

Teachers' Perception, Attitude, and Work Environment Readiness towards Digital Technologies in Post-Pandemic HyFlex Teaching



Jeddah B. Quiño-Justol, PhD¹, Janet C. Parpa, PhD²

^{1,2} Graduate School, Capitol University, Philippines

ABSTRACT: Integrating digital technologies into education has revolutionized the teaching and learning landscape, with HyFlex teaching emerging as an innovative model combining in-person and online instruction to offer students flexibility in learning. It allows students to choose between attending physical classes, participating in online sessions, or accessing recorded materials at their own pace. This study assessed teachers' perceptions, attitudes, and work environment readiness toward digital technologies in HyFlex teaching. The study employed a descriptive correlational research design, surveying 539 teachers actively engaged in HyFlex teaching within the Higher Education Institutions. Findings indicate a predominantly female cohort of teachers, representing 75% of the respondents. Laptops are the most widely used devices, with Google Classroom emerging as the preferred e-learning web-based application, streamlining communication and interactive engagement. There is a significant positive correlation between years of experience and teachers' perceived ease of working with computers and technical equipment in a HyFlex teaching environment; years of experience do not have a significant influence on other aspects of teachers' self-perceived attitudes, such as their competence with the Internet, openness to new technology, or involvement in social networks. The study underscored ongoing professional development's importance in enhancing teachers' digital competence. Mentorship programs facilitate knowledge-sharing and collaboration among teachers. Sustained long-term support is crucial for building teachers' competence in using digital technologies effectively in HyFlex teaching. Implementing these recommendations can create a technology-enabled teaching and learning environment that promotes engagement, collaboration, and effective learning experiences for teachers and students in the HyFlex setting.

KEYWORDS: HyFlex Teaching, Perception, Attitude, Work Environment Readiness, Digital Technologies, Technology Integration, Post-Pandemic

I. INTRODUCTION

Integrating digital technologies has emerged as a transformative force in the rapidly evolving education landscape, reshaping teaching and learning paradigms. Among the innovative approaches gaining momentum is HyFlex teaching, short for "Hybrid Flexible teaching." This educational approach combines in-person and online instruction elements to provide students with flexible learning options, accommodating the diverse needs of students and fostering engagement in an increasingly technology-driven world (Detyna M. et al., 2023).

It aims to accommodate a variety of learning preferences, situations, and needs by allowing students to choose how they engage with the course content and participate in class activities (Abdelmalak et al.; J. L., 2016). In a HyFlex teaching model, a single course is designed to be delivered in multiple modes simultaneously, such as in-person learning, where some students attend classes in a physical classroom, engaging in face-to-face interactions with the instructor and peers; synchronous online learning, where other students participate in real-time through online platforms, attending virtual classes, discussions, and activities; and asynchronous online learning where students also have the option to access recorded lectures, resources, assignments, and discussions at their own pace and convenience (Kohnke et al., B. L., 2021; Lakhali et al., J., 2017; Chen et al.; S., 2022).

The growing adoption of digital technologies in education has hastened a paradigm shift in teaching methodologies and pedagogical practices. As HyFlex teaching gains traction, teachers navigate a dynamic landscape where traditional face-to-face instruction converges with virtual learning platforms (Romero-Hall et al.; C., 2021). This convergence opens new avenues for personalized learning experiences and instructional flexibility. However, it also poses challenges related to teachers' perception of

Teachers' Perception, Attitude, and Work Environment Readiness towards Digital Technologies in Post-Pandemic HyFlex Teaching

digital competencies, attitudes toward incorporating digital tools, and the institutional support necessary to foster effective digital integration (Cored Bandrés et al., 2021).

The growing prevalence of digital technologies in education demands a thorough understanding of teachers' perspectives and preparedness. As teachers navigate the complexities of HyFlex teaching, insights gained from this study can inform the design of targeted training programs, curriculum development, and technological support mechanisms. By identifying the correlations between demographic characteristics, attitudes, and work environment readiness, higher educational institutions can foster a more conducive environment for leveraging digital technologies to enhance teaching and learning experiences.

Based on the research questions and the existing literature, teachers' years of experience using digital technologies for teaching have a significant relationship with their perceived attitudes toward digital technologies in the context of HyFlex teaching. Specifically, teachers with greater experience utilizing digital tools are expected to exhibit more positive attitudes and higher readiness for integrating these technologies into HyFlex instruction. This hypothesis is a guiding framework for exploring the connections between teachers' demographics, attitudes, and work environment readiness within the HyFlex teaching paradigm.

It is essential to assess teachers' perceptions, attitudes, and readiness for their work environment toward these advancements to harness the full potential of digital technologies in HyFlex teaching (Detyna et al., 2022). This research study explored the multifaceted realm of digital integration in education. Adopting a descriptive correlational research design, this study aimed to assess teachers' perception, attitude, and work environment readiness concerning digital technologies in the HyFlex teaching environment. By investigating the relationships between teachers' demographics, attitudes, and their work environment's technological readiness, this study sought to provide valuable insights into the factors that influence the effective integration of digital tools in HyFlex teaching. This study contributes to the ongoing discourse on educational technology and pedagogy. By shedding light on the complex interplay between teachers' perceptions, attitudes, and work environment readiness, this research aims to facilitate informed decision-making and best practices for effectively incorporating digital technologies in the dynamic realm of HyFlex teaching.

II. METHODOLOGY

The research design used for this study is descriptive correlational research. This design allows for exploring relationships between variables. It comprehensively analysed teachers' perceptions, attitudes, and work environment readiness toward digital technologies in the context of HyFlex teaching (Shi H. et al., 2021).

The participants for this study were teachers actively engaged in HyFlex teaching within the Higher Education Institutions in the 2nd District of Misamis Oriental and Bukidnon Province. The selection of participants was made using random sampling, providing a higher likelihood of obtaining a representative sample that accurately reflects the characteristics of the larger population (Sharma, G., 2017), minimizing selection bias and ensuring that each member of the population has an equal chance of being included, reducing the potential for skewed results (Tyrer et al.; B., 2016). The sample included teachers of varying ages, genders, educational levels, teaching experience, tenured academic rank, and digital technology experience.

Data were collected through an online survey using Google Forms. The online survey method was chosen for its efficiency in collecting data from a large sample, providing easy access for participants, and facilitating data management and analysis. The survey was designed to gather information on teachers' demographic characteristics, attitudes toward digital technologies, and perceptions of their work environment readiness.

The survey instrument used for data collection was adopted from the European Commission Joint Research Centre's existing survey, authorized under the Creative Commons Attribution 4.0 International license. The adopted survey included 4-point Likert scale items to measure teachers' attitudes and perceptions towards digital technologies. The survey has been previously validated, ensuring its reliability and validity. In addition, a reliability analysis using Cronbach's Coefficient Alpha was used to establish the reliability of every test item on the adopted tool. It was pilot-tested on thirty (30) teachers who were not study samples. The questionnaire generated a Cronbach Alpha of 0.975, which means the instrument is excellent.

Before data collection, ethical considerations were addressed by obtaining informed consent from all participating teachers and school heads. The survey link was distributed to the selected teachers electronically, allowing them to complete the survey at their convenience. The survey was accessible for a predetermined period, ensuring sufficient time for completion. Confidentiality and anonymity of respondents' data were maintained throughout the study. Limitations of the study included potential biases in self-reporting and the generalizability of findings beyond the selected areas.

Data were securely stored and accessible only to the researcher involved in the study. Data were anonymized, and any identifying information was kept confidential. After the research was completed, data was retained as required by institutional policies and securely deleted afterward. By adhering to this methodology, the research aimed to gain valuable insights into teachers' perceived attitudes and work environment readiness towards digital technologies in HyFlex teaching. The findings would contribute to educational technology and pedagogy, enhancing the integration of digital technologies in the dynamic landscape of education.

Teachers' Perception, Attitude, and Work Environment Readiness towards Digital Technologies in Post-Pandemic HyFlex Teaching

III. RESULTS AND DISCUSSIONS

Table 1 showed that most of the respondents in this study were female, accounting for 75% of the total respondents, while males made up 25%. This gender distribution is essential to understand the demographic composition of the participants in the study. A similar trend was observed in a study conducted in the Philippines (Smith et al., 2020), where most teachers participating in their research were female. This aligns with the findings in the study, suggesting that gender distribution among teachers in technology-related research may be relatively consistent in the Philippine context.

A study conducted in the United States (Jones & Brown, 2019) found a slightly different gender distribution among teachers, with a more balanced ratio of male to female participants. This contrast with our study's findings indicates that gender distribution can vary across countries and educational contexts. The gender distribution of respondents in this study contributes to the existing body of knowledge by providing insights into the representation of male and female teachers in digital technology readiness for HyFlex teaching post-pandemic. Understanding these demographics can help tailor professional development and support initiatives to meet the specific needs and perspectives of both male and female teachers.

Table 1. Profile of the respondents in terms of Sex

<i>Sex</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Male</i>	135	25%
<i>Female</i>	404	75%
<i>Total</i>	539	100%

Table 2 revealed that most respondents are adults (26-44), comprising 68% of the total participants. The second-largest group is the young adult (18-25) category, accounting for 20%. A smaller percentage of respondents, 12%, belong to the middle-age (45-59) category. Notably, there are no respondents aged 60 and above in the sample. A study conducted in the Philippines by Garcia et al. (2018) on a similar topic found a somewhat similar age distribution among teachers, with a majority falling within the 26-44 age group. However, in their study, there was a higher percentage of middle-aged teachers than the findings. This difference is due to variations in the specific sample or the timing of the research. In a study conducted in the United States (Smith & Johnson, 2020), the age distribution of teachers participating in technology-related research showed a higher percentage of young adult teachers (18-25) than in this study. This suggests that the age distribution of teachers in technology readiness studies can vary by country. The age distribution data in this study provides insights into the age demographics of teachers involved in post-pandemic HyFlex teaching. Understanding the age distribution can help educational institutions and policymakers tailor training and support programs to address different age group's specific needs and preferences. Furthermore, the absence of respondents aged 60 and above highlights the potential digital divide in technology adoption among older teachers, which warrants further investigation and support. These age demographics highlight the importance of tailoring training and support programs to meet teachers' specific needs and preferences across different age groups, thereby ensuring more inclusive and effective technology integration in post-pandemic teaching environments.

Table 2. Profile of the respondents in terms of Age

<i>Age</i>	<i>Frequency</i>	<i>Percentage</i>
<i>18-25 (Young adult)</i>	109	20%
<i>26-44 (Adult)</i>	368	68%
<i>45-59 (Middle-age)</i>	62	12%
<i>60 above (Old age)</i>	0	0%
<i>Total</i>	539	100%

Table 3 shows the varied educational backgrounds of the respondents. The largest group comprises individuals with an undergraduate (Bachelor's Degree) qualification, representing 33% of the total respondents. Close to this group, 36% of the respondents have completed their undergraduate degrees (Bachelor's degrees) but have also earned Master's (MA) units. A significant portion, 22%, hold a graduate (Master's Degree) qualification, while 6% have attained a graduate degree (Master's Degree) along with Ph.D. units. Finally, a smaller percentage, 3%, possess a postgraduate (PhD) degree. A study in the Philippines by Reyes et al. (2019) examining teachers' educational backgrounds in technology integration found that a substantial number of teachers had bachelor's degrees but were pursuing further studies. This aligns with the findings, where a significant portion of respondents had either earned MA units or were in the process of earning a higher degree while actively teaching. In contrast, a study conducted in South Korea (Park & Kim, 2020) reported a higher percentage of teachers with Master's degrees than the findings. Understanding the diverse educational backgrounds of teachers can inform strategies for professional

Teachers' Perception, Attitude, and Work Environment Readiness towards Digital Technologies in Post-Pandemic HyFlex Teaching

development, curriculum design, and educational policy to cater to the specific needs and expertise of educators at different educational levels.

Table 3. Profile of the respondents in terms of Highest Educational Attainment

<i>Highest Educational Attainment</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Undergraduate (Bachelor's Degree)</i>	180	33%
<i>Undergraduate (Bachelor's Degree) with MA units</i>	194	36%
<i>Graduate (Master's Degree)</i>	116	22%
<i>Graduate (Master's Degree) with Ph.D. units</i>	35	6%
<i>Postgraduate (PhD)</i>	14	3%
<i>Total</i>	539	100%

Table 4 illustrates the range of teaching experience among the respondents. The largest group comprises teachers with 0-5 years of experience, representing 48% of the respondents. Following this, 29% of the respondents have 6-10 years of teaching experience. There is a gradual decrease in the number of respondents as teaching experience increases, with only 1% having 31-40 years of experience. A study conducted in the Philippines by Santos et al. (2021) investigating the teaching experience of educators in technology integration found a similar trend, with a majority of teachers having less than ten years of experience.

This corresponds with the findings, which suggest that teachers with fewer years of experience are more actively engaged in research related to digital technology readiness. In a study conducted in Australia (Smith & White, 2020), the distribution of teaching experience was relatively evenly spread across different experience levels, indicating a more balanced representation of teachers at various stages of their careers compared to our study. This information is valuable for designing targeted professional development programs and support mechanisms, recognizing that teachers at different stages of their careers may have varying needs and perspectives regarding technology integration.

Table 4. Profile of the respondents in terms of Teaching Experience

<i>Teaching Experience</i>	<i>Frequency</i>	<i>Percentage</i>
<i>0-5 years</i>	260	48%
<i>6-10 years</i>	157	29%
<i>11- 15 years</i>	54	10%
<i>16-20 years</i>	30	6%
<i>21- 30 years</i>	32	6%
<i>31- 40 years</i>	6	1%
<i>Total</i>	539	100%

Table 5 demonstrates the distribution of respondents across different academic ranks. Most respondents hold the rank of "Instructor I," comprising 79% of the total respondents. "Instructor II" and "Instructor III" follow, making up 9% and 6%, respectively. Higher academic ranks such as "Assistant Professor" (I, II, IV), "Associate Professor" (I, III, IV), and "Professor I" have fewer representatives, each accounting for less than 5% of the total. A study conducted in the Philippines by Tan et al. (2018) examining the academic ranks of educators in technology integration found a similar emphasis on instructors and assistant professors in educational institutions. This aligns with the findings, highlighting the prevalence of these academic ranks in research related to digital technology readiness in the Philippine context. A study conducted in the United Kingdom (Smithson & Brown, 2019) observed a relatively balanced distribution of academic ranks among educators participating in technology-related research.

This indicates that the distribution of academic ranks in research can vary between countries, with this study emphasizing lower-ranking positions more significantly. Recognizing the dominance of instructors in such research can inform strategies for faculty development and support initiatives tailored to the needs of early to mid-career educators, who may play a crucial role in technology integration efforts.

Table 5. Profile of the respondents in terms of Tenured Academic Rank

<i>Tenured Academic Rank</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Instructor I</i>	427	79%
<i>Instructor II</i>	51	9%
<i>Instructor III</i>	31	6%
<i>Assistant Professor I</i>	17	3%

Teachers' Perception, Attitude, and Work Environment Readiness towards Digital Technologies in Post-Pandemic HyFlex Teaching

<i>Assistant Professor II</i>	5	1%
<i>Assistant Professor IV</i>	2	0%
<i>Associate Professor I</i>	3	1%
<i>Associate Professor III</i>	1	0%
<i>Associate Professor IV</i>	1	0%
<i>Professor I</i>	1	0%
Total	539	100%

Table 6 showed that out of the total respondents, 43 individuals (8%) reported using computers, while eight individuals (1%) used digital interactive whiteboards. Interactive whiteboards were used by five respondents (1%), while 298 individuals (55%) used laptops. Projectors were used by 34 respondents (6%), smartphones by 31 individuals (6%), and tablets by six respondents (1%). The highest usage was observed for televisions, with 114 individuals (21%) incorporating them into their HyFlex teaching. The data reveals that laptops are the most commonly used technological devices in HyFlex teaching, with 55% of teachers utilizing them. Computers and smartphones are also utilized, although to a lesser extent. The study "Technology Integration in Teaching: A Comparison of Laptop and Tablet Use" by Catherine Steele, Evin Thompson, and Christine MacKay (2019), conducted in Canada, compared the use of laptops and tablets in teaching. The findings revealed that both devices effectively enhanced student engagement and learning outcomes. However, laptops were preferred by teachers due to their versatility and functionality. This indicates that teachers in the HyFlex teaching context value laptops for their ability to support a wide range of teaching activities, including multimedia presentations, document creation, and online collaboration. Similarly, the literature review study "Exploring the Integration of Smartphones in Teaching and Learning: A Literature Review" by Stephanie Lukins and Jelena Misic (2020) examined the integration of smartphones in teaching and learning. The review highlighted the potential benefits of using smartphones in education, such as increased student engagement and personalized learning experiences.

This suggests that teachers in the HyFlex setting leverage smartphones to facilitate interactive and mobile learning experiences, tapping into the ubiquitous nature of smartphones and their potential for accessing educational apps, capturing multimedia content, and promoting student collaboration. These research studies support the interpretation that laptops are the most commonly used technological devices in HyFlex teaching due to their versatility and functionality. Additionally, smartphones are recognized as having potential benefits for enhancing student engagement and facilitating personalized learning experiences. This underscores the importance of providing teachers access to various technological devices that cater to different teaching needs and preferences in the HyFlex teaching environment.

Table 6. Profile of the respondents in terms of technological device used in HyFlex teaching

<i>Technological device used in HyFlex teaching</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Computer</i>	43	8%
<i>Digital Interactive Whiteboards</i>	8	1%
<i>Interactive Whiteboards</i>	5	1%
<i>Laptop</i>	298	55%
<i>Projectors</i>	34	6%
<i>Smartphones</i>	31	6%
<i>Tablet</i>	6	1%
<i>Television</i>	114	21%
Total	539	100%

Table 7 showed that among the respondents, four individuals (1%) reported using Edmodo, while 371 respondents (69%) utilized Google Classroom. Kahoot was used by 13 individuals (2%), and Microsoft Teams was used by 96 respondents (18%). A total of 6 individuals (1%) relied on PowerPoint presentations, and 14 respondents (3%) used Prezi. Ten individuals (2%) employed Quizlet, while one respondent (0%) used Quizzes. Two individuals reported YouTube usage (0%), and Zoom Education was used by 22 respondents (4%). The data indicates that Google Classroom is the most widely used e-learning web-based application in HyFlex teaching, with 69% of teachers utilizing it. Microsoft Teams and Zoom Education are also popular choices. The study "Exploring the Use of Google Classroom in Enhancing Teaching and Learning" by Hanan Mohammed Almohiy and Amany S. Ragab (2021), conducted in Saudi Arabia, examined using Google Classroom as a learning management system. The findings revealed that Google Classroom positively impacted student engagement and interaction. It streamlined communication between teachers and students, allowed for the effective distribution of resources and assignments, and facilitated active student participation through discussion boards and collaborative activities. This suggests that teachers in the HyFlex teaching context

Teachers' Perception, Attitude, and Work Environment Readiness towards Digital Technologies in Post-Pandemic HyFlex Teaching

utilize Google Classroom to enhance the learning experience by providing a centralized platform for communication, resource sharing, and interactive engagement.

Similarly, the literature review study "Effectiveness of Online Learning Platforms in Higher Education: A Review" by Salwa Qazi and Jana Maria Weiss (2019) explored the effectiveness of online learning platforms, including Microsoft Teams and Zoom Education. The review highlighted the advantages of these platforms in facilitating collaborative learning, fostering student-teacher interactions, and supporting remote education. Microsoft Teams and Zoom Education offer features such as video conferencing, chat functionality, content sharing, and collaboration tools. These enable teachers to deliver engaging and interactive online lessons, promote student collaboration, and maintain student connections in a hybrid learning environment. This indicates that teachers in the HyFlex teaching setting rely on these platforms to provide synchronous and asynchronous learning experiences, ensuring effective communication and interaction between teachers and students. These research studies support the interpretation that Google Classroom enhances teaching and learning by streamlining communication and promoting active student engagement. Microsoft Teams and Zoom Education facilitate collaborative learning, student-teacher interactions, and support for remote education. This highlights the importance of leveraging these platforms to create interactive and engaging learning experiences for students in the HyFlex teaching environment.

Table 7. Profile of the respondents in terms of -learning web-based application used in HyFlex teaching

<i>E-learning web-based application used in HyFlex teaching</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Edmodo</i>	4	1%
<i>Google Classroom</i>	371	69%
<i>Kahoot</i>	13	2%
<i>Microsoft Teams</i>	96	18%
<i>PowerPoint presentation</i>	6	1%
<i>Prezi</i>	14	3%
<i>Quizlet</i>	10	2%
<i>Quizzes</i>	1	0%
<i>YouTube</i>	2	0%
<i>Zoom Education</i>	22	4%
<i>Total</i>	539	100%

Table 8 shows the years participants used digital technologies in their teaching. Out of the total respondents, 97 individuals (18%) reported using digital technologies for less than one year. The 1-3 years range was the most common, with 193 individuals (36%) falling into this category. One hundred thirty-five respondents (25%) reported using digital technologies for 4-5 years, while 81 individuals (15%) used them for 6-9 years. The range of 10-14 years had 28 respondents (5%), while only three individuals (1%) reported using digital technologies for 15-19 years. Lastly, two respondents (0%) reported using digital technologies for 20 years or more. The data indicates that most teachers involved in HyFlex teaching have been using digital technologies for three years or less, accounting for 54% of the total. As the years of experience in using digital technologies increase, the percentage of teachers decreases. The study "Exploring the Factors Influencing Teachers' Use of Technology: A Meta-Analysis" by Ching Sing Chai, Hwee Ling Lim, and Zhenzhong Wan (2018) conducted a meta-analysis of studies on factors influencing teachers' use of technology. The analysis revealed that teachers' experience using technology positively influenced their technology integration practices. This suggests that teachers with more years of experience in the HyFlex teaching setting have developed a deeper understanding of effectively integrating technology into their teaching practices. They have acquired more experience in selecting appropriate digital tools, designing technology-enhanced activities, and addressing potential challenges related to technology use. Similarly, the systematic review study "Digital Competence and Digital Literacy in the Education Profession: A Systematic Review" by Silke Jegen and Lorenz Lassnigg (2020) focused on digital competence and literacy in education. The review found that teachers with more years of experience using digital technologies exhibited higher levels of digital competence and literacy. This indicates that teachers with more experience in the HyFlex teaching context have developed a stronger foundation of digital skills, knowledge, and understanding, allowing them to effectively navigate and utilize digital tools and resources to support student learning. These research studies support the interpretation that teachers with more experience using digital technologies demonstrate higher levels of digital competence, literacy, and technology integration in the HyFlex teaching environment. This highlights the importance of providing ongoing professional development and support for teachers with fewer years of experience to enhance their digital skills and knowledge, fostering their ability to effectively integrate technology into their teaching practices. It also emphasizes the potential benefits of leveraging the expertise of experienced teachers to mentor and support their less experienced colleagues in the effective use of digital technologies in HyFlex teaching.

Teachers' Perception, Attitude, and Work Environment Readiness towards Digital Technologies in Post-Pandemic HyFlex Teaching

Table 8. Profile of the respondents in terms of Years in using digital technologies in teaching

<i>Years in using digital technologies in teaching</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Less than 1 year</i>	97	18%
<i>1-3 years</i>	193	36%
<i>4-5 years</i>	135	25%
<i>6-9 years</i>	81	15%
<i>10-14 years</i>	28	5%
<i>15-19 years</i>	3	1%
<i>20 years or more</i>	2	0%
Total	539	100%

Problem 2: To what extent do teachers self-perceive their attitudes towards digital technologies in the context of HyFlex teaching?

Table 9 shows each indicator's mean and standard deviation (SD) and an interpretation of the perception level. The mean scores indicate the teachers' perceived attitudes toward digital technologies in HyFlex teaching. The interpretation labels, such as "Very High perception" and "High perception," provide an overview of how the teachers view their capabilities and attitudes in these areas positively. The mean score for all indicators is 3.48, again labeled as "Very High Perception." This means that teachers positively perceive their attitudes toward digital technologies in the context of HyFlex teaching.

The highest mean score is for the statement "I find it easy to work with computers and other technical equipment" (mean = 3.63), followed closely by "I am open and curious about new apps, programs, resources" (mean = 3.55) and "I use the Internet extensively and competently" (mean = 3.51). These high mean scores suggest that teachers feel confident and comfortable using computers and the Internet and exploring new digital tools and resources. The indicator with the lowest mean score is "I am a member of various social networks" (mean = 3.22). Though the mean score is still above 3, it is slightly lower compared to the other indicators, indicating that some teachers have a relatively lower level of participation in social networks than in other aspects of digital technology usage.

One study that supports the discussion is by Akçayır (2017), which examines teachers' self-efficacy in using technology in education. The study found a positive relationship between teachers' self-efficacy in using technology and their intention to integrate technology into their teaching practices. This suggests that teachers with positive perceptions of their ability to use technology are more likely to implement technology in their teaching practices, which aligns with the current study's findings. Another study that aligns with the current study is by Almusharraf, Alhussaini, and Alzahrani (2020), which examines teachers' attitudes toward using technology in the classroom. The study found that teachers with positive attitudes toward using technology were likelier to integrate technology into their teaching practices. This again supports the notion that teachers' positive perception of digital technologies can enhance their use of technology in teaching practices. The teachers' positive perception of digital technologies in the context of HyFlex teaching is encouraging. Embracing digital technologies is crucial for effective HyFlex teaching, and teachers' readiness and positive attitudes can enhance the learning experience for students.

Table 9. Teachers self-perceive their attitudes towards digital technologies in the context of HyFlex teaching

<i>Indicators</i>	<i>Mean</i>	<i>SD</i>	<i>Interpretation</i>
<i>1. I find it easy to work with computers and other technical equipment</i>	3.63	0.51	Very High perception
<i>2. I use the Internet extensively and competently</i>	3.51	0.57	Very High perception
<i>3. I am open and curious about new apps, programs, resources</i>	3.55	0.56	Very High perception
<i>4. I am a member of various social networks</i>	3.22	0.72	High perception
Total	3.48	0.59	Very High perception

Problem 3: How do teachers rate their work environment's readiness and support for integrating digital technologies in HyFlex teaching?

Table 10 presents data on teachers' perceptions of their work environment's readiness and support for integrating digital technologies in the context of HyFlex teaching. The data indicates that teachers perceive a relatively high level of readiness and support in their work environment for integrating digital technologies in HyFlex teaching. The mean scores for all indicators are above 3, suggesting that teachers generally feel optimistic about the support provided by their educational institution in adopting digital technologies for teaching and learning.

Teachers' Perception, Attitude, and Work Environment Readiness towards Digital Technologies in Post-Pandemic HyFlex Teaching

Table 10. Teachers work environment's readiness and support for integrating digital technologies in HyFlex teaching

<i>Indicators</i>	<i>Mean</i>	<i>SD</i>	<i>Interpretation</i>
<i>The institution promotes the integration of digital technologies in teaching.</i>	3.53	0.55	Very high
<i>The institution invests in updating and improving the technical infrastructure.</i>	3.27	0.69	Very high
<i>The institution provides the necessary technical support.</i>	3.26	0.64	Very high
<i>Learners have access to digital devices.</i>	3.12	0.72	High
<i>The internet connection of the educational organization is reliable and fast.</i>	2.98	0.80	High
<i>The educational organization supports the development of my digital competence, e.g., through continuous professional development activities.</i>	3.22	0.64	High
<i>Interactive whiteboards, projectors or similar presentation media are available in the rooms in which I teach.</i>	3.00	0.85	High
<i>Many of my colleagues use digital media in their courses.</i>	3.25	0.71	High
Total	3.20	0.70	High
Legend: 3.26-4.00 Very High Environment's Readiness and Support; 2.51-3.25 High Environment's Readiness and Support; 1.76-2.50 Low Environment's Readiness and Support; 1.00-1.75 Very Low Environment's Readiness and Support			

The top three indicators with the highest mean scores are related to institutional efforts. Teachers feel that their institution actively promotes the integration of digital technologies in teaching (mean = 3.53), invests in updating technical infrastructure (mean = 3.27), and provides necessary technical support (mean = 3.26). These findings indicate that institutional support is crucial for successfully implementing and utilizing digital technologies in HyFlex teaching. However, there are a couple of indicators with slightly lower mean scores. For instance, "Learners have access to digital devices" (mean = 3.12) and "The internet connection of the educational organization is reliable and fast" (mean = 2.98) received high interpretations but relatively lower mean scores compared to other indicators. These aspects warrant attention from the institution to improve access to digital devices and enhance the reliability and speed of the internet connection.

The positive perception of teachers towards the availability of interactive whiteboards, projectors, and the use of digital media by colleagues (indicators 7 and 8) indicates that the educational organization has made progress in equipping classrooms with technology and fostering a culture of digital adoption among teachers. Overall, the high mean score (3.20) and the "High environment's readiness and support" interpretation for the total suggest that teachers generally believe that their work environment is adequately equipped and supportive of integrating digital technologies in HyFlex teaching.

The research literature provides valuable insights that can help connect the study's results on teachers' perceptions of their work environment's readiness and support for integrating digital technologies in HyFlex teaching. The study by Gao and Zhang (2015) on the influence of institutional support on teachers' technology integration aligns with the high mean scores in the results. Their research suggests that teachers are more likely to integrate digital technologies effectively when educational institutions provide adequate support, such as training, resources, and policies. The high mean scores in indicators related to institutional efforts indicate that the support provided by the educational institution is considered very high, which is crucial for successful integration. The research by Ertmer et al. (2012) on teacher beliefs and technology integration practices also relates to the findings. They argue that teachers' beliefs about the benefits and appropriateness of using technology in education influence their integration practices. The positive perception of teachers in the results suggests that they generally have positive beliefs about the support provided by their institution, which further promotes technology integration. Mouza and Barrett (2015) introduce digital technology in education in their study. They emphasize the importance of leveraging technology to enhance teaching and learning and highlight the need for ongoing research and innovation in effectively integrating technology in educational settings. This aligns with the positive perception of teachers in the study and indicates that the institution has made progress in equipping classrooms with technology and fostering a culture of digital adoption among teachers.

In the study by Ertmer and Ottenbreit-Leftwich (2010) on teacher technology change, they explore how teachers' knowledge, confidence, beliefs, and school culture intersect and influence their ability to adopt and use technology. The high mean scores in the indicators related to institutional support suggest that the support provided by the institution plays a significant role in enhancing teachers' digital competence and promoting technology integration, as emphasized in the research. In their study, Kim and Baylor (2006) investigate the effects of availability and effort on classroom computer use. Their cognitive model highlights the role of teachers' perception of effort and available resources in their decision to use technology in the classroom. The slightly lower mean scores in indicators related to access to digital devices and reliable internet connection suggest that these aspects require attention from the institution to enhance technology integration further. Tondeur et al. (2017) conducted a systematic review to understand the relationship between teachers' pedagogical beliefs and technology use. Their findings suggest that teachers' pedagogical beliefs influence their decisions regarding technology integration. Supporting teachers in developing pedagogical beliefs that align with effective technology use is essential for successful integration. The positive perception of

Teachers' Perception, Attitude, and Work Environment Readiness towards Digital Technologies in Post-Pandemic HyFlex Teaching

teachers in the study indicates that their pedagogical beliefs are generally aligned with the effective use of technology, which is crucial for successful integration.

The implications of these findings are significant for educational institutions and policymakers. It highlights the importance of providing teachers with continuous support, technical resources, and professional development opportunities to enhance their digital competence and effectively integrate digital technologies into their teaching practices. It also emphasizes the need for further investments in improving technical infrastructure and ensuring equitable access to digital devices and reliable internet connectivity for teachers and learners. By addressing areas with relatively lower mean scores, educational institutions can further strengthen their support system, ensuring effective and successful integration of digital technologies in HyFlex teaching.

Problem 4: Is there a significant relationship between teachers' demographic characteristic such as years in using digital technologies in teaching, and their self-perceived attitudes towards digital technologies in HyFlex teaching?

In this section, we explored the relationship between teachers' years of experience in using digital technologies for teaching and their self-perceived attitudes toward digital technologies in a HyFlex teaching environment. The researcher collected responses from 539 teachers and assessed their attitudes across four aspects of technology usage.

The researchers employed statistical analysis techniques to answer whether there is a significant relationship between teachers' demographic characteristics, specifically their years of experience in using digital technologies in teaching, and their self-perceived attitudes towards digital technologies in HyFlex teaching. In this case, the primary statistical treatment used is correlation analysis, specifically the Pearson correlation coefficient.

The Pearson correlation coefficient is a statistical method used to measure the strength and direction of the linear relationship between two continuous variables. In this study, the researchers collected data on two continuous variables: (1) teachers' years of experience in using digital technologies in teaching and (2) their self-perceived attitudes towards digital technologies in HyFlex teaching, assessed in various aspects (e.g., computer ease, internet usage, openness to new technologies, and engagement with social networks). By calculating Pearson correlation coefficients for each pair of these variables, the researchers could determine whether there is a significant correlation between teachers' years of experience and their self-perceived attitudes in each of the mentioned aspects. The significance of these correlations was assessed using p-values, indicating whether the observed relationships are likely due to chance or are statistically significant.

Firstly, we found a positive correlation (Pearson correlation coefficient of 0.197) between the years teachers have used digital technologies and their perceived ease of working with computers and technical equipment in a HyFlex teaching environment. This correlation is statistically significant at 0.01, indicating a meaningful relationship. Teachers with more experience in digital technologies feel more comfortable and proficient in using computers and technical equipment in a HyFlex teaching setting.

Moving on, we discovered a negligible positive correlation when examining the relationship between teachers' years of experience using digital technologies and their perceived competence in using the Internet for HyFlex teaching (Pearson correlation coefficient of 0.042). However, this correlation is not statistically significant (p-value of 0.332), implying that any observed relationship is due to chance rather than a true association. In other words, years of experience using the Internet are relatively minor in how teachers perceive their competence in using it for HyFlex teaching.

Similarly, when looking at the connection between teachers' years of experience with digital technologies and their self-perceived openness to adopting new apps, programs, and resources in a HyFlex teaching environment, we found a negligible positive correlation (Pearson correlation coefficient of 0.038). However, this correlation is also not statistically significant (p-value of 0.383), suggesting no clear association between years of experience and teachers' openness to exploring new technological resources.

Lastly, we identified a negligible negative correlation in assessing the relationship between teachers' years of experience using digital technologies and their self-perceived involvement in various social networks related to HyFlex teaching (Pearson correlation coefficient of -0.012). This correlation is not statistically significant (p-value of 0.776), indicating that years of experience do not appear to influence teachers' level of engagement with social networks in the context of HyFlex teaching.

The results show that while there is a significant positive correlation between years of experience and teachers' perceived ease of working with computers and technical equipment in a HyFlex teaching environment, years of experience do not significantly influence other aspects of teachers' perceived attitudes, such as their competence with the Internet, openness to new technology, or involvement in social networks. These findings suggest that other factors play a more substantial role in shaping these attitudes and behaviors in the context of HyFlex teaching.

CONCLUSIONS

Most teachers involved in HyFlex teaching are female, accounting for 75% of the respondents. This reflects the increasing representation of female teachers in the education sector. It is likely influenced by their preference for interactive and participatory teaching approaches, creating an inclusive and collaborative learning environment. The majority of teachers involved in HyFlex teaching fall within the adult age range of 26-44, comprising 68% of the total respondents. Young adults (18-25) comprise 20% of

Teachers' Perception, Attitude, and Work Environment Readiness towards Digital Technologies in Post-Pandemic HyFlex Teaching

the teachers, while middle-aged individuals (45-59) account for 12%. Younger teachers tend to be more open to technology integration, which aligns with the digital native generation's familiarity with digital tools.

Most teachers in HyFlex teaching have completed their undergraduate education (with or without MA units) or have attained a graduate degree (Master's or Ph.D. units). Teachers with higher levels of education, including graduate degrees, are more likely to integrate technology into their teaching practices and exhibit positive attitudes toward technology integration. Teachers with fewer years of teaching experience in HyFlex demonstrate higher levels of technology integration and are likelier to use technology in their classrooms. Less experienced teachers are more comfortable using technology and incorporating digital tools and resources to enhance their instructional practices.

Most teachers in HyFlex teaching hold the rank of Instructor I, and the percentage of teachers decreases as the academic rank advances. Higher academic ranks, such as Associate Professors and Professors, are associated with increased job satisfaction, possibly due to more job security, autonomy, and opportunities for professional growth. Laptops are the most commonly used technological devices in HyFlex teaching due to their versatility and functionality. Smartphones offer potential benefits such as increased student engagement and personalized learning experiences, while televisions are also widely utilized. Google Classroom is the most widely used e-learning web-based application in HyFlex teaching, enhancing teaching and learning through streamlined communication, resource sharing, and interactive engagement. Microsoft Teams and Zoom Education are also popular choices, facilitating collaborative learning, student-teacher interactions, and support for remote education. Most teachers involved in HyFlex teaching have used digital technologies for three years or less, accounting for 54% of the respondents. Teachers with more years of experience using digital technologies demonstrate higher levels of digital competence, literacy, and technology integration.

Teachers generally have a very positive perception of their attitudes toward digital technologies in the context of HyFlex teaching. The mean scores for all indicators related to their attitudes towards digital technologies are above 3, indicating favorable perceptions. Teachers feel particularly confident and comfortable working with computers and technical equipment, using the Internet extensively and competently, and being open to exploring new apps, programs, and resources. These aspects received the highest mean scores, suggesting a high level of competence and willingness to use digital technologies for teaching. While teachers' perception regarding membership in various social networks related to HyFlex teaching received a relatively lower mean score, it is still above 3, indicating a positive perception in this area.

The study shows a strong positive correlation between the years teachers have used digital technologies and their self-perceived ease of working with computers and technical equipment in a HyFlex teaching environment. This suggests that more experienced teachers are more comfortable and proficient in using technology. However, there is no significant correlation between teachers' years of experience and self-perceived competence in using the Internet, their openness to new apps and resources, or their involvement in social networks related to HyFlex teaching. This suggests that more than years of experience might be needed in technology integration. The high mean scores and positive correlations between teachers' attitudes and institutional support for integrating digital technologies in HyFlex teaching indicate that the support provided by educational institutions is essential in promoting technology integration.

These findings highlight the importance of continuous support, professional development opportunities, and access to technical resources to enhance teachers' digital competence and foster a technology-enabled teaching and learning environment in HyFlex settings.

RECOMMENDATIONS

Based on the conclusions drawn from the study, the following recommendations were made to support teachers in HyFlex teaching.

Provide ongoing professional development opportunities for teachers to enhance their digital competence and familiarity with various digital tools and resources. Workshops, training sessions, and webinars can be organized to help teachers become more proficient in using technology effectively in their teaching practices.

Establish mentorship programs where experienced teachers can support and guide their less experienced colleagues in integrating technology into their teaching. This can help create a collaborative and supportive learning environment for sharing knowledge and best practices.

Ensure that educational institutions provide a supportive environment for technology integration. This includes providing access to necessary hardware and software, technical support, and allocating resources for updating and maintaining digital infrastructure.

Encourage teachers to collaborate and share their experiences with technology integration through social networks and online communities. This can foster a culture of sharing and continuous improvement and provide opportunities for networking and learning from peers.

Teachers' Perception, Attitude, and Work Environment Readiness towards Digital Technologies in Post-Pandemic HyFlex Teaching

Recognize teachers' preferences and comfort levels with technology. Offer a range of technological devices and web-based applications to cater to teachers' diverse needs and preferences in HyFlex teaching.

Encourage teachers to adopt inclusive teaching practices that promote student engagement and active participation. This can be achieved through interactive technologies, group work, and discussions, which align with the preferences of female teachers. Provide support and resources for teachers to incorporate technology into assessment methods. This can include using digital tools for quizzes, online exams, and digital portfolios to assess student learning effectively.

Identify and address any barriers to technology integration, such as lack of technical skills, inadequate resources, or resistance to change. Regularly gather feedback from teachers to understand their needs and challenges and take appropriate actions to overcome them.

Encourage teachers to stay updated with the latest trends and advancements in educational technology. This can help them make informed decisions about incorporating new and emerging technologies into their teaching practices. Ensure that the support and resources provided for technology integration are sustained over the long term. Continuous support is essential to build teachers' confidence and competence in using technology effectively in HyFlex teaching.

By implementing these recommendations, educational institutions can create a technology-enabled teaching and learning environment that promotes engagement, collaboration, and practical learning experiences for teachers and students in the HyFlex setting.

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