Challenges in Teaching Science in the Blended Learning Modality

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ABSTRACT

   This study aimed to determine the challenges in teaching science in the blended learning modality in DepEd Surigao City and Surigao del Norte Division as perceived by Senior High School (SHS) science teachers as to individual, instructional and institutional related challenges. Likewise, its significant difference when grouped according to the respondents' profile variables was also considered. Data were gathered from the 25 secondary schools and 41 science teachers through a research-adapted survey questionnaire. Results were treated statistically through Frequency and percent, Mean and Standard Deviation, Pearson-r, Spearman Rank Correlation, and Point Biserial Correlation.

   Majority of teacher respondents are female with 32 years of age. They hold a bachelor's degree and worked in an implementing unit school for 7 years in DepEd Surigao del Norte division and having attended an average of 4 relevant seminars. SHS teachers are challenged more in the modular (print) instruction of the blended learning modality. Challenges are found in all three factors; individual, instructional, and institutional.

   It was revealed that the profile of the respondents as to age, sex, highest educational attainment, type of school, years in teaching, and relevant seminars attended has nothing to do with the challenges encountered by the SHS teachers in the limited face-to-face instruction. However, in the modular (print) instruction, all the profile indicator is not related to the challenges in the blended learning modality except for the highest educational attainment, which is a contributing factor to the individual challenge. Furthermore, Senior high school (SHS) science teachers found difficulty in the instructional aspect of the modular (print) modality.

Problem and Review of Literature

   This chapter presents the introduction, review of literature, conceptual framework, and statement of the problem, significance of the study, scope and limitation, and definition of terms.

Introduction

   The unforeseen coming of the Covid-19 pandemic changes the education setting in the Philippines. It shifted the learners' traditional face-to-face classes to learning in the comfort of their own homes. One famous model the DepEd encourages the school to adopt is blended learning, which is a method of learning delivery that combines face-to-face instruction with one or more of the following: online distance learning, modular distance learning, and television/radio-based instruction.

   Through the vision of the Department of Education to further education despite the health emergency, the department crafted Basic Education-Learning Continuity Plan (BE-LCP). The BE-LCP was then adopted for the school year 2020-2021, through the DepEd Order No. 012, s. 2020 named adoption of the Basic Education Learning Continuity Plan (BE-LCP) for the school year 2020-2021.

   Furthermore, Deped called for preparations for the pilot face-to-face through DepEd Memorandum No.071, s. 2021. On September 20, 2021, the President approved a joint proposal from DepEd and DOH to conduct pilot face-to-face classes. According to the joint memorandum circular signed by the Secretaries of DepEd and DOH, schools that will be included in the pilot phase must meet the following criteria: be located in low-risk areas, have LGU approval, have passed the School Safety Assessment Tool (SSAT), and have parental consent. Months had passed, and applications to reopen schools through the blended learning modality had piled up. In line with this, the Department of Education (DepEd) issues the attached Guidelines on the Progressive Expansion of Face to Face Classes through DepEd Order No.017,s.2O22. These guidelines aimed to provide schools with guidance on the mechanisms and standards of F2F classes in order to ensure their successful, systematic, and safe implementation. This is based on the same shared responsibility principle introduced and adopted during the pilot implementation, as reflected in DepEd-DOH Joint Memorandum Circular (JMC) No. 7, s. 2027, titled Operational Guidelines on the Implementation of Face-to-Face Learning Modality.

   This study aimed to determine the different challenges in teaching science in the blended learning modality and devise a comprehensive intervention program to address the challenges related to individual, instructional and institutional. This study is unique, timely, and relevant because of the new normal education due to pandemic

outbreaks which shapes the educative process. The scope of this study is both the division of DepEd Surigao City and Surigao del Norte.

Review of literature

This section provides the concepts, writings, and findings of experts which are relevant to the present study. Cited literature and studies are synthesized to point out links, provide insights, and establish relationships, between and among the variables under investigation.

Blended learning instruction

Blended learning introduces a difficult role for teachers to play. According to Boelens et al., (2017) monitoring students' academic achievement necessitates effective collaboration through online interactions, whereas synchronous tasks encourage interpersonal interactions in the classroom.

Understanding the whole concept of blended learning is important to fully grasp its purpose. Tshabalala et al., (2014) noted that little or no understanding of blended learning concepts is a challenge. It was also perceived as tricky in the school setting given the lack of organizational policies and procedures on blended learning, and an absence of information communication technology learning.

Also, a wide array of difficulties awaits the teacher in the course of implementation of blended learning one of which is the observance of health and security protocol during the face-to-face instruction. According to Gunathunga & Hewagmage (2015), blended learning faces challenges such as limited or unreliable network capacity in certain areas, increased of teacher volume of work, and an inadequate infrastructure and technique training and/or acceptance.

Modular (print) instruction

The transition from traditional teaching to the new normal is quick, which caught the education system off guard. According to Bagood (2020), the transition of teaching-learning delivery in education institutions to modular distance learning made it increasingly difficult for school employees to provide basic lifelong learning opportunities.

The school faces a challenge as a result of the abrupt implementation of modular distance learning as to how and where to get funds in the continuity of module production. Dangle and Sumaoang (2020) discovered that teachers faced a number of challenges when implementing modular distance learning; teachers lack resources for module replication and dissemination, printing and bulk generating of modules are difficult and time-consuming, additional time and excessive work are required to monitor learners.

The modular (print) modality poses a challenge to module distribution and retrieval, as well as feedback to the learners. According to Castroverde and Acala (2021), teachers' module delivery struggles are related to delayed module claims and difficulty notifying both the learner and the parent. Several students claim modules after the scheduled time, resulting in some students submitting late or not at all. Furthermore, students' cell numbers are hard to reach. There are also guardians who are unresponsive to teachers' inquiries, which jeopardizes the scheduled time for module distribution and retrieval.

Additionally, teachers' extracurricular activities adds to the burden of complying with necessary activities related to modular (print) instruction. Alvarez (2021), found concerns raised by MSU-Sulu faculty members about the modular distance learning approach included: unknown operating costs on modules, educators' absence of teachers' 21st-century skills, the poor internet connection that interferes with the interaction between teachers and students, the limited time between many teachers due to necessary forms exhaustion, as well as students' progress measurement.

Limited face-to-face instruction

Limited face-to-face instruction refers to the assigned time of meet-up of the teacher and the student per week for the delivery of the lesson. As the blend for modular (print) instruction, this too poses a challenge to our educators. Inan (2021)stated the challenges in limited face-to-face education as follows: "too few equipment", "no field outings," "congested lecture halls, "less area on every child," "no outside opportunities, such as a garden," "challenges in understanding a specific topic,""insufficient support for children with special privileges," "inability to maintain social distance," and "Difficulty in performing project-based education."

Basic ICT skill is a must in teaching a long way before the coming of the Covid-19 pandemic, however, there are still teacher who struggle with manipulating computers and using the different software application. Shraim and Crompton (2020) stated that this scenario was thought to be due to educators' insufficiency of IT

expertise. Several educators' failure to take part efficiently in the procedure might be credited to a negative mindset to distance education, psychological trauma as well as interruptions created by the pandemic.

Perceived blended learning modality challenges

The blended learning modality has three governing factors that influence its implementation to a certain extent: individual, instructional, and institutional. To gear up educators and school leaders for myriad modes of learning delivery, they must be prepared to put the learning into action in line with the DepEd's professional development framework and standards. They will be presented with learning delivery modalities that they can quickly utilize depending on the community, and they will be offered tools and methodologies to make critical decisions. Training will be deployed beginning in June and lasting until July 2020 to ensure that learning activities flow smoothly into formats suitable for the platforms and modes of learning delivery they will employ.

Individual

One factor in determining the challenges brought by the blended learning modality is related to individuals. Individual-related challenges are roadblocks encountered by teachers in the implementation of the blended learning modality. Castroverde & Acala (2021) found that when it comes to monitoring students' performance, teachers frequently encounter problems with ineffective communication. The majority of the tracking is performed through messenger as well as other social networking sites. Teachers, on the contrary, communicate via text messages, but some guardians' phone numbers have been deactivated and cannot be reached.

Every teacher must be prepared morally, mentally, physically, and financially with blended learning modality implementation. According to Loveless (2020), the positive well-being of the teacher contributes to addressing the challenges of the new normal education. Guidance and motivation and stress reduction empower them to carry out their duties and obligations despite the difficulties of the present times. Teachers who promote a positive environment and well-being among themselves may improve academic performance and promote social-emotional skills among students outside the classroom.

Moreover, during this time of the new normal education, communication between teacher, student, and parents plays a pivotal role. According to Trust and Whalen's (2021) recent study, the most significant problem encountered by teachers during emergency remote education is a set of communication difficulties with students and families.

Additionally, teachers were made aware of the health risks associated with disseminating and collecting modules. Pizaña et al., (2021) stated different challenges teachers face in the application of the blended learning model; a fellow teachers who has been infected with COVID-19.Despite the danger to their lives, educators remained active and educate students in order to provide a high-quality education.

However, educational technology in this time is of high importance as it is during the traditional mode of teaching. Balas et al., (2021) stated that the pandemic has demonstrated that distance education, with its sophisticated software and hardware requirements, will continue to be an important component of public education even after the crisis is over. As a result, teachers' professional competencies must be supplemented with digital literacy and instructional technology training programs.

Instructional

Another factor in determining the challenges brought by the blended learning modality is related to instruction. According to Yeban (2020), teachers' methods should be repositioned toward creating instructional activities that challenge students to explore the discovery and application of existing knowledge, as well as pursue treatments to real-life challenges. The teacher's new role is to advise students on resources available that they can use and learn from.

Additionally, a teacher must be knowledgeable enough as to the content knowledge and pedagogy in order to have a smooth flow of instruction in the blended learning modality. According to Udomkan & Suwannoi (2018) to assess the learning and teaching process, appropriate instructional strategies and various assessment activities must be used. Moreover, Wells et al., (2019) noted that in order to create an effective learning environment, content and pedagogy must work together.

Another challenge teachers face instructional is contextualization and localization in teaching in the blended learning modality. According to De Villa & Manalo (2020), teachers should contextualize learning in light of current adversity, the resources at home, and also master the most important competencies in this pandemic era in which learners will learn remotely.

Furthermore, monitoring takes a lot of time in the instructional aspect of the teacher. According to Anzaldo (2021), most students finish their modules simply just for formality and to meet requirements. Knowing that

students take modules for granted can be devastating for educators. Text messaging and phone calls are the only ways for teachers to monitor their students' academic progress, as opposed to traditional face-to-face classes in which they can monitor and facilitate their students' learning.

On the other hand, diversity of learning calls for diversity of teaching pedagogy. With that being said, another issue raised by Benson et al., (2011) is the appropriateness of instructional material differentiation. It emphasized the importance of having a variety of learning activities rather than just face-to-face instruction. This primarily emphasizes the idea that the use of a blended learning environment should not be limited to assignment submission bins or file uploads, but rather than teaching and learning discussions can be integrated as a physical classroom extension.

Teachers' knowledge and skills are of great importance in the implementation of the blended learning modality. According to Kaur (2013), consider how to teach rather than just what to teach, match the best delivery medium to the performance objectives, keep online offerings interactive rather than "talking at" participants, ensure participant commitment and join with "non live" elements, and ensure all components of the blend are organized.

Public school teachers were having difficulty accessing the internet. Abante and Cruz et al., (2021) stated that some parents are unable to attend school to obtain the module due to financial constraints. Learners struggled to keep up with modular instruction, resulting in a significant learning gap.
Furthermore, proper feed backing and monitoring should be done accordingly by the teacher to bridge the gap with their students.

Institutional

Institutional-related challenges are difficulties encountered by teachers with regard to governing policies and regulations of the institution itself. According to Panda (2019)in the current situation, the pandemic has had a considerable impact on the education sector. The educational system's challenge demonstrates teachers' limitations as well as the country's capacity to support students at various stages of life. To achieve our goal of promoting quality education, we must also improve the quality of our teachers. Professional standards, mentoring, and development are all related to the quality and professionalism of teachers. As a result, teacher preparation is critical for both coaching and laying the foundations for career development.

The blended learning modality calls for a series of webinars and seminars to equip teachers with the teaching pedagogy needed for the blended learning modality. Some of the challenges that teachers face when using blended learning, according to Aldosemani et al., (2018), are a lack of faculty support and training. It was also discovered that technological facilities such as a lack of computers and an internet connection complicate matters.

The change in teaching modality also means putting educators' existing instructional techniques, methodologies, and strategies to the test. According to Castroverde and Acala (2021), some teachers are unfamiliar with technological devices such as computers, which adds to their difficulties in preparing modules. Indeed, teachers' adaptability and understanding of how to adapt to the pandemic's changes aid in overcoming certain challenges encountered in the implementation of modular distance learning.

In order for the teacher to be well equipped with the strategies needed for a successful blended learning teaching and learning process, they must undergo proper pedagogical retooling. According to Klapproth et al., (2020) training is required to improve teachers' distance education competencies as well as their skills in using IT and learning management systems.

Furthermore, the 21st-century teaching has improved the education setting. It has open information access to everybody regardless of where the person is. According to Pentang (2021), with the introduction of technology in teaching and learning, as well as unprecedented challenges, teachers are encouraged to implement innovative programs that support not only learning continuity, but also the delivery of quality education with the support of school administrators. This encourages local governments, electric cooperatives, and telecommunications companies to contribute to the country's educational sector.

Conceptual Framework

The study is based on the BE-LCP legal framework, which is responsive to the new normal while maintaining the constitutional duty to protect all citizens' right to quality education at all times. Communication and the support of our key stakeholders will be critical in implementing the BE-LCP. The Central Office will direct communications efforts to ensure consolidated branding while remaining grounded in grassroots contexts to ensure responsiveness to localized needs. It is also essential to ensure coordination and mutual benefits with national government media channels (PCOO, DOH, and IATF).The focus of these efforts will be the development of Public Health Information Protocols, which will be based on the core principles of being proactive, cooperative, responsive,

and highly engaged with the Department's various publics. Finally, to assist the Department in implementing the BE-LCP, a Monitoring and Evaluation framework tailored to the needs of learners during this emergency has been implemented.

Fig.1 Presents the paradigm of the study. In box 1, the Profile of the teacher is found. Age is considered because this can be used to determine the challenges in teaching science in the blended learning modality. Sex is also considered since the perception on the challenges in teaching science in the blended learning modality varies on the sex of the participants. The highest educational attainment and the years of teaching are also considered. The type of school is also considered whether the school is an implementing unit or not. Relevant seminars attended are also considered as a variable.

The second box includes the two instructional approaches in the blended learning modality, limited face-to-face and modular approach.

The third box includes the challenges in teaching science in the blended learning modality as perceived by the teachers as to individual-related, instructional related, and institutional related challenges.
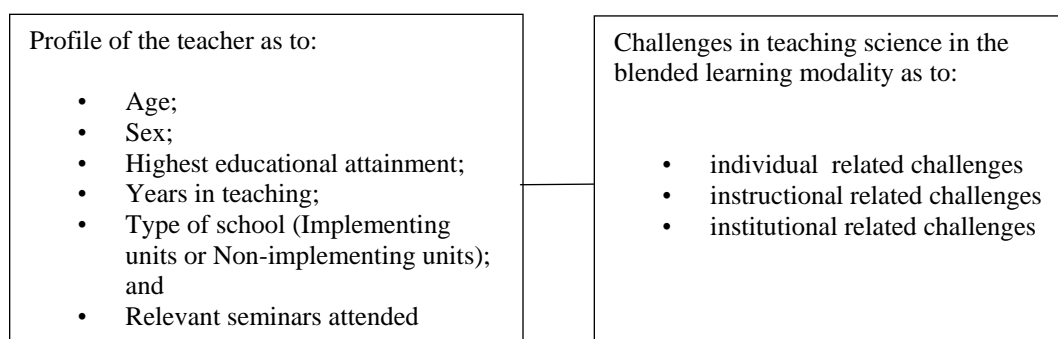
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┌─────────────────────────────────┐        ┌─────────────────────────────────┐
│ Profile of the teacher as to:   │        │ Challenges in teaching science  │
│                                 │        │ in the blended learning modality│
│   • Age;                        │        │ as to:                          │
│   • Sex;                        │────────│                                 │
│   • Highest educational         │        │   • individual related          │
│     attainment;                 │        │     challenges                  │
│   • Years in teaching;          │        │   • instructional related       │
│   • Type of school (Implementing│        │     challenges                  │
│     units or Non-implementing   │        │   • institutional related       │
│     units); and                 │        │     challenges                  │
│   • Relevant seminars attended  │        │                                 │
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Figure 1
Research Paradigm

Statement of the Problem

This study determines the challenges in teaching science in the blended learning modality.
Specifically, this sought to answer the following sub-questions:
1.　　What is the profile of the respondents in terms of:
1.1　　Teacher:
　　　1.1.1　　Age;
　　　1.1.2　　Sex;
　　　1.1.3　　Highest educational attainment;
　　　1.1.4　　Years in teaching;
　　　1.1.5　　　　Type of school (Implementing unit or non-implementing unit); and
　　　1.1.6　　Relevant seminars attended
2. What are the challenges in teaching science in the blended learning modality with face-to-face and modular instruction as perceived by the teachers and students in DepEd Surigao del Norte Division as to:
　　　2.1　　　individual related
　　　2.2　　　instructional related
　　　2.3　　　institutional related
3. Is there a significant relationship between the profile and the Challenges in teaching science in the blended learning modality?
4. Based on the findings of the study, what intervention program can be formulated?

Hypothesis

At a 0.05 level of significance, it was hypothesized that:

Ho1: There is no significant relationship between the profile and the Challenges in teaching science in the blended learning modality.

Significance of the Study

The results of this study may be deemed beneficial to the following:

Administrators. The result may serve as baseline data on the effectiveness of the program which may help them initiate policies, amendments, and intervention, programs that may improve the teacher performance and teaching quality.

Teachers. The findings of the study may challenge them to improve their teaching strategies and for them to be determined in pursuing personal and professional growth and development.

Students/Pupils. The findings of the study may provide teachers guidance to improve their performance in teaching science subjects in their school to provide quality education the learners.

Community. The findings of the study may help the community to be aware of the blended learning modality in education and more so be able to give the students the best avenue for learning.

Parents. The findings of the study may give them an overview of the teachers teaching styles and interventions during the blended learning modality.

Scope and Limitation of the Study

Focus. This study determined the challenges in teaching science in the blended learning modality. The respondents were limited only to 25 secondary schools and 41 Senior high school Science teachers in DepEd Surigao City Division and DepEd Surigao del Norte Division during the SY 2021-2022.

Respondents. The respondents were 11 secondary schools in DepEd Surigao del Norte Division with 25 SHS Science teachers and 14 secondary schools in DepEd Surigao city division with 16 SHS science teacher. A total of 25 Secondary schools and 41 SHS Science teachers.

Place and Time. This study was conducted in DepEd Surigao city division and Surigao del Norte division on SY 2021-2022.

Definition of Terms

The following terms are defined conceptually and operationally:

Blended learning. This refers to the blending of two learning modalities, the modular (print) instruction and the limited face-to-face approach. Modular (print) instruction refers to the use of printed learners' material or modules for the learners' consumption. It can either be provided by the central office through the Alternative delivery mode (ADM) or by the division through the teacher-made self-learning modules (SLM).Limited face-to-face instruction refers to the assigned time of meet-up by the teacher and the student per week to deliver instruction in-person approach.

Individual challenge. These refer to the challenges a teacher experienced personally during the conduct of the blended learning modality. It can either be related to, technology, learning environment, communication, and manage stress.

Institutional challenge. These refer to the challenges a teacher experienced with regards to the institution during the conduct of the blended learning modality. It can either be related to; school administration, academic services support, communication, or the DepEd itself.

Instructional challenge. These refer to the challenges a teacher experiences with regard to instruction during the conduct of the blended learning modality. It can either be related to; feed backing, instructional strategies and approaches, preparation time, the module, and time management.

METHOD

This chapter presents the description of the research design, research environment, research respondents, research instrument, ethics and data gathering procedure and data analysis.

Research Design

The study utilized a descriptive research design specifically the quantitative method which involved the collection of data from the population interest. This design was selected because it allows flexibility in investigating and describing the relationship among phenomena at a fixed point in time.

Research Environment

This study is conducted in the 11 secondary schools of DepEd Surigao del Norte Division and 14 secondary schools of DepEd Surigao City Division.

Plate 1
Map of Surigao del Norte

Surigao del Norte Division is made up of the 11 mainland municipalities of the second congressional district. Alegria, Anao-aon, Bacuag, Claver, Gigaquit, Mainit I, Mainit II, Malimono, Placer I, Placer II, Sison, Taganaan, and Tubod are the 13 school districts. However, the division is currently working on splitting Malimono into two districts due to its geographical location. It has 158 public and 3 private elementary schools, and 35 public and 6 private secondary schools. The Division Office is located beside the Provincial Sports Complex, Rizal Street, Surigao City.

Surigao City is divided into ten districts, with 65 public pre-schools and elementary schools, ten private elementary schools, 23 private preschools, 22 public junior schools, six private junior schools, 21 public senior high schools, and five private senior high schools, and one SUC senior high school. Surigao City is the capital of Surigao Del Norte, Philippines. The Division Office is located at Washington Barangay Hall, M., Ortiz Street, Surigao City, Surigao del Norte. Surigao City is the political, commercial, banking, industrial, and educational hub of Surigao Del Norte and the Dinagat Islands, as well as parts of neighboring provinces Surigao Del Sur, Agusan del Norte, and Southern Leyte.

Respondents

The respondents of this study were the SHS Science teachers of the 11 secondary schools of DepEd Surigao del Norte division and 14 secondary schools of DepEd Surigao City division who are currently implementing a blended learning modality.

Table 1
Distribution of the Respondents

	Secondary Schools in Surigao del Norte	Teachers
		N
1	Alegria Stand Alone High School	4
2	Claver National High School	6
3	Taganito National High School	3
4	Balite National High School	1
5	Toledo Pantilo Memorial National High School	1
6	Timamana National High School	2
7	Amando Fabio National High School	2
8	Tubod National High School	2
9	Placer National High School	1
10	Gigaquit National School of Home Industries	2
11	Bacuag National Agro-Industrial School	1
	Subtotal	**25**
	Secondary Schools in Surigao City	**Teachers**
1	Taft National High School	2
2	Anomar National High School	1
3	Capalayan National High School	1
4	Cantiasay National High School	1

Table 1
Distribution of the Respondents

	Secondary Schools in Surigao City	Teachers
		N
5	Wilfredo Rafols Memorial National High School	1
6	Manjagao National High School	1
7	Zaragosa National High School	1
8	Mat-i National High School	2

9	Patricio E. Bernaldez Memorial National High School	1
10	JP Cedro Sr. Memorial High School	1
11	Cabrera-Altres National High School	1
12	Nonoc National High School	1
13	Day-asan National High School	1
14	Ipil National High School	1
	Subtotal	**16**
	TOTAL	**41**

Research Instrument

The main tool for gathering the data is a questionnaire. The questionnaire in use on the challenges in teaching science in the blended learning modality (Appendix A) was adapted from the questionnaire in Judilla's (2021) study. The adapted questionnaire consists of 30 items that fall into 3 sections, each section has 10 items. The first section deals with the challenges related to the individual. Sections II and III respectively tackle the challenges related to instructional and institutional. The expected responses of the teachers were more challenging, challenging, less challenging, and not at all.

The responses of the teachers were analyzed using a 4-point Likert scale with the following equivalent:

1 –Not at all   2 – Less challenging
3 –Challenging   4 – More challenging

Validity - The adapted questionnaire was validated by internal and external validators. The researcher submitted a hardcopy of the questionnaire to the internal validators which consist of the panelist themselves. The researcher also submitted a copy to the external validators who are experts in the study about the blended learning modality of the Department of Education.

Reliability - The researcher conducted a dry-run of the questionnaire to at least 30 JHS Science teachers from selected implementing schools of the blended learning modality. A permit to conduct the pilot testing was given to the Principal for approval. The result of the dry-run was tallied by the researcher and was submitted to the statistician. The result shows, using that Cronbach's Alpha with 0.85, are interpreted as reliable.

Ethics and Data Gathering Procedure

The researcher prepared a preliminary questionnaire which was presented to the members of the panel for correction and requirement as well as to the subject instructor, and adviser. The comments regarding the questionnaire were considered and taken by the researchers and thus were improved. The researcher will write a letter addressed to the DepEd Schools Divisions Superintendent, District Supervisors, and Principals. When the approval was secured, the researcher immediately administered the questionnaire to the respondents. The data were gathered through a survey questionnaire. After answering, it was retrieved, tallied, analyzed, and interpreted.

Data Analysis

The data gathered from the retrieved questionnaires were analyzed using the following statistical tools:

Frequency and percent. These tools are used to describe categorical data of the profile of the respondents such as sex, highest educational attainment, school category, and school division.

Mean and Standard Deviation. These tools are used to describe quantitative data of the profile of the respondents in terms of age, years in teaching, and relevant seminars attended. These were also used to describe the extent of the challenges in teaching science in the Blended learning modality.

Pearson-r. This is the appropriate statistical tool to use to measure the relationship between two quantitative data like the relationship between the challenges in teaching science in the blended learning modality and the profile of the respondents in terms of age, years in teaching, and relevant seminars attended.

Spearman Rank Correlation. This is the appropriate statistical tool to use to measure the relationship between two sets of rank or ordinal data like the relationship between the challenges in teaching science in the blended learning modality and profile in terms of highest educational attainment.

Point Biserial Correlation. This is the appropriate statistical tool to use to measure the relationship between quantitative data such as the relationship between the challenges in teaching science in the blended learning modality and dichotomous nominal data like profile in terms of sex, school category, and school division.

RESULTS AND DISCUSSION

This chapter presents, analyzes and interprets the data on the challenges in teaching science in the blended learning modality of DepEd Surigao del Norte division and DepEd Surigao city division.

On the Profile of Respondents

Table 2
Profile of Respondents

Profile		f(n=41)	Percent
Sex	Male	20	48.78
	Female	21	51.22
Highest Educational Attainment	Bachelor's Degree	23	56.10
	Master's Degree	16	39.02
	Doctor's Degree	2	4.88
School Category	Implementing unit	23	56.10
	Non-implementing unit	18	43.90
School Division	Surigao City	16	39.02
	Surigao Del Norte	25	60.98
		Mean	**SD**
Age		32.10	8.26
Years Teaching		7.74	8.61
Relevant Seminars Attended		4.17	10.43

Table 2 shows the profile of the respondents as to sex, highest educational attainment, school category, school division, age, years teaching and relevant seminars attended.

Most of the teacher respondents are female (51.22%), while male comprises (48.78%). With regards to Highest educational attainment, there are (56.10%) of teachers with bachelor's degrees. There are (39.02%) teachers with Master's degrees and (4.88%) teachers with Doctor's degrees. There are (56.10%) of teacher-respondents who worked in schools categorized as implementing unit, and (43.90%) worked in schools categorized as non-implementing units. There are (39.02%) of teacher respondents from Surigao city division and (60.98%) from Surigao del Norte division. With regards to age, the average mean for the age of teacher respondents is 32.10 (SD 8.26). The average mean for years of teaching is 7.74 (SD 8.61). Relevant seminars attended average mean is 4.17 (SD 10.43). A profile such as sex, highest educational attainment, school category, school division, age, years teaching, relevant seminars attended are the basis for whether or not the determining variables are implemented. In this study, we are looking into the challenges in teaching science in the blended learning modality as to the individual, instructional, and institutional related challenges.

On the challenges in teaching Science in the blended learning modality

Table 3

Indicators	Individual Related Challenges in Teaching Science in the Blended Learning Modality with					
	Limited Face-to-Face Instruction			Modular Instruction		
	Mean	SD	QD	Mean	SD	QD
1. Technology-related anxiety and difficulties in technically demanding science activities.	2.63	0.70	Challenging	3.00	0.81	Challenging
2. Inability to innovate science teaching strategies to accommodate instructional platform	2.59	0.81	Challenging	3.05	0.77	Challenging

3. Poor internet connections and lack of access to the digital platforms for topics need more research.	3.10	0.86	Challenging	3.44	0.74	Challenging
4. Lack of time for lesson preparation and handling many subjects which can affect the planning and preparation in terms which can also affect the delivery of the lesson.	2.93	0.82	Challenging	2.66	0.88	Challenging
5. Financial constraints due to low salary/not enough salary. Hence, unable to procure instructional needs.	2.71	0.81	Challenging	2.73	0.87	Challenging
6. Unfavorable physical learning environment is it at home or at the workplace/school.	2.51	1.03	Challenging	2.88	1.03	Challenging

Indicators	Individual Related Challenges in Teaching Science in the Blended Learning Modality with					
	Limited Face-to-Face Instruction			Modular Instruction		
	Mean	SD	QD	Mean	SD	QD
7. Lack of moral and emotional support from family and employer/superiors.	2.22	0.85	Less Challenging	2.34	0.99	Less Challenging
8. Management stress caused by community quarantine in between modular and face-to-face class demands and other work-related issues.	2.73	0.87	Challenging	2.85	0.94	Challenging
9. Limited communications to students in the accessibility of modules, distribution/retrival of printed learning materials.	2.59	0.92	Challenging	3.32	0.79	Challenging
10. Additional workloads such as administrative or non-teaching-related assignment.	3.12	0.87	Challenging	3.15	0.85	Challenging
Average	2.71	0.53	Challenging	2.94	0.55	Challenging

Table 3 reflects the individual-related challenges in teaching science in the blended learning modality as perceived by the teacher with limited face-to-face instruction and modular instruction. Table shows that of the two distinctions in the blended learning modality, modular (print) instruction has gathered the highest average mean from the teachers.

The table generally revealed that individual-related challenges in teaching science in the blended learning modality with limited face-to-face instruction as perceived by teachers were observed with an average mean of 2.71, interpreted as challenging. On the other hand, the modular (print) instruction has an average mean of 2.94, interpreted as challenging.

Teachers found limited face-to-face instruction challenging because of the rapid implementation of the modality of the Department of Education for the continuity of education despite the Covid-19 crisis. According to Navarro (2020), the high rates of manifestation among teachers can be attributed to the academic environment in which they work, as well as the new measures that they have been forced to implement in the absence of the necessary support in the form of material and human resources. It should be noted, however, that this level of stress may also be linked to concern about the possibility of children becoming infected in schools.

The highest average mean falls to additional workloads such as administrative or non-teaching-related assignments (m=3.12) which is interpreted as challenging. Teachers in the present time are bombarded with a lot of extra-curricular work that they forgot to focus on their very purpose which is to teach. Furthermore, because of the increased workload of the teacher, professional development will be at stake surely. The main challenge, according to Newcombe and Kenney (2021), was finding time for training as well as redesigning and administering the course unit. Because the instructor's workload was not reduced, extra time for professional and course development had to be found. Blended learning environments, according to Garrison and Vaughan (2008), can reduce the workload when carefully designed.

It is also evident that teachers are less challenged with regards to the moral and emotional support from family and employer/superiors with an average mean (2.22) interpreted as less challenging. Rasmitadila et al., (2020) emphasized the importance of support for young children's education from all stakeholders, including the government, schools, teachers, parents, and the community. Respondents stated that their only sources of support were their school, their children's and their own families, and some volunteer/paid networks. In relation to individual-related challenges in teaching science in the blended learning modality as perceived by the teacher with modular instruction. Generally, teachers see it as challenging with an average mean (2.94). Teachers reported difficulties, according to Cardullo et al., (2021): equity was among the top challenges and disadvantages mentioned in their responses. Inequities ranged from a lack of resources like devices, internet, and parental support to disparities between districts and subpopulations. There were also fewer distractions and less peer pressure mentioned. Moreover, production of SLMs and ADMs has taken much of the time of the teacher. According to Solis (2021) teachers unanimously agree that they encountered numerous issues during the implementation of modular learning, including the creation of modules, delivery and retrieval, checking, recording, and monitoring, as well as other related tasks. This implies that the work of teachers was not easy with the implementation of modular learning, and they encountered many difficulties, challenges, and trials.

Furthermore, it is evident on the table that teachers see "poor internet connections and lack of access to the digital platform for topics need more research" as a challenge with the highest mean of (3.44) interpreted as challenging. Indeed, having a sustainable internet access greatly helps the implementation of modular (print) instruction. According to Tosun et al., (2021),issues such as a lack of internet access and inadequate infrastructure in rural areas impede learning delivery. In this regard, Agayon et al., (2022) call on the local government unit, electric cooperatives, and telecommunication companies to support the country's educational sector. It is also of great importance with regards to feed backing and communication of student's performance. According to Alvarez (2021), teachers agreed that poor internet access made it difficult to communicate with and guide students, it also impedes class discussion and proper communication between teachers and students. Teachers admitted that they received inappropriate approaches and complaints if students did not understand the modules, which resulted in late delivery of answer sheets. However, the Department of Education provides computers, tablets, and smart boards to schools that are designated as central schools. Because, according to Mean-Chin (2020), technical elements are the most significant issue in distance learning, which involves the availability of devices such as mobile phones.

Furthermore, "moral and emotional support from family and employer/superiors" appeared to be less challenging to teachers in the blended learning modality, with an average mean of (2.34).Rasmitadila et al., (2020) emphasized the importance of support from all stakeholders in young children's education, including the government, schools, teachers, parents, and the community. Respondents stated that their school, children's and their own families, and some volunteer/paid networks were their only sources of support.

Moreover, financial constraints due to low salary/not enough salary that affects the procurement of instructional needs are seen to be a challenge for the teacher-respondents in both the modular (print) modality and the limited face-to-face instruction. A Teacher I earns P23,877 per month in the Philippines, a Teacher II earns P26,052, and a Teacher III earns P28,276.According to Sarmiento (2021) 97.82 percent of teachers rely on printed modules. Online meetings are used by at least 29.61 percent of people. Only 7.73 percent of teachers use radio broadcasts of lessons. A lower percentage, 6.79 percent, use TV lessons, and teachers use their own resources for school-related expenses, especially for distance learning needs like laptops, phones, printers, and internet connection.

On the challenges in teaching science in the blended learning modality

Table 4

| Indicators | Instructional Related Challenges in Teaching Science in the Blended Learning Modality with | | | | | |
| | Limited Face-to-Face Instruction | | | Modular Instruction | | |
	Mean	SD	QD	Mean	SD	QD
11. Delayed/ineffective feedback from the immediate supervisor/head as to the required documents/report e.g. syllabus, TOS, questionnaire ad learning modules.	2.61	0.86	Challenging	2.61	0.89	Challenging
12. Difficulty to apply appropriate instructional strategy in teaching science due to limited interaction.	2.76	0.77	Challenging	3.39	0.77	Challenging
13. Difficulty to observe students' immediate response to appropriate scaffolding during the conduct of science experiments.	2.71	0.81	Challenging	3.49	0.68	Challenging
14. No sufficient time in the preparation of material for the delivery of instruction due to work overload other than teaching.	2.85	0.88	Challenging	2.73	0.98	Challenging

| Indicators | Instructional Related Challenges in Teaching Science in the Blended Learning Modality with | | | | | |
| | Limited Face-to-Face Instruction | | | Modular Instruction | | |
	Mean	SD	QD	Mean	SD	QD
15. Time constraints in catering to the learning difficulties of students during a particular instructional platform/teaching modality.	2.93	0.72	Challenging	2.98	0.72	Challenging
16. Unhelpful module content standard and lack of proper orientation with the assigned task.	2.46	0.84	Less Challenging	2.85	0.91	Challenging
17. Lack of effective and efficient technology resources in science teaching during a particular modality/instructional platform.	2.83	0.70	Challenging	3.00	0.81	Challenging
18. Lack/ineffective feedback from the immediate supervisor after the delivery	2.39	0.77	Less Challenging	2.51	0.84	Challenging

of instructional materials by the teacher.						
19. Insufficient provision of instructional materials to support a particular teaching strategy for the improvement of the delivery of blended learning.	2.61	0.77	Challenging	2.88	0.84	Challenging
20. Time management during a particular teaching instruction/instructional platform, monitoring of student's responses, availability of students pose a challenge.	2.85	0.79	Challenging	3.02	0.88	Challenging
Average	2.70	0.53	Challenging	2.95	0.56	Challenging

Table 4 reflects the instructional-related challenges in teaching science in the blended learning modality as perceived by the teacher with Limited Face-To-Face instruction and modular (print) instruction. Generally, with limited face-to-face instruction, teachers see it as challenging with an average mean of (2.70). Table shows that of the two in the blended learning modality. Modular (print) instruction has gathered the highest average mean from the teachers. According to Benson et al., (2011), a blended learning environment necessitates a significant amount of time for instructional preparations such as course design and development. Surprisingly, it was emphasized that prior experiences are critical for teachers to engage in collaborative planning. This emphasizes the idea that the use of a blended learning environment should not be limited to assignment submission bins or file uploads, but that teaching and learning discussions can be integrated as a physical classroom extension. Despite these challenges, the benefits that blended learning can bring to the teaching and learning environment are important to consider, as various studies show that it provides flexibility, and improves learning autonomy, and accessibility; thus, it reduces the teaching and learning gap that exists between teachers and students.

It can be gleaned from the table that teaching in the limited face-to-face approach challenges "time constraints in catering to the learning difficulties of students" with an average mean of (2.93), the highest among the other indicators. Moreover, because of some health and safety protocol like social distancing, proximity control by the teacher to the students is hardly observed making it more difficult to address misbehaving students. According to Castroverde (2021) teachers find it difficult to inform students about their performance due to factors such as internet connectivity, health risks, and a lack of technology. In line with this, social distancing should also be observed while the instruction is being delivered. According to Almahroug (2021) teachers found it difficult to observe and follow students' work in the classroom when they do exercises, written activities, or any other class activity. Furthermore, many teachers attribute the limitations placed on observing students and providing feedback to social distancing and fear of transmitting the infection. As a result, teachers discovered that if they leave students to do the activities without checking to see if they understood and got the information correctly by following their work, the majority of the effort and explanation will be wasted.

However, with an average mean of (2.46), "unhelpful module content standards and lack of proper orientation with the assigned task" is less challenging for teachers. Content standard of modules is well examined through a series of quality assurance processes that took place before the final printing of the modules. Contents in the modules are crafted in such a way that learners can relate because of the localization that the department encourages. Heilporn et al., (2021) stated that maintaining a consistent pace throughout the course, both synchronously and asynchronously, will result in increased student engagement. Teachers in asynchronous mode assisted students in maintaining a consistent pace of learning by diversifying activities throughout the semester, which fostered behavioral engagement. Teachers explained that this allowed students to get through the content while balancing more and less demanding activities throughout the semester to account for students' individual preferences. Teachers explained that this allowed students to complete the content while balancing more and less demanding activities throughout the semester to account for individual preferences. Teachers also encouraged student participation by meticulously planning synchronous meetings to reduce leisure time while maintaining a

high level of interaction. This enabled students to complete important tasks while emphasizing the teacher's concern and care, which they appreciated.

Lack of/ineffective feedback from the teacher's immediate supervisor following the delivery of instructional materials is also less challenging for teachers with (2.39) average mean. Moreover, proper feedback from teachers and its immediate supervisor resulted in a harmonious flow of information at this present time. The principal initially made personal contact with each staff member via phone call or text message, according to Brock et al., (2021). The communication's goal was to ensure that each staff member was doing well and that their individual and professional needs were being met, as well as to express appreciation for their dedication and commitment. Teachers were also given the opportunity to privately ask questions, share feedback, and express concerns as the situation worsened. Supervisors immediately followed up with any teachers who needed additional consultation following the meeting. The goal was to keep not only the community alive, but also accessibility and approachability.

Regarding the instructional challenges in teaching science in the blended learning modality as perceived by the teacher using modular instruction. With an average mean of (2.95), teachers find it challenging. "Difficulty observing students' immediate response for appropriate scaffolding during the conduct of science experiments" had the highest average mean of the other indicators, at 3.49. Modular learning has been tagged as useless by teachers due to its illogical sense of implementation. Students are just taking modules activities and experiments for granted. According to Castroverde and Acala (2021), the most common issue that teachers face when monitoring students' performance is a lack of effective communication. The majority of monitoring is done via messenger and other social media platforms due to students' lack of gadgets and unstable internet connectivity. However, teachers face difficulties in validating students' learning because some modules are answered by parents and tutors rather than students. Some of the issues that all teachers faced were related to assessment and evaluation. Teachers saw such situations as a problem because they made monitoring students' academic achievement difficult. It is nearly impossible to determine the level of students if this process is not managed. Clausen et al., (2020) obtained comparable results.

Furthermore, modular (print) instruction is prone to cheating. Sofi and Laafou (2020) investigated the effects of distance education and discovered that copy-paste behavior was common. It was discovered that teachers were having difficulty validating their students' performances. In these times, assessing and engaging students are critical issues (Affouneh, 2020). In line with this, According to Anzaldo (2021), not all students diligently complete their modules, and in absence of teachers and classmates who remind them of their responsibilities, students are more likely to become sidetracked and lose sight of deadlines. Especially since there were no face-to-face lectures and they had to rely solely on modules. According to Pentang et al., (2020), independent learners do not fully guarantee quality learning. Unresponsiveness of students to the lesson and no feedback for the questions asked, according to Campbell et al., (2020) are among the challenges that teachers face.

Lack/ineffective feedback from the immediate supervisor following the delivery of instructional materials by the teacher, on the other hand, has the lowest mean, with an average mean of (2.51), interpreted as challenging. Though it has got the least mean, some teachers see it as a challenge. Teachers agreed, according to Ogana (2021) that the implementation of modular distance learning should have an organized and clear schedule for the distribution and retrieval of learning modules and activities.

On the challenges in teaching science in the blended learning modality

Table 5

Indicators	Institutional Related Challenges in Teaching Science in the Blended Learning Modality with					
	Limited Face-to-Face Instruction			Modular instruction		
	Mean	SD	QD	Mean	SD	QD
21. Lack of reference materials in teaching (Books, encyclopedia, magazines, journals etc.)	2.76	0.92	Challenging	3.00	1.00	Challenging

Indicators	Institutional Related Challenges in Teaching Science in the Blended Learning Modality with

	Limited Face-to-Face Instruction			Modular instruction		
	Mean	**SD**	**QD**	**Mean**	**SD**	**QD**
22. School administrations inadequately provide teachers with supplementary materials for blended learning or a particular type of instructional platforms such as a subscription to online libraries and educational websites (ex. Khan academy, Teachers Try Science, The Exploratorium etc.).	2.88	0.75	Challenging	2.88	0.85	Challenging
23. Lack of academic services support and unrealistic deadline set by the administration.	2.78	0.69	Challenging	2.73	0.82	Challenging
24. Lack of an effective institutional network and technical assistance for blended learning.	2.83	0.77	Challenging	2.83	0.90	Challenging
25. Lack of responsiveness from DepEd Central and Regional offices in times of academic concerns.	2.71	0.84	Challenging	2.73	0.88	Challenging
26. Lack/delayed dissemination of important information from the top and middle management which concerns the teacher.	2.83	0.83	Challenging	2.88	0.82	Challenging
27. Delayed release of salary among the faculty.	2.34	0.99	Less Challenging	2.18	0.90	Less Challenging

Indicators	Institutional Related Challenges in Teaching Science in the Blended Learning Modality with					
	Limited Face-to-Face Instruction			Modular instruction		
	Mean	**SD**	**QD**	**Mean**	**SD**	**QD**
28. Lack of institutional seminars on science teaching during a particular instructional platform.	2.78	0.94	Challenging	2.83	0.96	Challenging
29. Inconsistency of disseminating information from the higher-ups of the administration and immediate supervisor to teachers (ex. Crafting of learning modules, distribution, and retrieval of module etc.)	2.85	0.85	Challenging	3.08	0.92	Challenging
30. Inadequate instructional materials to be used in the delivery of lessons.	2.71	0.78	Challenging	2.78	0.89	Challenging
Average	2.75	0.58	Challenging	2.81	0.63	Challenging

Table 5 reflects the institutional-related challenges in teaching science in the blended learning modality as perceived by the teacher with limited face-to-face instruction and modular instruction. Generally, teachers see limited face-to-face challenges with an average mean of (2.75).According to Peñalvo (2021) teachers face the challenge of adapting to a new paradigm in which, if they choose to participate, they will have to put in significant effort to implement the subjects and then focus on the learning platform.

It can be seen in the table that school administration inadequately provide teachers with supplementary materials for blended learning or a particular type of instructional platforms such as a subscription to online libraries and educational websites (ex. Khan academy, Teachers Try Science, The Exploratorium etc.) poses a challenge with the highest average mean of (2.88) and is interpreted as challenging. Alea and Fabrea et al., (2020) found a challenge in the use of online learning management systems and supplementary materials for distance learning such as subscriptions to online libraries. During this time of the covid-19 outbreak, much of the experiments are done at the comfort of the learner. However, Duban et al., (2019) observed that when the lessons were prepared, it was a popular method that the experiment was done in the classroom due to a lack of laboratory space, that software was used in the lessons, that videos of the experiment were watched on the internet, and that the textbook was processed in the science course. When science lessons are actively being taught, it has been stated that science laboratories play a critical role. Similarly, it has been stated that using simple tools and instruments in the classroom is preferable to never using laboratories in science subjects. Furthermore, according to Alea et al., (2020) during these times, there are still several basic education schools that lack the facilities, amenities, and training to provide distance learning education.

On the other hand, the table reflects the institutional-related challenges in teaching science in the blended learning modality as perceived by the teacher with modular instruction. Generally, teachers see it as challenging with an average mean of (2.81). This platform, according to Tanhueco and Tumapon (2020), presents new challenges for both teachers and students. In the face of the pandemic, this necessitates a 'adopt quickly' response to the new normal in teaching and learning. The transition to online or modular learning was hasty, but academic institutions must strategize and accelerate new forms of teaching pedagogy. The question of how well the schools are prepared in terms of technical infrastructure remains unanswered. Furthermore, reopening the schools at this point is prohibitively expensive (Felter & Maizland, 2020).

It can be gleaned from the table that inconsistency of disseminating information from the higher-ups of the administration and immediate supervisor to teachers (ex. Crafting of learning modules, distribution and retrieval of modules etc.) is a challenge with an average mean of (3.08), as a result, the teachers expressed difficulties with module distribution, and retrieval. Modules were not posted on time; the teachers rely on modules that must be downloaded at the regional or central office. During the pandemic, schools mostly rely on the division office for the printed modules. There are instances where modules were given late to the students due to late delivery of modules from the division to the schools. Tagupa (2018) stated that teachers are frequently forced to spend their own wages on necessities that they should not be shouldering. Moreover, Agayon et al., (2022) found that teachers were challenged due to a lack of resources. The teachers, however, do not have access to printers. As a result, several teachers used their own money to buy one for their classes.

Anzaldo (2021) emphasized that the module could be created sooner to help teachers complete their weekly home learning plans. Teachers must create their own instructional activities for their students when uploads are delayed. As a result, the teacher's workload is increased. There are still students who have not claimed their modules. It is a further hardship because it simply adds extra work to the teachers because they will have to wait for late outputs, which means they will be unable to compute their grades. Another consideration is that a teacher has a limited amount of time to wait because of the numerous activities listed in the module that must be completed.

Delayed salary release among faculty members, on the other hand, is less challenging in the blended learning modality. The majority of the teacher-respondents in this study (56.10%) work in an implementing unit school; however, payroll is processed internally within the school level, allowing it to be released earlier than the late. Moreover, results from the World Bank Group (2016) study conducted by the Department of Education found that secondary teachers were paid on time.

On the significant relationship between profile and challenges in Teaching Science in the Blended Learning

Table 6

Results on challenges and profile with Limited Face-to-Face instruction

Profile	Challenges	r	p	D	I
Age	Individual	0.25	0.12	NR	NS

	Instructional	0.23	0.14	NR	NS
	Institutional	0.08	0.64	NR	NS
Sex	Individual	0.06	0.71	NR	NS
	Instructional	0.02	0.91	NR	NS
	Institutional	-0.01	0.93	NR	NS
Highest Educational Attainment	Individual	0.11	0.48	NR	NS
	Instructional	0.08	0.62	NR	NS
	Institutional	-0.11	0.49	NR	NS
Years Teaching	Individual	0.07	0.67	NR	NS
	Instructional	0.08	0.62	NR	NS
	Institutional	0.06	0.73	NR	NS
School Category	Individual	-0.17	0.29	NR	NS
	Instructional	-0.09	0.60	NR	NS
	Institutional	0.07	0.68	NR	NS
School Division	Individual	0.04	0.82	NR	NS
	Instructional	0.17	0.28	NR	NS
	Institutional	0.06	0.69	NR	NS
Related Training Attended	Individual	0.11	0.48	NR	NS
	Instructional	-0.01	0.94	NR	NS
	Institutional	-0.03	0.87	NR	NS
Legend:					
	R-Rejected			S-Significant	
	NR-Not Rejected			NS-Not Significant	

The Table shows that p-values greater than 0.05 level of significance were obtained when the relationship between the profiles of the respondents under limited face-to-face instruction and the challenges of teaching science in the blending learning modality was measured. This is the basis of not rejecting the null hypotheses which suggest that the two variables are not significantly correlated. This also means that the challenges encountered by teachers who undergo limited face-to-face instruction have nothing to do with their profile.

The table shows no significant difference in the profile of the respondents to the challenges in the blended modality which means that respondents regardless of their sex, highest educational attainment, school category, years of teaching, and relevant seminars attended. In terms of age, the average mean for age in this study is (32.10).

On the significant relationship between profile and challenges in Teaching Science in the Blended Learning

Table 7

Results on challenges and profile with modular (print) instruction

Profile	Challenges	R	p	D	I
Age	Individual	0.05	0.77	NR	NS
	Instructional	-0.07	0.68	NR	NS
	Institutional	-0.01	0.94	NR	NS
Sex	Individual	0.02	0.90	NR	NS
	Instructional	-0.04	0.80	NR	NS
	Institutional	0.03	0.85	NR	NS
Highest Educational Attainment	Individual	0.36	0.020	R	S
	Instructional	0.24	0.13	NR	NS
	Institutional	-0.17	0.28	NR	NS
Years Teaching	Individual	-0.17	0.28	NR	NS
	Instructional	-0.23	0.15	NR	NS
	Institutional	-0.05	0.77	NR	NS
School Category	Individual	-0.10	0.52	NR	NS
	Instructional	0.09	0.56	NR	NS

	Institutional	0.18	0.27	NR	NS
School Division	Individual	-0.01	0.94	NR	NS
	Instructional	0.02	0.89	NR	NS
	Institutional	-0.02	0.89	NR	NS
Relevant Seminars Attended	Individual	0.01	0.97	NR	NS
	Instructional	0.01	0.94	NR	NS
	Institutional	0.06	0.71	NR	NS
Legend:					
	R-Rejected		S-Significant		
	NT-Not Rejected		NS-Not Significant		

Table 7 shows that p-values greater than 0.05 level of significance were obtained when the relationship between the profiles of the respondents under modular instruction and the challenges of teaching science in the blending learning modality was measured. This is the basis of not rejecting the null hypotheses which suggest that the two variables are not significantly correlated. This also means that the challenges encountered by teachers who undergo limited face-to-face instruction have nothing to do with their profile. However, in the case of the highest educational attainment, and individual challenges (p=0.020), we have to reject the null hypotheses. Since the result is less than the p-value. Results show that the highest educational attainment of the teacher has a significant relationship in teaching science in the blended learning modality with modular instruction which means that if a teacher holds higher educational attainment, the teacher tends to have less challenge in teaching in the blended learning modality. Saga and Agua (2021) discovered that the participants' highest educational attainment is related to the extent of challenges in instructional materials in implementing modular distance learning modality.

Furthermore, Abun and Asuncion et al., (2021) discovered a link between the highest educational attainment and teacher self-efficacy. It has been discovered that the higher one's educational attainment, the greater one's self-efficacy. However, in the school setting, the educational attainment level must be taken seriously as an important consideration in determining the acceptance of an employee or faculty member for a teaching position during the selection and recruitment process. When participants consider improving their professional development, they will face fewer challenges in terms of instructional materials.

PROPOSED INTERVENTION PROGRAMS TO ENHANCE BLENDED LEARNING MODALITY
Introduction:
The proposed training program will cater to the competencies of SHS science public school teachers in utilizing limited face-to-face and modular learning instruction of the blended learning modality.
Rationale:
Findings revealed that there were problems identified by the Senior High School(SHS) science public teachers as to: additional workloads such as administrative or non-teaching related assignment, poor internet connections and lack of access to digital platform for topics need more research, time constraint in catering the learning difficulties of students during a particular instructional platform/teaching modality, difficulty to observe students' immediate response for appropriate scaffolding during the conduct of science experiments, school administration inadequately provide teachers with supplementary materials for blended learning or a particular type of instructional platform such as subscription to online libraries and educational websites like Khan Academy, Teacher Try Science, The Exploratorium etc. and inconsistency of disseminating information from the higher ups of the administration and immediate supervisor to teachers (ex. Crafting of learning modules, distribution and retrieval of module etc.)

General Objective:
The overall goal of this training program is to provide teachers competencies and provide activities that may cater to the difficulties in utilizing the limited face-to-face and modular resources modes of learning.

Table 8
SHS teachers' blended learning modality proposed training program

Program	Objective and Activity	Venue and time	Resource needed	Source of fund
Pedagogical	**Objective:**	-Gateway	Human–	Human

retooling on catering to the learning difficulties of students during the limited face-to-face approach of blended learning.	a. To enhance the teachers' content knowledge and pedagogical skills and attitude in Science. b. To improve their ability in assessing learners' various learning difficulties. **Activity:** Conduct In-Service Training (INSET) with all the teachers	convention hall -August-September (First quarter)	Resource Speaker Materials- notebook, ballpen, laptop, bondpaper, manila paper, etc.	Resource Training & Development (HRTD) funds of DepEd Surigao City Division and DepEd Surigao del Norte Division.
Seminar Workshop on Monitoring Students response during the conduct of science experiments in modular approach.	**Objective:** a. To Craft an Action Plan in Properly Monitoring the learning of the learners. 　**Activity:** Conduct feed backing sessions on monitoring students response in the conduct of science experiments in modular approach	-Gateway convention hall. -August-September (first quarter)	Human – Resource Speaker Materials- notebook, ballpen, laptop, bond paper, etc.	Human Resource Training & Development (HRTD) funds of DepEd Surigao City Division and DepEd Surigao del Norte Division.

Program	Objective and Activity	Venue and time	Resource needed	Source of fund
Administrative training program: Orientation on Non-teaching extracurricular activities.	**Objective:** a. To be acquire administrative skills in works like LIS management, Learning Management System (LMS), NetAcad. Etc. **Activity:** ICT Training Course for teachers	-Gateway convention hall. -October-November (second quarter)	Human – Resource Speaker Materials- notebook, ballpen, laptop, bond paper, internet, etc.	Human Resource Training & Development (HRTD) funds of DepEd Surigao City Division and DepEd Surigao del Norte Division.
Pedagogical retooling on the different learning modalities in the New normal: modular (printed or digitized), online learning, radio and	**Objective:** 　To be familiar with the different learning modalities and its 5 w's. **Activity:** Writeshop/seminar	-Zoom -September-October (first quarter)	Human – Resource Speaker Materials- notebook, ballpen, laptop, bond paper, etc.	Human Resource Training & Development (HRTD) funds of DepEd Surigao City Division and

television-based instruction, or blended learning.	on TPACK: Technological Pedagogical Content Knowledge Framework			DepEd Surigao del Norte Division.
Seminar Workshop on the use of the freemium access particular type of online educational websites like Khan academy, Teachers TryScience, The Exploratorium etc.	**Objective:** To perform and be acquainted on freemium access different science educational websites. **Activity:** Workshop/Seminar	-Gateway convention hall. -September-October (first quarter)	Human – Resource Speaker Materials-notebook, ballpen, laptop, bond paper, internet connection, etc.	Human Resource Training & Development (HRTD) funds of DepEd Surigao City Division and DepEd Surigao del Norte Division.

As highlighted, it is designed to equip SHS Science teachers with the necessities relative to the blended learning modality of the Department of education. It will capacitate teachers with the knowledge and skills to provide quality education despite the threat of the pandemic.

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter discusses the summary of the findings, the conclusions drawn from the findings, and the recommendations based on the significant problems and conclusions.

Summary

This study aimed to perceive the challenges in teaching science in the blended learning modality of public Senior high school science teachers in the DepEd Division of Surigao City and Surigao del Norte. It also looked into the significant relationship between the profile and the challenges in teaching science in the blended learning modality in relation to the individual, and instructional and institutional-related challenges. Results of this study served as the basis of a comprehensive intervention program for managing the blended learning modality. This study utilized a descriptive research design specifically the quantitative method which involved the collection of data from the population interest. This study involved forty-one (41) SHS science teacher respondents. The main tool for gathering the data is a questionnaire. The questionnaire in use on the challenges in teaching science in the blended learning modality (Appendix A) was adapted from the questionnaire in Judilla's (2021) study. The adapted questionnaire consists of 30 items that fall into 3 sections: individual, instructional, and institutional related challenges. Data yielded from the survey questionnaire were analyzed and interpreted with the use of statistical tools such as frequency and percent, mean and standard deviation, Pearson-r, Spearman Rank Correlation and point biserial correlation.

Findings

The major findings of the present study are as follows:

1. The majority of teacher respondents are female at 32 years of age. They hold a bachelor's degree and worked in an implementing unit school for 7 years in the DepEd Surigao del Norte division and having attended an average of 4 relevant seminars.

2. Based on individual-related challenges. Teachers are more challenged by blended learning's modular approach. In the new normal, the inability to use technology with modular instruction is threatening in the teaching and learning process as it is considered a vital tool for the success of the teaching modality. Furthermore, the findings showed that teacher-respondents demonstrate a positive relationship between the teacher and the stakeholder.

3. Teachers are more challenged by the modular approach of blended learning. Indeed, in-person experimentation is more valuable in the teaching and learning process than at home, where real-time feedback and response are difficult to observe. Teachers, on the other hand, are less challenged by the limited face-to-face instruction in module content standards and feedback from the immediate supervisor to the teacher.

4. Based on institutional-related challenges. Most of the teachers are more challenged in the modular approach of the blended learning modality because of the inconsistency in the dissemination of information from the top-down. Salary release, on the other hand, is less challenging in the blended learning modality.

Conclusions

Based on the findings of the study the following conclusions are presented

1. SHS teachers are challenged more in the modular (print) instruction of the blended learning modality. Challenges are found in all three factors; individual (2.94), instructional (2.95), and institutional (2.81). When compared to the face-to-face modality, the results shown in the modular print have the highest means.

2. The profile of the respondents as to age, sex, highest educational attainment, type of school, years in teaching, and relevant seminars attended has nothing to do with the challenges encountered by the SHS teachers in the limited face-to-face instruction. However, in the modular (print) instruction, all the profile indicators are not related to the challenges in the blended learning modality except for the highest educational attainment, which is a contributing factor to the individual challenge.

Recommendations

In view of the findings and conclusions of the study, the following recommendations are endorsed:

1. Tap the help of the LGU to provide free wifi to the education hotspot. Investing in education, means investing for the future;

2. Teachers should devise a weekly learning plan that places science experimentation in a face-to-face setting and not in the modular;

3. Teachers should be well informed as to authorship. Enough time will also help teachers design better instructional materials for their class. This will help teachers to revise, enhance and validate the reliability of their assessment tools for learners;

4. The comprehensive intervention program to enhance blended learning modality should be tried out in other schools, district and division for further enhancement in relation to the individual, instructional and institutional challenges of the SHS science teachers;

5. Further study should be conducted to improve the weak points of the comprehensive management intervention program.

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