



Faculty competence in online teaching: Basis for a training design towards distance education

Ruth Ladip Ladwingon^{1*}, ^D Zorayda Calaycay Gavino², ^D Angeline Badong Valdez³, ^D Rodemelia Bustamante Bangat⁴, ^D Eunice Wacdagan Baggas⁵

1.2.3.4.5 College of Engineering and Information Technology, Kalinga State University, Philippines.

Corresponding author: Ruth Ladip Ladwingon (Email: <u>ruthladip22@gmail.com</u>)

Abstract

This study assessed faculty members' online teaching competencies across technical, administrative, and pedagogical domains, prompted by the COVID-19 pandemic's shift to flexible learning. A survey questionnaire measured competence levels, with ANOVA and Chi-square tests analyzing differences among faculty grouped by age and teaching experience. Results revealed generally high competence across all three areas, yet pinpointed specific indicators needing further training and development. Significantly, senior faculty demonstrated lower competencies than younger colleagues. This underscores the need for targeted professional development programs to enhance online teaching skills, specifically addressing the needs of faculty based on age and experience. Such programs are crucial to ensuring all faculty are equipped for effective online instruction, thereby maximizing the success of flexible learning initiatives. The identified areas for improvement will inform the design of these targeted interventions, leading to more effective and equitable online learning experiences for all students.

Keywords: Distance education, Online learning, Pedagogy, Teaching competence, Technology integration, Higher education.

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Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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1. Introduction

The global lockdown due to this pandemic greatly affected the education sector. The COVID-19 pandemic has created the largest disruption of education systems in human history, affecting nearly 1.6 billion learners in more than 200 countries [1]. Many schools in elementary and high schools and universities worldwide are locked down, causing a major interruption in students' learning [2]. It has generated changes in the teaching-learning process, particularly in the interaction between the teachers and the students [3]. Since schools switched to online teaching and remote learning, students' social lives and learning conditions, parents' productivity, and teachers' teaching strategies have also been affected [4].

Recently, regardless of how well-prepared they were, schools worldwide were forced to move to online instruction, which threw them off balance. Schools have recognized that they are unlikely to return to normal anytime soon due to the COVID-19 problem and that online teaching has evolved from an ancillary learning approach for teachers and learners to a primary modality. The need to quickly transition to online teaching with little to no preparation, implement and maintain online teaching under challenging pandemic conditions, and follow extended online teaching with little to no knowledge regarding the anticipated duration of the course have all forced teachers worldwide to move their courses online [5].

Although online education is not new, it recently gained attention after the COVID-19 outbreak forced school campuses worldwide to close. The abrupt need for change showed new logistical and psychological difficulties with online instruction. The capacity to gauge how prepared teachers are for online instruction is a significant barrier that must be overcome to provide those who require it with the right feedback and training. As many HEIs offer their courses online, college professors face new challenges: pedagogical shift, a different type of relationship with students, and a need to redefine their role [6].

The rapid evolution of technology necessitates new approaches to the creation, organization, delivery, and evaluation of online courses and learning materials [7, 8]. While some argue that existing face-to-face teaching experience translates directly to online instruction, citing similarities in required competencies [9, 10] other scholars highlight crucial differences between online and in-person teaching roles and modalities [10, 11]. Effective online instruction demands expertise in managing virtual learning environments, optimizing instructional time and space, and fostering student interaction [12]. Competency, defined as the knowledge, skills, and abilities needed to perform occupational functions to required standards [13] has been a focus of online teaching research Guasch, et al. [14]. Building on Berge [15] foundational work identifying pedagogical, social, managerial, and technical competencies [14] subsequent research has expanded these frameworks. Williams [16] proposes four broad competency categories for higher education: learning and instruction, communication and interaction, management and administration, and technology. Guasch, et al. [14] further refine this, identifying key tasks for online professors: designing/planning, social interaction, instruction, technology, and management. These varied perspectives underscore the multifaceted nature of online teaching competency and the ongoing need for research to define and assess these crucial skills.

Technical expertise is independent of the technology and is particular to its use in education [17]. They consist of technical expertise in using current technology, the capacity to troubleshoot technology issues, and the capacity to support learners. Examples of technical expertise include how to use software, synchronous and asynchronous tools, operating systems, learning systems and tools, Web browsers, and how to successfully implement security updates [17, 18].

Faculty frequently need to be more relaxed with technical issues and the length of time needed to enter text for communication or instruction [19]. To ensure that students, especially those utilizing adaptive or assistive technologies, receive aid when needed, faculty members must learn how to acquire technological assistance [17]. Since online gradebooks are becoming the standard, faculty are increasingly expected to manage courses with Web-based enrolment [20].

This coincides with the findings of Ladwingon, et al. [21] in their study on the teaching experiences of the senior faculty of Kalinga State University. The identified themes lead to trouble with internet connectivity, limited knowledge in the use of different technologies, and managing their online classroom. They also mentioned their shame of asking for technological assistance from more knowledgeable colleagues, thinking these faculty members also have online classes to facilitate.

When teaching online, facilitating dialogues is crucial [22]. A range of tools are available to educators through discussion forums, emails, and chats to encourage learner-instructor, learner-content, and learner-learner engagement [23]. To promote involvement, faculty must be able to moderate, take part in, and advance discussions [18]. Faculty members should use a range of active, interesting, and successful communication techniques, foster internal dialogue, and develop appropriate replies [17].

The KSU senior faculty aired concerns about their dissatisfaction with the inconsistent communication between them and their students due to their inability to facilitate a smooth flow of discussion using different technology tools like chat rooms and classroom streams [21].

The complaints, difficulties and sentiments shared by the senior faculty included in the mentioned study prove the struggle they go through to deliver the lessons assigned to them. Claiming they perform way better during traditional conduct of classes, the senior faculty shared the observed decline in their teaching performance.

The success of any learning strategy hinges on instructors' ability to effectively transition from traditional face-to-face teaching to the more complex demands of online instruction [4]. While the literature on online teaching and learning is growing, many aspects remain under-researched Williams [16] and Bocchi, et al. [24] particularly regarding faculty perceptions and preparedness for online teaching [Singh & Paliwal, Academic Exchange Quarterly]. Despite resource limitations, instructors' adaptability and pedagogical innovation are crucial for successful online education. This study aims to develop a checklist for improving the online teaching environment by analyzing teaching competencies and technology training needs across diverse faculty groups, including senior faculty with prior online teaching experience and faculty varying in age and years of service. The resulting data will inform targeted professional development initiatives.

More specifically, this paper looked into the competencies possessed by the Kalinga State University faculty in online teaching, which will be significant in checking their quality of learning. The study further analyzed the connection of competence to the participants' ages and years in service as teachers. This aimed to assess faculty competence in online teaching, aligning with the university's aim to offer distance education and projecting training needs. It sought to determine the description of faculty competence in online teaching, considering variables such as age and years in service, and investigate if there were significant differences or relationships between faculty competence and these variables.

This may contribute further to the discipline of online education as it will document the readiness of faculty members for the new normal scenario by using a self-assessment tool to judge their preparedness to teach online. The results may add

to the present body of knowledge but also be applicable to training programs in the future, which could cater to the needs of faculty members. The results of these studies may be a reminder of what has to be considered for faculty in preparing to teach effectively online and will inform the development of future training initiatives and provide a foundation on which school preparation rests as it embarks upon offering distance education programs.

Specifically, the training unit is given a picture of the training needs along with instructions on the use of technology, considering that the university remains in a flexible learning mode. Moreover, the Internationalization Unit will have a basis for the preparation procedures to consider when the school's goal of offering distance education comes into place.

2. Literature Review

The COVID-19 pandemic has brought challenges to the Philippine education system. From the normal face-to-face interaction inside the classroom, the school has extended its services to different communities and homes through different distance education approaches.

Higher education institutions have opted for online learning, while basic education produced modules to cater to elementary and high school children.

A planned teaching/learning experience that uses a variety of technologies to reach learners at a distance and is intended to promote student involvement and certification of learning is defined as distant education [25]. The terms "distance learning" and "other teaching approaches" have been used interchangeably, but according to Teaster and Blieszner [26] their main distinction is that "the teacher and the learner are separated in location and possibly time."

Online learning refers to the creation of educational resources, the delivery of instruction, and program management using the Internet and other key technologies [27]. Online learning is the use of computers, other digital technologies, and the Internet for educational purposes Means, et al. [28]. Hrastinski [29] stated that asynchronous and synchronous online learning are the two types of online learning most frequently compared, but for online learning to be effective and efficient, institutions, companies, and teachers must be thoroughly aware of its advantages and drawbacks.

With the COVID-19 epidemic, it is more obvious that the educational system is vulnerable to outside threats [2]. The digital transformation of instructional delivery came with a number of logistical difficulties and changes in attitude [13]. Feldman [30] notes that pandemic-related anxiety will hurt student academic performance, (ii) racial, economic, and resource differences may have an impact on student's academic performance, and (iii) the majority of teachers were not adequately prepared to provide high-quality instruction. He then discusses how schools can legislate fair and impartial grading policies based on these recommendations.

One area of concern in distance learning is the faculty's ability to deliver quality education despite the limitations in their knowledge of navigating forms of technology and adapting to the demands of online classes.

Ladwingon, et al. [21] stated in their study that there is a wide range of obstacles that senior teachers need to overcome when conducting distance learning. Some of these issues are maintaining academic integrity, classroom management, internet use, and need for computer literacy. Their study also shows that senior teachers' efficacy in online learning is declining, and they suggested the need for specialized training programs and strong support structures to overcome these obstacles. The study of Lichoro [31] also supports this claim, wherein integrating information and communication technology (ICT) strategies in higher education faces challenges and obstacles for faculty members who lack ICT skills. However, conducting ICT training skills for faculty members can help them develop their teaching competencies.

Digital natives are those who were born in the computer era; hence, they are easily learned on the rudiments of technology. Some digital immigrants have adapted to the challenges of the digital time. However, there are still digital refugees who need help maneuvering a laptop or a desktop computer and, more often than not, prefer the old ways of delivering instruction.

Research on faculty preparation for online teaching remains limited. While Gay [32] highlighted the need for robust support services based on an evaluation of instructor preparedness before, during, and after course delivery, Lichoro [31] emphasizes the general feeling among faculty of needing adequate preparation for online instruction. Downing and Dyment [19] further underscore this need, finding that instructors perceive online teaching as time-intensive, particularly for those new to the modality, who reported needing support in time management, pedagogy, and technology. To comprehensively assess preparedness, Chapnick [33] proposes a framework encompassing eight categories: psychological, sociological, environmental, human resource, financial, technological skill, equipment, and content readiness. This multifaceted approach recognizes the diverse factors influencing successful online teaching.

Institutions need to have sufficient and reliable technological infrastructure, teachers and students need to be technically proficient in using e-learning tools, and teachers need to restructure their courses to incorporate e-learning into their pedagogy successfully.

Faculty readiness to teach online is a state of faculty preparation for online teaching [2]. Numerous factors may impact faculty readiness and competencies in relation to online education in the context of the COVID-19 dilemma. It is necessary to clarify the duties and responsibilities of educators in online education and their impact on the process in order to go past an instrumental approach to online teaching and learning. It has been asserted that teachers' willingness to adapt their instruction for online delivery and share control of their classes with pupils who had technological proficiency beyond their own was motivated by the pressing need for preparation [34].

With all the practical and technological obstacles this entails, teaching professionals of different ages and backgrounds have frequently had to prepare and deliver their classes from home without the required technical support [35]. Additionally, a major obstacle for university instructors has been their lack of the pedagogical content knowledge (PCK) necessary for online instruction [36-38]. According to Gay [32] such PCK encompasses the technological and managerial facets of online

teaching (e.g., respectively, using platforms and tools and organizing workflows). More importantly, it has the pedagogical underpinnings and core understanding required to develop and facilitate effective online learning experiences.

Keengwe and Kidd [39] study revealed challenges faced by faculty in adapting to online teaching, including increased lesson preparation time (11.6% of respondents) and competing demands, such as supporting children's online learning. While 40% expressed confidence in their ability to create audio-visual resources, approximately one-third remained uncertain about their overall preparedness and digital competence for online instruction. This study aimed to assess faculty competence in online teaching at Kalinga State University, informing distance education initiatives and future training needs. Specifically, it examined competence levels across different age and experience groups, analyze differences in competence based on faculty profiles, and investigate the relationship between competence and age/years of service.

3. Research Methodology

The study methodology involved a quantitative research design with a comparative, cross-sectional, and survey-type approach. It aimed to identify differences in faculty readiness to teach online based on age and years in service. Data was collected through a survey of faculty members in the College of Engineering and Information, with 47 out of 52 responses received. The research instrument used was Penn State Online Faculty Engagement Subcommittee [40] consisting of 30 questions covering technical, pedagogical, and administrative competencies. Google Forms was used for data collection, and SPSS was utilized for data analysis, including the use of weighted mean, chi-square test, and ANOVA to determine relationships and differences between variables.

4. Results

This part of the study includes the findings. The first table presents the overall competence of the faculty in online teaching when they are grouped according to age.

Table 1.

Indicators	20-30	31-20	41-50	51-60	61 & above	Mean	20-30
Technical competency	3.0455	2.7500	2.7656	2.3125	0	2.7660	3.0455
Administrative competency	3.0496	2.8430	2.5909	2.3939	0	2.7911	3.0496
Pedagogical competency	3.1240	2.7975	2.6818	2.3485	0	2.7969	3.1240
Total mean	20-30	31-20	41-50	51-60	61 & above	Mean	20-30

Faculty competence in online teaching as to age.

Table 1 presents that the obtained mean for all the competencies, such as Technical, Administrative, and Pedagogical, is 2.78. This implies that the faculty considers their conduct of online teaching to be successful.

The result also shows that the obtained means in all competencies belong to the group that can perform online teaching successfully, except for those respondents who belong to the age group of 51-60 years old. The obtained mean for this group is 2.35 in all competencies. This age group of respondents performed online teaching with a mix of success and a possibility of failure or disengagement.

The table also shows that the highest obtained mean for all competencies is 3.073, which is identified under the age group of 20-30 years old. This implies that the younger respondents note a higher level of success in conducting online teaching.

Test of difference on the faculty competence in online teaching as to age.						
Source of	Sum of squares	df	Mean square	F	Sig.	
Variation						
Between groups	2.131	3	0.710	3.867	0.016	
Within groups	7.901	43	0.184			
Total	10.032	46				

Table 2.

Note: P-value (0.016) is greater than 0.05; reject the null hypothesis.

There is a significant difference in the online teaching competencies the faculty possesses when grouped according to age, as presented in Table 2. This is further shown by the computed F-ratio of 3.867, which is greater than the F-tabular value of 2.84 at a .05 level of significance.

This could further be explained through the obtained means for each age range across the identified indicators for the three (3) competencies. Among the eight indicators under technical competency, the faculty in the age range of 51-60 showed observance of the skills but with mixed results of success or failure, as indicated by the computed mean of 2.32. This age includes senior faculty in the university who projected low scores in terms of skills in managing the course roster in the learning management system and monitoring student submissions.

These specific skills under technical competency detail that a faculty must know how to set up and manage teams or groups within a course and add instructors, teaching assistants, and outside guests with the appropriate permissions. Moreover, a competent online teacher must also know how to upload and download submissions via LMS Dropbox, Google Docs, or other student submission tools.

Moreover, additional elaboration on the significant difference in administrative competence is presented. The faculty under the age ranges of 41-50 and 51-60 indicated they experienced mixed success and failure on the skills under the competence.

The senior faculty ages 51-60 remain consistent in relaying that they exhibited the skills but showed mean scores along 1.76-2.50, which is described as "done and had a mix success or failure," further leading to either a good attempt or failure. They needed to improve on the following skills: communicating and monitoring compliance regarding institutional academic integrity policies, revising course content according to student feedback, providing technical assistance for their students at the appropriate time, and actively participating in the course through a variety of communication tools.

Under pedagogy, there was also a significant presentation of competence differences in age. The faculty under the age range of 51-60 remain consistent in scoring and performing the skills with a mix of success or failure. They were of similar results with those in the age range of 41-50 under the following indicators: familiarity with the unique learning needs and situations of both traditional age and adult learners, providing an educational experience appropriate for both of them and continuous monitoring of student progress by using course statistics to identify students who are not accessing course materials, participating in learning activities and reaching out to encourage engagement.

The results also revealed consistency in the competence levels of the faculty in the age ranges of 21-30 and 31-40 years. Their scores are likely supported by their exposure to a curriculum that included technology integration.

Table 3.

Faculty competence in online teaching as to years in service.						
Indicators	1 & below	2-5	6-10	11-15		
Technical competency	3.17	3.02	2.69	3.08		
Administrative competency	3.00	3.03	2.86	2.85		
Pedagogical competency	3.15	3.17	2.80	2.84		
Total mean	3.11	3.07	2.78	2.92		
Indicators	1 & below	2-5	6-10	11-15		
Technical competency	3.17	3.02	2.69	3.08		
Administrative competency	3.00	3.03	2.86	2.85		

The Table 3 shows the different competency skills for online learning regarding the Years in Teaching. The table shows that the obtained mean is 2.79, which signifies that the respondents successfully participated in online teaching activities. The table also shows that among the respondents, those teaching one (1) year and below have the highest computed mean of 3.11 for all three (3) competencies.

The Technical Competency has the highest computed mean of 3.17 among the three competencies. This signifies that this group of faculty possesses technical competency to perform online teaching activities successfully. This result also shows that they are more familiar with technology in their online teaching.

Among the respondents, those who belong to the 16 to 20 years of teaching have the lowest mean of 2.49 in all the three competencies. This implies that most of the respondents in this group have performed online teaching but with a mix of success or failure.

From this result, it can also be seen that the lowest obtained mean is from the Technical and Administrative Competency of 2.47 and 2.43, respectively, under the description "I have done this and had mixed success."

Source of Variation	Sum of	df	Mean square	F	Sig.
	squares				
Between groups	1.909	5	0.382	1.927	0.111
Within groups	8.123	41	0.198		
Total	10.032	46			
Note: p-value (0.111) is greater than 0.05; reject null hypothesis.					

Table 4. Test of difference on the faculty competence in online teaching as to years in service.

; reject r nyp

There is a significant difference in faculty competence when they are grouped according to their years in the teaching service, as presented in Table 4. This could further be explained by the obtained computed means for the specific years in services across the three (3) online teaching competencies.

Along with technical competence, the newly-hired faculty members with teaching service of at least a year showed consistency in identifying themselves as experts on the given indicators and being able to teach others, as revealed further by the computed total mean of 3.17.

On the other hand, those with 2-5 years of experience claimed having done the indicated skills successfully with a computed total mean of 3.02. However, these faculty showed attempts and indicated uncertain success in the following specific skills: managing the course roster in the LMS to set up and manage teams, adding instructors, teaching assistants, our outside guests with appropriate passwords and rights, and student submissions using tools such as Dropbox. These skills refer to the ability of online instructors to integrate peer teaching and collaboration in their instruction. Moreover, it suggests that these faculty members need familiarization on securing uploading and downloading materials for their online classes.

The inability to do the abovementioned skills was revealed in the mean score of the faculty members who have been in the service for 16-20 years.

In addition, the significant difference in the faculty competence could also be attributed to the indication that faculty members who have been teaching for 21 years and above experienced doing the following technically related skills with a hint of success or failure: navigating the LMS to locate critical elements such as syllabus and grade book, setting up the grade book and grade scale, using percentages and managing the course files and folders. These skills that obtained low mean scores suggest low competence among faculty members with more teaching experience.

Along with administrative competence, the faculty with different years in service similarly scored low on their ability to maintain adherence to institutional policies. Those faculty members with more years in the service (16-20 and 21 & above) showed low administrative competence, as revealed by the computed total means of 2.43 and 2.55. The specific skills that contributed to these include active participation through various communication tools, grading and returning assessment outputs, providing a comprehensive syllabus that adheres to the institution's policies, revising content based on student feedback and monitoring academic integrity.

The pedagogical competence of the faculty also contributed to the significant difference revealed when the faculty members were grouped according to years in service. The senior faculty with 21 and above years in service remain consistent in airing that they have attempted to experience the specified skills with a mix of success and a hint of failure.

Those also with 16-20 years in service signified success in doing the skills but obtained low means on specific skills like addressing the unique challenges of online learning where learners are separated by time and interactions are synchronous, promoting and encouraging a safe and mutually respectful learning environment and observing netiquette. They also obtained a mean score of only 2.50 or having done the indicator with a mix of success and demonstrated sensitivity to individual differences and inclusive education.

Table 5.

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Test of significant re	elationship of facul	tv.comnetence.in	online teaching at	nd vears in service
rest of significant is	ciacionship of facul	ty competence m	omme teaching a	ia years in service

Variable		YRSINSERVICE	Mean		
	Pearson correlation	1	-0.385**		
YRSINSERVICE	Sig. (2-tailed)		0.007		
	Ν	47	47		
	Pearson correlation	-0.385**	1		
Mean	Sig. (2-tailed)	0.007			
	Ν	47	47		
Note: ** Correlation is significant at the 0.01 level (2 tailed)					

ignificant at the 0.01 level (2-tailed).

Table 5 reveals that the correlation between the faculty competence in online teaching and their years in service is significant, as proven by the p (0.007) < 0.05. However, the relationship between the years of service and faculty competence is negative. This implies that the greater length of service does not guarantee higher competence.

This finding supports the earlier results discussed where it is consistent that the senior faculty aged 51-60 and with 21 and above years in service showcase low competence to teach online and those younger and years in service perform better in online instruction.

5. Discussion

This study reveals a significant gap in online teaching competence between senior faculty and their younger counterparts, particularly in areas related to technology integration and pedagogical approaches. Senior faculty (51-60 years old) consistently reported challenges with technology, particularly in navigating the Learning Management System, uploading/downloading materials, and providing technical assistance to students [17, 21]. This aligns with research suggesting that faculty not introduced to technology early in their careers may need help with its integration [38]. Conversely, faculty aged 21-30 and 31-40, who likely experienced technology-integrated curriculums during their education, demonstrated higher levels of competence in using technology for teaching [28]. This suggests that exposure to technology during training significantly impacts its adoption in teaching practices. While senior faculty reported some success in understanding the learning needs of both traditional and adult learners, they consistently needed help with monitoring student progress, providing feedback, and facilitating online discussions [21, 22]. This suggests a need for targeted training in these areas to enhance their online teaching effectiveness.

The study also highlights the importance of understanding the unique needs of adult learners in online environments [40]. While senior faculty attempted to address these needs, they reported limited success, indicating a need for further development in this area.

Overall, the study suggests that senior faculty require additional training and support to integrate technology and implement pedagogical approaches for online teaching effectively [17, 21]. Exposure to technology-integrated curriculums during training significantly impacts faculty competence in online teaching [41]. The study emphasizes the need for a digital culture within the university to bridge the knowledge gap between senior and younger faculty members [19].

6. Conclusion

The success of distance education and internationalization activities in Kalinga State University thus necessitates faculty competency in teaching online. Key areas identified for more training and assistance for faculty members, particularly senior faculty members, relate to technical skills, administrative competence, and educational approaches. The findings call for designing targeted online teaching training programs, incorporating these findings in compliance reports to secure permits for offering Distance Education and imposition of assistance programs on senior faculty in collaboration with the Office of Information and Communications Technology. These are the recommendations that the university will address to prepare its faculty for the challenges and opportunities of distance education and a successful transition to a more flexible and globally connected learning environment.

7. Limitations of the Study

Limitations of this study include the fact that the participants come from a single university, which may limit the generalizability of the findings to other universities. The researchers acknowledge this limitation and suggest that future studies should include participants from a variety of online universities and programs of study.

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