The indicator my close friend posted a mean of 4.127, described as highly extensive, indicating that support from close friends is oftentimes observed. This is parallel to the findings from the study of Mosanya [22], which stated that the support of close friends is almost equal in percentage to the support of the parents as to the best support perceived by the students. This is because students see their close friends as significant in dealing with the challenges brought about by the COVID-19 pandemic.

The next indicator is my parents, which got a mean of 3.950 with a descriptive equivalent of highly extensive, also indicating that support from parents is oftentimes observed. The study of Agaton et al. [1] agrees with the result, as parents' extensive involvement in their student's learning at home can positively impact academic performance in distance learning.

The indicator my classmates got a mean of 3.801, described also as highly extensive, implying that support from classmates is oftentimes observed. This result is congruent with the study of Pecjak et al. [25] that the most significant factor in promoting adolescents' psychosocial well-being during distance learning was contact with classmates through online social networks.

Finally, the indicator people in my school got the lowest mean of 3.528; it also means that support from people in school is oftentimes observed. The result shows that students usually noticed that personnel at their school assisted them in finding solutions to their issues and could provide them with encouraging feedback. The result is related to the study of Darling-Hammond [7], which inferred that a solid foundation for learning is established by setting a favorable school climate based on strong relationships with the school staff, curriculum specialist, guidance counselor, school head, and teachers. Students must have a sense of belonging and security to succeed in school.

Level of Students' Attitudes toward Science in Distance Learning

Table 3 presented the level of students' attitudes toward science in distance learning as to science teacher, anxiety in science, enjoyment of science, and science in society. The overall mean is 3.370, and the descriptive equivalent of moderate. This means that the variable -

student's attitudes toward science in distance learning is moderately evident. Most of the students' responses in this variable are not that high, implying that they are not fully confident and not that great in favor of learning science in distance learning.

Table 1. *Level of Self-directed Learning Readiness*

Indicators	Mean	SD	Descriptive Equivalent
Learning with Intention	3.999	0.535	High
Open-mindedness	4.429	0.599	Very High
Characteristics of Self-discipline	3.902	0.639	High
Characteristics of Self-management	3.847	0.702	High
Desire to Learn	4.166	0.633	High
Overall	4.069	0.536	High

Table 2. *Level of Perceived Social Support*

Indicators	Mean	SD	Descriptive Equivalent
My Parents	3.950	0.820	Highly Extensive
My Teacher(s)	4.133	0.688	Highly Extensive
My Classmate(s)	3.801	0.757	Highly Extensive
My Close Friend	4.127	0.832	Highly Extensive
People in My School	3.528	0.877	Highly Extensive
Overall	3.908	0.623	Highly Extensive

Table 3. *Level of Students' Attitudes toward Science in Distance Learning*

Indicators	Mean	SD	Descriptive Equivalent
Science Teacher	3.406	0.772	High
Anxiety in Science	2.904	1.039	Moderate
Enjoyment of Science	3.422	0.614	High
Science in Society	3.728	0.627	High
Overall	3.370	0.585	Moderate

Table 4. *Significance on the Relationship between Self-directed Learning Readiness and Perceived Social Support to Students' Attitudes toward Science in Distance Learning*

Independent Variable	Dependent Variable	r-value	r-squared	p-value	Decision α = 0.05
Self-directed Learning Readiness	Students' Attitude toward Science	0.245*	0.0600	0.001	Ho is rejected
Perceived Social Support		0.370*	0.1369	0.001	Ho is rejected

*p<0.05

Table 5. *Significance on the Relationship between Self-directed Learning Readiness and Students' Attitudes toward Science in Distance Learning*

Independent Variable	Dependent Variable	r-value	r-squared	p-value	Decision α = 0.05
Learning with Intention	Students' Attitude toward Science	0.180*	0.0324	0.005	Ho is rejected
Open-mindedness		0.012	0.0001	0.848	Ho is not rejected

Characteristics of Self-discipline		0.235*	0.0552	0.001	Ho is rejected
Characteristics of Self-management		0.342*	0.1170	0.001	Ho is rejected
Desire to Learn		0.246*	0.0605	0.001	Ho is rejected

*p<0.05

Table 6. *Significance on the Relationship between Perceived Social Support and Students' Attitudes toward Science in Distance Learning*

Independent Variable	**Dependent Variable**	**r-value**	**r-squared**	**p-value**	**Decision** $\alpha = 0.05$
My Parents	Students' Attitude toward Science	0.275*	0.0756	0.001	Ho is rejected
My Teacher(s)		0.237*	0.0562	0.001	Ho is rejected
My Classmate(s)		0.332*	0.1102	0.001	Ho is rejected
My Close Friend		0.131*	0.0172	0.040	Ho is rejected
People in My School		0.461*	0.2125	0.001	Ho is rejected

Table 7. *Regression Analysis on the Influence of Self-directed Learning Readiness and Perceived Social Support to Students' Attitudes toward Science in Distance Learning*

Independent Variable	**Unstandardized coefficients**		**Standardized Coefficients Beta**	**t-value**	**P-value**	**Decision**
	B	Std. Error				
(Constant)	2.004	0.273		7.338	0.001	
Self-directed Learning Readiness	0.004	0.086	0.004	0.051	0.959	Ho is not rejected
Perceived Social Support	0.345	0.074	0.367*	4.657	0.001	Ho is rejected
Dependent Variable: Students' Attitudes toward Science in Distance Learning						
***p<0.05 R=0.370 R2=0.137 F=19.353 p-value=0.001**						

Table 8. *Regression Analysis on the Influence of the Domains of Perceived Social Support to Students' Attitudes toward Science in Distance Learning*

Independent Variable	**Unstandardized coefficients**		**Standardized Coefficients Beta**	**t-value**	**P-value**	**Decision**
	B	Std. Error				
(Constant)	2.004	0.273		7.338	0.001	
My Parents	0.025	0.057	0.035	0.434	0.665	Do not Reject Ho
My Teacher(s)	-0.020	0.074	-0.023	-0.269	0.788	Do not Reject Ho
My Classmate(s)	0.139	0.063	0.179*	2.193	0.029	Reject Ho
My Close Friend	-0.089	0.052	-0.127	-1.701	0.090	Do not Reject Ho
People in My School	0.270	0.048	0.405*	5.662	0.001	Reject Ho
Dependent Variable: Students' Attitudes toward Science in Distance Learning						
***p<0.05 R=0.483 R2=0.233 F=14.654 p-value=0.001**						

These findings show parallelism with the results obtained by the study of Tanik-Önal [34], stating that some of the topics in science increased students' academic success, ensured the longevity of their knowledge, and developed their competence in the scientific process in distance learning. However, there are growing downsides. One of them was that, since processes like experiments were not used in distance learning, it did not match the nature of the science subject. This could be the cause of why the sum-up of participants' responses falls to moderate.

Moreover, this result is supported by the study of Delyana [8], stated that worries about students' attitudes toward science are aroused. The formerly positive attitudes toward science could turn negative because science learning activities have changed unexpectedly. Since science education has been less effective throughout the COVID-19 pandemic, science learning may present challenges for students that did not happen before the COVID-19 outbreak.

On the other hand, science in society received the highest mean, 3.728, out of all the indicators, with a descriptive equivalent of high, which means that this indicator in distance learning is evident. This result also parallels the study conducted by Matuk et al. [20] which assessed the COVID-19 pandemic as a context to examine the role of science in an international health crisis.

The next indicator is the enjoyment of science, which got the second highest mean of 3.422 with a descriptive equivalent of high, implying that this indicator in distance learning is evident. The result could be accredited to the enduring students' interest in studying science even amidst the challenges of distance learning. This is supported by the study of Lu et al. (2022), pointing out that people's enjoyment of learning about science may be influenced by their increased interest in science-related activities.

Another indicator described as high is science teacher, with a mean of 3.406, indicating that the student's attitudes toward science in distance learning is evident. The participants' responses signify the vital role of science teachers in cultivating their attitudes toward learning science. Yerdelen [37] inferred that science teacher effectiveness is directly linked to teachers' characteristics that can influence students' learning outcomes. These characteristics are focused on teachers' personality traits, teaching strategies, and occupational well-being.

Lastly, anxiety in science got the lowest mean of 2.904, described as moderate. This means that the student's attitudes toward science in distance learning is moderately evident regarding anxiety in science. Further, Caymaz & Aydin [3] stated that the attitude of the family, the attitude of the teacher, activities that are inappropriate for the student's level, incorrect perception of the lesson, a lack of role models, negative experiences, fear of tests and exams, and a lack of social support could all contribute to science anxiety. This result also could be explained by the fact that students thought transitioning to online learning was advantageous. Students could participate in activities at convenient times and locations in online learning.

Significance on the Relationship between Self-directed Learning Readiness and Perceived Social Support to Students' Attitudes toward Science in Distance Learning

Shown in Table 4 is the significance of the relationship between self-directed learning readiness and perceived social support to students' attitudes toward science in distance learning. The p-value found in the table was then compared to a 0.05 level of significance to determine the relationship. It was found that self-directed learning readiness has a weak positive correlation with the dependent variable, with an R-value of 0.245 and a p-value of 0.001. A weak positive correlation with the dependent variable is also evident in the r-value of perceived social support, which is 0.370 with a p-value of 0.001. Even though they are both significantly related to students' attitudes toward science, the R-value produced by each variable differs. The results further imply that when students' self-directed learning readiness and social support from their environment increases, their positive attitude towards learning science in distance learning also increases.

These results can be explained by the proposition of Faaz and Khan [9] presented in their study, students' attitude toward science indicates that they are interested in learning and studying science. Hence, self-directed learning has been highly regarded as it can allow learners to adapt to changing contextual social conditions, such as in the context of distance learning.

On the other hand, perceived social support positively correlates with students' attitudes toward science, and

many studies affirmed this, such as the study of Rice et al. [30] and Anggoro [2]. The latter elaborated on these by citing studies that mentioned that learning is a holistic and sustained process of knowledge development by socializing with others based on experience and students' adaptation to their lives.

Significance on the Relationship between Self-directed Learning Readiness and Students' Attitudes toward Science in Distance Learning

Table 5 shows the significance of the relationship between self-directed learning readiness and students' attitudes toward science in distance learning. Among all the indicators under self-directed learning readiness, only open-mindedness has a negative correlation with the dependent variable since it got an r-value of 0.012 which is close to zero, implying a near to negative correlation and a p-value of 0.848 is way greater than the significance level of 0.05. Meanwhile, the rest of the indicators' results imply a positive correlation with the dependent variable since their r-value and p-value results are not close to zero and beyond the significance level of 0.05, respectively. So if taken as a whole, the variable – self-directed learning readiness has a significant relationship with the students' attitudes toward science in distance learning; however, not all the indicators positively correlate with the dependent variable. This means that having a high level of open-mindedness would not guarantee that the students' level of attitudes toward science will increase.

This result could be attributed to decreased interactions between the science teachers and students due to limiting factors such as the online learning equipment and the accessibility to an internet connection, thus, negatively affecting their attitudes toward science. It was supported by Lindahl and Folkesson [15], mentioning that a high open-mindedness may result from more interactions during the teaching-learning process. By looking at these, it can be shown that the students accept new teaching strategies and ideas.

Significance on the Relationship between Perceived Social Support and Students' Attitudes toward Science in Distance Learning

Presented in Table 6 is the significance of the relationship between perceived social support and students' attitudes toward science in distance learning. All the indicators under perceived social support positively correlate with the dependent variable, evident in their r-value and p-value, which are lesser than the significance level of 0.05. This made the independent variable – perceived social support has a significant relationship with the students' attitudes toward science in distance learning. This also means that the null hypothesis is rejected.

The result agrees with the study of Rice et al. [30], stating that students' attitudes toward science are better and they feel more competent in this area when they perceive stronger social support for science from parents, teachers, and friends.

Regression Analysis on the Influence of Self-directed Learning Readiness and Perceived Social Support to Students' Attitudes toward Science in Distance Learning

Table 7 shows the regression analysis on the influence of self-directed learning readiness and perceived social support on students' attitudes toward science in distance learning. In general, the table shows that the F-ratio of 19.353 and p-value of 0.001 indicate that the two independent variables are unquestionably less than the 0.05 level of significance.

The two independent variable can significantly determine students' attitudes toward science when taken as a whole. However, among the two variables, only perceived social support significantly determines students' attitudes toward science in distance learning based on the linear regression analysis of the variables under consideration.

The result of this study is not conforming to the study of Mentz & Van Zyl [21] that self-directed learning and students' attitudes toward learning science have significant relationships.

Positive attitudes toward learning contributed to students' self-directed learning skills. As the sub-themes inquisitiveness, improved learning methods, improved social skills, increased interest, motivation to learn, a need and willingness to use other resources, and enjoyment can link to characteristics of a self-directed learner.

Further, the researcher inferred that the result might present that self-directed learning readiness is not a determinant of students' attitudes toward science in distance learning; however, it does affect the student's academic performance in distance learning, as the findings of other studies.

Regression Analysis on the Influence of the Domains of Perceived Social Support to Students' Attitudes toward Science in Distance Learning

Table 8 shows the regression analysis on the influence of the domains of perceived social support on students' attitudes toward science in distance learning. The F-ratio of 14.654 and p-value of 0.001 presented in the table imply that the indicators under the variable – perceived social support are less than the 0.05 level of significance. This means that when taken as a group, the domains of perceived social support significantly influence students' attitudes toward science in distance learning.

The result in the indicator – My parents- is inconsistent with Ofek-Geva et al. [24], asserting that students' attitudes toward science are strongly related to parents' support and attitudes toward science. Parents have a crucial and significant role in keeping their children interested in science, even if they are disappointed in one or more of their science learning environments.

On the other hand, the result in the indicator – My Teacher(s), is found to be not conforming to the study, as mentioned earlier by Villegas-Puyod [36], inferring that teachers support comfort and aid students in developing a sense of enthusiasm and self-motivation in completing their schoolwork, teachers also encourage them to employ various learning strategies that deepen their understanding of the subject.

Further, the findings in the indicator – My Close Friends is not in congruence to the claim of Mosanya [22], stating that relationship with close friends is best support perceived by the students, seeing their close friends as significant in dealing with the challenges brought about by the pandemic.

IV. CONCLUSION AND RECOMMENDATION

Conclusion

After reviewing back, the results of the research objectives, the researcher concluded that the level of self-directed learning readiness among Grade-10 students was high, indicating that the Grade-10 students' self-directed learning readiness in science distance learning is evident. Open-mindedness has the highest mean of the five indicators, with a mean of 4.429 with a verbal description of very high. It is then followed by the desire to learn, which posted a mean of 4.166; learning with intention with a mean of 3.999; characteristics of self-discipline, which received a mean of 3.902; and characteristics of self-management, which attained a mean of 3.847, these all have a verbal description of high.

The level of perceived social support was described as highly extensive. This implies that social support is often observed. Among all the indicators under the variable – perceived social support, my teacher(s) got the highest mean of 4.133, followed by my close friend, with a mean of 4.127, then my parents got a mean of 3.950, my classmates, which has a mean of 3.801, and finally, people in my school with a mean of 3.528. All the indicators got a descriptive equivalent of highly extensive.

On the other hand, the level of students' attitudes toward science got a descriptive equivalent of moderate. Science in society received the highest mean of 3.728 out of all the indicators. It was followed by enjoyment of science, with a mean of 3.422, and science teacher, which has a mean of 3.406. All of them got the descriptive equivalent of high. On the other hand, anxiety in science got the lowest mean of 2.904, described as moderate.

Regarding the significant relationship among variables, both self-directed learning readiness and perceived social support have a significant relationship with students' attitudes toward science in distance learning. Moreover, self-directed learning readiness and perceived social support were found to be determinants of students' attitudes toward science when taken as a whole.

However, between the two variables, only perceived social support significantly determines students' attitudes toward science in distance learning based on the linear regression analysis of the variables.

The result was backed by the Self-determination Theory of Ryan and Deci [31] which refers to a person's capacity for self-management, making confident choices, and independent thought. With this, when self-directed learning is met, students' attitudes toward science are enhanced.

Lastly, the findings of this study were also supported by the Social Cognitive Career Theory of Lent [14]. This theory manifested that as long as students have the social support and necessary skills, they become interested and perform better academically through a positive attitude towards the subject.

RECOMMENDATION

After carefully examining the findings and conclusions of this study, the researcher offered many recommendations for how students' attitudes toward science could be increased from moderate to high or even very high.

First, DepEd officials may develop and implement more programs and interventions for distance learning, specifically for online learning and printed modular distance learning, that would cater to the students' different learning preferences and styles. They may also establish more guidelines for conducting face-to-face, synchronous, and asynchronous classes. The students will benefit from having a clear schedule or list of the assignments they must complete within a given day, week, or month. Since the findings revealed that self-directed learning readiness in terms of characteristics of self-management is less evident, it will help students manage their time and tasks effectively, which may boost their positive attitude toward science.

Second, these programs and interventions could be effectively integrated into the teaching-learning process in the actual field through active monitoring by the school administrators. Additionally, they may plan and conduct workshops and seminars for teachers on topics like self-directed learning readiness, the impact of perceived social support, and how to cultivate students' attitudes toward science in the context of distance learning. Through this, students may have greater school support for their studies, particularly throughout the modular distance learning period, as this study revealed that people in school got the lowest mean.

Third, as stated in this study, the indicators - support from teachers and parents have been found to be no contributors that significantly determine students' attitudes toward science. Hence, science teachers should use more appropriate activities and teaching methods suitable for distance learning to address and enhance students' attitudes toward science. Further, parental social support should be provided to the students. Students might be more encouraged to be interested in learning science when their parents give them more time to assist and direct them while they do their tasks and homework. This could also address the findings of this study that that the student's attitudes toward science in distance learning is moderately evident regarding anxiety in science, as it found out that the family's attitude could contribute to lessen science anxiety.

Finally, the researcher recommends that future researchers look into other variables relating to students' science learning, such as science anxiety and learning preferences, among others. For the findings, this study could also be done in different grade levels, such as in senior high or college.

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