CHALLENGES, TEACHING METHODS AND METHODS OF ASSESSMENT IN ONLINE MODALITY: A CAUSAL-COMPARATIVE AND CORRELATIONAL STUDY

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Abstract:

This study aims to determine the cause of the differences on the challenges, teaching methods, and methods of assessment of teachers in online modality, and to establish the relationship among these three variables. It made use of the causal-comparative and correlational research designs. It included as respondents fifty college teachers of Notre Dame of Midsayap College who were variably apportioned among its seven colleges. The respondents were 22-70 years old, composite of males and females; mostly married; and predominantly teaching major courses. All of them were using laptops; mostly were using smartphones, majority were using router/pocket Wi-Fi and camera, several were using desktops; a few of them were using iPad/tablet; and a minority of them were using noise-canceling headsets. The top challenges they experienced in online modality were instruction, assessment and economic related. The primary teaching methods they employed were lecture, demonstration, and discussion. The main methods of assessment they used was the subjective type, and mainly addressed the cognitive domain of learning. There is no significant difference on the challenges, teaching methods, and methods of assessment of respondents when they are grouped according to sex. There is a weak direct relationship between challenges and teaching methods and a very weak

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positive relationship between challenges and methods of assessment. In both cases, however, the relationships were not significant. There is a moderately strong positive relationship between teaching methods and methods of assessment, and that relationship is highly significant.

Keywords: challenges, teaching methods, methods of assessment, online teaching

1. Introduction

COVID-19 Pandemic, a globally historical event suddenly "changed" the world and its movement. In the realms of education, it has posed unprecedented challenges. One of the changes pertains to online teaching and learning. Oztok et al. (2013) explained that online learning might be in terms of synchronous, real-time lectures, and time-based outcomes assessments, or asynchronous, delayed-time activities, like pre-recorded video lectures and time-independent assessments.

With the Philippine government imposing quarantine protocols and a temporary shutdown of education institutions, over 28 million Filipino learners across academic levels have to stay at home (UNESCO, 2020 as cited by Joaquin, 2020). The Secretary of the Department of Education (DepEd), Secretary Leonor Briones, said, "*education must continue even in times of crisis whether it may be a calamity, disaster, emergency, quarantine, or even war*" (Department of Education, 2020). To respond to the crisis, the educational institutions opted for feasible solutions to continue the education of the learners.

NDMC is one of the educational institutions that readily adopted the online education. The adoption by the college of this new modality paved the way for modifications, adjustments, and 'new' teaching methods. Beforehand, varying opinions surfaced concerning the implementation of online education, questioning its credibility, and considering the bulk of challenges that affect students, parents, and teachers.

Studies revealed that online teaching through a web-based learning management system is relatively new in the Philippines. To the best knowledge of the researchers, there are limited studies that dealt with the challenges, teaching methods, and methods of assessment of teachers in the context of online modality. This is the gap that the research hopes to fill in the stream of knowledge about online education.

1.2. Statement of the Problem
1) What is the profile of the respondents?
2) What are the challenges encountered by the respondents in online modality?
3) What are the teaching methods employed by the respondents in online modality?
4) What are the methods of assessment used by the respondents in online modality?
5) Is there a significant difference in the challenges encountered by the respondents in online modality when they are grouped according to sex?

6) Is there a significant difference in the teaching methods employed by the respondents in online modality when they are grouped according to sex?

7) Is there a significant difference in the methods of assessment used by the respondents in online modality when they are grouped according to sex?

8) Is there a significant relationship between the challenges and teaching methods in online modality?

9) Is there a significant relationship between the challenges and methods of assessment in online modality?

10) Is there a significant relationship between the teaching methods and methods of assessment in online modality?

1.3. Significance of the Study

- **Students**. The results of this study may help students become more 21st century learners in a way that they are being taught and assessed with teaching methods and methods of assessment in this time of pandemic.

- **Teachers.** The findings of this study may help teachers identify their strengths and weaknesses in dealing with challenges in online modality. This may also serve as a guide to devise better teaching methods and methods of assessment.

- **School Administrators.** The results of this study may inform school administrators and encourage their teachers to utilize innovative teaching methods and methods of assessment in online education.

- **Commission on Higher Education**. The information that this study may generate can be used as a foundation in the development of online education policies and programs in the country.

- **Future Researchers.** The information yielded in this study may serve as a guide for future studies relating to teaching methods and methods of assessment suitable for online education.

1.4. Scope and Delimitation

This study had focused on the causes of difference in and relationship among challenges, teaching methods, and methods of assessment. Fifty (50) part-time and full-time college teachers of Notre Dame of Midsayap College were the participants of this study. The context of this study is Schoology as the Learning Management System of NDMC (Mahinay et al., (2022). This study was conducted in the second semester of Academic Year 2020-2021. The variable challenges were confined to technology, economic, health, classroom instruction, learning materials, and assessment-related challenges; the variable teaching methods only included lecture method, discussion method, reporting method, demonstration method, activity method, integrated method, and investigatory method; and the variable methods of assessment only considered types of tests based on test items and based on domains of learning.

2. Theoretical Framework

Technological Pedagogical Content Knowledge (TPACK) Theory is a framework that combines the teacher's three knowledge areas: technological knowledge, content knowledge, and pedagogical knowledge. The framework emphasizes how the connections among teachers' understanding of content, pedagogy, and technology interact with one another to produce effective teaching. It suggests that teachers need to have deep understandings of each of the above components of knowledge in order to orchestrate and coordinate technology, pedagogy, and content into teaching (Koehler et al., 2013).

Substitution, Augmentation, Modification, and Redefinition (SAMR) Theory proposes a framework for technology integration into the curriculum. In the e-learning context, instructors substitute in-person class materials, such as lectures for their digital versions (substitution); incorporate interactive components, such as hyperlinks, comments (in a discussion board or blog), or multimedia (augmentation), use course management platforms, such as Blackboard or Google Classroom (modification), and "redefine" learning components that were previously impossible in the in-person modality (redefinition) (Puentedura, 2010).

2.1 Conceptual Framework

This study postulates that, during online teaching, the respondents have differing challenges, teaching methods, and methods of assessment, and that such differences are caused by the difference on their sex. It also theorizes that their challenges, teaching methods, and methods of assessment are correlated with each other. These differences and relationships are visualized in Figure 1.

The first circle contains the independent variable of the sex of the respondents. The second circle contains the dependent variable challenges; the third circle contains the dependent variable teaching methods; and the fourth circle contains the dependent variable methods of assessment. The arrow that points from the first circle to the second circle illustrates that the difference in the sex of the respondents causes difference on their challenges. The arrow that points from the first circle to the third circle illustrates that the difference in the sex of the respondents causes difference on their teaching methods. The arrow that points from the first circle to the fourth circle illustrates that the difference in the sex of the respondents causes difference on their methods of assessment. The two-way arrow the points to the second circle and the third circle illustrates a correlation between the challenges and teaching methods. The two-way arrow that points to the second circle and the fourth circle illustrates a correlation between the challenges and methods of assessments. The two-way arrow that points to the third circle and the fourth circle illustrates a correlation between the teaching methods and methods of assessment.

Figure 1: Schematic Diagram of the Conceptual Framework
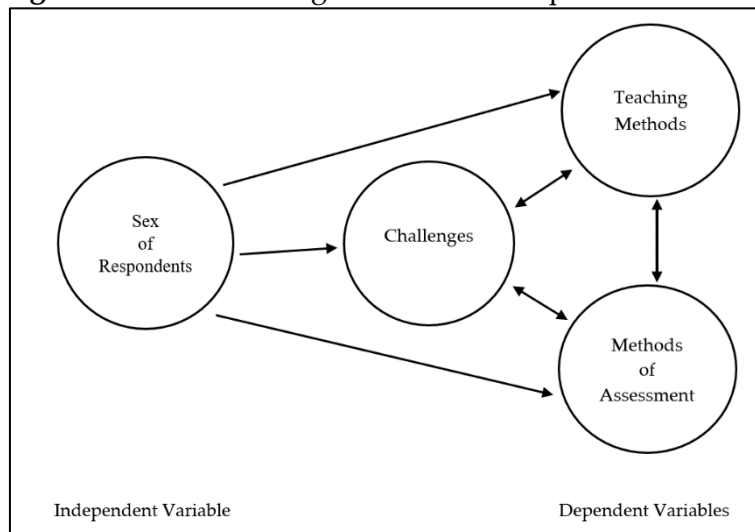
2.2. Hypotheses

Ho1. There is no significant difference on the challenges of the respondents when they are grouped according to sex.

Ho2. There is no significant difference on the teaching methods of the respondents when they are grouped according to sex.

Ho3. There is no significant difference on the methods of assessment of the respondents when they are grouped according to sex.

Ho4. There is no significant relationship between the challenges of respondents and their teaching methods in online modality.

Ho5. There is no significant relationship between the challenges of respondents and their methods of assessment in online modality.

Ho6. There is no significant relationship between the teaching methods of respondents and their methods of assessment in online modality.

3. Methods

3.1. Research Design

This study made use of causal-comparative and correlational research designs. It would compare the two groups (male and female) to find out whether the independent variable (sex) affected the outcome of the dependent variables (challenges, teaching methods, and methods of assessment (Ucar et al., 2021; Velazquez, 2023). It would thus determine whether the differences on the challenges, teaching methods, and methods of assessment of the respondents are caused by the difference of their sex. This study would also determine the nature (direction) and magnitude (strength) of the relationships among the variables challenges, teaching methods and methods of assessment (Hayes, 2022).

3.2. Locale and Respondents of the Study

The study was conducted at Notre Dame of Midsayap College, Midsayap, Cotabato. It included as respondents fifty full-time and part-time teachers apportioned among its seven colleges: College of Education, College of Arts and Science, College of Business and Accountancy, College of Criminal Justice Education, College of Information Technology and Engineering, College of Nursing, and Graduate Studies.

3.3. Sampling Design

This study utilized quota sampling. It was deemed the feasible sampling design with respect to time and practicality. It covered the sample size of fifty college teachers sufficient to represent the population of interest – the college faculty (Simkus, 2022).

3.4. Instrumentation

The researchers utilized a self-made questionnaire. The questionnaire thus made was comprised of five parts. Part I contained the personal profile of the respondents; Part II sets out the challenges they encountered; Part III drew out their teaching methods. Part IV elicited their methods of assessment. Their responses were made in the context of online modality.

3.5. Data Gathering Procedure

The researchers employed the survey method to gather the pertinent data. They secured permission to conduct the study through separate letters from the deans of the colleges. They distributed the questionnaires to the respondents with the assistance of their deans. The questionnaires were then answered individually by the respondents and were immediately retrieved by the researchers.

3.6. Data Analysis

The researchers utilized the descriptive statistics of frequency and percentage distribution to characterize the respondents in terms their personal profile. They employed the univariate descriptive statistics of mean (M) and standard deviation (SD) to describe their challenges, teaching methods and methods of assessment in terms of average and dispersion. They applied bivariate inferential statistics of t-test (p-value approach) for independent sample mean to determine whether there is significance difference on their challenges, teaching methods, and methods of assessment when they are grouped according to sex (Hayes, 2022), and to find out if sex is the cause of such difference (Ucar et al., 2021). They applied the bivariate inferential statistics of Pearson correlation coefficient (r) to establish the magnitude (strength) and nature (direction) of relationships among the variables. Finally, they calculate the t-test (p-value approach) to determine if such relationships are significant (Turney, 2022).

4. Results and Discussion

4.1. Profile of Respondents

Table 1: Personal Profile of the Respondents

Characteristics	Frequency (f)	Percentage (%0
Age		
22- 29 years old	23	46.0
30- 37 years old	9	18.0
38- 45 years old	9	18.0
46- 53 years old	4	8.0
54- 61 years old	3	6.0
62- 69 years old	1	2.0
70 years old	1	2.0
Total	50	100.0
Sex		
Male	26	52.0
Female	24	48.0
Total	50	100.0
Civil Status		
Married	27	54.0
Single	22	44.0
Widowed	1	2.00
Total	50	100.00
College/ Department		
CAS	14	28.0
CED	9	18.0
CBA	6	12.0
CITE	7	14.0
CCJE	3	6.0
CN	9	18.0
Graduate School	2	4.0
Total	50	100.0
Area of Specialization		
General Education Courses	15	30.0
Major Courses	33	66.0
Mandated Courses	2	4.0
Total	50	100.0
Gadgets Being Used		
Laptop	50	100.0
Smartphone	46	92.0
iPad/Tablet	4	8.0
Desktop	24	48.0
Router/ Pocket Wi-Fi	39	78.0
Camera	28	56.0
Noise Cancelling Headset	16	32.0
Total	50	100.0

The greater number (f = 23 or 46%) of the respondents are 22-29 years old; most (f = 26 or 52%) of them are males; the greater number (f = 27 or 54%) of them are married; a considerable number (f = 22 or 44%) of them are single. They are distributed among College of Arts and Sciences (f = 14 or 28%), College of Education (f = 9 or 18%); College of Nursing (f = 9 or 18%); College of Information, Technology and Engineering (f = 7 or 14%); College of Business and Accountancy (f = 6 or 12%); College of Criminal Justice Education (f = 3 or 6%); and the Graduate Studies (f = 2 or 4%). The greater number (f = 33 or 66%) of the respondents are teaching Major Courses; 32% are teaching General Education Courses; and 4% are teaching Mandated Courses. All (f = 50 or 100%) of the respondents are using laptop; 92% are using smartphones; 78% are using Router/ Pocket Wi-Fi.

4.2. Challenges in Online Teaching

Table 2: Challenges Encountered by Respondents in Online Teaching

Item	Mean	SD	Description
Technology-related challenges			
I had a poor/unstable internet connection at home.	3.62	1.00	Agree
I used outdated devices (laptop, cell phone) for online classes.	2.16	1.10	Disagree
I found it difficult to utilize educational applications.	2.58	1.14	Moderately Agree
I found it difficult to use different productivity tools.	1.94	0 .93	Disagree
Overall M/ SD	2.58	1.04	Moderately Agree
Economic-related challenges			
I had to incur more expenses for my transportation.	2.86	1.13	Moderately Agree
I had to buy additional loads to be used for online class.	3.88	1.19	Agree
I had to borrow money and/or avail loan to secure my needs in online teaching.	2.94	1.46	Moderately Agree
I used my own extra money to acquire the gadgets needed for online teaching.	4.00	1.10	Agree
Overall M/ SD	3.42	1.22	Agree
Health-related challenges			
I had suffered from dizziness.	2.92	1.38	Moderately Agree
I experienced eye-related problems because of time spent on the screen.	3.72	1.23	Agree
I was anxious of the need to adjust in the new modality of learning.	3.22	1.13	Moderately Agree
I altered my sleeping pattern to find time for a better internet connection.	3.46	1.37	Agree
Overall M/ SD	3.33	1.28	Moderately Agree
Instruction-related challenges			
My class rules could not be consistently implemented.	3.68	1.04	Agree

My instructions could not be understood and/or not be followed by students.	3.06	0.89	Moderately Agree
I had to loosen my rules to consider the internet connection of my students.	4.16	0.89	Agree
I had to use a variety of media to disseminate my instructions, and reminders.	4.48	0.76	Strongly Agree
Overall M/ SD	3.85	0.90	Agree
Learning materials- related challenges			
I had very limited relevant learning resources for my course (s).	3.00	1.18	Moderately Agree
I had to record myself explaining complicated topics of my lessons.	3.52	0.91	Agree
I experienced hardship in making my students participate in class discussions.	3.76	1.04	Agree
I found it taxing to convert my learning materials into viewable digital forms.	3.22	1.23	Moderately Agree
Overall M/ SD	3.38	1.09	Moderately Agree
Assessment-related challenges			
I found it hard to implement graded oral recitations online.	3.82	1.04	Agree
I could hardly give varied types of assessments to my students.	3.44	1.18	Moderately Agree
I struggled in administering "performance tasks" to my students.	3.28	1.17	Moderately Agree
Some of my students missed the major exam because of unstable internet connection and/or power interruptions.	3.88	1.15	Agree
Overall M/ SD	3.61	1.13	Agree

*Scale	Range	Description	Interpretation
1	1.00 to <1.80	Strongly Disagree	Not a Challenge
2	1.80 to <2.60	Disagree	A Slight Challenge
3	2.60 to <3.40	Moderately Agree	A Moderate Challenge
4	3.40 to <4.20	Agree	A Great Challenge
5	4.20 to 5.00	Strongly Agree	A Very Great Challenge

The respondents Moderately Agree (OM = 2.58, OSD = 1.04) that they are facing "Technology-related challenges in online teaching." They Agree (M = 3.62) that they "have a poor/unstable internet connection at their respective homes" but Disagree (M= 2.16) that they "are using outdated devices (e.g., laptop, smartphone) for online class." They Agree (OM = 3.42, OSD = 1.22) that they face "Economic- related challenges in online teaching." They Agree (M = 4.00) that they "use their own extra money to acquire gadgets (e.g., laptop, Wi-Fi router, smartphones, printer, camera) for online teaching" but Moderately Agree (M = 2.86) that they "had to incur expenses for transportation." They Moderately Agree (OM = 3.33, OSD = 1.28) that they face "Health- related challenges in online teaching". They Agree (M = 3.46) that "had to alter their sleeping pattern to find time for a better internet connection," but Moderately Agree (M = 2.92) that they "suffered from dizziness." They Agree (OM = 3.85, OSD = 0.90) that they face "Instruction-related challenges in online teaching". They Strongly Agree (M = 4.48) that they "had to use

variety of media (e.g., group chats, Facebook, personal messages) to disseminate instructions, directions and reminders," but Moderately Agree (M = 3.06) that their "instruction could not be understood and/or not be followed by the students." They Moderately Agree (OM = 3.38, OSD = 1.09) that they face "Learning Materials- related challenges in online teaching". They Agree (M = 3.76) that they "experienced hardship in making materials that will make students participate and interact in class discussions," but Moderately Agree (M = 3.00) that they "had very limited relevant learning resources." They Agree (OM = 3.61, OSD = 1.13) that they face "Assessment- related challenges in online teaching." They Agree (M = 3.88) that "some of their students missed major exams because of unstable internet connection and/or power interruption" but Moderately Agree (M = 3.28) that they "struggle in administering performance tasks to students"; finally,

Overall, they variably agree that, in online modality, they face Instruction-related challenges (OM = 3.85), Assessment-related challenges (OM = 3.61), Economic-related challenges (OM = 3.42), Learning materials-related challenges (OM = 3.38), Health-related challenges (OM = 3.33) and Technology- related challenges (OM = 2.58). Impliedly, teachers need to improve their teacher–student interaction and maintain student interest and engagement during online teaching (Huang, 2020), and have to use variety of media to disseminate their instructions, and reminders for these purposes.

4.3. Teaching Methods in Online Teaching

Table 3: Teaching Methods Employed by Respondents in Online Modality

Item	Mean	SD	Description
Lecture Method			
I present and explain particular topics in class by myself. (Lecture)	4.00	0.86	Oftentimes
Overall M/ SD	4.00	0.86	Oftentimes
Discussion Method			
I allow students who are formed into groups to freely exchange ideas about a topic among themselves. (Small Group Discussion)	3.26	1.07	Sometimes
I involve myself and my class to freely exchange ideas among us. (Socialized Classroom Discussion)	3.60	1.20	Oftentimes
I ask questions about a topic to be answered by students in class. (Recitation)	3.78	1.00	Oftentimes
Overall M/ SD	3.66	1.03	Oftentimes
Reporting Method			
I individually assign students specific topics and for each of them deliver the information orally in class. (Individual Reporting)	2.78	1.13	Sometimes
I assign students, as a group, specific topics for them to research and deliver the information orally in class. (Group Reporting)	2.74	1.27	Sometimes
Overall M/ SD	2.76	1.20	Sometimes
Demonstration Method			
I show and explain to students the procedure of performing an activity for them to know how to do it themselves. (Demonstration)	3.74	1.01	Oftentimes
Overall M/ SD	3.74	1.01	Oftentimes

Activity Method			
I require students to engage in making projects or submit finished works. (Activity - Project)	4.06	0.89	Oftentimes
I bring students to a trip or a place where they gain the opportunity to experience knowledge. (Activity - Field trip)	1.28	0.81	Seldom
I make students think and speak out freely about all possible solutions to a given problem. (Activity - Brainstorming)	3.72	1.01	Oftentimes
I let students who are formed into two groups argue on an issue before an audience in accordance with set procedure. (Activity - Debate)	2.44	1.13	Seldom
I involve students in telling a story through acting in front of a class, television, on stage or over the radio. (Activity - Dramatization)	1.88	1.12	Seldom
I involve students to act out or emote their real reactions to a certain problematic situation. (Activity - Role-playing)	2.22	1.31	Seldom
I involve my students in an activity which is an imitation of a reality or an illusion of real experience. (Activity - Simulation)	3.14	1.29	Sometimes
Overall M/ SD	2.68	1.08	Sometimes
Integrated Method			
I let students view films, videos and other forms of media and discuss salient points seen in them. (Integrated - Film-showing-Discussion)	3.40	1.23	Sometimes
Overall M/ SD	3.40	1.23	Oftentimes
Investigatory Method			
I engage students to actively manipulate and study a given artificial situation upon which a given problem arises. (Investigatory - Laboratory)	3.28	1.43	Sometimes
I require students to work actively in the solution of a difficult problem or situation. Investigatory - Problem-solving)	3.30	1.34	Sometimes
I require students to seek the truth about an actual condition, event, or situation. (Investigatory – Research)	3.58	1.20	Oftentimes
I let students investigate a given situation by being part, of that situation. (Investigatory - Field Study)	3.16	1.36	Sometimes
I let students discover the effects of a phenomenon under a controlled situation. (Investigatory - Experimental)	3.10	1.37	Sometimes
Overall M/ SD	3.28	1.34	Sometimes

*Scale	Range	Description	Interpretation
1	1.00 to <1.80	Never	Very Low
2	1.80 to <2.60	Seldom	Low
3	2.60 to <3.40	Sometimes	Moderate
4	3.40 to <4.20	Oftentimes	High
5	4.20 to 5.00	Always	Very High

The respondents Oftentimes (OM = 4.00, OSD = 0.86) utilize "Lecture Method in Online Modality". They Oftentimes (M = 4.000) "present and explain topics in class". They Oftentimes (OM = 3.66, OSD = 1.03) utilize "Discussion Method in Online Modality. They Oftentimes (M = 3.78) "ask questions to be answered by the students in class (Recitation)" but they Sometimes (M = 3.26) "allow students to form groups and freely exchange ideas about topics (Small Group discussion." They Sometimes (OM = 2.76, OSD = 1.20) utilize "Reporting Method in Online Modality". They Sometimes (M = 2.78) "assign students topics to deliver in class (Individual Reporting). They Oftentimes (OM = 3.74, OSD = 1.01)

utilize "Demonstration Method in Online Modality". They Oftentimes (M = 3.74) "show and explain to students the procedure of performing an activity for students to know how to do it (Demonstration)." They Sometimes (OM = 2.68, OSD = 1.08) utilize "Activity Method in Online Modality". They Oftentimes (M = 4.06) "require students in making projects (Activity- Project)" but they Seldom (M = 1.28) "bring students to a trip or place to gain knowledge (Activity- Fieldtrip)." They Oftentimes (OM = 3.40, OSD = 1.23) utilize "Integrated Method in Online Modality". They Oftentimes (M = 3.40) "let students view films, videos and discuss salient points (Integrated- Film showing- Discussion)." They Sometimes (OM = 3.28, OSD = 1.34) utilize Investigatory Method in Online Modality. They Oftentimes (M = 3.58) "require students to seek the truth about actual condition or situation (Investigatory- Research)" but they Sometimes (M = 3.10) "let students discover the effects of a phenomenon under a controlled situation (Investigatory- Experimental)."

Overall, they, in online modality, had variably utilized Lecture Method (OM= 4.00), Demonstration Method (OM = 3.74), Discussion Method (OM = 3.66), Integrated Method (OM = 3.4), Investigatory Method (OM = 3.28), Reporting Method (OM = 2.76), and Demonstration Method (OM = 2.68). In a study, it was found out that teaching strategies during online included pre-recorded videos and self-directed learning in which teachers assigned specific tasks for students to perform independently (DeCoito & Estaiteyeh, 2022).

4.4. The Methods of Assessment of Respondents in Online Modality

Table 4: Methods of Assessment Used in Online Modality

Item	M	SD	Description
Based on the Type of Test Items			
Subjective			
Essay test items	4.06	1.00	Oftentimes
Problem-solving test items	3.42	1.36	Sometimes
Overall M/ SD	3.74	1.18	Oftentimes
Objective			
Matching test items	3.70	1.23	Oftentimes
True or False test items	3.88	1.00	Oftentimes
Ordering test items	2.64	1.16	Sometimes
Enumeration items	2.58	1.36	Sometimes
Completion or Fill-in the blanks test items	3.72	1.21	Oftentimes
Performance test (experiments, reporting, debates)	3.16	1.36	Oftentimes
Multiple-choice test items	4.44	0.84	Always
Overall M/ SD	3.45	1.17	Oftentimes
Authentic			
Composing portfolios	2.40	1.29	Seldom
Overall M/ SD	2.40	1.29	Seldom
Based on Domains of Learning			
For Cognitive Domain			
Those that measure ability of students to remember or recall previously learned concepts (Knowledge)	3.90	1.07	Oftentimes

Those that measure ability of students to understand or get the meaning of learned concepts (Comprehension)	4.10	0.95	Oftentimes
Those that measure ability of students to apply or use concepts to concrete situation (Application)	4.24	0.87	Always
Those that measure ability of students to analyze or identify the component parts of a concept and determine their relationship with each other (Analysis)	4.18	0.74	Oftentimes
Those that measure ability of students to evaluate or judge the importance of a concept for a given purpose (Evaluation)	4.12	0.82	Oftentimes
Those that measure ability of students to combine ideas to form or create a new pattern or functional whole (Synthesis)	3.94	0.87	Oftentimes
Overall M/ SD	4.08	0.89	Oftentimes
For Affective domain			
Those that measure the willingness of students to conform to values or belief (Responding)	3.98	0.87	Oftentimes
Those that measure the willingness of students to practice values and belief (Characterization)	4.06	0.89	Oftentimes
Overall M/ SD	4.02	0.88	Oftentimes
For Psychomotor Domain			
Those that measure the skills of students in vision (sight), audition (hearing), tactile (touch), and kinesthetic (bodily coordination) (Perceptual abilities)	3.54	1.07	Oftentimes
Those that measure the skills of students in expressive movements through posture, gestures, facial expressions, and/or creative movements (Non-discursive communication)	3.32	1.10	Sometimes
Overall M/ SD	3.43	1.09	Oftentimes
Grand M/SD	3.52	1.08	Oftentimes

*Scale	Range	Description	Interpretation
1	1.00 to <1.80	Never	Very Low
2	1.80 to <2.60	Seldom	Low
3	2.60 to <3.40	Sometimes	Moderate
4	3.40 to <4.20	Oftentimes	High
5	4.20 to 5.00	Always	Very High

The respondents Oftentimes (OM = 3.74, OSD = 1.18) utilize "Subjective Test Items" and they Oftentimes (M = 4.06) utilize "Essay Item Test". They Oftentimes (OM = 3.44, OSD = 1.19) utilize "Objective Type of Test Items." They Always (4.44) utilize "Multiple-choice test items" and Oftentimes (M = 3.88) utilize "True or False Test Items. They Seldom (OM= 2.40, OSD=1.29) utilize "Authentic Type of Test Items" and they Seldom (M = 2.40) utilize "Composing Portfolios." They Oftentimes (OM = 4.08, OSD = 0.89) utilize "Cognitive Domain". They Always (M = 4.24) "employ methods that measure ability of students to apply or use concepts to concrete situation (Application) and Oftentimes (M = 4.12) "employ methods that measure ability of students to evaluate or judge the importance of a concept for a given purpose (Evaluation)." They Oftentimes (OM = 4.02, OSD = 0.88) utilize "Affective Domain". They Oftentimes (M = 3.98) "employ methods that measure the willingness of students to conform to values or belief system (Responding)" and

Oftentimes (M=4.06) "employ methods that measure the willingness of students to practice values of belief system (Characterization)." They Oftentimes (OM = 3.43, OSD = 1.09) utilize "Psychomotor Domain". They Oftentimes (M = 3.53) "employ methods that measure the skills of students in vision, audition, tactile, and kinesthetic (Perceptual Abilities)" but Sometimes (M = 3.32) "employ methods that measure the skills of students in expressive movements through posture, gesture, facial expressions, and/or creative movements (Non-Discursive Communication)".

Based on type of test items, they variably utilize Subjective Type Test Items (OM = 3.74), Objective Type Test Items (OM = 3.44), and Authentic Type Test Items (OM = 2.40). Based on the domains of learning, they variably utilize Cognitive Domain (OM = 4.08), Affective Domain (OM = 4.02), and Psychomotor Domain (OM = 3.43). A parallel study indicated that the problems in the application of online learning in the affective and psychomotor domains concern, among others, student learning interests (El Iq Bali and Musrifah, 2020).

4.5. Difference on Challenges

Table 5: Difference on the Challenges of Respondents when Grouped According to Sex

Group	n	Group Mean	Difference in Mean	p-value	Indication	Decision
Male	26	3.49	(+) 0.27	.083*	Difference is not significant	Sustain null hypothesis
Female	24	3.22	(-) 0.27			
Total	50					

*Significant at p-value ≤ 0.05, two-tailed

With respect to Challenges in Online Teaching, the group mean of male is 3.49 while the group mean of female is 3.22, with the difference in mean of 0.27. The computed p-value for the two intact groups (male and female) with respect to the criterion variable (challenges) is .083, which is greater than the set p-value of 0.05. This indicates that the difference is not significant, and that difference occurs merely by chance (Beers, 2023). This implies that the difference in the sex of the respondents does not cause difference on their Challenges in online teaching. The first null hypothesis therefore is sustained.

4.6. Difference on Teaching Methods

Table 6: Difference on the Teaching Methods
of the Respondents when Grouped According to Sex

Group	n	Group Mean	Difference in Mean	p-value	Indication	Decision
Male	26	3.25	(+) 0.26	.136*	Difference is not significant	Sustain null hypothesis
Female	24	2.99	(-) 0.26			
Total	50					

*Significant at p-value ≤ 0.05, two-tailed

With respect to Teaching Methods in Online Modality the group mean of Male is 3.25 while the group mean of Female is 2.99 with the difference mean of 0.26. The computed p-value for the two intact groups (male and female) with respect to the criterion variable (teaching methods) is .136 which is greater than the set p-value of 0.05. It indicates that the difference is not significant, and that difference occurs merely by chance (Beers, 2023). This implies that the difference in the sex of the respondents does not cause difference on their teaching methods in online modality. The second null hypothesis is sustained.

4.7. Difference on Methods of Assessment

Table 7: Difference on the Methods of Assessment
of the Respondents when Grouped According to Sex

Group	n	Group Mean	Difference in Mean	p-value	Indication	Decision
Male	26	3.66	(+) 0.20	.901*	Difference is not significant	Sustain null hypothesis
Female	24	2.68	(-) 0.20			
Total	50					

*Significant at p-value ≤ 0.05, two-tailed

With respect to Methods of Assessment in Online Modality, the group mean of Male is 3.66 while the group mean of Female is 3.68 with the difference mean of 0.02. The computed p-value for the two intact groups (male and female) with respect to the criterion variable (Methods of Assessment) is .901 which is greater than the set p-value of 0.05. It indicates that the difference is not significant, and that difference occurs merely by change (Beers, 2023). This implies that the difference in the sex of the respondents does not cause difference on their methods of assessment in online modality. The third null hypothesis, therefore, is sustained.

4.8. Relationship between Challenges and Teaching Methods

Table 8: Relationship between Challenges and Teaching Methods in Online Modality

Variables	r-value	Indication	p-value	Indication	Decision
Challenges	0.240	Weak direct relationship	0.093*	Relationship Is not significant	Sustain Null Hypothesis
Teaching Methods					

*Correlation r-index	
r-value	**Indication**
0	No relationship
>±0.0 to <±0.20	Very weak direct / Inverse relationship
±0.20 to <±0.40	Weak direct / Inverse relationship
±0.40 to <±0.60	Moderately strong direct / Inverse relationship
±0.60 to <±0.80	Strong direct / Inverse relationship
±0.80 to <±1.00	Very strong direct / Inverse relationship
±1.00	Complete direct / Inverse relationship

**Significant at p-value ≤ 0.01, 2– tailed.

The computed r-value for the variable challenges in relation to the variable teaching methods is 0.240. This figure indicates that there exists a weak direct (positive) correlation between the two variables. However, the computed p-value with respect to the relationship between the said variables is 0.093 which is greater than the set p-value of 0.05. This figure indicates that the correlation between the two variables is not significant and merely occurs by chance (Turney, 2022). The fourth null hypothesis, therefore, is sustained.

4.9. Relationship between Challenges and Methods of Assessment

Table 9: Relationship between Challenges and Methods of Assessment in Online Modality

Variables	r-value	Indication	p-value	Indication	Decision
Challenges	0.054	Very Weak	0.709*	Relationship	Sustain
Methods of Assessment		Direct relationship		Is not significant	Null hypothesis
*Correlation r-index					
r-value	**Indication**				
0	No relationship				
>±0.0 to <±0.20	Very weak direct / Inverse relationship				
±0.20 to <±0.40	Weak direct / Inverse relationship				
±0.40 to <±0.60	Moderately strong direct / Inverse relationship				
±0.60 to <±0.80	Strong direct / Inverse relationship				
±0.80 to <±1.00	Very strong direct / Inverse relationship				
±1.00	Complete direct / Inverse relationship				

**Significant at p-value ≤ 0.01, 2– tailed.

The computed r-value for the variable challenges in relation to the variable methods of assessment is 0.054. This figure indicates that there exists a weak positive correlation between the two variables. However, the computed p-value with respect to the relationship between the said variables is 0.709 which is greater than the set p-value of 0.05. This figure indicates that the correlation between the two variables is not significant and merely occurs by change (Turney, 2022). The fifth null hypothesis, therefore, is sustained.

4.10. Relationship between Teaching Methods and Methods of Assessment

Table 10: Relationship between Teaching Methods
and Methods of Assessment in Online Modality

Variables	r-value	Indication	p-value	Indication	Decision
Teaching Methods	0.434	Moderately strong	0.002*	Relationship	Reject
Methods of Assessment		Direct relationship		Is significant	Null hypothesis

*Correlation r-index	
r-value	Indication
0	No relationship
>±0.0 to <±0.20	Very weak direct / Inverse relationship
±0.20 to <±0.40	Weak direct / Inverse relationship
±0.40 to <±0.60	Moderately strong direct / Inverse relationship
±0.60 to <±0.80	Strong direct / Inverse relationship
±0.80 to <±1.00	Very strong direct / Inverse relationship
±1.00	Complete direct / Inverse relationship

**Significant at p-value ≤ 0.01, 2– tailed.

The computed r-value for the variable teaching methods in relation to the variable methods of assessment is 0.434. This figure indicates that there exists a moderately strong direct correlation between the two variables. Moreover, the computed p-value with respect to the relationship between said variables is 0.002 which is less than the set p-value of 0.05. This figure indicates that the correlation between the two variables is significant and occurs not merely by chance but true across the population of interest (Turney, 2022). The sixth null hypothesis, therefore, is rejected.

5. Conclusion

The college teachers had varied and great challenges on instructions, assessments, finances (economic), and learning materials; had moderate challenges on health; and had slight challenges on technology during online modality. They had high utilization of lecture, demonstration, discussion, and integrated teaching methods; moderate utilization of investigatory, reporting and demonstration teaching methods during online modality. They had high utilization of subjective type of tests, but moderate utilization of authentic type of tests. They had high utilization of assessments that address the cognitive and affective domains of learning, but moderate utilization of assessments that address the psychomotor domain.

The difference on the sex of the respondents was not the cause of the difference on their challenges, teaching methods, and methods of assessment. It implies that there are factors other than their sex that cause such differences. There is a weak direct relationship between the challenges and teaching methods, but such relationship occurs merely by chance; there is a very weak direct relationship between challenges and methods of assessment, but such relationship occurs merely by chance; there is a moderately strong direct relationship between teaching methods and methods of assessment, and that relationship occurs across the population of interest (faculty).

The finding of this study substantiates the Technological Pedagogical Content Knowledge Theory (TPACK) and Substitution, Augmentation, Modification, and Redefinition (SAMR) Theory. The respondents orchestrated and coordinate technology, pedagogy, and content into teaching. They employed variety of teaching methods and methods of assessments in online modality. By utilizing Schoology as Learning

Management System, the respondents practically incorporated technology in their teaching methods like lecture, demonstration, discussion, integrated, investigatory, reporting and demonstration methods, as well as in their methods of assessment like subjective, objective, and authentic types of test items, and cognitive, effective, and psychomotor domains of learning. Some respondents also "redefine" the concept of "field-trip" by carrying out this teaching method in the virtual classroom. Such was previously impossible in the in-person modality.

5.1. Recommendation

Policy Recommendation. The school shall implement program to help college teachers cope with their challenges in online teaching specifically in relation to classroom instruction-related challenges.

Problem-Discovered Recommendation. The school together with the Local Government Unit, parents and students shall enter into an agreement for the installation of internet connections especially in remote areas. Teachers should practice the use of virtual field trip in online teaching.

Future Research Recommendation. Utilization of Computer Devices by College Teachers in NDMC: Its Impact to Delivery of Instructions Through Online Modality. Relationship Among Area of Specialization, Challenges and Teaching Methods of College Teachers of NDMC in Online Teaching.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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