Teachers' Perceptions Towards Education 4.0:
Readiness and Challenges

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Abstract

Aim: The advancement of technology has paved the way to enhance and make learning fun and easy. This study determined the perceptions and level of readiness of instructors and professors at Caraga State University in terms of faculty, teaching process, infrastructure, technological skills, technological implementation, and challenges.

Methodology Descriptive – quantitative method of research was used in the study to determine the perceptions, readiness, and challenges of the teacher faculty for education 4.0 readiness and explore the challenges encountered.

Results: The goal of the study is to determine the perceptions, readiness, and challenges of the teaching faculty for education 4.0. Twenty percent (20%) of the participants are from the College of Education with experience in teaching for 1-5 years. Data show that the highest number of training and seminars attended by the participants are held locally. Education 4.0 is a new paradigm on the participating university that reinterprets concepts like learning, student, teacher, and school. Indicator develops 21st-century skills such as problem solving, collaboration, reflection, critical thinking, and communication. The indicator has access to blogs, vlogs, wikis, google classroom, Edmodo, and other related sites and reference databases. Data provided show that the indicator *organization* tops the technological implementation of the instructors or professors' readiness towards implementing education 4.0. Data also show that *participants creating lessons in LMS, Google Classroom*, etc. indicators have obtained an average of 4.57 that has been interpreted into always.

Conclusion: The emergence of technology had a tremendous impact on the lives of people, specifically in the academic world. The industry has adapted to the new normal and introduced a new style of learning called Education 4.0. Challenges include lack of resources and technology itself, as well as the implementation of the system.

Keywords: *Education 4.0, Challenges Encountered, Level of Perception, Readiness*

INTRODUCTION

Education 4.0 is the latest buzzword, and it's overturning how we think of schooling, teaching and learning. It focuses on learning through the help of improved and advanced digital technology. Some of these are digitalization, teleconferencing and automatization in a classroom setting. In numerous educational institutions around the world, fourth industrial revolution technology will be incorporated into the learning and teaching process (Creswell, 20214). Teachers must be mindful of emerging technologies to determine what needs to be accomplished in order to remain important and support the global community. This strategic approach will explore new opportunities or possibilities and develop instructors alongside the students. The modern educational paradigm would prepare students for careers that do not yet exist. Robotics, artificial intelligence, and Internet of things (IoT) have now a significant impact towards our living. The 4th Industrial revolution has a major impact on our daily lives, particularly in terms of improving and enhancing quality in all areas, particularly in education (Alakrash & Razak, 2020).

The teachers are the main implementers of blended learning thus professional development is important. In Philippines, the Department of Education suggested to apply the blended learning, but the lack of technological resources like computer and internet connectivity is a unique challenge in the country (Tupas & Linas-Laguda, 2020)

According to Boticki *et al* (2009), blended learning is a common type of e-learning that is well suited to the process of shifting from traditional modes of learning and teaching to e-learning. This concept is achieved as a hybrid of face-to-face and online learning, with the help of a proprietary learning management system (LMS).

Implementation of blended learning in the Philippines is new and young. The HEIs in the Philippines is using blended learning approach for better performance from students in accomplishing course requirements. This learning modality is now the "new normal" of delivering basic education services in the Philippines while promoting the welfare of teachers, students, and other education stakeholders amidst pandemic.

Tupas and Linas-Laguda (2020) discuss that through blended learning students can set their own learning paces. Additionally, students can browse for numerous materials and resources as needed. Added by Gedik, Kiraz and Ozden (2013), blended learning encourages student participation and promotes engagement. However, a study by Lunesto *et al,* (2021) emphasized that blended learning has numerous problems, such as the forced consideration of digital technology characteristics, which necessitate skills and knowledge, as well as the enhancement of each student's reading comprehension ability. Also probable is a lack of access to technology for online learning that hinders the effective delivery of instruction in teaching and learning. These challenges is also evident in emerging nations such as the Philippines, especially in rural places where obtaining a steady source of electricity and internet requires traveling great distances.

Alvarez (2020) posits that constant human resource investment is required in the form of technology-enabled workshops and orientation, training and development, and assessment of blended learning classroom integration to overcome the challenges of blended learning. This means that teachers in blended learning environments should have at least the necessary knowledge and skills to mix the appropriate mixing in the teaching and learning process. The power of technology will aid to support teaching and learners in reaching the curriculum's needed competencies. Innovation may alter the traditional method of facilitating classes by creating new opportunities for students to learn (Salcito,2018).

Objectives

This study aims to determine the perception, readiness and challenges of the college faculty towards Education 4.0, in the field of the faculty, teaching process, technological skills and infrastructure or facilities. Moreover, to identify and learn its possible challenge2008s along the way and to encourage recommendations and formulations on an enhanced training design for instructors to be prepared to Education 4.0.

RESEARCH QUESTIONS

1. What is the professional profile of the participants in terms of: (i) college, (ii) years of experience; (iii) seminar-trainings attended; and (iv) highest educational attainment
2. What is the level of readiness of the participants in terms of: (i) faculty readiness (ii) teaching process; (iii) infrastructure; and (iv) technological skills.
3. What is the level of readiness of the participants in technological implementation in terms of (i) communicative, (ii) organizational, (iii) analytical or programming, (iv) recreational, (v) expansive, (vi) creativity, (vii) expression, (viii) evaluation and (ix) information?
4. Is there a significant relationship between the level of readiness and the level of technological skills?
5. Based on the result of the study, what training design may propose?
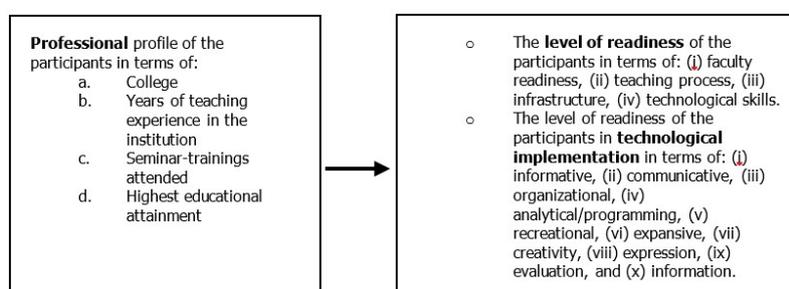
CONCEPTUAL FRAMEWORK

Professional profile of the participants in terms of:		The **level of readiness** of the participants in terms of: (i) faculty readiness, (ii) teaching process, (iii) infrastructure, (iv) technological skills.
a. College	→	The level of readiness of the participants in **technological implementation** in terms of: (i) informative, (ii) communicative, (iii) organizational, (iv) analytical/programming, (v) recreational, (vi) expansive, (vii) creativity, (viii) expression, (ix) evaluation, and (x) information.
b. Years of teaching experience in the institution		
c. Seminar-trainings attended		
d. Highest educational attainment		

Figure 1.
Conceptual Framework of the Study

METHODS

Research Design

To identify the actual participants, purposive study. The college instructors and professors of Caraga State University was the participants. The Descriptive method a quantitative research design to determine the perceptions, readiness, and challenges of the teacher faculty for education 4.0 readiness and explore the challenges encountered Convergent parallel mixed methods was applied, it is a mixed methods design in which the researcher congregates quantitative and qualitative data for comprehensive analysis based on the problem (Creswell, 2014).

Procedure

The researchers sent a letter of consent to ask permission to survey the deans of every college of Caraga State University. After permission was sought, the researchers explained the purpose of the study to the selected participants. Due to this pandemic outbreak, the online media platform was used in the distribution of the survey questionnaire such as the messenger app in sending a link to the selected participants and as a mode of communication between the participants and the researchers. The google form was also used as a medium of a survey questionnaire. The participants were given time to respond and then, the researchers checked, tallied, and analyzed the response collected. The researchers also made use of other resources such as literature and published articles to support the survey results.

Treatment of Data

The following statistical tools was used to treat the data that will be gathering:

Mean. This will be used to identify the average distribution of the level of readiness of the instructors and professors in implementing education 4.0 in terms of faculty readiness

Frequency and Percentage. The computation for this is to identify the percentage of the participants

education attainment taking the undergraduate programs and graduate studies.

The answers of the participants on the readiness towards education 4.0 were determined with the use of the Likert Scale. This scale used to determine the participant's level of readiness to a statement typically in five points: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; and (5) Strongly agree.

Table 1. Scoring and Quantification of Data

Description	Scale	Score Range	Interpretation
Strongly Agree	5	4.50 – 5.00	Ready
Agree	4	3.50 – 4.49	
Neither Agree nor Disagree	3	2.50 – 3.49	Approaching Readiness
Disagree	2	1.50 – 2.49	Developing Readiness
Strongly Disagree	1	1.00 – 1.49	

RESULTS and DISCUSSION
Professional Profile of the Participants

Data on professional profile of Participants were determined in terms of college, years of experience, seminars/trainings attended, and highest educational attainment.
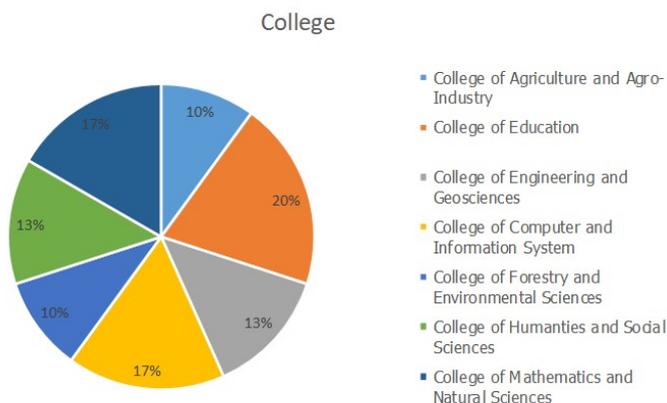

College

- College of Agriculture and Agro-Industry
- College of Education
- College of Engineering and Geosciences
- College of Computer and Information System
- College of Forestry and Environmental Sciences
- College of Humanities and Social Sciences
- College of Mathematics and Natural Sciences

Figure 1. Graphical Presentation of the Participants in terms of college assigned in teaching

The College of Education has the highest percentage (20%) of instructors, professors assigned in teaching based on the number of participants. Followed by the College of Computer and Information system (17%) ranked 2nd and College of Agriculture and Agro-Industry (17%).

The participants have been selected through purposive sampling with the condition that they are preparing for Education 4.0. This implies that majority of the participants in the colleges mentioned were in most concern on the new trends in teaching for the preparation for Education 4.0 through researches, and bench marking on the other universities in implementing the new educational system.
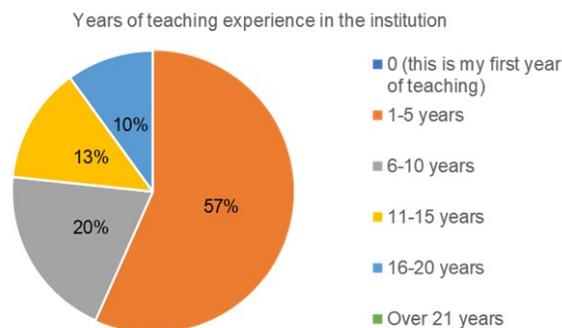
Figure 2. Graphical Presentation of the Participants in terms of Teaching Experience

Results revealed that majority (57%) of the participants had 1-5 years teaching experience in the institution, followed by a small number (20%) of participants with 6-10 years, a few (13%) had 11-15 years in teaching and only 10 percent of the participants were still new in the institution (first year of teaching). This indicates that majority of the participants had rendered their teaching services for 1-5 years. With the growing teaching experience, a faculty can gain more knowledge on their profession.
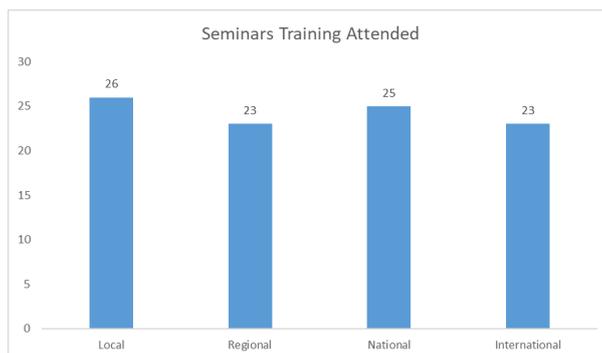

Figure 3. Graphical Presentation of the Participants in terms of Seminars/Trainings Attended

Based on the findings, it can be observed that among the seminars attended by 30 participants, the highest number of seminars that they have attended is the local seminars, with a frequency of twenty-six (26) followed by national with a frequency of twenty-five (25) and the lowest training that had been attended by the participants were the regional and international with a frequency of twenty-three (23). This implies that training and seminars can be very beneficial in terms of enhancing and improving the quality of education and learning provided to students.

According to Felipe (2013), trainings and seminars on ICT, new methods and techniques in teaching will support them in creating an effective learning environment, improving teaching-learning conditions, staying updated on the latest instructional gadgets, and inspiring them to become better and prepare for globalization.
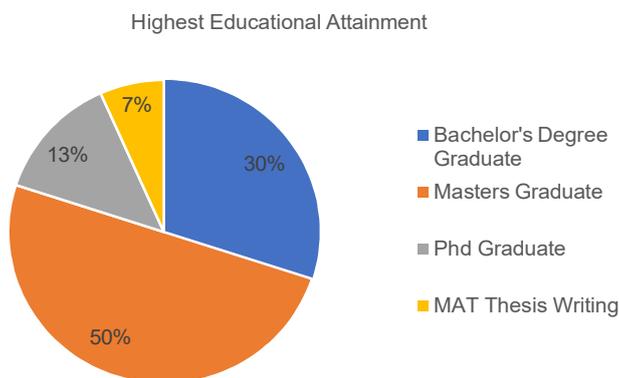
Highest Educational Attainment

Figure 4. Graphical Presentation of the Participants in terms of Highest Educational Attainment

Finding shows that the highest score in terms of highest educational attainment is the master's degree graduate, garnering fifteen (15) or fifty percent (50%) of the participants. There are nine (9) or thirty percent (30%) of the participants are bachelor's degree graduates, four (4) or thirteen percent (13%) of the participants are Ph.D. graduates, and the lowest score in terms of highest educational attainment is the MAT thesis writing, garnering two (2) or seven percent (7%) of the total participants. This implies that the participants pursue higher degree which is one of the requirements of the Commission on Higher Education (CHED) for faculty teaching in any of the degree programs offered.

Level of Readiness of the Participants in the Implementation of Education 4.0

Data on the level of readiness of participants in the implementation of Education 4.0 in terms of faculty readiness, teaching process, infrastructure, technological skills and technological implementation were presented below:

Faculty Readiness

Table 2 shows that in terms of the level of readiness of the participants in implementing education 4.0 in terms of faculty readiness, indicator attends seminars and conferences to enhance my technological and pedagogical skills obtained an average of 4.37 making it the top reason why faculty is ready for education 4.0. Followed by indicators experiment new approaches using technology and accept the vital role of technology in the 21st century and beyond, that gained an average of 4.33 making it the second top reasons why they are ready for education 4.0. Moreover, indicator am technologically literate gained an average of 4.07 making it the least reason why they are ready for educational 4.0. According to Chauhan (2017), adopting Education 4.0 will necessitate a paradigm shift in faculty roles, reversing years of one-way pedagogy. It also necessitates that the professors have up-to-date industrial expertise. It will also necessitate a significant shift in faculty attitudes toward engaging with students and creating a collaborative approach to problem-solving. To stay up with the times, conventional educational paradigms must be revisited with a future perspective.

As a faculty, I am ready for Education 4.0 because I ……	Perception		Level of Readiness
	Mean	Description	
1. am technologically literate	4.07	Agree	High
2. am skillful in the use of learning management system, google classroom, and online class modality.	4.23	Agree	High
3. accept the vital role of technology in the 21st century and beyond.	4.33	Agree	High
4. integrate digital technology in teaching and learning.	4.30	Agree	High
5. attend seminars and conference to enhance my technological and pedagogical skills.	4.37	Agree	High
6. experiment new approaches using technology.	4.33	Agree	High
7. lead in the development of innovative materials.	4.13	Agree	High
8. collaborate and build partnership from other institutions.	4.20	Agree	High
Overall Weighted Mean	**4.25**	**Agree**	**High**

Table 2. Faculty Readiness

Legend: 1.00-1.49 (Strongly Disagree); 1.50-2.49 (Disagree); 2.50-3.49 (Neither Agree nor Disagree);
3.50-4.49 (Agree);4.50-5.00 (Strongly Agree)

Teaching Process

Table 3 displays the level of readiness of the participants towards education 4.0 in terms of teaching process. From the result, it shows that participants agreed that they are ready in implementing Education 4.0 as they practiced integrating technology in various techniques, methods, and approaches in teaching and learning. Based on the result, with an overall weighted mean of 3.89, the participants agreed that the level of their readiness towards education 4.0 is high in terms of teaching processes. This implies that the participants had a high level of readiness and agreed that they had used various teaching strategies in delivery of instructions using technology.

Table 3. Teaching Process

My classes are Education 4.0 because I ……	Perception		Level of Readiness
	Mean	Description	
1. use the following strategies in the delivery of instruction			
a) individualized teaching	3.93	Agree	High
b) gamification and simulation	4.00	Agree	High
c) problem and inquiry-based teaching and learning	3.53	Agree	High
d) augmented and virtual reality	3.47	Neither Agree nor Disagree	Moderate
2. boost students' creativity through digital enablers like 3D printing and robotics.	3.47	Neither Agree nor Disagree	Moderate
3. use technology-based assessments tools (ex. Kahoot, Quizlet etc.)	4.07	Agree	High
4. develop 21st century skills (ex. Problem solving, collaboration, reflection, critical thinking, and communication)	4.40	Agree	High
5. teach digital citizenship (technology ethics, social, ethical, and legal responsibilities in the utilization of technological tools and resources etc.)	4.20	Agree	High
6. use individualized modular instructional materials	3.67	Agree	High
7. expose students to more participatory learning through field experiences.	3.87	Agree	High
8. accommodate multiple learning style through flexible assignments.	4. 17	Agree	High
Overall Weighted Mean	**3.89**	**Agree**	**High**

Legend: 1.00-1.49 (Strongly Disagree); 1.50-2.49 (Disagree); 2.50-3.49 (Neither Agree nor Disagree); 3.50-4.49 (Agree);
4.50-5.00 (Strongly Agree)

Infrastructure

The data shows that in terms of the level of readiness of the participants in implementing education 4.0 in terms of infrastructure, the indicator has technology that provides access to blogs, vlogs, wikis, Google Classroom, Edmodo, and other related sites and reference databases (e.g., Google Scholar, Ebsco Host, LISA, et al.) obtained an average of 4.13, claiming the top of the data gathered. Moreover, the indicator has an office that takes charge of the ICT needs of the university or college garnered an average of 4.03, making it the second-highest level of preparedness of the instructors in implementing education 4.0 in terms of infrastructure.

However, the indicator that has remote and virtual laboratories and a stable internet connection for teachers and students had the lowest level of readiness of the participants in implementing education 4.0 in terms of infrastructure. This means that among the indicators provided by the researchers, participants have chosen an indicator that has technology that provides access to blogs, vlogs, wikis, Google Classroom, Edmodo, and other related sites and reference databases (e.g., Google Scholar, Ebsco Host, LISA, etch.). This is supported by the study conducted by Aydug (2020), Education 4.0 is a new paradigm that reinterprets notions such as learning, student, instructor, and school in light of Industry 4.0 requirements.

Education is one of the most essential instruments for developing human abilities because of the 21st century's economic, social, and technological developments. According to Goker and Goker (2019), education 4.0's current creative and leadership-based learning objectives have made the transition from traditional industrial society classrooms to the establishment of digital classrooms a necessity. This change will include a digital curriculum, which may have an influence on learning outcomes and minimize in-class administration. Education 4.0, which stresses an education that will elevate Industry 4.0 producers and consumers, as well as innovation in education and the development of innovative skills through education, are explored in this context. New mobile technologies such as 5G and the benefits of high-speed mobile connections have been highlighted in the context of smart campuses and buildings. While a technical infrastructure is required for online teaching and learning at the university level, student and teacher preparedness is equally critical (Kusel, et, al. 2020).

Table 4. Infrastructure

The institution where I'm currently employed is ready for Education 4.0 because I ……	Perception		Level of Readiness
	Mean	Description	
1. has an office that takes charge of the ICT needs of the University/college.	4.03	Agree	High
2. has a stable internet connection which is accessible both for teachers and students.	3.27	Neither Agree nor Disagree	Moderate
3. has digital infrastructure which provide open access to the repository of information and scientific data.	3.63	Agree	High
4. has available teaching and learning spaces that provide greater opportunity for collaboration.	3.57	Agree	High
5. has technology that provides access to blogs, vlogs, wikis, google classroom, Edmodo, and other related sites and reference database (e.g., google scholar, Ebsco Host, LISA, etch.)	4.13	Agree	High
6. has a computer laboratory with internet connection in which students can watch educational videos and	3.63	Agree	High

collaborate with other students and other universities			
7. has remote and virtual laboratories.	3.13	Neither Agree nor Disagree	Moderate
Overall Weighted Mean	**3.63**	**Agree**	**High**

Legend: 1.00-1.49 (Strongly Disagree); 1.50-2.49 (Disagree); 2.50-3.49 (Neither Agree nor Disagree);
3.50-4.49 (Agree); 4.50-5.00 (Strongly Agree)

Technological Skills

Table 5 displays the level of readiness of the participants towards education 4.0 in terms of technological skills. From the results in Table 6, it shows that participants agreed that they perceived readiness in implementing Education 4.0. Based on the result, with an overall weighted mean of 3.82, the participants agreed that the level of their readiness towards education at 4.0 is high in terms of their technological skills. The result implies that the participants had a high level of readiness and agreed that they had adequate skills in terms of technology and digital platforms.

Table 5. Technological Skills

My technological skills are ready towards education 4.0 because I ……	Perception		Level of Readiness
	Mean	Description	
1. am expert in word processing, spreadsheets and other Microsoft office documents.	4.20	Agree	High
2. can do web navigation and web designing.	3.13	Neither Agree nor Disagree	Moderate
3. have an adequate knowledge about computer security.	3.50	Agree	High
4. can install computer software onto a computer system.	3.53	Agree	High
5. can operate digital cameras and video conferencing.	4.07	Agree	High
6. can create electronic presentation	4.27	Agree	High
7. can enter and retrieve data from existing database.	4.07	Agree	High
Overall Weighted Mean	**3.82**	**Agree**	**High**

Legend:
1.00-1.49 (Strongly Disagree);
1.50-2.49 (Disagree);
2.50-3.49 (Neither Agree nor Disagree);
3.50-4.49 (Agree);
4.50-5.00 (Strongly Agree)

Technological Implementation

Informative

Table 6 shows that the data of the participant's level of readiness for technological implementation of the instructors in implementing education 4.0 in terms of being informative is moderate with an overall weighted mean of 3.29. The indicator I utilize tutorials for self-training has gained an average of 3.93, making it the top choice of the participants. However, the indicator I let students use tutorials for remediation (in class) obtained an average of 3.27,

making it the second top choice of the participants. Furthermore, the indicator I used in lessons claimed the least number of averages, which is 2.67, making it the least popular choice for the participants.

This means that the participants' level of technological implementation of the instructors in implementing education 4.0 in terms of being informative is moderate as they have used education 4.0 in the sector of informative as a tool to utilize tutorials for self-training. Though each topic is taught with the same goal in mind, the path to that goal might differ depending on the instructor. Instructors will be able to alter their learning process with resources that they deem essential, similar to the individualized learning experience. Students will study using a variety of devices, applications, and approaches, depending on their personal preferences (Fisk, 2017).

Table 6. Informative

INFORMATIVE	Perception		Level of Readiness
	Mean	Description	
I use WebQuest in lessons	2.67	Sometimes	Moderate
I let students use tutorials for remediation (in class).	3.27	Sometimes	Moderate
I utilize tutorials for self-training	3.93	Very Often	High
Overall Weighted Mean	**3.29**	**Sometimes**	**Moderate**

Legend: 1.00-1.49 (Never); 1.50-2.49 (Rare); 2.50-3.49 (Sometimes); 3.50-4.49 (Very Often); 4.50-5.00 (Always)

Communicative

Table 7 shows that the data of the participant's level of readiness for technological implementation by the instructors in implementing education 4.0 in terms of being communicative is high with an overall weighted mean of 3.51. The indicator I create PowerPoint presentations for class use, gathered an average of 4.33, making it the top choice of the participants in terms of the level of technological implementation of the instructors in implementing education 4.0 in terms of being communicative. The indicator, I use e-mail to communicate with other teachers, gained an average of 4.07, making it the second top choice of the participants. However, the indicator I use e-mail to communicate with parents obtained an average of 2.17, making it the least chosen of the participants.

Table 7. Communicative

COMMUNICATIVE	Perception		Level of Readiness
	Mean	Description	
I use e-mail to communicate with other teachers	4.07	Very Often	High
I use e-mail to communicate with students	3.97	Very Often	High
I use e-mail to communicate with parents	2.17	Rare	Low
I use LCD projector (a projector connected to a computer) in class.	3.03	Sometimes	Moderate
I create PowerPoint presentations for class use.	4.33	Very Often	High
Overall Weighted Mean	**3.51**	**Very Often**	**High**

Legend:
1.00-1.49 (Never);
1.50-2.49 (Rare);
2.50-3.49 (Sometimes);
3.50-4.49 (Very Often);
4.50-5.00 (Always)

Organizational

Table 8 shows that, the data of the participant's level of readiness of technological implementation of the instructors in implementing education 4.0 in terms of organizational is high with an overall weighted mean of 4.52. Indicator I plan and create lessons in LMS, Google Classroom, etc. clinched an average of 4.57 making it the top level of technological implementation of the instructors in implementing education 4.0 in terms of organizational. Indicator I prepare handouts, tests/quizzes, and homework assignment for students procured an average of 4.53 making it the second top choice of the participants. Furthermore, indicator I keep track of students' grades or marks acquired an average of 4.47 making it the least choice of the participants.

Table 8. Organization

ORGANIZATIONAL	Perception		Level of Readiness
	Mean	Description	
I keep track of students' grades or marks.	4.47	Very Often	High
I prepare handouts, tests/quizzes, and homework assignment for students	4.53	Always	Very High
I plan and create lessons in LMS, Google Classroom, etc.	4.57	Always	High
Overall Weighted Mean	**4.52**	**Always**	**High**

Legend:
1.00-1.49 (Never); 1.50-2.49 (Rare); 2.50-3.49 (Sometimes); 3.50-4.49 (Very Often); 4.50-5.00 (Always)

Analytical/Programming

Table 9 shows that, the data of the participant's level of readiness of technological implementation of the instructors in implementing education 4.0 in terms of being analytical/programming is high with an overall weighted mean of 3.77. The indicator I create a class/school website or put students work on-line, acquired an average of 3.97 making it the top choice of the participants in terms of the level of technological skill of the instructors in implementing education 4.0 in terms of analytical/programming. The indicator I analyze data using digital tools has obtained an average of 3.93 making it the second top choice of the participants. Moreover, indicators I do statistics or data analysis clinched an average of 3.60 making it the least choice for the participants. This implies that participants create a class/school website or put students' work online with the use of technology for easy access. Students' engagement can be increased, instructors' lesson plans can be improved, and individualized learning may be facilitated with digital learning technologies in the classroom. It also assists pupils in developing critical 21st-century abilities. Students benefit from technology because it gives them fast access to knowledge, rapid learning, and entertaining ways to put what they've learned into practice (American University, 2020).

Table 9. Analytical/Programming

ANALYTICAL/PROGRAMMING	Perception		Level of Readiness
	Mean	Description	
I create charts or graphs	3.67	Very Often	High
I create a class/school website or put students work on-line	3.97	Very Often	High
I analyze data using digital tools.	3.83	Very Often	High
I do statistics or data analysis	3.60	Very Often	High
Overall Weighted Mean	**3.77**	**Very Often**	**High**

Legend: 1.00-1.49 (Never); 1.50-2.49 (Rare); 2.50-3.49 (Sometimes); 3.50-4.49 (Very Often); 4.50-5.00 (Always)

Recreational

Table 10 shows that the data of the participant's level of readiness for technological implementation of the instructors in implementing education 4.0 in terms of recreation is moderate with an overall weighted mean of 2.68. The data shows that indicators, I let students play educational games in class, garnered an average of 2.93, making it the top choice of the participants. Furthermore, the indicator I use computer time as a reward for completing class work or good behavior, obtained an average of 2.43, making it the least choice of the participants.

This implies that in the realm of education, technological advancements have paved the way for remote learning and increased creativity in both inside and outside the classroom teaching techniques. Smart sensors, big data, and 3D printing, for example, have been effectively employed in the business sector and have contributed to economic and social growth (Almeida & Simoes, 2019). Industrial 4.0, as described by Rojko (2017), is the integration of emergent.

Table 10. Recreational

RECREATIONAL	Perception		Level of Readiness
	Mean	Description	
I let students play educational game in class.	2.93	Sometimes	Moderate
I use computer time as a reward for completing class work or good behavior.	2.43	Rare	Low
Overall Weighted Mean	**2.68**	**Sometimes**	**Moderate**

Legend: 1.00-1.49 (Never); 1.50-2.49 (Rare); 2.50-3.49 (Sometimes); 3.50-4.49 (Very Often); 4.50-5.00 (Always)

Expansive

Table 11 shows that the data of the participant's level of readiness for technological implementation of the instructors in implementing education 4.0 in terms of being expansive is low with an overall weighted mean of 2.47. The data shows that the indicator I let students conduct experiments or laboratory exercises in a class or school lab garnered an average of 2.80, making it the level of technological skill of the instructors in implementing education 4.0 in terms of the participants. Indicator, I allow students to use 3-D modelling software or simulation in class/school lab, obtaining a 2.13, making it the least chosen of the participants out of the two indicators.

This implies that laboratories can be used in the educational process to build scientific notations and design models to test ideas. Laboratory work also aids in comprehending the distinction between data observation and data presentation. In certain studies, practical work has also been proven to increase students' communication abilities, allowing them to address issues in

science and therefore become more interested in science.

Table 11. Expansive

EXPANSIVE	Perception		Level of Readiness
	Mean	Description	
I let students conduct experiments or laboratory exercise in class/school lab.	2.80	Sometimes	Moderate
I allow students use 3-D modelling software or simulation in class/ school lab.	2.13	Rare	Low
Overall Weighted Mean	**2.47**	**Rare**	**Low**

Legend: 1.00-1.49 (Never); 1.50-2.49 (Rare); 2.50-3.49 (Sometimes); 3.50-4.49 (Very Often); 4.50-5.00 (Always)

Creativity

Table 12 shows that, the data of the participant's level of readiness of technological implementation of the instructors in implementing education 4.0 in terms of creativity is moderate with an overall weighted mean of 3.12. Indicator, I scan pictures or images obtained an average of 3.70 making it the top choice of the participants, however, indicator I use drawing or paint programs acquired an average of 2.53 making it the least choice level of technological skill of the instructors in implementing education 4.0 in line with activity.

This implies that even with an average of 3.70 the participants still rarely use the scanning of pictures and images is still rarely done. According to Campus (2020), Education 4.0 is built on the foundation of creativity. It highlights the importance of preparing pupils to face and overcome obstacles. To stay up with the times, conventional educational paradigms must be revisited with a future perspective. Students should be able to master the abilities required by rapidly changing technology; they should be guided rather than instructed, and knowledge should be made available rather than fed to them.

Table 12. Creativity

CREATIVITY	Perception		Level of Readiness
	Mean	Description	
I use drawing or paint programs	2.53	Sometimes	Moderate
I scan pictures or images	3.70	Very Often	High
Overall Weighted Mean	**3.12**	**Sometimes**	**Moderate**

Legend: 1.00-1.49 (Never); 1.50-2.49 (Rare); 2.50-3.49 (Sometimes); 3.50-4.49 (Very Often); 4.50-5.00 (Always)

Expression

Table 13 shows that the data of the participant's level of readiness for technological implementation of the instructors in implementing education 4.0 in terms of expression is high with an overall weighted mean of 3.67. I use a word processor and obtain an average of 4.30, making it the top level of technological skill of the instructors in implementing education at 4.0 in terms of expression. Furthermore, the indicator I maintain an on-line journal (diary) or discussion board clinched an average

of 3.03, making it the least chosen of the participants between the two indicators.

This means that the manipulation of word processors indicates that the easy access of the participants in writing and formulating ideas has been made easier. The findings of numerous recent studies show that the pre-existing levels of editing and revising competence that students bring to computer-based writing have an influence on their editing and rewriting habits. Contexts may have a major participant's level of readiness for technological implementation of the instructors in implementing education. 4.0 in terms of expression is high with an overall weighted mean of 3.67. I use a word processor and obtain an average of 4.30, making it the top level of technological skill of the instructors in implementing education at 4.0 in terms of expression. Furthermore, indicator I maintain an on-line journal (diary) or discussion board clinched an average of 3.03 making it the least choice of the participants between the two indicators.

Table 13. Expression

EXPRESSION	Perception		Level of Readiness
	Mean	Description	
I use a word processor.	4.30	Very Often	High
I maintain an on-line journal (diary) or discussion board	3.03	Sometimes	Moderate
Overall Weighted Mean	**3.67**	**Very Often**	**High**

Legend: 1.00-1.49 (Never); 1.50-2.49 (Rare); 2.50-3.49 (Sometimes); 3.50-4.49 (Very Often); 4.50-5.00 (Always)

Evaluation

Table 14 shows that the data of the participant's level of readiness for technological implementation of the instructors in implementing education 4.0 in terms of evaluation is high with an overall weighted mean of 3.77. Indicator, I test or assess student learning, acquired an average of 4.30, making it the highest score. However, the indicator I use for digital portfolios obtained an average of 3.23, making it the least chosen of the participants out of the two indicators.

This leads us to the idea that participants use tests in order to assess students' learning rather than using digital portfolios. According to Leon and Elias (1998), traditional success metrics, such as standardized examinations, may underestimate students' skills and lead to ineffective educational decisions. During testing, key concepts learned in class are ignored, while important time is spent "teaching the exam." Authentic assessment approaches are criterion-referenced activities that are completed in real-life settings rather than in a lab setting. Authentic assessments produce outcomes that are directly connected to the curriculum and are continuously evaluated in order to enhance the course of study, rather than evaluating what the student has learned after it is too late to make changes.

Table 14. Evaluation

EVALUATION	Perception		Level of Readiness
	Mean	Description	
I test or assess student learning	4.30	Very Often	High
I use digital portfolios	3.23	Sometimes	Moderate
Overall Weighted Mean	**3.77**	**Very Often**	**High**

Legend: 1.00-1.49 (Never); 1.50-2.49 (Rare); 2.50-3.49 (Sometimes); 3.50-4.49 (Very Often); 4.50-5.00 (Always)

Information

Table 15 shows that the data of the participant's level of readiness for technological implementation by the instructors in implementing education 4.0 in terms of information is moderate. Indicator, I searched the Internet for information for a lesson and obtained an

average of 4.60, making it the highest score in technological implementation as a source of information. Indicator, I access CD-ROM reference materials acquired at an average of 2.37, making it the least preferred choice for the participants. This conclude that the participants have opted to manipulate the internet in order to gather information and acquired data that are essential in their field of expertise. The internet has become a vital component of academic institutions, since it serves as a vital resource for obtaining knowledge and communicating with institutions and individuals. According to the findings of this survey, the majority of pupils (92.30 percent) had good internet exposure (Singh & Pant, 2013). Teachers must teach and advise their pupils on reasonable techniques for sorting through the amount of information, given the Internet's potential as a research tool. If students are left to their own devices in their initial quest for reputable materials, it may be both daunting and frustrating. A few simple rules may make research more manageable, dependable, and enjoyable necessary to build one themselves.

Table 15. Information

INFORMATION	Perception		Level of Readiness
	Mean	Description	
I search the Internet for information for a lesson	4.60	Always	Very High
I access CD-ROM reference materials	2.37	Rare	Low
Overall Weighted Mean	**3.48**	**Sometimes**	**Moderate**

Legend: 1.00-1.49 (Never); 1.50-2.49 (Rare); 2.50-3.49 (Sometimes); 3.50-4.49 (Very Often); 4.50-5.00 (Always)

Summary of Level of Readiness in terms of Technological Implementation

Table 16 shows the level of readiness of the participants in terms of technological implementation. Based on the findings, participants' level of readiness in terms of technological implementation is moderate with an overall weighted mean of 3.43 as participants responded. The result implies that, technological implementation in school is moderately practiced. As the data shows in table 17, the data suggests that implementation of technology as organizational scores the highest with an overall weighted mean of 4.52. Participants used technology to organize the student's records and for the preparation of lesson. However, in terms of expansive in technological implementation, it scores the lowest with an overall weighted mean of 2.47 which means that utilizes of 3D modelling and laboratory simulations were rarely used by the participants due to limited digital resources. Nonetheless, in terms of informative, communicative, analytical/programming, recreational, expression, and evaluation were used by the participants very often as shown in the table.

Table 16. Summary of Technological Implementation

Indicators	Perception		Level of Readiness
	Mean	Description	
1. Informative	3.29	Very Often	High
2. Communicative	3.51	Very Often	High
3. Organizational	4.52	Always	Very High
4. Analytical/Programming	3.77	Very Often	High
5. Recreational	2.68	Very Often	High
6. Expansive	2.47	Rare	Low
7. Creativity	3.12	Sometimes	Moderate
8. Expression	3.67	Very Often	High
9. Evaluation	3.77	Very Often	High
10. Information	3.48	Sometimes	Moderate
Overall Weighted Mean	**3.43**	**Sometimes**	**Moderate**

Correlation Analysis between level of readiness and the level of technological skill

Table 17 show the result of correlation analysis between the level of readiness and the level of technological skill. Based on the findings, there is a significant relationship in the level of readiness of the instructors and professors between their level of technological skills having significant values which are lower than the 0.05 level of significance set for analysis. As for evidence for this claim, there is a significant (2-tailed) value of .000 by which means that the values of the participants between level of readiness and technological skills were less than 0.05. With this, the null hypothesis is rejected. This implies that if the level of readiness of the participants is high then the technological skills will also be positively related or high.

The concept of the enhancement training program will anchor on the idea for honing the teaching faculty's technological skills and readiness in perception to Education 4.0. Also, this training will help the participants to give the best learning experience to their students. Through this study, the proponents will be able to understand and investigate on the efficient professional development program needed for the instructors and professors' readiness in Education 4.0.

Table 17. Correlation analysis between the level of readiness and the level of technological skills

Correlation analysis between the level of readiness and the level of technological skills						
Variable	Mean	SD	R	Sig. (2-Tailed)	interpretation	Significance
Level of Readiness	3.9282	.75021				
Technological Skills	3.8238	0.90870	.671	.000	High Positive Correlation	Significant

Conclusion

The emergence of technology has had a tremendous impact on the lives of people, specifically in the academic world. While humanity has proven to be robust and strategic, the industry has adapted to the new normal and introduced a new style of learning. Education 4.0. With the rapid shifting of the educational system, most of the students and teachers in today's generation are already equipped by the 21st century skills and are also technologically literate. However, as with the results that are shown in this paper there are factors that can be improved, develop and encounter. The faculty members might be able to attend more trainings, workshops, and seminars for ICT integration in a classroom setting. Internet connection is also a problem faced by the participants that affects the factor in the system, virtual laboratories, and accessibility. Teachers' use of computers and the Internet for educational purposes was linked to their training and preparation, as well as their work environment. Teachers were more likely to use these technologies when they were available to them.

Furthermore, teachers who felt more prepared were more likely to use these tools than those who felt less prepared. Teachers who invested more time in professional development felt more prepared than their peers.

Finally, the main challenges in implementing this system are the lack of resources and technology itself as well as the implementation of the system, especially in the remote areas where people struggle with a lot of factors that hinder Education 4.0.

REFERRENCES

Alakrash H., & Razak, N. A. (2020). Towards the education 4.0, readiness level ofEFL students in utilising technology- enhanced classroom. *International Journal of Innovation, Creativite and Change*. https://www.researchgate.net/publication

Alvarez A. (2020). Learning from the problems and challenges in blended learning: Basis for faculty

development and program enhancement. *Asian Journal of Distance Education*, *15*(2)
https://files.eric.ed.gov/fulltext/EJ1285361.pdf

Boticki I., *et al* (2009), "A Blended Learning Approach to Course Design and Implementation," in IEEE
Transactions on Education, vol. 52, no. 1, pp. 19-30, https://doi.org/10.1109/TE.2007.914945.

Chauhan, S. (2017). A meta-analysis of the impact of technology on learning effectiveness of elementary
students. Science Direct. https://doi.org/10.1016/j.compedu.2016.11.005

Creswell, J.W. (2014). Research design; qualitative, quantitative and mixed Methods approaches 4th
edition. SAGE Publication.

Felipe, R. (2013). The Importance of Seminars and Trainings in Improving Teachers Performance.
Teacher's Essay | It's all about teachers through, experiences, and observations of daily
school life. https://www.teachersessay.com

Gedik, N., Kiraz, E., & Ozden, M. Y. (2013). Design of a   blended learning environment: Considerations
And implementation issues. *Australasian Journal of Educational Technology*, *29*(1).
https://doi.org/10.14742/ajet.6

Fisk, P. (2017, January 25). Education 4.0 the future of learning will be dramatically different, in
school and throughout life. Genius Works.   https://www.peterfisk.com/2017/01/future-

Küsel, J., Martin, F. & Markic, S. (2020) University Students' Readiness for Using Digital Media and
Online Learning—Comparison between Germany and the USA.
www.mdpi.com/journal/education, doi:10.3390/educsci10110313

Lunesto, J. P., *et al* (2021). Mag-Aral ay Di 'Biro: Phenomenological Study on the Lived Experiences of the
Students on Blended Learning Amidst COVID-19. *International Journal of Advance Research and
Innovative Ideas in Education.*, *7* (1).
http://ijariie.com/AdminUploadPdf/Mag_Aral_ayDi_%E2%80%98Biro__A_Phenomenological_St

Salcito, A. (2018). *Transforming Education*. https://news.microsoft.com/wpcontent/upload

Tupas, F.P., & Linas-Laguda, M. (2020). An Approach in Philippine Basic Education Curriculum in New
Normal: A Review of Current Literature. *Universal Journal of Educational Research* 8(11): 5505-
5512, 2020 http://www.hrpub.org DOI:10.13189/ujer.2020.081154