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Faculty's perceived readiness, technical competencies, and challenges in online teaching-learning environment

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Abstract

The purpose of this study was to explore the perceptions of faculty for the implementation of the online teaching-learning environment and to determine their readiness, technical competence, and challenges in the new normal teaching-learning method. Survey questionnaires were used to examine the familiarity with the technology used in various social media, video conferencing, and learning management systems of 188 university teachers and the use of descriptive data to explore its findings. The respondents were asked to understand online teaching-learning to course design, course communication, time management, and technical competence. Designing the course learning module and activities should be one of the faculty's important readiness and competencies in delivering an online teaching-learning environment. Managing and creating their course in a limited time before offering the course online are challenges for the faculty. Based on the result of the study, it revealed that there were significant differences between readiness, competencies, and challenges with respondents' different demographic variables. It can be concluded that technical skills are necessary for implementing online teaching-learning. Integrating the new normal of teaching-learning online is not an easy task for the faculty and requires various skills in preparing the course materials for online classes. The study contributes to understanding faculty readiness and competencies for using the new normal of teaching and learning. Hence, the findings of this study have implications for the schools to consider teachers' competency when encouraging them to implement online teaching-learning education.

Keywords: online teaching-learning, ICT integration, teacher's familiarity in technology, teacher's preparedness, teacher's competence

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1. Introduction

The COVID-19 epidemic disrupted college and university students' academic year in shuttered about a month earlier. Many of the schools have moved to electronic instruction. Within this "new normal," technology plays a considerable role in supporting teaching and learning. The teacher will need to find new ways in this new environment where social distancing will be the norm—integrating online learning as a model for education (Dziuban et al.,2018). With the advancement of information and communication technology (ICT), a clear education method emerged. With these advancements, the online learning model is becoming more prominent. Where the learning-teaching process is involved, technology has become a necessity (Scott, 2015).

Online learning poses a challenge to the learners' end as perceived as the end of social presence. Another, as traditional mortar and brick classroom transitions to virtual, the teachers also role changes. This change even becomes more concerning when they are not prepared for it (Redmond, 2011). Moving from a pure face-to-face (f2f) interaction to an online environment has been identified as a considerable challenge (Yang & Cornelious, 2005). In an online learning platform, the teachers must consider the two primary delivery approaches to the learners and their effects, either asynchronous or synchronous (Chauhan, 2017). Online learning is the notion of learning using online resources; an online course essentially means a barrier between yourself and your instructors (Appana, 2008). Designing, developing, consolidating, and organizing the sequence of topics for courses facilitates and delivers the new learning model of instruction for students separated by place and time (Gurley, 2018). The growing reliance on technology to provide and teach education has led to today's definitions of distance (Lee et al., 2012). Students may interact with peer groups or teachers in real-time and participate in lectures remotely (Eryilmaz, 2015). The focus on online technology has given rise to "online learning" alongside the declining sense of space (Redmond, 2011). When contemplating technical advances, it is shown that learning improves the standard of education, and therefore, in the future, it should be a more favored approach to learning (Eryilmaz, 2015).

Higher education institutions (HEIs) have become the learning environments for the ICT availability of teaching and learning. They are designed to supplement classroom teaching and learning based on teacher and learner preferences, regardless of time or place (Singh & Kaurt, 2016). Adopting online learning, particularly for higher education institutions (HEIs), has many advantages and benefits, and online teaching-learning is considered one of the best alternative education methods. The use of information and communication technology systems for integrated digital teaching is very significant. Different digital platforms for teaching and learning allow students to study anytime and anywhere and strengthen the relationship to maintain education, given the difficulties and challenges of e-learning (Arkorful & Abaidoo, 2015). Teachers have a significant role in developing the knowledge and skills of the students for this 21st-century education (Schibeci et al., 2008). Nowadays, the use of ICT of teachers serves as an important skill in integrating online teaching and learning (Fraillon et al., 2014).

This study aims to establish whether faculty members are significantly different if grouped based on their demographic data and perceived readiness, technical competence, and challenges in online learning. In addition, to evaluate their abilities to use the different technical resources used in the new teaching-learning environment. This study sought the following questions:

- How may the respondents be described as to Gender, Age, Years of Teaching, and School/College?
- How may the faculty's assessment in implementing online teaching be described in factors of course

design, course communication, time management, and course competence? and

- Are there differences in teachers' readiness and competencies in course design, communication, time management, and technical competence based on gender, age, employment status, years in teaching, and respective schools/colleges to teachers' readiness and competencies towards online learning?

There are two null hypotheses for the study:

- There is no significant difference between the teacher's genders in readiness and competencies to teach blended learning environment and
- There is no significant difference between the age, employment status, years of teaching, and respective schools/colleges in the readiness and technical competencies of implementing an online learning environment.

2. Related Literature

Readiness in Online Learning Environment. The faculty readiness is a big factor to teach online is a state of faculty preparedness for teaching online. Readiness of faculty refers their willingness to prepare, effectively design and facilitate courses within an online environment, given the teachers' interest, knowledge, and experience about the delivery of online coursework (Hoppe, 2015). Teachers' readiness assessment should be conducted at the school firstly to identify the level of readiness of the teachers in particular and the school in general and then design appropriate training courses for the lecturers (Phan & Dang, 2017). Many believe that a successful online learning implementation depends entirely on the teachers' capacity concerning their online learning readiness, expertise, skills, knowledge technology, and different platforms where they play an essential role in delivering and ensuring the achievable online learning of students. (Andarwulan et al., 2021).

Technical Competencies. Teachers were expected to use the online learning platform immediately because of the sudden transition from face-to-face to online education (Zhang et al., 2020). It is becoming the most important demand for teachers at every level of education. Factors that need to assess the faculty's competencies determine their knowledge of various social media, video conferencing, learning management systems, and online repository tools. However, teachers reported that they lacked the knowledge and skills to convert hardcopy lesson materials into online lesson content and share them on online learning platforms because they have limited experience in online teaching (Zhang et al., 2020). Lack of preparation has a negative impact, which is magnified in online learning contexts. Teaching online and technology-enhanced courses necessitates changing pedagogical techniques to make them more compatible with technology integration. (Bailey & Card, 2009). Teachers may experience the feeling of discomfort when dealing with technology-enhanced classrooms (Palloff & Pratt, 2011). Teachers should possess adequate technological literacy skills to access various technical resources and tools, productivity tools, procedures on creating e-content, and be aware of the latest updates and renovations in educational technology (Albrahim, 2020). Effective online teachers must get ongoing training and assistance and be knowledgeable with and comfortable with the most recent technological advancements and related applications (Fish & Wickersham, 2010).

Challenges in Online Learning. Teachers unfamiliar with online learning platforms to effectively utilize them in delivering online lessons seem to be a big problem that they will likely experience. The challenge of shifting from traditional face-to-face learning to online learning is changing the curriculum. Wallace stated that these include deciding and structuring the online materials, allocating enough time for creating the online learning modules and activities, identifying the readings and other related course work, and ensuring that changes are relevant to the assigned course content (2000). Oliver stated that online teaching needs to be supported with the complete infrastructure to access online courses (2001). With an inadequate infrastructure, there is a possibility of adverse effects on the integration of online teaching and learning (Ahmad et al., 2019). The lack of teachers' training in digital literacy, lack of training in ICT online classrooms, and the lack of training

concerning the use of technology for online teaching hindered the new teaching-learning environment (Bingimlas, 2005). The pedagogical implications, the impact on the structure and content of the curriculum, classroom organization and practice, and the transformed role of the teacher are without a doubt the significant challenges that will be encountered in the integration of ICT in the classroom (Raob et al., 2012).

Examining the individual demographic data differences or characteristics is also a substantial research area in e-learning stated by Agarwal and Prasad (1999). Researchers address demographic differences regarding the use and implementation of e-learning environments, including gender, age, and ICT experiences, among the differences based on individual characteristics (Abouchedid et al., 2004). Studies show that males have more positive perceptions of online learning than females (Ong & Lai, 2006, Li & Kirkup, 2007). There have been consistent reports in the ratio of males and females using technology that males are more positive towards technology and most likely to adopt new technology on a voluntary basis (Volman & van Eck, 2001). Studies also revealed that teacher's age matters in their use of ICT (O'Bannon & Thomas, 2014). A survey by McFarland (2001) found that age has a direct effect on computer efficacy. Other studies also found that older people have low self-efficacy in using technology (Czaja et al., 2006).

3. Research Method

To reiterate, the research study was designed to address the research questions: How may the faculty's assessment implement online teaching and if there are differences in their readiness and technical competencies when grouped based on their demographic profiles. A cross-sectional quantitative method of research and convenience sampling was used for the study. The target participants were the 362 college teachers and graduate professors for 1st semester AY 2020-2021 of a private institution of higher learning in Angeles City. A power analysis was performed to determine the sample size needed for the quantitative data to be significant with a 95% confidence level and 5% confidence interval (Macorr Research Solution Online, 2020). A total of 188 out of 362 target participants responded to the survey questionnaire. The study adopted the Faculty Readiness Teaching Online (FRTO) survey instrument to assess teachers' readiness, technical competence, and challenges developed by Martin et al. (2019). The first section of the instrument gathered the demographic data and their familiarity with the technology. The second section of the survey showed their understanding of online learning through the four-sub part: course design, course communication, time management, and technical competencies. The adopted survey instrument was generated using the Google Form, and the response was extracted and consolidated in CSV format for analysis. The response rate gathered is .519 or 52% from the respondents. The obtained data used a quantitative method to evaluate the respondents' demographic profile percentage and frequency. The study also compared respondent demographic profiles to assess the significant difference in the new learning environment for their readiness, technological competence, and challenges.

Mean and verbal interpretations were used for the respondents' familiarity with web and internet technology, and the four factors of readiness and competencies. Chi-square was used to determine the significant difference in respondents' gender regarding their readiness and competencies. Analysis of Variance (ANOVA) was used to examine the significant differences in respondent's age, employment status, years of teaching, and school/college readiness and competencies in a new learning environment. Fishers Least Significant Difference (LSD) was used to examine the post hoc analysis of the significant difference for the group comparison. The researchers seek the authors' approval for the FRTO instrument, the university president's approval thru the Director of Human Resource and Management Office (HRMO). The participating respondents were informed of the research objective, including the importance of their participation in the study using informed consent. The researchers also secured the University's Institutional Review Board (IRB) for approval to ensure that appropriate steps were taken and reviewed of the informed consent to protect participants' rights and welfare as subjects in the research study.

4. Results and Discussion

Table 1 shows the respondents' demographic profile and familiarity with the different technologies used for social media, learning management systems, and video conferencing. Table 2 shows that respondents' familiarity with web and internet technologies. Table 3 summarizes the respondent's readiness and competencies on the four factors course design, course communication, time management, and technical competencies, where respondents respond that they can do it all the time.

Table 1

Demographic profile of the respondents

Indicator	Frequency	Percentage (%)
Gender		
Male	99	52.7
Female	89	47.3
Age		
20-25 years old	14	7.4
26-30 years old	26	13.8
31-35 years old	33	17.6
36-40 years old	26	13.8
41-45 years old	38	20.2
46-50 years old	24	12.9
51-55 years old	17	9.0
Above 55 years old	10	5.3
Employment Status		
Tenured	60	31.9
Probationary	34	18.1
Fixed Termer	75	39.9
Guest Lecturer	19	10.1
School/College		
School of Arts and Science (SAS)	27	14.4
School of Business and Accountancy (SBA)	36	19.1
School of Education (SED)	16	8.5
School of Nursing and Allied Medical Sciences (SNAMS)	3	1.6
School of Engineering and Architecture (SEA)	49	26.1
School of Hospitality and Management (SHTM)	6	3.2
School of Computing (SOC)	16	8.5
College of Criminal Justice Education and Forensics (CCJEF)	3	1.6
Institute for Christian Formation and Social Integration (ICFSI)	32	17.0
Number of Years in Teaching		
5 years and below	93	49.5
6-10 years	40	21.3
11-15 years	15	8.0
16-20 years	19	10.1
20 years and above	21	11.2

Table 2

Respondents' familiarity in web and internet technologies.

Indicator	Mean	Verbal Interpretation
Social Media	2.82	Familiar
Learning Management System	2.50	Slightly Familiar
Video Conferencing	2.38	Slightly Familiar

Table 3

Respondent's readiness and competence in terms of:

Indicator	Weighted Mean	Verbal Interpretation
Course Design	4.22	I can do it most of the time
Course Communication	4.22	I can do it most of the time
Time Management	4.23	I can do it most of the time
Technical Competence	4.01	I can do it most of the time
Overall Weighted Mean	4.17	I can do it most of the time

4.1 Significant difference in the readiness and competencies of respondents

A chi-square was performed to test the null hypothesis for the respondent's gender. Table 4 shows the significant difference in readiness and competence, that whether the respondents are male or female, their readiness and competencies are the same.

Table 4

Chi-Square Test: Significant difference in the readiness and competence of teachers in terms of gender

Profile Variables	Person Chi-Square	p-value	Decision	Remarks
Course Design	3.423	0.490	Failed to Reject Ho	Not Significant
Course Communication	3.884	0.274	Failed to Reject Ho	Not Significant
Time Management	1.975	0.740	Failed to Reject Ho	Not Significant
Technical Competence	2.263	0.687	Failed to Reject Ho	Not Significant

Note: If the p-value is less than or equal to the level of significance (0.05), reject Ho, otherwise failed to reject Ho.

One-way Analysis of Variance (ANOVA) was performed to test the demographic data of each group. Finding in Table 5 is the results when respondents are grouped by age that indicate a significant difference in "Technical Competence." Faculty whose age 51 and above considers significant challenges faced by the teachers in the university. Table 6 shows a significant difference in their readiness and competencies in factor "Course Design" when grouped according to their employment status. Table 7 shows that when respondents are grouped based on their respective school or colleges, a significant difference for factors "Time Management" and "Technical Competencies" is still considered a challenge for the faculty. When respondents are grouped based on their total number of years in teaching, there is no significant difference in their readiness and competencies, as shown in Table 8.

Table 5

ANOVA Test: Significant difference in the readiness and competence of teachers in terms of age

Age	Weighted Mean			
	Course Design	Course Communication	Time Management	Technical Competence
20-25 years old	4.44	4.65	4.55	4.48
26-30 years old	4.31	4.33	4.20	4.21
31-35 years old	4.31	4.41	4.34	4.26
36-40 years old	3.98	4.10	3.93	3.73
41-45 years old	4.33	4.43	4.34	4.02
46-50 years old	4.23	4.49	4.25	3.82
51-55 years old	3.84	4.19	4.04	3.64
>55 years old	4.27	4.34	4.20	3.69
f-value	1.836	1.758	1.422	3.439
p-value	0.083	0.098	0.199	0.002
Remarks	Not Significant	Not Significant	Not Significant	Significant

Note: If the p-value is less than or equal to the level of significance (0.05), reject Ho, otherwise failed to reject Ho.

Table 6

ANOVA Test: Significant difference in the readiness and competence of teachers in terms of employment status

Factors	Employment Status	Mean	f-value	p-value	Remarks
Course Design	Tenured	4.37	3.083	0.029	Significant
	Probationary	4.37			
	Fixed Termer	4.09			
	Guest Lecturer	4.04			
Course Communication	Tenured	4.45	1.649	0.180	Not Significant
	Probationary	4.48			
	Fixed Termer	4.26			
	Guest Lecturer	4.31			
Time Management	Tenured	4.34	1.644	0.181	Not Significant
	Probationary	4.37			
	Fixed Termer	4.11			
	Guest Lecturer	4.13			
	Tenured	4.05			

Technical Competence	Probationary	4.17	1.253	0.292	Not Significant
	Fixed Termer	3.95			
	Guest Lecturer	3.79			

Table 7

ANOVA Test: Significant difference in the readiness and competence of teachers in terms of school / college

School/College	Weighted Mean			
	Course Design	Course Communication	Time Management	Technical Competencies
SAS	4.40	4.60	4.40	4.00
SBA	4.05	4.20	4.01	3.73
SED	3.91	4.01	3.98	3.55
SNAMS	3.89	4.15	4.22	3.38
SEA	4.33	4.35	4.29	4.19
SHTM	4.31	4.48	4.47	4.29
SOC	4.46	4.47	4.35	4.44
CCJEF	4.52	4.63	4.67	4.48
ICFSI	4.14	4.48	4.23	4.02
Graduate Studies	4.22	4.37	4.23	4.01
f-value	1.650	2.056	1.145	3.057
p-value	0.114	0.042	0.335	0.003
Remarks	Not Significant	Significant	Not Significant	Significant

Note: If the p-value is less than or equal to the level of significance (0.05), reject Ho, otherwise failed to reject Ho.

Table 8

ANOVA Test: Significant difference in the readiness and competence of teachers in total number years teaching

Total Number of Years in Teaching	Weighted Mean			
	Course Design	Course Communication	Time Management	Technical Competencies
5 years and below	4.27	4.36	4.27	4.08
6-10 years	4.18	4.36	4.20	4.09
11-15 years	4.14	4.34	4.17	3.96
16-20 years	4.31	4.41	4.17	4.01
20 years and above	4.08	4.38	4.22	3.55
f-value	0.497	0.037	0.15	2.338
p-value	0.738	0.997	0.963	0.057
Decision	Failed to Reject Ho	Failed to Reject Ho	Failed to Reject Ho	Failed to Reject Ho
Remarks	Not Significant	Not Significant	Not Significant	Not Significant

Note: If the p-value is less than or equal to the level of significance (0.05), reject Ho, otherwise failed to reject Ho.

A post-hoc analysis was performed from Table 9 -Table 11 to show demographic data of each group's significant differences. Table 9 shows that when group based on employment status, there is a significant difference from their multiple group comparisons in Course Design. Table 10 shows that the school/college groups are significantly different in their multiple group comparisons in Course Communication. Results show that there is a significant difference between groups. Table 11 shows that the school/college groups are significantly different in their multiple group comparisons in terms of Technical Competence.

Table 9

Post-hoc analysis: Significant difference on employment status group in terms of course design

Groups	Mean Difference	p-value	Remarks
Tenured - Fixed Termer	0.282	0.015	Significant
Probationary - Fixed Termer	0.286	0.038	Significant

Table 10

Post-hoc analysis: Significant difference on school/college group in terms of course communication

Groups	Mean Difference	p-value	Remarks
ICSFI – SBA	0.276	0.049	Significant
ICFSI – SED	0.462	0.009	Significant
SAS- SED	0.583	0.001	Significant
SoC – SED	-0.452	0.027	Significant
SED-SEA	-0.340	0.041	Significant

Table 11

Post-hoc analysis: Significant difference on employment status group in terms of technical competence

Groups	Mean Difference	p-value	Remarks
CCJEF-SED	0.924	0.044	Significant
ICFSI – SED	0.466	0.037	Significant
SBA – SoC	-0.703	0.001	Significant
SBA – SEA	-0.453	0.005	Significant
SoC- SED	0.884	0.001	Significant
SoC – SNAMS	1.057	0.022	Significant
SED- SEA	-0.634	0.003	Significant
SED – SHTM	-0.731	0.036	Significant

The demographic profile of faculty plays an essential role in implementing online teaching to determine the faculty's readiness, competencies, and challenges. Various research is dedicated to investigating the significant differences and effects between individual data and implementation of online teaching-learning (Agarwal & Prasad, 1999). The differences between the course design, course communication, time management, and technical competencies in online teaching are based on demographic variables. The demographics of faculty that have been selected for the study are gender, age, employment status, school/colleges, and years of teaching experience. The study's findings showed that there is no significant difference between male and female readiness and competencies that affect the implementation of online teaching. And findings did not agree with the study, that males have more positive perceptions of online learning than females (Ong & Lai, 2006, Volman & van Eck, 2001).

In terms of variable age, the result showed significant differences for faculty's age groups regarding the technical competencies. The result implies an effect on technical competencies, which include the readiness of faculty toward the implementation of online teaching. The research to Czaja (2007), the older age groups have more challenges regarding the technological issues, agreed with the findings in this study. When it comes to variable employment status, the result revealed a significant difference with different employment status when it comes to their readiness in course design factor. It may imply that part-timers and guest lecturers were not given enough training to prepare for online teaching. With regards to grouping the respondents based on their respective schools/colleges. The results showed a significant difference when it comes to technical competencies. Lastly, when it comes to a number of teaching experiences, the results revealed no significant differences in faculty's readiness and technical competencies. The findings showed that it does not affect the implementation of online teaching with their experience in a number of years teaching.

Regarding the totality of faculty readiness and competencies, the faculty recorded significant differences on three factors: course design, course communication, and technical competencies of implementing the online teaching-learning. In other words, the study's findings revealed that faculty, when grouped, hold the same relation in their readiness and competencies of implementing online teaching. With the challenges faced by the faculty, the findings showed a challenge for the implementation of online teaching. Based on the result of the study, it revealed that there were significant differences between readiness, competencies, and challenges with respondents' different demographic variables. It can be concluded that technical skills are necessary for implementing online teaching-learning. Integrating the new normal of teaching-learning online is not an easy task for the faculty and requires various skills in preparing the course materials for online classes.

5. Conclusion and recommendation

The study investigated the impacts of demographic data on the implementation of online teaching-learning. The use of online has completely transformed the traditional way of teaching and learning in education. The online teaching-learning environment impacts the teachers because they must put additional efforts into their teaching aside from incorporating their course materials in the online platform and how to manage their class online. This result was also verified by Albrahim (2020) that teachers should possess adequate technical literacy skills to access various technical resources and tools, productivity tools, procedures on creating e-content, and be

aware of the latest updates and renovations in educational technology.

The study contributes to the field of education by examining the implications that affect the readiness and competencies of faculty in the integration of online teaching and learning. Andarwulan et al. (2021) stated that a successful online learning implementation depends entirely on the teachers' capacity concerning their online learning readiness, expertise, skills, knowledge technology, and different platforms. They play an essential role in delivering and ensuring the achievable online learning of students. It is suggested that the administrators provide faculty training, seminars, hands-on training, and simulations using other technology/tools and online collaborative tools to design and deliver the courses online. And to provide enough time for the faculty to develop the module content for the course so it can integrate other tools that will make their modules more interactive with the students (e.g., one semester before implementing the online courses). Finally, the study contributes to understanding faculty readiness and competencies for using the new normal of teaching and learning. Hence, the results of this study have implications for the schools to consider teachers' competency when encouraging them to implement online teaching-learning education.

Future researchers could examine the readiness, technical competencies, and challenges with additional indicators and categories not included in this study. Future research could also investigate the readiness, technical competencies, and challenges of students.

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