International Journal of Humanities and Social Sciences
p-ISSN: 1694-2620
e-ISSN: 1694-2639
Vol. 15, No. 1 (2023), pp. 19-41, ©IJHSS

Level of Engagement of Junior High School Students in Science During Online Distance Learning

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Abstract
This study focuses on the Junior High School students' science engagement in online distance learning at Statefields School Inc. Learner engagement in science was analyzed using a validated researcher-made questionnaire based on the three interactions: learner-content, learner-teacher, and learner-learner. This study used a descriptive research design. Out of 891 learners, 256 participated in the research. Most learners are female, post-paid users, have good internet connection and spent 3-5 hours daily using the Learning Management System (Quipper). Most learners are in Grade 8 and share the internet with 2-3 users. Findings show that learners have a high level of engagement in science during online distance learning through all interaction schemes. The study also reveals that there is a significant difference in science engagement based on learners' grade level. The difference was noted between grades 9&10 and 9&7 learners. Grade 9 students have the lowest science engagement. This study recommends allotting more synchronous sessions for teacher-learner interaction; employing diverse forms of assessment; optimal use of LMS; utilization of digital apps in science class; and further study to evaluate the success of the proposed plan in amplifying learners' science engagement.

Keywords: science engagement; learner-learner; learner-teacher; learner-content; online learning

1. Introduction

1.1. Background of the Study

Online learning, as coined by the Department of Education (2021, p. 8), was defined as a venue "where learning takes place between the teacher and the learner who are geographically remote from each other during instruction." Distance learning in the Philippines, as mandated by the

DepEd, has two modalities: Online Distance Learning (ODL) and Modular Distance Learning (MDL) with the use of Self-Learning Modules. Online Distance Learning (ODL) is a learning mode where teachers deliver instruction using video-sharing and conference platforms such as Zoom, Google Meet, etc. Students follow a certain schedule for synchronous classes for discussions and a schedule for asynchronous periods when they managed learning and activities independently. On the other hand, Modular Distance Learning (MDL) is a mode of learning where learners are provided with self-learning modules. Learners may be provided printed modules or digitally produced modules, depending on which is available and more applicable to learners. Either or both modalities were used by both public and private educational institutions nationwide from 2020 up to the present. These learning modalities brought a major change in the education system. As Statefields School, Inc. has shifted from face-to-face to online distance learning modality in the delivery of instruction, changes have been observed.

1.2. Response of Statefields School, Inc.

Sudden changes in instructional delivery were observed by academic institutions. Statefields School, Incorporated's initial response to the situation was to use a learning management system and have the delivery of instruction done online. With this setup, teachers prepare and send lessons and assessment activities in a work-from-home scheme and learners manage their learning and respond to assessments in the comfort of their homes. In its final term for the academic year 2019-2020, it used the learning management systems Edmodo and Google Classroom. Using the learning management systems, teachers were able to send lessons and assessment tools to learners and likewise, students were able to submit written works and other requirements. This was the initial action done by SSI; with the main purpose of ensuring the delivery of the remaining skills for each grade level for the remaining part of the academic year. Another effort made by SSI was to ensure regular teacher-to-parent communication to keep parents and guardians updated on the learners' academic performance, especially requirements they have yet to submit. Some learners were able to submit on time and finish requirements earlier than expected but some learners were not able to follow the given schedule for activities. Constant reminders for learners and steady communication with parents to address non-compliance to instructional requirements have been truly challenging for teachers. But one of the school's major concerns is the declining level of engagement of learners, especially in science.

1.3. Challenges during Online Distance Learning

The main challenge faced by the Science subject area with regards to the implementation of the ODL in SSI for SY 2021-2022 is the learners' engagement in the different activities in the subject. The learners' participation in the discussion of current events in relation to the environment is noticeably low. Teachers and learners do not have the luxury of time to either extend or deepen their discussion/sharing in relation to global environmental awareness. Science contents from the MELC and the integration of SIP were prioritized. Due to this reason, regular and periodic conduct of the Sessions for Earth Awareness (SEA) was not possible. Another indicator of the lack of learner engagement was during synchronous and asynchronous classes. During synchronous class, not all learners are active in class during oral recitation especially if the task involves problem-solving. In addition, most of the learners were hesitant or quite reserved in sharing their answers since most of the lessons in science, particularly in Chemistry and Physics, involved both conceptual and practical (mathematical) approaches. Doing the computational part for these topics synchronously was really a challenge in terms of getting maximum participation from learners. While during asynchronous classes, not all learners were consistent in doing the assigned tasks during the prescribed time slot (asynchronous schedule). Such delay created a domino effect. There were instances that a current lesson or activity was a prerequisite for the next content to be covered. When all these pile up, then the situation can become more complex for the learners. Distinct science programs such as Science Investigatory Project (SIP) and laboratories were not exempted

from the lack of learner engagement. Learners find it hard also to do SIP because the teachers cannot really conduct intensive and more frequent training/discussions due to the limited time. Coaching and monitoring are also a challenge because of the schedule of the learners as well as of the teachers. Additionally, not all learners are interested in doing research. Home-based laboratory activities were limited due to the unavailability of resources and materials, which are always taken into consideration. Teachers cannot just give any activity to the students for learners' safety is always the priority. Conducting Science activities, especially experiments, remotely was challenging to both learners and teachers. Learners require close supervision while doing an experiment which was not quite possible for teachers with the current setup.

1.4. Changes in the Science Subject Area

To address the problem in the science engagement of learners, the Junior High School Science Subject Area has adopted changes for quality instruction. Four synchronous sessions were allotted for each section during face-to-face classes. Four science sessions split into 2 synchronous and asynchronous via Quipper e-learning for ODL. Screen time was limited to 50 minutes per subject and a maximum of 2-3 synchronous sessions only per day. Grading components were also modified. The 2020-2021 school year's first term had four long quizzes, a product task, a summative test, and a term exam for grading. Due to ODL being new for learners, changes were frequent. Term 2 grading is composed of 3 quizzes, a product task, a summative test, and a term exam. In term 3, grading included 2 quizzes, a product task, a summative test, and an exam. Teachers must create and vigilantly upload lesson packages in Quipper. The packages included study guides, videos, and worksheets. The school year 2020-2021 was an experimental school year with adjustments made to manage workload and skill attainment.

Some of the changes that were made in the school year 2020-2021 were extended or carried over to the school year 2021-2022 but additional changes were made, and some special programs were reintroduced. As for the schedule, grades 7 and 8 have their synchronous sessions in the morning and then the asynchronous sessions in the afternoon while for grades 9 and 10, synchronous sessions were held in the afternoon, and asynchronous sessions were done in the morning. For the Science subject area, though they still observe the 2 synchronous and 2 asynchronous sessions per week, one of the asynchronous sessions may be used for product tasks or Science Investigatory Project sessions, or consultation. One of the special programs that were reintroduced this school year is the Science Investigatory Project (SIP) which is under the Written Works component. Other special programs of the Science subject area for the school year 2021-2022 are the following: Interest Club (TUKLAS), laboratory activity, and Session for Earth Awareness (SEA). TUKLAS is a science interest club where learners are encouraged to do experiments and learn Science in a fun way. The laboratory activity includes a 10-item quiz and a 10-point essay. The Session of Earth Awareness (SEA) is designed to be done once every term. The creating and uploading of learning packages by the teachers is carried over this school year.

1.5. Science Engagement of Learners

According to Dr. Sutton (2021), learner engagement may be thought of as the substance that binds all facets of a learner's development. Learner engagement has been found to have significant effects on students in addition to making teaching itself more enjoyable, rewarding, and entertaining. Students are more likely to succeed academically and feel more connected to their school when they exhibit high levels of behavioral, emotional, and cognitive engagement. Additionally, learners feel better about their social and emotional well-being. Low learner involvement, on the other hand, has been linked to several unfavorable outcomes, including delinquency, aggression, drug addiction, and school dropout. Having poor engagement in elementary and middle school can lead to these negative consequences, even though they usually manifest in adolescence. Thus, it is critical to promote learner engagement across all grade levels.

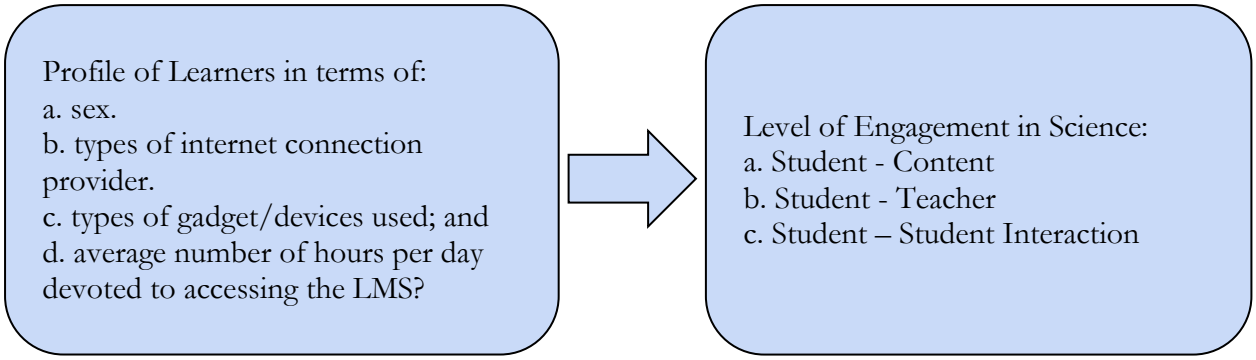

Figure 1. Research Paradigm

Figure 1 shows the variables of the student. The main objective of this study is to determine the level of engagement of learners in Science during the Online Distance Learning. Specifically, the level of engagement was determined by looking at Learner-Content Interaction, Learner-Teacher Interaction, and Learner-Learner Interaction.

Moreover, this report also determined the association of the demographic profile sex, grade level, types of internet connection providers, types of gadgets used, and the average number of hours per day devoted to accessing the LMS to the level of engagement of learners in Science during the Online Distance Learning.

2. Theoretical Framework

According to Anderson (2003), student engagement is developed through interaction which is an important element in online distance learning. Interaction is a term that carries so many meanings as to be almost useless unless specific sub-meanings can be defined and generally agreed upon (Moore, 1989). The terms interaction and engagement were used interchangeably, and play a significant role in fostering usability and quality in online education (Alhih et al., 2017).

Before the pandemic struck the world and online distance learning began, Moore (1989) previously formulated a theoretical framework for the interactions observed in distance learning. The framework developed by Moore has been extensively employed to investigate the interactions occurring within the context of online learning in the realm of higher education. The framework delineates a triadic interactional configuration that involves student-content, student-teacher, and student-student interaction. The detailed discussion of the types of interaction in Moore's theory is as follows:

2.1 Learner-Content Interaction

The interaction between learner and content is crucial for education, as Moore (1989) argues. It allows learners to intellectually engage with the subject matter, leading to changes in understanding and cognitive structure. He added that this is the type of interaction where learners internally discuss the information and ideas they acquire from various sources like text, TV, or lectures.

It suggests that courses should be well-designed to promote interaction, social presence, a clear learning path, efficient use of time, goal-linked activities, addressing understanding gaps, and real-world experiences (Buck, 2016; Frey, 2015). Poorly designed online courses can harm student engagement (Stone & O'Shea, 2019).

2.2 Learner-Teacher Interaction

The other interaction is between the learner and the expert or instructor. Moore (1989) stated that teachers experiment with strategies to reach learning goals. Teachers create a program to engage and motivate students to learn, encouraging self-direction and motivation. They create teacher-made instructional materials such as mock-ups, models, and presentations. These can be information, skill, or attitude presentations. Teachers assess progress and adjust strategy accordingly. Lastly, teachers offer guidance and motivation to students.

Teaching support is vital in online courses, with teacher engagement positively impacting student retention (Stone & O'Shea, 2019). Kahu et al. (2019) found that student self-efficacy impacted learning engagement. Therefore, online self-efficacy predicts success.

2.3 Learner-Learner Interaction

Learner-learner interaction is valuable for learning and very essential, according to Moore (1989). Teachers must provide inter-learner group interaction based on learners' circumstances. For young learners, peer interaction aids simulation and motivation, but not necessary for adult or advanced learners who are self-directed.

Revere et al. (2011) and Banna et al. (2015) showed that traditional technologies like discussion boards, chat sessions, blogs, wikis, group tasks, and peer assessments promote student-to-student interaction in online courses. Use web-based applications to improve online course engagement. Shea et al. (2001) found that when discussions counted for more of the grade, students were more satisfied and perceived greater learning (n=3,800). Learners had increased interaction with peers and instructors. Banna et al. (2015) recommend using videoconferencing/chatting for synchronous activities and discussion boards for asynchronous activities to improve student interaction. Social media in online courses enhances engagement through social interaction.

3. Research Problem and Assumptions

3.1 Research Questions

This research study aims to answer the following questions:

1. What is the demographic profile of the learners in terms of:
    a. sex;
    b. grade level;
    c. type of internet connection provider;
    d. number of internet users at home; and
    e. average number of hours per day devoted to accessing the LMS?

2. What is the perceived level of engagement by the learners in Science during ODL in terms of:
    a. learner-content interaction;
    b. learner-teacher interaction; and
    c. learner-learner interaction?

3. Is there a significant difference in the perceived level of engagement by the learners in science (learner-content interaction, learner-teacher interaction, and learner-learner interaction) when they are grouped according to:
    a. sex;
    b. grade level;
    c. type of internet connection provider;
    d. the number of internet users at home; and
    e. average number of hours per day devoted to accessing the LMS?

4. Based on the findings of the study, what intervention could be proposed in order to enhance/improve the level of student engagement in science?

3.2 Hypothesis of the Study

This research study will test the hypothesis that there is no significant difference in the perceived level of engagement by the learners in Science (learner-content interaction, learner-teacher interaction, and learner-learner interaction) when they are grouped according to sex, grade level, type of internet connection provider, number of internet users at home, types of gadgets/device used, and the average number of hours per day devoted in accessing the LMS.

4. Methodology

4.1 Research Design

This study uses descriptive research method. It is used to analyze and discuss current phenomena. Williams (2007) defined descriptive research as a method for assessing current phenomena. Nassaji (2015) states that descriptive research aims to classify and describe phenomena. The descriptive method of research was used to determine the level of engagement in Science of Junior High School learners during ODL in SSI.

4.2 Respondents of the Study

This research study included the Junior High School learners of Statefields School Inc. for SY 2021-2022. Out of 891 populaces, only 256 learners consented and opted to join the research. The 256 learners are composed of the following: 45 (17.6%) Grade 7 learners, 94 (36.7%) Grade 8 learners, 59 (23.0%) Grade 9 learners, and 58 (22.7%) Grade 10 learners.

4.3 Research Instrument

The researchers utilized a self-made questionnaire that consists of a three-part scheme; learner-content, learner-teacher, and learner-learner interaction. The self-made questionnaire was based on an article by Moore (1989) entitled "Types of Interaction."

The first part of the questionnaire deals with the learner-content interaction, covering the areas concerning the interaction of the learner with the subject matter (13 items). The second part deals with learner-teacher interaction, which covers how teachers demonstrate a particular skill, and implement student-teacher interaction, such as calling students during recitations and maintaining the interests of learners (17 items). Lastly, the third part of the questionnaire deals with learner-learner interaction, which deals with how learners interact with their peers and in the whole class (10 items). A five-point Likert scale was used to determine the level of engagement of Junior High School Students in Science during online distance. The scores were interpreted using the following scales:

Score	Range	Response	Interpretation
5	4.50 - 5.00	Strongly Agree	Very High Engagement
4	3.50 - 4.49	Agree	High Engagement
3	2.50 - 3.49	Neither Agree nor Disagree	Uncertain
2	1.50 - 2.49	Disagree	Low Engagement
1	1.00 - 1.49	Strongly Disagree	Very Low Engagement

The self-made questionnaire was face and content validated by the following: (a) SSI Junior High School Science Coordinator, (b) SSI Junior High School Vice Principal, and (c) SSI Junior High School Principal. Their comments and suggestions were considered in the final copy of the research questionnaire.

4.4 Data Gathering Procedures

The researchers gathered the necessary data by conducting a survey. A letter of permission to conduct the study was made and approved by school officials. As the study was approved, it was followed by the sending of letters of consent and assent to the subjects and to their parents/guardians. In addition, a Zoom meeting was also conducted last February 3, 2022, to explain the nature and background of the research. A total of 776 learners attended the said meeting. After receiving the reply to slips from the letters of consent and assent, the list of subjects was finalized. The respondents were given an orientation on the study, ensuring an understanding of the purpose of the research. After this, a survey was conducted through a self-made questionnaire. Data collection with the use of Google Forms ended on May 22, 2022. After collecting all the data, the results were tabulated and tallied by a statistician. The results were used as the basis for the design of the intervention in enhancing learner participation in science class.

5. Analysis and Discussion

5.1. Research Question 1

What is the demographic profile of the learners in terms of sex, grade level, type of internet connection provider, number of internet users at home, types of gadgets/devices used, and average number of hours per day devoted to accessing the LMS?

Table 1. Profile of the Learners According to Sex

Sex	*n*	%
Male	100	39.1
Female	156	60.9

Note. $N = 256$

Table 2. Profile of the Learners According to Grade Level

Grade Level	*n*	%
Grade 7	45	17.6
Grade 8	94	36.7
Grade 9	59	23.0
Grade 10	58	22.7

Note. $N = 256$

Table 3. Profile of the Learners According to the Type of Internet Connection

Type of Internet Connection	*n*	%
Prepaid	61	23.8
Postpaid	195	76.2

Note. $N = 256$

Table 4. Profile of the Learners According to Strength of Internet Connection

Strength of Internet Connection	*n*	%
Poor	15	5.9
Good	201	78.5
Better	40	15.6

Note. $N = 256$

Table 5. Profile of the Learners According to Number of Internet Users at Home

Number of Internet Users at Home	*n*	%
1 to 2 users	13	5.1
3 to 4 users	116	45.3
more than 4 users	127	49.6

Note. $N = 256$

Table 6. Profile of the Learners According to Average Number of Hours per day Devoted to Accessing the LMS

Average Number of Hours per day Devoted to Accessing the LMS	*n*	%
3 to 5 hours	160	62.5
6 to 8 hours	70	27.3
more than 8 hours	26	10.2

Note. $N = 256$

Table 1-6 shows that the majority of the learners are female, post-paid users, have a good internet connection and devote three (3) to five (5) hours per day to accessing the LMS. Moreover, most of the learners are from the Grade 8 level and share their internet connection with 2 to 3 users.

5.2. Research Question 2

What is the perceived level of engagement by the learners in Science during ODL in terms of learner-content interaction, learner-teacher interaction, and learner-learner interaction?

Table 7. The Perceived Level of Engagement by the Learners in Science during Online Distance Learning in Terms of Learner-Content Interaction

Statement	Mean	SD	Response/ Interpretation
1. I access the learning materials regularly and as often as necessary (Quipper, PowerPoint presentations, recorded videos, downloadable guides)	4.10	0.889	Agree
2. I find our synchronous lessons and activities engaging and interesting.	3.93	0.871	Agree

3. I find our asynchronous lessons and activities engaging and interesting.	3.36	1.038	Neither agree nor disagree
4. I am able to master and deepen my understanding of the lessons through learning materials such as worksheets, video lessons, study guides, etc.	4.09	0.812	Agree
5. I participate in experiential learning through digital laboratory simulation, actual laboratory experiments, and Science Investigatory Projects, etc.	4.32	0.820	Agree
6. I am provided with activities that allow me to enhance my scientific skills such as observing.	4.25	0.758	Agree
7. I am provided with activities that allow me to enhance my scientific skills such as inferring.	4.04	0.804	Agree
8. I am provided with activities that allow me to enhance my scientific skills such as concluding.	4.26	0.744	Agree
9. I am provided with activities that allow me to enhance my scientific skills such as problem-solving.	4.23	0.821	Agree
10. I am provided with activities that stir my imagination to make an attempt to create and discover new things and ideas.	4.18	0.852	Agree
11. I become more aware of the interrelatedness of things.	4.13	0.844	Agree
12. I developed a sense of concern and appreciation to take action, either on my own or with the help of others, to protect the environment.	4.39	0.759	Agree
13. I get to develop my intelligence , positive values, and 21st-century skills as they are inherently integrated into our lessons.	4.31	0.763	Agree
Mean	4.12	0.547	High Engagement

Note. Response/Interpretation for the Level of Engagement in Science in Terms of Learner-Content Interaction during Online Distance Learning: 1.00-1.49 (strongly disagree/very low), 1.50-2.49 (disagree/low), 2.50-3.49 (neither agree nor disagree/uncertain), 3.50-4.49 (agree/high), and 4.50-5 (strongly agree/very high).

Table 7 shows the perceived level of engagement by the learners in Science during Online Distance Learning in terms of Learner-Content Interaction. The study shows that learners agree with the following statements: "I developed a sense of concern and appreciation to take action, either on my own or with the help of others, to protect the environment" (M=4.39, SD=0.759), I participate in experiential learning through digital laboratory simulation, actual laboratory experiments and Science Investigatory Projects, etc. (M=4.32, SD=0.820), and I get to develop my intelligence, positive values, and 21st-century skills as they are inherently integrated into our lessons (M=4.31, SD=0.763). This means that Science teachers were able to integrate appropriate and suitable activities that are beyond the competencies of their lessons. It also proves that teachers are intentional in bringing their subject matter to life by developing a sense of concern for the environment. Moreover, it also reflects that teachers are the stewards of the school in making its mission and vision come to reality by linking multiple intelligences, positive values, and 21st-century skills in their lessons.

On the other hand, learners neither agree nor disagree with the statement "I find our asynchronous lessons and activities engaging and interesting" (*M*=3.36, *SD*=1.038). This is because of insufficient time allotment for the subject. According to the Science teachers, insufficient time during synchronous sessions affects the level of engagement of students, teachers are urged to skip their prepared instructional materials/activities such as Kahoot, Padlet, etc. which makes the learning interesting and engaging just to cover up the intended learning outcome within the given period. Moreover, if teachers fail to finish the topic, it becomes a practice to give a playback video of their synchronous lesson and then afterward give five-item conceptual questions regarding the topic during the asynchronous session. This is their last resort to assess whether learners were able to comprehend the topic or not.

Overall, the results show high engagement (*M*=4.12, *SD*=0.547) among the learners in science during online distance learning in terms of Learner-Content Interaction.

Table 8. The Perceived Level of Engagement by the Learners in Science during Online Distance Learning in Terms of Learner-Teacher Interaction

Statement	Mean	SD	Response/ Interpretation
1. My Science teacher creates factual, updated, relevant, meaningful, and challenging instructional materials.	4.51	0.708	Strongly Agree
2. My Science teacher uses various applications during synchronous sessions to interact with students (Kahoot, Padlet, Google Classroom, Canva, etc.)	4.00	1.076	Agree
3. My Science teacher gives clear and specific instructions on how to do different tasks.	4.41	0.782	Agree
4. My Science teacher gives timely and meaningful feedback for our written works, product tasks, and group activities.	4.43	0.799	Agree
5. My Science teacher offers timely and personalized feedback that addresses students' individual needs.	4.36	0.789	Agree
6. My Science teacher maintains a positive, harmonious, and supportive teacher-student relationship.	4.50	0.782	Strongly Agree
7. My Science teacher provides opportunities for students to develop leadership, responsibility, and a sense of urgency.	4.46	0.713	Agree
8. My Science teacher monitors the safety of students during discussions and laboratory activities.	4.50	0.657	Strongly Agree
9. My Science teacher respects and deals appropriately with the opinions and views of students during class discussions to promote mental wellness and emotional safety.	4.56	0.706	Strongly Agree
10. My Science teacher conducts consultation sessions to help the students cope with learning deficiencies and difficulties.	4.22	0.959	Agree
11. My Science teacher uses varied, appropriate, and effective teaching strategies such as collaborative and outcomes-based learning.	4.34	0.787	Agree
12. My Science teacher offers personalized learning options such as allowing students to work at their own pace and according to their own interests.	4.24	0.904	Agree

13. My Science teacher adjusts teaching-learning activities based on students' needs and capabilities.	4.30	0.834	Agree
14. My Science teacher utilizes different forms of assessments to gauge and monitor student progress.	4.24	0.852	Agree
15. My Science teacher conducts relevant and meaningful laboratory experiments.	4.49	0.674	Agree
16. My Science teacher shares relevant Science related issues in our class.	4.55	0.690	Strongly Agree
17. My Science teacher provides activities like product/performance tasks that are related to and enriches our lesson.	4.71	0.479	Strongly Agree
Mean	4.40	0.556	High Engagement

Note. Response/Interpretation for the Level of Engagement in Science in Terms of Learner-Teacher Interaction during Online Distance Learning: 1.00-1.49 (strongly disagree/very low), 1.50-2.49 (disagree/low), 2.50-3.49 (neither agree nor disagree/uncertain), 3.50-4.49 (agree/high), and 4.50-5 (strongly agree/very high).

Table 8 shows the perceived level of engagement by the learners in Science during Online Distance Learning in terms of Learner-Teacher Interaction. The study shows that the item with the highest ratings but not limited to the following are (a) "My Science teacher provides activities like product/performance tasks that are related to and enriches our lesson" (*M*=4.71*, SD*=0.479), (b) My Science teacher respects and deals appropriately with the opinions and views of students during class discussions to promote mental wellness and emotional safety (*M*=4.56*, SD*=0.706), and (c) My Science teacher shares relevant Science related issues in our class (*M*=4.55*, SD*=0.690). This shows that teachers are consistent in giving activities that enrich the learning competencies. Providing product/performance tasks that are related to their lessons and are communicated to the whole class makes these tasks more feasible on the part of learners. Teachers' unbiased teaching mirrors the school's intention to become a Whole-Child Community School that trains the teachers to always be fair and objective in judging their learners' work, response, or even views and opinions to promote mental wellness and emotional safety.

On the other hand, the items with the lowest ratings are (a) "My Science teacher uses various applications during synchronous sessions to interact with students (Kahoot, Padlet, Google Classroom, Canva, etc.) (*M*=4.00*, SD*=1.076), (b) "My Science teacher conducts consultation sessions to help the students cope with learning deficiencies and difficulties" (*M*=4.22*, SD*=0.959), (c) "My Science teacher offers personalized learning options such as allowing students to work at their own pace and according to their own interest." (*M*=4.24*, SD*=0.904), and (d) "My science teacher utilizes different forms of assessments to gauge and monitor student progress." (*M*=4.24*, SD*=0.852). Parallel to the analysis in Table 7, this proves that insufficient time allotment can affect the performance of learners. Due to limited instructional time, teachers were not able to utilize various applications that could stir and activate the mind of the learners. Hence, instead of using the asynchronous session to help the learners with learning deficiencies and difficulties, it was used to continue the unfinished lesson caused by insufficient time allotment in the synchronous session. Science as an integral subject uses objective-type assessment especially during midterm and final term examinations. But, due to its nature, various assessment types like SIP and laboratory experiments were also included in the grading components to cater to learners' differences.
Overall, the results show high engagement (*M*=4.40, *SD*=0.556) among the learners in science during online distance learning in terms of Learner-Teacher Interaction.

Table 9. The Perceived Level of Engagement by the Learners in Science during Online Distance Learning in Terms of Learner-Learner Interaction

Statement	Mean	SD	Response/ Interpretation
1. We are able to actively participate in small discussions online.	4.02	0.907	Agree
2. We are able to participate in discussions with the entire class.	4.03	0.920	Agree
3. We are able to communicate pertinent ideas, opinions, and viewpoints as part of the discussion.	4.12	0.808	Agree
4. We are able to exchange reliable resources, such as links or documents and information, with classmates.	4.32	0.821	Agree
5. We are able to facilitate/lead effectively the class or group discussions.	4.08	0.773	Agree
6. We are able to rate fairly each other's performance through peer evaluation.	4.55	0.723	Strongly Agree
7. We use different online communication tools to work collaboratively for reports/oral presentations and product or performance tasks.	4.50	0.680	Strongly Agree
8. We are given the freedom in class to express our creativity and other skills.	4.36	0.769	Agree
9. We are able to share necessary personal information to build rapport among classmates.	3.99	0.948	Agree
10. We are able to discover and explore information and solutions with regard to environmental issues through group research activities like Science Investigatory Projects and product/performance tasks.	4.47	0.702	Agree
Mean	4.24	0.558	High Engagement

Note. Response/Interpretation for the Level of Engagement in Science in Terms of Learner-Learner Interaction during Online Distance Learning: 1.00-1.49 (strongly disagree/very low), 1.50-2.49 (disagree/low), 2.50-3.49 (neither agree nor disagree/uncertain), 3.50-4.49 (agree/high), and 4.50-5 (strongly agree/very high).

Table 9 shows the perceived level of engagement by the learners in Science during Online Distance Learning in terms of Learner-Learner Interaction. The study shows that the items with the highest rating are (a) We are able to rate fairly each other's performance through peer evaluation (*M*=4.55, *SD*=0.723), (b) We use different online communication tools to work collaboratively for reports/oral presentations and product or performance tasks (*M*=4.50, *SD*=0.680), and (c) We are able to discover and explore information and solutions with regard environmental issues through group research activities like Science Investigatory Project and product/performance tasks (*M*=4.47, *SD*=0.702). This shows that learners were consistently provided opportunities to rate their classmates' performance and give their honest feedback. Varied online communication tools were also maximized in order for learners to work well on their outputs, especially on product and performance tasks which have greater percentages in the grading components. The conduct of research activities like the Science Investigatory Project and product/performance tasks were able to help learners to be more aware of the environmental issues and to think of a solution on how they can help in solving these problems.

On the other hand, the items with the lowest rating are (a) "We are able to share necessary personal information to build rapport among classmates" (*M*=3.99*, SD*=0.948), (b) We are able to actively participate in small discussions online (*M*=4.02*, SD*=0.907), and (c) We are able to participate in discussion with the entire class (*M*=4.03, *SD*=0.920). According to the Science teachers, the Online Distance Learning (ODL) modality served as a barrier for learners to become sociable and build rapport among their classmates. They were limited to seeing their classmates through Zoom and Messenger, which hindered them from sharing personal information and building rapport. The limited synchronous meetings also played a major role for the Science teachers to minimize small and entire class participation. They were pressured to finish the lesson within the given synchronous meeting which pressed them to conduct lectures instead of providing engaging activities. In addition to this, whenever the Science teachers asked questions, learners opted to chat about their answers instead of sharing them with the class which lessened the participation among learners. Overall, the results show high engagement among the learners in science during online distance learning in terms of Learner-Learner Interaction (*M*=4.24*, SD=0.558).*

Table 10. The Perceived Level of Engagement by the Learners in Science during Online Distance Learning in General

Level of Engagement	Mean	SD	Interpretation
Learner-Content	4.12	0.547	High
Learner-Teacher	4.40	0.556	High
Learner-Learner	4.24	0.558	High
Mean	4.25	0.465	High

Note. Response/Interpretation for the Level of Engagement in Science in Terms of Learner-Learner Interaction during Online Distance Learning: 1.00-1.49 (very low), 1.50-2.49 (low), 2.50-3.49 (uncertain), 3.50-4.49 (high), and 4.50-5 (very high).

Table 10 shows the perceived level of engagement by the learners in Science during Online Distance Learning in general. The type of interaction with the highest level of engagement is the Learner-Teacher Interaction (*M*=4.40, *SD*=0.556) followed by the Learner-Learner Interaction (*M*=4.24, SD=0.558) then Learner-Content Interaction (*M*=4.12, *SD*=0.547). Overall, the results show that the perceived level of engagement by the learners in Science during Online Distance Learning, in general, is high (*M*=4.25, *SD*=0.465).

5.3. Research Question 3

Is there a significant difference in the perceived level of engagement by the learners in science when they are grouped according to sex, grade level, type of internet connection provider, number of internet users at home, types of gadgets/devices used, and average number of hours per day devoted in accessing the LMS?

Table 11. Comparison of the Level of Engagement by the Learners in Science During Online Distance Learning According to Sex

Level of Engagement	Male		Female			
	n	*Mean Rank*	*n*	*Mean Rank*	*U*	*p*
Learner-Content	100	122.79	156	132.16	7229	.323
Learner-Teacher	100	123.77	156	131.53	7327	.411
Learner-Learner	100	123.21	156	131.89	7270.5	.359
Overall Level of Engagement	100	123.57	156	131.66	7307	.394

Note: Not Significant at .05 level.

The Mann Whitney *U* Test revealed that there is no significant difference in the level of engagement by the learners in Science during online distance learning in terms of (a) learner-content, *U*=7229, *p*=.323, (b) learner-teacher, *U*=7327, *p*=.411, (c) learner-learner, *U*=7270.5, *p*=.359, and (d) overall level of engagement, *U*=7307, *p*=.394 when they are grouped according to sex. These findings mean that the learners' level of engagement in science during online distance learning does not significantly vary when they are grouped according to sex.

Table 12. Comparison of the Level of Engagement by the Learners in Science During Online Distance Learning According to Grade Level

Level of Engagement	Grade 7		Grade 8		Grade 9		Grade 10		*H*	*p*
	n	*Mean Rank*	*n*	*Mean Rank*	*n*	*Mean Rank*	*n*	*Mean Rank*		
Learner-Content	45	150.27	94	127.20	59	113.39	58	129.09	6.393	.094
Learner-Teacher	45	162.39	94	124.57	59	85.53	58	152.29	35.817*	<.001
Learner-Learner	45	143.51	94	129.45	59	121.44	58	122.50	2.795	.424
Overall Level of Engagement	45	155.42	94	129.07	59	99.77	58	135.91	15.418*	.001

Note: *df* = 3. *Significant at .05 level.

There is no significant difference in the level of engagement in science during online distance learning when the learners are grouped according to grade level in the areas of (a) learner-content interaction, *H*=6.393, *p*=.094 and (b) learner-learner interaction, *H*=2.795, *p*=.424. The null hypothesis is not rejected.

On the other hand, the Kruskal Wallis *H* Test revealed that there is a significant difference in the level of engagement in science during online distance learning in terms of learner-teacher interaction, (*H*=35.817, *p*=.001) when the learners are grouped according to grade level. The alternative hypothesis that there is a significant difference in the level of engagement in terms of learner-learner interaction when grouped according to grade level is accepted. Specifically, a significant difference was noted between (a) grades 9 (*MR*=85.53, *n*=59) and grade 10 (*MR*=152.29, *n*=58) learners and (b) grades 9 (*MR*=85.53, *n*=59) and grade 7 (*MR*=162.39, *n*=45) learners. The overall level of engagement in science during online distance learning significantly differs when the learners are grouped according to grade level, (*H*=15.418, *p*=.001). Specifically, a significant difference was noted between (a) grades 9 (*MR*=99.77, *n*=59) and grade 10 (*MR*=135.91, *n*=58) learners and (b) grades 9 (*MR*=99.77, *n*=59) and grade 7 (*MR*=155.42, *n*=45) learners.

In terms of Learner-Teacher Interaction, a significant difference was noted between grades 9 and 10 students and grades 9 and 7 students. The topics in grade 9 are more complex than those in grades 7 and 8 which could lead to a decline in the level of engagement of the students. Based on the most essential learning competencies (MELC) of JHS Science, the topics were just introduced in grades 7 and 8 but an in-depth discussion of the topics was done in Grade 9. As the topics were highly technical, the teachers are more focused on the discussion than in providing interesting activities for the students. According to Gerstein (2012), meaning making activities deepen the understanding of the content. These may also increase the level of engagement of students. However, the imbalance in the time allotted between discussions and make meaning activities might lead to a decline in the level of engagement of students. Another major factor would be the attitude of the teacher toward his students. A study on the effects of teachers' attitudes on students'

personalities and performance (Ulug et al., 2011) uncovered how the attitudes of teachers affect the personalities and performances of students. The study's findings revealed that the teachers' positive attitudes showed positive effects on students' performance and personality development while the negative attitudes resulted in a negative effect on both the performance levels and personality development of students. When lessons are challenging, students' queries increase. Therefore, students might ask questions during discussion or the teacher for clarification after the synchronous session. Immediate response from the teacher might lead to a higher level of interest. On the other hand, if the teacher is unresponsive to the queries of the students, the interest in the topic might diminish, thus, lowering the level of engagement.

Table 13. Comparison of the Level of Engagement by the Learners in Science During Online Distance Learning According to Type of Internet Connection

Level of Engagement	Prepaid		Postpaid			
	n	*Mean Rank*	*n*	*Mean Rank*	*U*	*p*
Learner-Content	61	136.54	195	125.98	5457	.331
Learner-Teacher	61	143.39	195	123.84	5039.5	.071
Learner-Learner	61	140.53	195	124.74	5213.5	.145
Overall Level of Engagement	61	141.80	195	124.34	5136.5	.108

Note: Not Significant at .05 level.

The Mann Whitney *U* Test revealed that there is no significant difference in the level of engagement by the learners in Science during online distance learning in terms of (a) learner-content, U=5457, p=.331, (b) learner-teacher, U=5039.5, p=.071, (c) learner-learner, U=5213.5, p=.145, and (d) overall level of engagement, U=5136.5, p=.108 when they are grouped according to the type of internet connection. These findings mean that the learners' level of engagement in science during online distance learning does not significantly vary when they are grouped according to the type of internet connection.

Table 14. Comparison of the Level of Engagement by the Learners in Science During Online Distance Learning According to Strength of Internet Connection

Level of Engagement	Poor		Good		Better			
	n	*Mean Rank*	*n*	*Mean Rank*	*n*	*Mean Rank*	*H*	*p*
Learner-Content	15	133.37	201	122.48	40	156.91	7.299*	.026
Learner-Teacher	15	117.37	201	128.31	40	133.65	0.538	.764
Learner-Learner	15	127.40	201	123.95	40	151.78	4.737	.094
Overall Level of Engagement	15	127.33	201	124.39	40	149.60	3.872	.144

Note: df = 2. *Significant at .05 level.

There is no significant difference in the level of engagement in science during online distance learning when the learners are grouped according to the strength of internet connection in the areas of (a) learner-teacher interaction, H=0.538, p=.764 and (b) learner-learner interaction, H=3.872, p=.144. The null hypothesis is not rejected.

On the other hand, the Kruskal Wallis *H* Test revealed that there is a significant difference in the level of engagement in science during online distance learning in terms of learner-content interaction, *H*=7.299, *p*=.026 when they are grouped according to the strength of internet connection. The null hypothesis that there is no significant difference in the level of engagement by the learners in science during online distance learning in terms of learner content when they are grouped according to the strength of the internet connection is rejected. The alternative hypothesis that there is a significant difference in the level of engagement in terms of learner-content interaction when grouped according to the strength of the internet connection is accepted. Specifically, a significant difference was noted between (a) good (*MR*=122.48, *n*= 201) and better (*MR*=156.91, *n*=40).

In general, the overall level of engagement in science during online distance learning does not significantly differ when the learners are grouped according to the strength of the internet connection, *H*=3.872, *p*=.144. Specifically, a significant difference was noted between (a) good (*MR*=124.39, *n*=201) and better (*MR=1*49.60, *n*= 40).

Learners with a good internet connection may mean that there are days when they have an excellent internet speed and days with poor internet speed, thus causing them not to be able to attend or finish all synchronous classes which led to a significant difference in their level of engagement. Inconsistent internet strength may not motivate learners to participate during synchronous classes and accomplish tasks during asynchronous sessions. Thus, the level of engagement of learners with good but inconsistent internet strength is lower than those learners with poor and better internet strength.

Table 15. Comparison of the Level of Engagement by the Learners in Science During Online Distance Learning According to Number of Internet Users at Home

Level of Engagement	1 to 2		3 to 4		More Than 4			
	n	*Mean Rank*	*n*	*Mean Rank*	*n*	*Mean Rank*	*H*	*p*
Learner-Content	13	128.65	116	133.20	127	124.19	0.899	.638
Learner-Teacher	13	108.69	116	123.09	127	135.46	2.692	.260
Learner-Learner	13	150.46	116	132.20	127	122.87	2.176	.337
Overall Level of Engagement	13	132.58	116	129.24	127	127.41	0.078	.962

Note: *df* = 2. Not Significant at .05 level.

The Kruskal Wallis *H* Test revealed that there is no significant difference in the level of engagement by the learners in Science during online distance learning in terms of (a) learner-content, *H=0.899, p=.638,* (b) learner-teacher, *H=2.692, p=.260,* (c) learner-learner, *H=2.176, p=.337,* and overall level of engagement, *H=0.078, p=.962* when they are grouped according to the number of internet users at home. These findings mean that the learners' level of engagement in science during online distance learning does not significantly vary when they are grouped according to the number of internet users at home.

Table 16. Comparison of the Level of Engagement by the Learners in Science During Online Distance Learning According to Average Number of Hours per Day Devoted to Accessing the LMS

Level of Engagement	3 to 5		6 to 8		More Than 8			
	n	*Mean Rank*	*n*	*Mean Rank*	*n*	*Mean Rank*	*H*	*p*
Learner-Content	160	120.83	70	148.33	26	122.33	6.934*	.031
Learner-Teacher	160	128.22	70	133.44	26	116.90	0.959	.619
Learner-Learner	160	126.15	70	138.56	26	115.87	2.220	.330
Overall Level of Engagement	160	124.88	70	141.53	26	115.73	3.324	.190

Note: *df* = 2. *Significant at .05 level.

There is no significant difference in the level of engagement in science during online distance learning when the learners are grouped according to the average number of hours per day devoted to accessing the LMS in the areas of (a) learner-teacher interaction, H=0.959, p=.619, and (b) learner-learner interaction, H=2.220, p=.330. The null hypothesis is not rejected.

On the other hand, the Kruskal Wallis H Test revealed that there is a significant difference in the level of engagement in science during online distance learning in terms of learner-content interaction, H=6.934, p=.031 when they are grouped according to the average number of hours per day devoted to accessing the LMS. The null hypothesis that there is no significant difference in the level of engagement by the learners in science during online distance learning in terms of learner content when they are grouped according to the average number of hours per day devoted to accessing the LMS is rejected. The alternative hypothesis that there is a significant difference in the level of engagement in terms of learner-content interaction when grouped according to the average number of hours per day devoted to accessing the LMS is accepted. Specifically, a significant difference was noted between (a) 3-5 hours (*MR=120.83, n*=160) and 6-8 hours (*MR*=148.33, *n*=70).

In general, the overall level of engagement in science during online distance learning does not significantly differ when the learners are grouped according to the average number of hours per day devoted to accessing the LMS, H=3.324, p=.190. Specifically, a significant difference was noted between (a) 3-5 hours (*MR*=120.83, *n*=160) and 6-8 hours (*MR*=148.33, *n*=70).

The World Health Organization (WHO, 2020) recommended that the screen time for children must be from 1-2 hours only per day. But due to exigency of the Online Distance Learning, synchronous sessions take 3-4 hours a day aside from the 2-3 hours asynchronous sessions which require learners to extend time in front of their working devices. Learners accessing the LMS for 6-8 hours are more engaged than learners accessing the LMS for 3-5 hours because learners were promptly and productively using the LMS during their respective synchronous and asynchronous time. According to teamly.com, time management is a sign that learners have a good level of motivation, hence it increases the accomplishment of tasks effectively, skyrocketing one's productivity.

5.4. Research Question 4

Based on the findings of the study, what intervention can be proposed in order to enhance/improve the level of student engagement in science?

According to Jenna Buckle of Panorama Education, an intervention plan is a blueprint for helping a learner build specific skills or reach a goal. She also added that an intervention plan shall include

the following: goal/s, intervention strategy, timeline, and progress monitoring method. In line with the result of this study, the researchers come up with an intervention plan whose main goal is to enhance/improve the level of engagement of learners in Science during Online Distance Learning.

Proposed Intervention/Action Plan in Enhancing the Level of Engagement of Learners in Science

Objectives	Address the need of science teachers for sufficient time for lesson discussion and reinforcement	Enhance the level of engagement of learners in Science during ODL in terms of Learner-Content Interaction	Enhance the level of engagement of learners in Science during ODL in terms of Learner-Teacher Interaction	Enhance the level of engagement of learners in Science during ODL in terms of Learner-Learner Interaction
Level	Department	Classroom	Classroom	Classroom
Activities	a) Add one synchronous session for science subject	a) Employ more engaging activities like Kahoot, Quizizz, and PHet Interactive Simulations (PHet Colorado), etc. both in synchronous and asynchronous sessions. b) Require the learners to accomplish worksheets and do simulations during asynchronous time. c) Check regularly the number of learners accessing the learning package in Quipper.	a) Use the asynchronous session to follow up learners with learning difficulties. b) Employ varied/differentiated engaging forms of assessment in monitoring student progress. c) Modify some assessment tools like the usual Science Investigatory Project (SIP).	a) Apply some Social-Emotional Learning activities in class discussions that allow learners to share personal information to build rapport among classmates. b) Employ small and big group activities during class discussions. c) Allow learners to choose their group mates in some activities to build rapport among classmates
Persons Involved	• Principal • Vice Principal • Subject Coordinator • Head Teacher • Administrative Officer	• Coordinator • Teacher	• Coordinator • Teacher	• Coordinator • Teacher
Success Indicator	Teachers are able to integrate activities or the use of digital tools in the MILP. Teachers are able to employ more activities during synchronous sessions.	The level of engagement of learners in Science during ODL in terms of Learner-Content Interaction improves as reflected in the survey.	The level of engagement of learners in Science during ODL in terms of Learner-Teacher Interaction improves as reflected in the survey.	The level of engagement of learners in Science during ODL in terms of Learner-Learner Interaction improves as reflected in the survey.

	Learners are given more chances to participate during class discussions: answer comprehension questions, ask for clarification, etc.			

6. Conclusions

The authors studied the Level of Engagement of Junior High School students in Statefields School Inc. and findings showed that the majority of the learners are female, postpaid users, have a good internet connection and devote three (3) to five (5) hours per day accessing the LMS. Moreover, most of the learners are from the Grade 8 level and share their internet connection with 2 to 3 users. It also revealed that learners have a high level of engagement in Science during ODL in terms of learner-content interaction, learner-teacher interaction, and learner-learner interaction.

Analysis was implied in the results of the survey, and it shows that the level of engagement of the learners in science does not significantly differ when they are grouped according to sex, type of internet connection, the strength of internet connection, number of internet users at home, and the average number of hours per day devoted to accessing the LMS.

On the other hand, a significant difference was noted in the learners' level of engagement in science when they are grouped according to grade level. Specifically, a significant difference was noted between (a) Grades 9 and 10 and (b) grades 9 and 7 learners. Moreover, grade 9 learners were found to have the lowest level of engagement in science. Investigation implies that teachers have a big impact on the level of engagement of learners and schools should focus more on developing the learner-teacher interaction.

7. Recommendations

After a thorough analysis of data, the researchers recommend utilizing the proposed intervention plan and identifying if the level of engagement of learners in Science during ODL is improved. Sufficient time should be allotted during synchronous sessions to ensure that teachers integrate interactive lessons to increase engagement and learners' interest in the topic. Science subject teachers should maximize the use of Quipper messaging and encourage learners to post their questions and inquiries in relation to the subject matter during asynchronous sessions. For Grade 9 learners, having obtained the lowest level of engagement in science should be engaged with:

- the use of various applications during synchronous sessions to interact with learners (Kahoot, Padlet, Google Classroom, Canva, etc.);
- maintaining a positive, harmonious and supportive teacher-learner relationship;
- the conduct of consultation sessions to help the learners cope with learning deficiencies and difficulties;
- the use of varied, appropriate, and effective teaching strategies such as collaborative and outcomes-based learning; and
- the application of different forms of assessments to gauge and monitor learner progress.

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9. Appendices

9.1 Research Questionnaire

Demographic Profile:
Grade Level: 7, 8, 9 or 10
Sex: Male or Female

1. What is the type of internet connection you have at home?
   - Prepaid
   - Postpaid

2. What is the quality/strength of your internet connection at home?
   - Poor
   - Good
   - Better

3. How many person/s is/are using the internet at home?
   - 1 to 2
   - 3 to 4
   - more than 4

4. What is the average number of hours you spend per day accessing the Quipper LMS and other educational websites?
   - 3 – 5 hours
   - 6 – 8 hours
   - More than 8

Level Of Engagement Perceived By The Learners

Instructions:
This research questionnaire aims to measure your level of engagement in Science during online distance learning in Statefields School, Inc. The provisions below apply to your experiences during SY 2021-2022 in Science. Please indicate the degree of your engagement using the following scale below. Shade the circle that corresponds to your answer. For each statement, please check whether you **Strongly Disagree (SD), Disagree (D), Neither Agree nor Disagree (NAND), Agree (A) or Strongly Agree (SA).**

Learner-Content Interaction
1. I access the learning materials regularly and as often as necessary (Quipper, PowerPoint presentations, recorded videos, downloadable study guides)
2. I find our synchronous lessons and activities engaging and interesting
3. I find our asynchronous lessons and activities engaging and interesting
4. I am able to master the deepen my understanding of the lessons through learning materials such as worksheets, video lessons, study guides, etc.
5. I participate in experiential learning through digital laboratory simulation, actual laboratory experiments and Science Investigatory Projects, etc.
6. I am provided with activities that allow me to enhance my scientific skills such as observing.
7. I am provided with activities that allow me to enhance my scientific skills such as inferring.
8. I am provided with activities that allow me to enhance my scientific skills such as concluding.

9. I am provided with activities that allow me to enhance my scientific skills such as problem-solving.
10. I am provided with activities that stir my imagination to make an attempt to create and discover new things and ideas.
11. I become more aware about the interrelatedness of things.
12. I developed a sense of concern and appreciation to take action, either on my own or with the help of others, to protect the environment.
13. I get to develop my intelligences, positive values, and 21st century skills as they are inherently integrated in our lessons.
Learner-Teacher Interaction
1. My Science teacher creates factual, updated, relevant, meaningful and challenging instructional materials
2. My Science teacher uses various applications during synchronous sessions to interact with students (Kahoot, Padlet, Google Classroom, Canva, etc.)
3. My Science teacher gives clear and specific instruction on how to do different tasks
4. My Science teacher gives timely and meaningful feedback for our written works, product tasks, and group activities.
5. My Science teacher offers timely and personalized feedback that addresses students' individual needs.
6. My Science teacher maintains a positive, harmonious and supportive teacher-student relationship.
7. My Science teacher provides opportunities for students to develop leadership, responsibility and sense of urgency.
8. My Science teacher monitors the safety of students during discussion and laboratory activities.
9. My Science teachers respects and deals appropriately with the opinions and views of students during class discussions to promote mental wellness and emotional safety.
10. My Science teacher conducts consultation sessions to help the students cope with learning deficiencies and difficulties.
11. My Science teacher uses varied, appropriate, and effective teaching strategies such as collaborative and outcomes-based learning.
12. My Science teacher offers personalized learning options such as allowing students to work at their own pace and according to their own interest.
13. My Science teacher adjusts teaching-learning activities based on students' needs and capabilities.
14. My Science teacher utilizes different forms of assessments to gauge and monitor student progress.
15. My Science teacher conducts relevant and meaningful laboratory experiments.
16. My Science teacher shares relevant Science related issues in our class
17. My Science teacher provides activities like product/performance tasks that are related to and enriches our lesson
Learner-Learner Interaction
1. We are able to actively participate in small discussions online (small group discussions in the break out room)
2. We are able to participate in discussion with the entire class
3. We are able to communicate pertinent ideas, opinions, and view-points as part of discussion
4. We are able to exchange reliable resources, such as links or documents and information, with classmates
5. We are able to facilitate/lead effectively the class or group discussions

6. We are able to rate fairly each other's performance through peer evaluation.
7. We use different online communication tools (Canva, Google Slides, Google ocument, Messenger, Zoom, etc.) to work collaboratively for reports/oral presentations and product or performance tasks
8. We are given the freedom in class to express our creativity and other skills
9. We are able to share necessary personal information to build rapport among classmates
10. We are able to discover and explore information and solutions with regard environmental issues through group research activities like the Science Investigatory Project and product/performance tasks

9.2. Certificate of Validation

CERTIFICATE OF VALIDATION

This is to certify that the research questionnaire of Alex B. de Lara, Floremae D. Hababag, Angeli Arah A. Lacaba, Jason Mari P. Mariano, and Alvin D. Crudo in their study entitled **"The Level of Engagement of Junior High School Students in Science During Online Distance Learning in Statefields School Inc."** was face and content validated by the undersigned.

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