Teacher's Readiness towards Online Distance Learning in Science Teaching in the New Normal

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Abstract

This study aims to assess teacher's readiness towards online distance learning in science teaching in the new normal in terms of technical skills, communication skills, attitudes towards online learning, and time management. Specifically, it determines the profile of the respondents, the significant difference between teachers' readiness and their profile, and estimates teachers' readiness based on the profile using a predictive model. Using a researcher-made questionnaire, this analytical research design gathered data from 39 science teachers through purposive sampling from the secondary schools. Gathered data were systematically treated and analyzed utilizing descriptive and inferential statistics such as frequency, percentage count, mean, standard deviation, one-way analysis of variance (ANOVA), and regression analysis. Results revealed that teachers' readiness in terms of technical skills, communication skills, attitude towards online distance learning, and time management was high. There was a significant difference in time management according to age and technical skills when grouped according to the number of relevant trainings attended. Based on the identified predictors, the predictive model for teachers' readiness is Mean score (Teachers' Readiness) = 3.002 - (0.149*Age) + (0.201*Training), which implies that teachers are ready towards online distance learning in science teaching in the new normal. In conclusion, teacher's readiness towards online distance learning was high in all indicators. Science teachers face challenges and struggles but still acquire competencies needed in the online teaching and learning environment.

Keywords: distance education; new normal; online learning; science teaching; teacher's readiness.

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1. Introduction

The Philippines is one of the countries affected by COVID-19 in which; educators, students, and schools are still coping and adjusting to the new normal [1,2,3]. This pandemic has profoundly impacted teaching, resulting in adaptation and shifting to remote teaching [4]. One of the challenges in implementing distance education is the teacher's readiness for effective online science teaching. Science teachers' readiness should be assessed to assure quality teaching and learning.

Online technology can offer efficient and convenient ways to achieve learning goals for online education students [5,6,7]. It is crucial to establish further assessment, and evaluation techniques for distance learning as technology swiftly develops, and more students pursue the online learning route for various reasons [8]. In these environments, students can learn independently and interact with teachers and other students [9]. Supporters of online distance learning [10,11] argue that learning at a distance can be as practical or even more effective than a face-to-face pattern. It is reported that the delivery media for instructional content is unlikely to dramatically impact the learning outcomes, whereas content, teaching methods, communication, and learner support are essential for student satisfaction. There were arguments associated with online pedagogy, such as accessibility, affordability, flexibility, learning pedagogy, life-long learning, and policy. It is said that the online mode of learning is easily accessible and can even reach rural and remote areas [12].

Several studies have been conducted to assess teachers in online teaching and learning environment over the past few years [13,14,15]. According to Kebritchi and his colleagues [16], to ensure that all students have the same access to high-quality learning, it is, therefore, necessary to explore a wide range of factors related to teacher's adaptation and use of online teaching to help institutions better support teaching and to learn in online spaces. Consequently, this rapid transition in all education provides a unique opportunity to observe how teachers felt prepared for online teaching and learning [17]. It is essential to acknowledge that teachers' perceptions of their readiness for online teaching and learning represent a multifaceted problem [18]. To be ready for this shift, teachers need to have all the competencies that will help them adopt this change successfully [13]. However, the pandemic has brought unprecedented challenges to the teachers and students, especially in the distance learning modality. It is essential to assess teachers in this pandemic on their readiness for online distance learning. The researchers wanted to fill in the gap by studying the teachers' readiness toward online distance learning in science teaching in the new normal in terms of technical skills, communication skills, attitudes toward online teaching, and time management. These aspects should be studied to address the challenges and struggles faced by the teachers in this time of uncertainty.

The researchers believed that in studying the different aspects of teachers' readiness, school improvements and adjustments could be made in the sudden change of mode of learning delivery, and it is for these reasons, the study has been conducted. Thus, this study will focus on assessing the teachers' readiness toward online distance learning in science teaching in the new normal regarding technical skills, communication skills, attitudes toward online learning, and time management. The researchers believed that any meaningful educational endeavor is incomplete without factoring in the competency of the teachers and their teaching readiness.

1.1 Review of Literature

Online Distance learning in Education

Online learning provides learning experiences for students to access education, enabling the teacher and students to set their own pace with added flexibility of setting and schedule. Rapanta and his colleagues [19] pointed at the design of learning activities with specific characteristics, the combination of three types of presence, and the need for adapting assessment to the new learning requirements. Responding to crises may precipitate enhanced teaching and learning practices in the post digital era.

Over the past three decades, online learning has become a significant part of education internationally [9]. Immersive technologies for visualization and interactivity and their educational applications have recently received a lot of attention [20]. The study of Wang and his colleagues [21] found these immersive advantages, including integrating e-learning, virtual reality, and virtual worlds, will improve students' concentration and control the learning environment. However, future research directions must include the integration of virtual reality with emerging education paradigms and visualization technologies. Students need to feel that they engage in human-to-human interaction and develop personal relationships [22]. The sense of belonging to a meaningful learning community is an essential factor in students' online learning experience, mainly because it is difficult to make social presence perceptible in the online environment [23,24].

Local studies found out that teacher's readiness in embracing distance learning modality in the online teaching in terms of technical skills and pedagogy were approaching readiness. Teachers should have an intensive training and workshops on approaches in online teaching and further capacitate them on both the technical and pedagogical aspects of online teaching. There is a need to explore furthermore on the teachers' readiness towards online teaching such their communication skills, time management, and their attitudes towards online learning [25].

The advances in technology and social media today provide an optimal solution to maintaining the teaching and learning experience. Al-Balas and his colleagues [26] reported that technical and infrastructural resources are a significant challenge for implementing distance learning, so understanding technological, financial, institutional, educator, and student barriers are essential for successfully implementing distance learning. This is congruent with the study of Geverola and his colleagues [27] that teachers experience challenges and struggles in the new normal education.

The challenges posed by the Corona Virus pandemic introduced everyone to a new world of online learning and remote teaching. Teachers indulged them in remote education via a few platforms such as Google Hangouts, Skype, Adobe Connect, Microsoft teams, and a few more, though Zoom emerged as a clear winner. The products of Google can be beneficial under such problematic situations as Gmail, Google Forms, Calendars, G-drive, Google hangouts, Google Jam Board and Drawings, and Google Classroom. These tools can successfully be used as an alternative to face-to-face classes [28]. A list of online etiquettes was shared with students to conduct smooth teaching-learning programs, and proper instructions for attending classes were given to them

[29].

The current COVID-19 pandemic has presented educators at all levels of schooling with the challenge of converting face-to-face instruction to online learning [30]. To support the continuity of education for students throughout the COVID-19 pandemic, online learning plans, including digital and distant learning options, have been implemented where practicable and suitable. Many academic institutions that were reluctant to change their traditional pedagogical approach had no opportunity but to shift entirely to online teaching-learning [12]. Due to changing educational environment, online learning has a definite future in education [25]. Ali [31] proposes online and remote learning during lockdowns and social distancing due to the COVID-19 pandemic. It is a trend at most schools in many countries (Phan & Dang, 2017). Institutions can only help us deal with this pandemic [32].

Teachers Readiness on Online Teaching

Readiness to teach online can be broadly defined as "the state of faculty preparation" to teach online [14]. Teachers play the leading role in determining the outcomes of 21st-century learning. Their perceptions and understanding of innovation in education influence their action, decision, and practice in the classroom. They are also the main factor contributing to students' performance in mastering 21st-century skills: creativity, communication, collaboration, and critical thinking skills [33].

As the spearhead of the implementation of online learning, they must condition all instructional components as the driving force behind the deployment of online learning. These include teaching methods, educational media, instructional time connected to application use, and psychological and social elements that have a substantial impact on instructors' motivation during teaching [34]. According to McQuirter [30], strong institutional support for technical skill development, collegial sharing, and improving present methods leads to a sense of agency among instructors and a more substantial openness to accept change. The study did not suggest that educational change can be mapped in basic education. Regardless of grade level or curricular area, fundamental ideas like building on the strengths of current practices, fostering and supporting teacher collaboration, and offering targeted, methodical, multi-level implementation assistance serve as the foundation for innovation. Ali [31] reveals that besides resources, staff readiness, confidence, student accessibility, and motivation play an essential function in ICT integrated learning. Teaching online requires technical skills and different pedagogical approaches than teaching face-to-face to support learning online [35].

According to Huang and his colleagues [36], online teaching self-efficacy can be considered a critical component of educators' readiness to teach online. Teachers have responsibilities that are not easily transferable when they must change from a face-to-face learning system to online distance learning experiences that have never been implemented before. A teacher must overcome all the challenges that occur in online learning responsively to continue to achieve the targets set [34].

Distance, scale, and personalized teaching and learning are the three biggest challenges for online teaching [12]. It is challenging to develop content that covers the curriculum and engages students [16]. Martin [18] suggests

that instruction, content, motivation, relationships, and mental health are the five essential things an educator must keep in mind while imparting online education. When teachers are not adequately equipped with the technology and instructional practices, they have difficulty adjusting to their new duties of supporting student learning online, which influences student preparedness and engagement with online learning, such as online participation and interaction [16].

Torun [37] concluded that, especially with the spread of Covid-19 worldwide, education is currently switching from face-to-face to online learning immediately and unexpectedly; therefore, e-learning readiness must be carefully considered within this new educational paradigm. The changes from conventional teaching to online teaching require good preparation for faculty to adapt to the paradigm shift [32]. Ventayen [15] recommended that virtual learning environment training be implemented to benefit the teachers. These circumstances make us realize that scenario planning is an urgent need for academic institutions [38].

The studies mentioned above, and the literature reinforced the present study by providing the researcher's knowledge, information, and insights. Various authors' ideas, concepts, results, and findings support the present study, particularly regarding online learning and teachers' readiness. However, the researcher also wanted to assess the teachers' readiness in science teaching in terms of technical skills, communication skills, attitudes toward online learning, and time management, and if there is a significant difference between teachers' readiness and their profile.

1.2. Theoretical Framework

This study was anchored with Mezirow theory on transformative learning [39]. According to this theory, learning begins with an experience that leads to what is called a *disorienting dilemma* (cognitive dissonance). Laat et.al [40] found that the role change and transformation of practice is required when teaching online. The unexpected, unplanned, and sudden shift to online learning caused by COVID-19 has certainly been an experience that has led to cognitive dissonance as our assumptions about education have been challenged and start inequities in our system. Teachers who are new to this modality may experience frustration, anxiety, and confusion as they embark on a new learning journey as online teachers. Going beyond content delivery, teachers must become a "guide on the side" who scaffolds and coaches, and often this demands a change in teachers' skills and pedagogies, with a consequent rethinking or transformation of professional identity and role [41]. There are several features of the online environment that require teachers to adopt new practices, to step back from their directive roles and instead become facilitators of learning.

This theory pointed out that faculty members assumptions regarding online teaching and whether their experiences led to the construction of new beliefs and understanding and deconstruction of existing perceptions. This study through the means of reflective discourse looked at the experiences of transitioning to an online teaching. Moreover, faculty members' knowledge of teaching and their perceptions of their role as teachers from traditional cultural perspective were examined to identify whether their self-concept had been altered in the transition to online facilitator of learning. Mezirow [39] states that only through critical reflection of previously held beliefs and assumptions will adults go through the process of building new roles and acquiring new skills

that integrate into the individual's life as it was prior to the disorienting dilemma.

Reflecting on this theory, the researcher prompted to assess the readiness of science teachers toward online distance learning. In this research the principle of transformative learning was applied in which memory is the key to the reflective process. Reflective discourse enabled teachers in the process of integrating new information and creating new meaningful perspective. Thus, this theory was deemed appropriate for this research endeavor.

1.3. Objective of the Study

This study aims to assess the teachers' readiness toward online distance learning in science teaching in the new normal in terms of technical skills, communication skills, attitudes toward online teaching, and time management. Specifically, it determines the profile of the respondents in terms of sex, age, teaching position, highest educational attainment, number of years in teaching, relevant training, and seminar attended; the significant difference between teachers' readiness and their profile; and predicts teachers' readiness toward online distance learning in science teaching.

1.4. Scope and limitations of the Study

The respondents of this study were limited to the science teachers in Surigao del Norte and Surigao City, Philippines implementing online distance learning. Two schools were respondents in this study, one from Surigao del Norte Division, and other from Surigao City Division. Thus, the results may be distinctive to the teachers from the two schools. Future researchers should increase the sample size and use other sampling techniques. Survey questionnaires were all sent to the respondents via email and messenger considering that the teachers were under alternative work arrangements and most teachers were in work-from-home setup.

2. Methodology

2.1. Research Design

The study used analytical research employing quantitative method. The design was considered appropriate because the study conducted a hypothesis testing to determine significant difference of teachers' readiness toward online distance learning when grouped according to their profile. This also used survey method in gathering data.

2.2. Research Respondents

The study was conducted in two public secondary schools in Surigao del Norte and Surigao City, Philippines implementing online distance learning. The science teachers were selected through purposive sampling. A total of 39 science teachers were recruited in the study.

2.3. Research Instrument

A researcher-made questionnaire was used to gather the needed data in the study using the Likert Scale. This

helps in obtaining the necessary information to assess the readiness of science teachers toward online learning modality. The researchers-made instrument was composed of two parts. Part I obtained the profile of the respondents, and Part II assessed the readiness of science teachers in terms of technical skills, communication skills, attitudes toward online learning, and time management.

In justifying the teachers' readiness toward online distance learning, a parameter sets were used by the researcher that indicated the scaling of 1-4 with verbal interpretation and equivalent qualitative description (Table 1).

Table 1: Likert Scale Parameter

Mean Parameter	Scale	Descriptive Value	Interpretation
3.26 - 4.00	4	Strongly Agree (SA)	Very High (VH)
02.51 – 03.25	3	Agree (A)	High (H)
01.76 – 02.50	2	Disagree (D)	Low (L)
01.00 – 01.75	1	Strongly Disagree (DS)	Very Low (VL)

2.4. Validity and Reliability

The content validity of the instrument was conducted and authenticated by the panel of experts. The construct validity was also checked which indicated in the research instrument that the questions appeared once and making sure that there would be no duplication of the items that will appear in the questionnaire. The reliabilities of the instrument were also established using Cronbach's alpha (Table 2).

Table 2: Reliability testing of research instrument divided into four components and **their** corresponding Cronbach's alpha coefficient and interpretation

Constructs	No. of Items	Cronbach's alpha	Interpretation*
Technical Skills	10	0.79	Acceptable
Communication Skills	10	0.84	Good
Attitudes toward Online Learning	10	0.86	Good
Time Management	10	0.91	Excellent

Legend: Below 0.50 (unacceptable); 0.50-0.59 (poor); 0.60-0.69 (questionable); 0.70-0.79 (acceptable);

0.80-0.89 (good); 0.90 and above (excellent)

2.5. Data Gathering and Ethical Consideration

A certificate from the graduate school, superintendents, public schools district supervisors, and the school principals was secured before the conduct of the study. Upon approval, researchers sent an invitation, an informed consent form that indicates voluntary participation and roles of the respondents, and a provision to withdraw from the study at any time. A research outline with a copy of the participant's rights and confidentiality protection was also attached to that form. All these were sent to the respondents via email and messenger. All these were given to the respondents. For confidentiality and anonymity, a code was assigned to

each respondent. The hard copies of the data gathered from the respondents were kept in locked file cabinets, while the soft ones were stored in password-protected computers.

2.6. Data Analysis

Data were systematically treated and analyzed using descriptive and inferential statistics to achieve an accurate and reliable result. Frequency and Percentage count were used to describe the variables for the demographic profile of the respondents. Means ± standard deviation (SD) statistical analysis was utilized to determine the level of readiness of science teachers toward online distance learning. One-way Analysis of Variance (ANOVA) was utilized to determine the significant difference in the level of readiness of science teachers toward online distance learning when grouped according to respondents' profiles. Pearson Product-Moment Correlation was used to determine the significant difference in the level of readiness of science teachers toward online distance learning when grouped according to the profile of the respondents. Lastly, regression analysis was used to determine what model can be designed to estimate the readiness of the teachers based on their profile.

3. Results

3.1. Demographic Profile of the Respondents

A total of 39 teachers participated in the study. Table 3 shows the descriptive statistics of the demographic characteristics of respondents. Demographic information of the teachers consists of sex, age, teaching position, highest educational attainment, number of years in teaching, and number of relevant trainings. Most of the respondents were females (84.62%) and their ages group mostly belonged from 36 years old and above. As to the teaching position, most of them were secondary teacher III (41.03%) and had masteral units and master's degree. As to their teaching experience, 33.33% already rendered above 10 years in service ad 35.90% between 1 to 5 years teaching experience. When it comes to the trainings attended, 33.90% had trainings between 3 to 6 number of relevant trainings.

Table 3: Demographic Profile of the Respondents

Profile		f (n=39)	%
Sex	Male	6	15.38
	Female	33	84.62
Age	36 and above	18	46.15
	31-35	6	15.38
	25-30	7	17.95
	Below 25	8	20.51
Teaching Position	MT II	3	7.69
	MT I	3	7.69
	SST III	16	41.03
	SST II	9	23.08
	SST I	8	20.51
Highest educational attainment	Doctoral Degree	2	5.13
	With doctoral units	4	10.26
	Master's degree	11	28.21
	With Masteral units	12	30.77
	Bachelor's Degree	10	25.64
Number of years in teaching	Above 10	13	33.33
	6-10	8	20.51
	1-5	14	35.90
	Below 1	4	10.26
Number of relevant trainings attended	7 and above	7	17.95
	3-6	14	35.90
	Below 3	18	46.15

3.2. Teachers' Readiness Toward Online Distance Learning in Science Teaching

Extracted from teachers' readiness toward online distance learning in science teaching in terms of technical skills, it was revealed in Table 4 that teachers' technical skills were predominantly rated as "High" with a composite mean of 3.07. Ultimately, four out of ten items described as "Very High" on the teachers' readiness in terms of technical skills. Teachers can operate laptops/computers, including peripherals like printers, speakers, and mouses (3.49±0.68) were rated the highest. This would mean that the teachers already have excellent skills in using their laptops/computers and accessories such as a printer, speaker, and mouse. In addition, this also indicates that teachers are already equipped with sufficient skills in using the technology to aid in online distance learning and have good communication skills. Yet, seemingly not reassuring, creating, and editing videos using different applications that can be used in science-related discussions had the lowest mean of 2.72. This suggests that teachers need to hone their skills in creating and editing videos that can aid the teaching-learning process in science. Nevertheless, training and seminars have been conducted to cater to the needs of the teachers to hone their skills in creating and editing videos.

Similar to the current study's findings, Javier [42] reported that teachers were competent in using technology, especially in the conduct of virtual instruction. Teachers perceived that they could perform tasks using computers and technology and claimed they were adept with technology as they were integrated into daily life. The familiarity and capability, preparation, device, access connectivity, self-efficacy, and experience with technology significantly influence their readiness for the conduct of online teaching and learning modality. The preparedness for online teaching and learning is determined by their competence, accessibility to ICT tools,

preparedness, confidence in their ability to use technology, and exposure to e-learning materials [43].

Alqurashi [44] emphasized that computer self-efficacy was essential for online learning and was significantly correlated with the success of students' online learning. Using video clips can be a great tool to assist students in gaining a deeper understanding of content [45]. However, the study by Guillén-Gámez and Mayorga-Fernández [46] found that there was an average attitude toward ICT among university professors. Teachers had basic technology skills, but they made ineffective pedagogic use of technology [47]. Teachers' technological skills are an obvious necessity [48]. However, trainings and seminars should be conducted to cater the needs of the teachers to further hone their technical skills such as creating and editing videos.

Table 4: Teachers' Readiness in terms of Technical Skills

Indicators	MeanSD	DV	Interpretation
1. operate Laptop/computer including its peripherals like printer, speaker, and mouse.	3.49±0.68	SA	Very High
2. edit documents, delete files, move, and copy files, and managing files and folders.	3.36±0.81	SA	Very High
3. navigate World Wide Web and search effectively for data and Internet.	3.28±0.72	SA	Very High
4. create and edit videos using different applications (Movie maker, Kinemaster, Viva video etc.) that can be used in science-related discussions.	2.72±0.89	A	High
5. use effectively online collaborative tools (G-mails, Google chrome, Google Meet, Zoom, Youtube, Facebook, messenger etc.) as teaching tools.	3.15±0.59	A	High
6. download, save, open, and print materials found online to be used for science –related discussions without any help from colleagues.	3.33±0.62	SA	Very High
7. download software from the web and know of the major sites that can be used for this purpose and install computer software onto computer system.	2.79±0.77	A	High
8. design online quizzes for teaching my class and able to publish my lessons and classroom activities on web.	2.79±0.86	A	High
9. resolve common errors while surfing the internet like "page cannot be found" or connection timeout.	2.73±0.86	A	High
10. choose effectively online Science-related simulation activities.	3.10±0.68	A	High

In communication skills, indicator 10, a foster feeling of connection with students in a timely and effective manner (3.19±0.39), was rated the highest, interpreted as "High". It is understood from the findings that science teachers kept building a sense of connection with students in a timely and effective manner, even with online distance learning. Good communication skills are the basic need for students' academic success and progress. The way teachers communicate with the students can positively affect their perceptions, abilities, and motivation toward success. It also showed that indicator two was rated lowest (2.82±0.64). However, teachers are doing their best to relay clear and concise information to reduce the risk of confusion, especially in online distance learning, where the teacher and students meet virtually.

Effective teachers are closely linked to the way how they interact. Teachers keep building a sense of connection with the students. This can be observed on the result on teacher's readiness in terms of communication skills.

Teachers with good communication skills create a more productive teaching and learning environment for the students [49]. Good communication skills are not only crucial for a teacher, but it is also essential for students for their academic success. A teacher must have good communication skills since communication can improve the learning experience and create a positive setup [50]. Communicating with students in an online environment requires more thought and planning than communicating with students in the traditional setting. Hence, the teacher must possess good communication skills when teaching online [51].

Table 5: Teachers' Readiness in terms of Communication Skills

Indicators	MeanSD	DV	Interpretation
1. convey a right tone of voice in communicating with my students.	2.92±0.62	A	High
2. relay a clear and concise information to be able to reduce the risk of confusion to my students.	2.82±0.64	A	High
3. provide appropriate feedback in response to my student's outputs.	3.10±0.45	A	High
4. use sufficient and understandable terms in discussing lessons online.	3.10±0.38	A	High
5. actively listen and pay attention while students share ideas, asking and clarify questions.	3.18±0.45	A	High
6. ensure clarity, conciseness, and correct punctuation of written messages when having conversations with students through text, email, and chat.	3.13±0.47	A	High
7. show sensitivity when communicating with students online and manage misunderstandings and conflicts effectively.	3.15±0.43	A	High
8. maintain a warm and friendly atmosphere and stay focus on intended learning activity despite online disturbances.	3.13±0.41	A	High
9. facilitate and maintain interactive online environment during online class interaction.	3.15±0.43	A	High
10. foster feeling of connection in timely and effective manner with students.	3.19±0.39	A	High

Table 6 revealed teachers' readiness in terms of attitudes toward online distance learning was predominantly rated as "High". Indicator ten, encouraging students to be competent and knowledgeable in using technology (2.90±0.38), was rated the highest and interpreted as "High" on teachers' readiness. This means that teachers wanted to encourage students to be competent and knowledgeable in using technology, especially during this pandemic, wherein online distance learning was chosen as one of the learning modalities to be implemented. Teachers' attitudes toward online distance learning encourage students to be competent and knowledgeable in using technology, especially in this pandemic wherein online distance learning was chosen as one of the learning modalities.

The principle and pedagogy of technology impact the intervention, teaching, practice, and strategy in online learning support among students [52]. Traditionally, the implementation of online classes during the COVID-19 pandemic adequately positions to teach and provides students with the learning process of technology as part of their curriculum for their practice, intervention skills and module which is developed by teachers [53]. The demand is based on the knowledge of the teacher and beliefs. It is an online integration and interaction simulation toward advanced technology among the learners [54]. Science teachers still believe that high-quality learning can only occur when interacting with students face-to-face, not online distance learning. It cannot be

denied that online learning was the best solution to this unprecedented situation. However, it does have some drawbacks; as Chung and his colleagues [55] asserted, it cannot replicate the direct face-to-face human contact or the level of social engagement one experiences when in a classroom. It is said that students in online environments tend to feel more confused, isolated, and frustrated, and as a result, their learning effectiveness and satisfaction can be reduced [56]. Learning effectiveness is a complex concept with multiple dimensions and should be assessed with various measures. Although students positively evaluate their distance learning experiences, they face some learning challenges, especially regarding effective teaching practices and communication patterns. The prediction is that the teachers play a crucial role in knowledge construction and can be helpful to all stakeholders in exploring solutions to maximize the ICT potential in distance tertiary education [57].

On the contrary, teachers disagree that online distance learning can provide a meaningful learning experience (2.62±0.63). Students had difficulty answering the lessons due to a lack of in-person activities. Because of the online learning modality, physical interaction between teacher and students is missing; then, the students tend to lose personal interaction with their teachers, and thereby the mental buildup of students may get hampered. Most teachers prefer physical interaction with the students to provide effective and meaningful interaction.

Similar to the findings, Adnan and Anwar [58] that online learning does not produce desired results because of a lack of face-to-face interaction with the teachers, and students cannot access the internet due to technical and monetary issues. Other issues highlighted were highlighted: lack of face-to-face interaction with the instructor, response time, and absence of traditional classroom socialization. This implies that the intervention of technology is higher than the impact of human intervention leading to a substantial reduction in social interaction. Students face learning challenges, especially regarding effective teaching practices and communication patterns. There were chances of schedule slippage due to the adoption of online learning. The lack of follow-ups from the teachers can also be identified as the reason for the same. [57]. Some students feel they want to connect with their peers and establish some sense of social presence; hence they perceive online learning as a disadvantage. The process of online learning is strongly dependent upon stable internet connectivity. The robust internet connectivity mentioned in this case refers to internet connectivity at the server end and internet connectivity at the client end. At the server end, internet connectivity is required to ensure that the content is seamlessly delivered from the server. As part of this connectivity, it is crucial to maintain high-speed connectivity to provide the content efficiently and stably. Further, the importance of a seamless delivery cannot be negated. This has a high impact on the efficiency of learning [59].

In time management, send regular announcement/ reminders to students of upcoming activities (3.00±0.40) was rated as the highest described equivalently as agree. It is understood from the findings that science teachers really allocate time to give regular announcement/ reminders for an upcoming activity. On the contrary, the results show that indicator three was rated lowest (2.46±0.55), which is interpreted as "Disagree". This indicates that teachers have a difficulty in balancing and managing time between teaching and learning activities and obligations at home. This suggest that an intervention should be done to achieve work-life balance to teachers.

Time management is more critical when dealing with an online distance learning environment than in a

traditional classroom. A lack of a schedule can lead to poor time management in online learning, so teachers and students should devote adequate time to their respective courses, participate in group discussions by posting messages, and submit their work on time [21].

Table 6: Teachers' Readiness in terms of Attitudes toward Online Distance Learning

| Indicators	MeanSD	DV	Interpretation
1. online distance learning is the best distance learning modality to be applied in this time of pandemic.	2.59±0.59	A	High
2. online distance learning can provide meaningful learning experience to the students.	2.62±0.63	D	Low
3. high quality learning experiences can occur without interacting with students face-to-face.	2.38±0.49	A	High
4. enjoy using technology as a teaching tool in delivering Science lessons.	2.69±0.61	A	High
5. comfortable communicating and confident in delivering lessons online.	2.67±0.62	A	High
6. online learning can provide students with unlimited access to information needed in their science lessons.	2.82±0.45	A	High
7. support online learning in integrating different types of media in learning new things.	2.82±0.51	A	High
8. online learning ensures effectiveness in terms of coping up with missed lessons.	2.82±0.45	A	High
9. online learning is economic in terms of time for students and teachers.	2.79±0.52	A	High
10. encourage students to be competent and knowledgeable in using technology.	2.90±0.38	A	High

Teachers allocate time to give regular announcements and reminders for upcoming activities. However, teachers had a hard time balancing coursework and obligations at home, and many changes happened that were different from the usual work setup. The teaching staff of all backgrounds and ages have had to prepare and deliver their classes from home, with all the practical and technical challenges this entails, and often without proper technical support. As the current emergency remote teaching situation invoked by the Covid-19 crisis is also new to the students, teachers must consider the time and effort they need to regulate themselves to adapt to the unique learning situation [60].

However, the result also revealed that teachers have a hard time balancing coursework and obligations at home. Teachers face challenges in managing learning activities through online learning [61,16]. Problems were encountered in handling existing technology and effectively facilitating online teaching because of the transition from conventional to online learning [62]. Moreover, Santoso and Santosa [63] discovered that the work-life balance was observed to be significantly lower during the pandemic. This indicates the absence of role conflict between job demands and family life before adopting the online learning method. Therefore, working from home during the period requires high flexibility [63], and the stresses experienced with this condition were observed to have led to an inadequate psychological status for the lecturers [64].

Table 7: Teachers' Readiness in terms of Time Management

Indicators	MeanSD	DV	Interpretation
1. spend significant time and energy to engage in online class even if I have lots of work-related tasks.	2.59±0.55	A	High
2. organize my time well and tend to plan in my teaching so that work and tasks don't build up.	2.62±0.54	A	High
3. balance between coursework and obligations at home.	2.46±0.55	D	Low
4. deal with such issues in terms of due dates, absences, and make up assignments of my students effectively.	2.90±0.38	A	High
5. organize my time in terms of planning what to do with my lessons prior to delivery.	2.87±0.41	A	High
6. provide time to space out required readings, assignments, and online lessons.	2.87±0.47	A	High
7. review my schedule periodically- work and personal to avoid conflict of activities.	2.59±0.32	A	High
8. respond to students queries in their emails and chats after receiving it immediately.	2.92±0.35	A	High
9. send regular announcement/ reminders to students of upcoming activities.	3.00±0.40	A	High
10. allocate time to provide feedbacks and check assignments, quizzes, and science activities.	2.95±0.3	A	High

As seen in Figure 1, the mean values for technical skills, communication skills, attitudes toward online learning, and time management are similarly between 2.71 and 3.09. However, the mean values for communication skills (3.09) and attitudes toward online learning (2.71) are strikingly different. Accordingly, the highest mean value of teachers' readiness toward online distance learning is observed in communication skills, whereas the lowest mean value is observed in attitudes toward online learning.
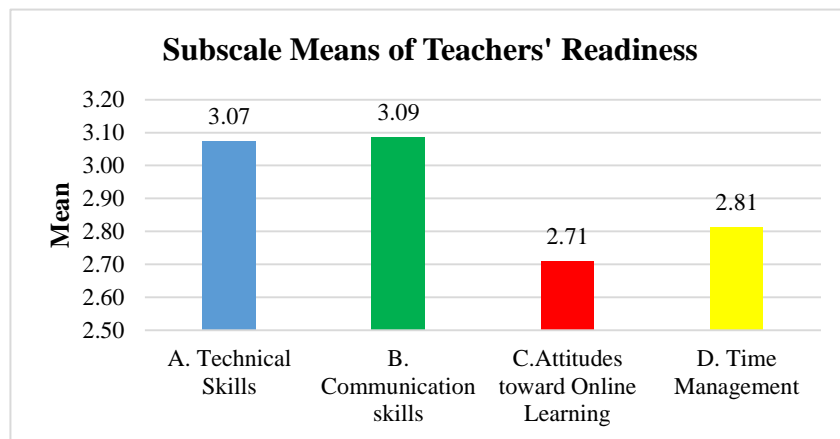
Figure 1: Subscale means of the Teachers' Readiness in toward Online Distance learning

3.3. Teachers' Readiness and Respondent's Profile

The significant difference in teachers' readiness toward online distance learning in science teaching when grouped according to respondent's profile variables was evaluated and measured, and the results are presented in Table 8.

As observed in the table, the p-values across all factors and based on sex, position, highest educational attainment, and teaching experience are greater than 0.05 level of significance. This indicates that there was no

statistically significant difference in the level of readiness of the teachers toward online distance learning in terms of technical skills, communication skills, attitude toward online learning, and time management when they were grouped according to sex, position, highest educational attainment, and number of years of teaching experience. There was also no statistically significant difference in the level of readiness of the teachers toward online distance learning in terms of technical skills, communication skills, and attitude toward online learning based on their age groups. Furthermore, the level of readiness of the teachers toward online distance learning in terms of communication skills, attitude toward online learning, and time management did not statistically significantly vary based on the no of relevant training they attended.

On the contrary, a significant difference was found in teachers' readiness when grouped according to age in terms of time management. This suggests that teacher's age and time management are related. It also showed a significant difference in teachers' readiness when grouped according to training in terms of technical skills. Many teachers sourced their technical skills from teacher training.

One of the key findings from the study was that there was no statistical difference on teachers' readiness in terms of technical skills, communication, skills, attitude toward online learning, and time management when grouped according to sex, position, highest educational attainment, and number of years of teaching experience. On the contrary, a significant difference was found in teachers' readiness when grouped according to age in terms of time management. The findings are supported by the study by Holmes [65] that adulthood and time management are positively related, meaning that people who felt they were closer to reaching adulthood had better time management skills. It was found that older emerging adults tended to have better time management skills than younger emerging adults; it also showed that better time management had higher self-esteem. However, it contradicts the study of Kaya and his colleagues [66] and Eldeleklioğlu [67] that age did not affect time management.

The study's findings also showed a significant difference in teachers' readiness when grouped according to training in terms of technical skills. These findings suggested that many teachers sourced their technical skills from teacher training. These findings are consistent with the observations of Al-Senaidi and his colleagues [68], Bingimlas [69], and Goktas and his colleagues [70], which revealed practical teacher training is one of the critical factors which influenced the integration of ICT in the classroom. Further, ICT training enhances the acceptance of the technology. According to Kiridis and his colleagues [71], Drent and Meelissen [72], and Al-Zaidiyeen and his colleagues [73], successful implementation of ICT strongly depends on teachers' positive attitudes. Thus, when teachers were not trained with ICT, it would be problematic to utilize ICT in an innovative way of teaching within a curriculum-oriented perspective [74,75].

Table 8: Teachers' Readiness toward Online Distance Learning and Respondents' Profile

Profile	Indicators	F	p	Remarks
Sex	Technical Skills	2.18	0.15	Not significant
	Communication skills	2.34	0.14	Not significant
	Attitudes toward Online Learning	2.16	0.15	Not significant
	Time Management	2.03	0.16	Not significant
Age	Technical Skills	1.44	0.25	Not significant
	Communication skills	1.53	0.22	Not significant
	Attitudes toward Online Learning	1.02	0.40	Not significant
	Time Management	3.09	0.04	Significant
Position	Technical Skills	0.34	0.85	Not significant
	Communication skills	0.95	0.45	Not significant
	Attitudes toward Online Learning	0.80	0.54	Not significant
	Time Management	0.61	0.66	Not significant
Highest Educational Attainment	Technical Skills	0.56	0.69	Not significant
	Communication skills	1.22	0.32	Not significant
	Attitudes toward Online Learning	1.13	0.36	Not significant
	Time Management	0.97	0.44	Not significant
Teaching experience	Technical Skills	1.23	0.31	Not significant
	Communication skills	2.57	0.07	Not significant
	Attitudes toward Online Learning	1.37	0.27	Not significant
	Time Management	0.57	0.64	Not significant
Training	Technical Skills	3.52	0.04	Significant
	Communication skills	1.96	0.16	Not significant
	Attitudes toward Online Learning	1.31	0.28	Not significant
	Time Management	0.40	0.67	Not significant

3.5. Predicting Teachers' Readiness Toward Online Distance Learning in Science Teaching

Another interest of this study is to predict teachers' readiness for online distance learning. It is posited that sex, age, position, highest educational attainment, teaching experience, and frequency of relevant training attended are variables that may allow estimating teachers' readiness and are considered predictors. As assumptions were met, multiple linear regression was performed into the predictive model.

The predictor variables must be related to the outcome variable in multiple regression. With this, predictors, and outcome variables intercorrelations are presented in Table 9. As observed from the table, only age and training are the predictor variables correlated to the outcome variable, teacher readiness. Results suggest multiple regression is appropriate for age and training as predictors. In the case of intercorrelations between predictor variables, correlations are around $r = .5$, indicating that the predictors are not strongly related to one another and so not multicollinear. This suggests that multiple linear regression is suitable.

Table 9: Intercorrelations of predictor and outcome variables

Variables	Sex	Age	Position	HEA	Teaching Experience	Training	Readiness
Sex	1	-0.48	-0.29	-0.27	-0.18	-0.01	0.29
Age		1	0.43	0.54	0.51	0.30	-0.38*
Position			1	0.42	0.49	0.32	-0.23
HEA				1	0.52	0.31	-0.12
Teaching Experience					1	0.29	-0.24
Training						1	0.27*
Readiness							1

* Correlation is significant at the .05 level

Table 10 displays information about how the predictor and outcome variables relate to one another. In this case, the term 'model' is used because we are trying to build a model of the relationship between the teachers' age, number of relevant trainings attended and their readiness toward online distance learning in science teaching. The results of the regression indicated that the model explained 47.2% of the variance and that the model was a significant predictor of teachers' readiness toward online distance learning, $F_{(2,36)} = 7.97$, $p = .001$. Teachers' age contributed significantly to the model (B = -0.149, p<.05). Number of relevant trainings attended also contributed significantly to the model (B = 0.201, p<0.05). The final predictive model was Mean score = 3.002 - (0.149*Age) + (0.201*Training). Base on the analysis of variance since the p-values is less than 0.05. This implies that if the model is used, the likelihood that teachers are ready towards online distance learning in science teaching in the new normal. Another key finding of the study is to predict teachers' readiness for online distance learning. Based on the profile of the teachers, only age and training are the predictor variables correlated to the outcome variable, which is teachers' readiness. Results suggest multiple regression is appropriate for age and training as predictors. On the analysis of variance, the p-values are less than 0.05. This implies that teachers are ready for online distance learning in science teaching in the new normal. Similarly, Korkmaz and Toraman and his colleagues [76] educators were ready for online learning, although most experienced some problems during their online learning practices. Specific changes can be made in the educational methods in the post-COVID-19 world. Essential measures must be taken in education against a potential outbreak in the future. However, the results contradict the study of Andarwulan and his colleagues [77] that the teachers were not ready to implement online learning policies. The research recommended that school administration, the department of education, and policymakers, in general, reevaluate the inclusion of online learning curricula, particularly in basic education. It is crucial to consider curriculum arrangements, student aid arrangements, content arrangements, and online learning structures to satisfy student demands.

4.1. Implications of the Study

The findings of this study would help the school administrators make some preparations and actions about any improvements and adjustments due to sudden changes in the educational system. It may provide teachers with meaningful and valuable information that may guide them to reinforce meaningful activities for the students to be more competent in the field of endeavor. This may help them consider new ways to prepare, organize,

deliver, and assess learning materials for online teaching. Lastly, this may help the students be more competitive in embracing the world of technology, especially when dealing with the sudden change in the educational system where online teaching and learning are applied through the proper guidance of their teachers, who are always ready to embrace it change.

Table 10: General Regression Analysis

Regression Model					
TR=3.002 - 0.149*Age + 0.201*Training					
Coefficients					
Term	**Coef**	**SE Coef**	**t**	**P**	**Remarks**
Constant	3.002	0.15	19.92	0	Significant
Age	-0.149	0.043	-3.47	0.001	Significant
Training	0.201	0.069	2.93	0.006	Significant
Summary of Model					
R=0.687		R-sq=0.472		R-sq(adj)=0.38	
Analysis of Variance					
Source	**df**	**SS**	**MS**	**F**	**p**	**Remark**
Regression	2	1.49	0.75	7.968	0.001	Significant
Residual	36	3.38	0.09			

5. Conclusions and Recommendations

This study focuses on teachers' readiness toward online distance learning in science teaching in new normal. Teachers' readiness was measured by six indicators: technical skills, communication skills, attitudes toward online learning, and time management. It concludes that teachers' readiness toward online distance learning was high in all indicators. However, science teachers face challenges and struggles but still acquire competencies needed in the online teaching and learning environment. Results of the study also showed that there was no significant difference in teachers' readiness toward online distance learning in science teaching when grouped according to respondents' profiles in terms of sex, position, highest educational attainment, and teaching experience. There was also no significant difference in age regarding technical skills, communication skills, and attitudes toward online learning. In addition, no significance was found in training in terms of communication skills, attitudes toward online learning, and time management. It can be concluded that teachers' demographic profile does not affect teachers' readiness toward online distance learning in science teaching. However, a significant difference was found in teachers' readiness when grouped according to age in terms of time management and a significant difference in teachers' readiness when grouped according to training in terms of technical skills. This concludes that these aspects affect teachers' readiness. The model designed can be used to predict teachers' readiness for online distance learning in science teaching. Hence, in light of the study results, it is recommended that school management re-examine the implementation of online distance learning in the new normal. They may also conduct an assessment to identify the training needs of the science teachers. Teachers should be encouraged to attend seminars/training, especially digital literacy, and online teachings. Researchers are encouraged to use the results of this study as a springboard for related research works in the future.

6. Conflict of Interest

The author declares no conflict of interest in the completion of this research paper.

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